AN EMPIRICAL STUDY ON ONLINE TEACHING AND LEARNING IN HIGHER EDUCATION IN MAHARASHTRA

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Abstract

A paradigm shift has occurred in every facet of human existence as a consequence of the worldwide spread of the COVID-19 pandemic. Overnight, every aspect of human existence underwent a profound shift, starting with the fundamentals. In a matter of a few short hours, phrases such as homestays, quarantine, and curfews enter common parlance. The education sector was similarly impacted, along with the rest of the economy's sectors. The pandemic caused Students' ability to learn, especially in higher education, to be impacted by the Coronavirus. There was no other choice than to go to learn by using available online lecture platforms. The survey aims to collect data on how students feel about these online courses. Recently, there has been a rise in the popularity of concepts like "online education," "virtual learning," and "online exams in the comfort of one's own home. Like any other learning method, online schooling has advantages and disadvantages. This article aims to shed light on many aspects of online learning. As a result of the pandemic, the newly implemented education policy revisions for the academic year 2020 have been met with significant problems. The Ministry of Education has been working toward changing the educational system by implementing several different reforms. Academics have researched to investigate the gaps and difficulties in online teaching and learning outcomes. This study paper focuses on the improvements that have resulted from using online instruction. There have been numerous advancements, and research that KPMG India just published indicates that the market for online education in Maharashtra is likely to have a phenomenal boom that is equivalent to an increase of eight times during the next three years.

Keywords: Online Teaching, Online Learning, Higher Education, Survey, Online Exams, Online Education Market

1. INTRODUCTION

In March 2020 saw the arrival of the Republic of India's regular visitors. It turned out to be nothing more than a microscopic virus that originated in China and caused a complete and total standstill to the whole planet, including India. On March 18th, the Central Board of Secondary Education (CBSE) issued amended criteria for test centers. This involves keeping a gap of at least one meter between students taking the test and ensuring the number of students in the class is less than 24. If the test centers have rooms that are on the tiny side, the pupils should be split up and required to sit in various rooms. The CBSE and JEE main exams were postponed on March 19 and will now take place on March 31, 2020. [3]

The Maharashtra government canceled the tests for classes 1 through 8 on March 20. As a result, the pupils were advanced to the next grade level. However, the examinations for classes 9 and 11 were postponed till April 15th. The Madhya Pradesh Board of Secondary Education decided to postpone the board examinations for classes 10 and 12, and it gave instructions to school principals to decide whether or not pupils in classes 5 through 8 should be promoted or held back depending on their performance in prior terms. The state examinations for students in Kerala's 10th and 12th grades have been delayed. The government of Assam has decided to

postpone the examinations till March 31. The Union Public Service Commission has also postponed the interview phase of the 2019 Civil Services Exam, which was originally planned for March 23rd to April 3rd. The Secondary School Certificate examinations that were scheduled for Tamil Nadu and Pondicherry on April 15, 2020, have been postponed [4].

According to statistics provided by the Union Health Ministry, India's Covid-19 caseload increased to 10,558,710 on Sunday, January 17, 2021, with 15,144 new infections. At the same time, the number of recoveries increased to 10,196,885, bringing the national recovery rate up to 96.58 percent. According to the statistics provided by World Meter, the nation is still the second most impacted in the world and ranks thirteenth among the worst-wit countries in terms of the number of current cases.

Throughout the whole of this cautionary story about Covid 19, the education sector gradually but steadily transformed into the industry of virtual online education. The whole educational system was shifted to an online format, beginning with pre-primary and continuing through higher education.

1.1 What exactly is meant by "online education"?

Today, the influenza pandemic caused by virus 19 is generating a lot of issues all across the globe. Because of the lockdown and the Janta curfew, getting an education outside of the house has become impossible. During this period, educators from a wide variety of schools and colleges around the nation began instructing students over the Internet. Mobile applications like Skype, WhatsApp, Zoom Video, and others like them are becoming more popular as online educational resources. Students can get instruction via a laptop or mobile device while sitting at their study table in the comfort of their own homes [5].

1.2 Benefits of online learning

A new type of contemporary education might be termed online education. In this scenario, students do not have to take up seats in front of the college or school board since they are free to move about and speak with their instructors' using computers from the comfort of their own homes.[6] The student is expected to have access to a reliable internet connection as well as a computer, mobile device, or laptop to participate in this instruction. Students preparing for college, school, or a competitive test may now learn to prepare for these exams without leaving their homes and attending traditional coaching programs [7]. Academic training for a student who lives far from their institution or school, this education reduces the amount of time and money spent on travel. Students who have the ambition to study in a foreign country but do not have a stable financial condition have profited from receiving this education. The flexibility of online education allows us to schedule our lectures at the most convenient times for us.

1.3 Disadvantages of online education

Spending less time and money on education thanks to online options. On the other hand, it is stated that every coin has two faces. The same is true for education obtained online. In the same manner that it has certain benefits, it is also plagued by a great number of drawbacks and drawbacks. There are still many rural areas in our nation that do not have access to the internet,

and even in the little towns that do have it, the connection speed and quality may vary greatly. The appropriate network was necessary for online learning. The absence of networks and energy in rural areas may cause a variety of issues, including voice loss, video interruption, and video interruption [8].

1.4 Survey of online education in Maharashtra

Even though the state education department in Maharashtra has started providing digital learning material to students attending government and aided schools across the state, only fifty percent of kids enrolled in classes one through eight at government schools in Maharashtra have access to online education, according to research. The Maharashtra State Council of Educational Research and Training (MSCERT) and the United Nations Children's Fund (UNICEF) conducted the research for this study [9]. The results of the poll indicate that around 59.8% of the student population has access to cell phones, and approximately 57% of the student population has an internet connection. Thirty percent of students are using the Diksha app, the state's digital hub for educational content and related web media. The survey found that 72.2% of inaccessible parents lacked basic digital literacy and that 66.4% of households lacked access to smartphones. The percentage of material available on personal computers (such as desktops and laptops) is quite low. Five-hundred-and-fifty percent of those with access to digital learning have made use of it. Access to urban and rural areas, children with special needs, and socioeconomic status were shown to be significantly different from one another, but not between the sexes. Even though there is no discernible difference between males and females, there is a major disparity in the following areas: 34% relied on digital resources and television for education, followed by 26% who attended online courses and 10% who listened to the radio [10].

1. In recent years, the field of education has witnessed a significant transformation with the emergence and widespread adoption of online teaching and learning platforms. The advent of digital technologies has revolutionized the way knowledge is imparted and acquired, particularly in higher education institutions. This empirical study focuses on examining the impact and effectiveness of online teaching and learning in the context of Maharashtra, India.

2. Maharashtra, being one of the largest and most populous states in India, is home to numerous higher education institutions catering to a diverse student population. The COVID-19 pandemic further accelerated the adoption of online teaching and learning methods as traditional classroom settings became restricted due to social distancing measures. This transition to online education brought both opportunities and challenges, necessitating a comprehensive assessment of the online learning environment in the state.

3. The purpose of this empirical study is to evaluate the various aspects of online teaching and learning in higher education in Maharashtra. It aims to gather empirical evidence to understand the impact of online education on student engagement, learning outcomes, pedagogical approaches, technological infrastructure, and the overall effectiveness of the online learning environment. By conducting this study, we seek to provide valuable

insights to educational policymakers, administrators, and instructors to enhance the quality and delivery of online education in Maharashtra.

4. To achieve our objectives, we will employ a mixed-methods research approach, combining both qualitative and quantitative data collection methods. Surveys, interviews, and observations will be conducted to gather information from students, teachers, and administrators in higher education institutions across Maharashtra. The data collected will be analyzed using statistical techniques and thematic analysis to identify patterns, trends, and significant findings.

5. The findings of this empirical study are expected to contribute to the existing body of knowledge on online teaching and learning in higher education. It will shed light on the effectiveness of online education, identify the strengths and weaknesses of the current online learning environment in Maharashtra, and suggest strategies for improvement. The insights gained from this study will be invaluable for educational institutions and policymakers in Maharashtra, as they navigate the challenges and opportunities presented by online education.

In conclusion, this empirical study on online teaching and learning in higher education in Maharashtra seeks to provide a comprehensive assessment of the online learning environment in the state. By examining the impact and effectiveness of online education, we aim to generate valuable insights to enhance the quality and delivery of online education in Maharashtra. Ultimately, this study aims to contribute to the ongoing evolution of higher education in the digital age and facilitate the creation of effective and engaging online learning experiences for students.

LITERATURE REVIEW

Muthuprasad T, et al (2021) emphasized that most students see online learning favorably because of the advantages it offers them. To maximize the learning experience, the students also needed some interactive sessions, such as quizzes and assignments, at the conclusion of each lesson.

Faizul Nisha and V. Senthil (2015) stated that Massive Online Open Courses are online education with the potential of the future for today's distance education. Because of Massive Online Open Courses education has become easily available at any time to anyone and anywhere and has improved students' life by providing excellent education at flexible times.

Indrajit Bhattacharya and Kunal Sharma (2007) puts across a strong case for online education in building up human resources capacities and capabilities. The paper advises heavy investments at a higher education level in ICT at the institutional level to improve human resources for a developing nation like India.

Ansari and Jilani (2008) examined Delhi University students' gender ratio, search engines, goals, and concerns. Internet services and student views on replacing libraries. Postgraduates (62%), undergraduates (32%), and research scholars (6%) answered 100 questions. According

to studies, most internet users spent 1-2 hours online every day and used Internet Explorer. Students and researchers utilized the internet for academics and tests. Trial-and-error and friend guidance taught respondents internet skills. Internet speed was the biggest complaint. Many respondents found the Internet more informative, cheaper, and quicker than conventional resources.

Deepa and Ghatak (2013) evaluated email users' netiquette. 25-item Likert questionnaires gathered data. Population, etc. 250 persons from banks, software companies, HR outsourcing organizations, and private and public schools were surveyed. To collect data, researchers set quotas by organization, position, age, qualification, etc. The study analyzed netiquette variables. Qualification, work type, and income influenced netiquette. Researchers suggested academics organize seminars and training sessions on email communication best practices.

Beetham (2015) identified six digital competencies from over 60 projects, publications, and websites. The researcher concluded the six digital abilities showed higher education's digital competency. The competence covers digital invention, scholarship, creativity, communication, collaboration, participation, learning and personal/professional progress, and digital identity and well-being. This strategy required ICT competence to access all five sections. Information, media, and data literacy are necessary, but digital innovation, research, and invention are creative. Digital identity and well-being, the sixth aspect of the framework, is at the top of the pyramid model of digital behaviors. Digital communication, cooperation, and engagement include involvement in digital teams, projects, and other online networks. This sixth feature controls online profiles, portfolios, and blogs with safety, ethics, respect, and responsibility, which researchers considered self-actualizing.

1.5 Objective of the Study

1. To have an understanding of the experiences that students have had with online education in Maharashtra.

2. To investigate the number of hours that are spent participating in online education as well as the technology that is used for this participation.

3. To determine the institutional assistance that is offered to students so that they may participate in online education.

METHOD OF STUDY

After securing consent from the relevant authorities, a cross-sectional study was conducted. A study questionnaire was designed after a thorough examination of the pros and cons of existing studies on the topic of online lecture delivery and after consultation with both students and instructors about the difficulties they face. The Google form used for the survey has 20 questions in total. Following are the broad classes into which the questions fell: details on the user's demographics (age, grade, institution attended, kind of device used for courses, access to the internet, etc.); On a 5-point Likert scale, where 5 is "excellent," 4 is "above average," 3 is "average," 2 is "below average," and 1 is "very poor," students were asked five questions on

their impressions of the faculty's approach to the course material and their confidence after participating in the online courses. Students were asked 6 questions on how they felt the professor handled the topic in class and 5 questions about how they felt they were taught.

The research was carried out in 2020 between November and December. There is no research period since the program was a single point of contention.

1.6 Statistical Analysis

Excel was used to input the data. Descriptive statistics expressed as percentages were utilized to analyze the demographic information as well as information about the tool used to participate in online courses. Percentages, averages, and standard deviations were calculated independently for dental and medical schools for the Likert scale perception items. Data on time spent online for assignments and time spent watching online lectures were analyzed using descriptive statistics. Analysis of free-form responses and suggestions was performed using data collected from medical and dental schools.

Table 1: Shows the n (percentage) age distribution of the student body

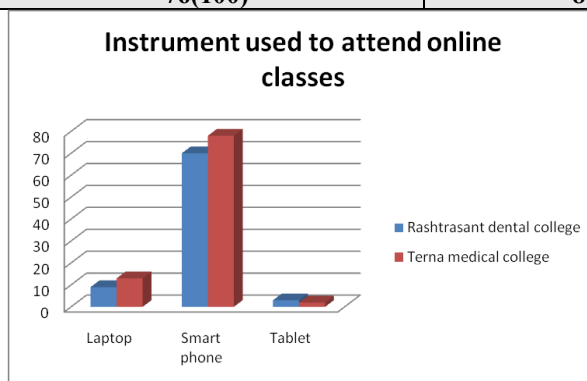| Age in years	Rashtrasant Dental College N (%)	Terna Medical College N (%)
18	6(7.8)	1(1.1)
19	31(50.4)	28(31.1)
20	26(30.1)	24(25.7)
21	9(11.6)	22(24.5)
22	3(1.0)	6(6.7)
23	1	3(11.2)
TOTAL	**76(100)**	**84(100)**

Figure 1: For A Breakdown of How People Access Their Online Courses

Online live course management: This online live course is taught in one class composed of all the students in the same grade, using the innovative "on-site classroom-style" live broadcast method, creating a sense of presence through various ways: the teacher is in formal attire, back to school, entering the classroom and standing on the platform. In order to ensure the quality of the live broadcast courses, the school formulated the Guanghua School of Stomatology 2020 "starting school without returning to school" undergraduate teaching work plan during epidemic prevention and control, and carried out the "Guanghua Internet Celebrity Teachers"

selection activity to inspire teachers; each class was broadcast live in the lecture hall of the college equipped with the professional facility and also must have a teaching assistant resident on the teaching site and teaching platform to supervise students' attendance and learning effect at any time; the school also convened teachers and research ocers from each educating department for network collective lesson preparation and trial lectures, model lectures and teaching classes observation. In addition, on-site and/or online supervision is arranged for each class. Supervisors include college leaders, teaching supervisors, teaching management staff, multiple directors of educating department and deans. Other colleagues can also silently enter the online classroom to listen to classes at any time.\

The vast majority of teachers would study course standards and textbooks, and relevant materials outside the textbooks, conduct course design, write teaching plans, and prepare online live lessons. The number of teachers participating in lectures rehearsal was significantly higher than that offline course (Fig. 3).

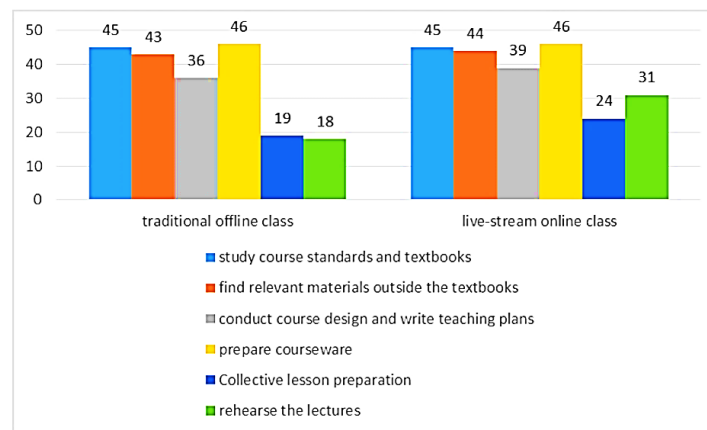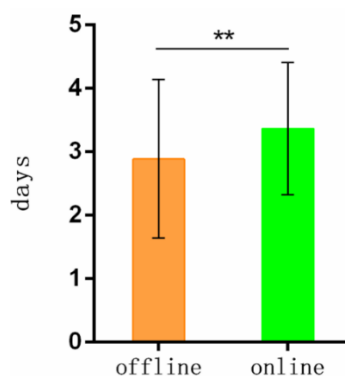**Figure 2: Survey on Students' Satisfaction**

Figure 3: Analysis of Online and Offline Course Preparation Content

Moreover, it took more time to prepare for online courses: to prepare two-hour courses, for online courses 30% teachers needed 6–10 days and 30% teachers needed more than 10 days while as for online courses 26% teachers needed 6–10 days to prepare lessons, and 48%

teachers needed more than 10 days to prepare, showing that teachers are more cautious about live broadcast lessons (Fig. 4).

Figure 4: Analysis of online and offline course preparation time (**p<0.01)
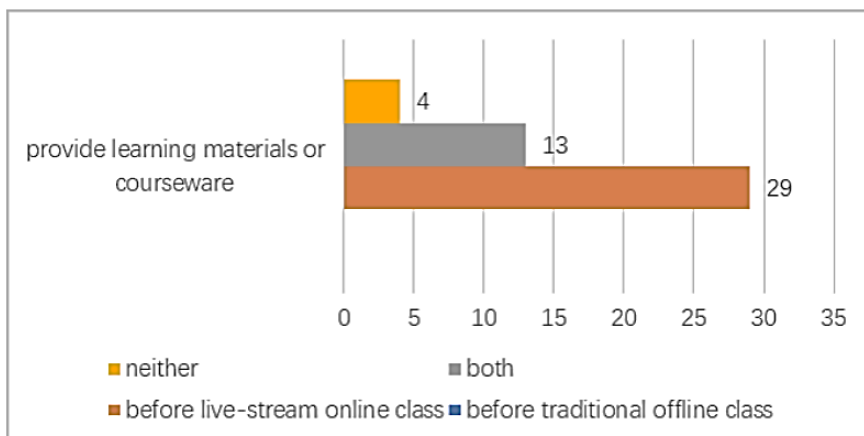
In addition, in order to facilitate students' preview and review, up to 63% teachers will provide learning materials to students before online live classes, and 28% teachers will send learning materials to students in both online live classes and offline classes (Fig. 5).

Correspondingly (gure not shown), students also believed that the teachers of the "online" live-streaming courses attach more importance to the courses, and they were more satisfied with the learning materials such as courseware obtained before the online courses than the offline ones, and 91.18% of the students believed that the recording and playback of online live lessons was useful for learning. The enthusiasm of the students in the online live class was the same as the traditional offline class. No matter what kind of teaching method, the teacher's teaching content was both closely integrated with the outline; and also there is no difference between the two courses with the regard to the difficulty to grasp the main points, the enthusiasm of the answer questions in class, and the situation of getting the teacher's answers and guidance in time after class.

Extracurricular activities and their place in students' lives

Schools are increasingly prioritizing both academic and extracurricular activities. Students were also aware of the significance of extracurricular activities in terms of cultivating their personal brand and advancing their professional careers. Students' conduct has been negatively impacted by a lack of outdoor activities during this pandemic era. Because of this, the researcher wants to know how students feel about ECA taking a backseat during the epidemic. For the perception of students on extracurricular activities, we performed a descriptive analysis and a t-test, as shown in Table 5.

Table 2: Descriptive Analysis of Students' Perception on Co-Curricular Activities

Statements	Mean	SD	t value	P value
Co-curricular activities Individual games will be preferred over team sports	3.45	1.03	8.10	< 0.001**
Co-curricular activities such as debating, discussions, performances, and literary competitions will be shifted completely to online medium	3.29	1.16	4.67	< 0.001**
Activities like annual functions will take a backseat	3.53	1.20	8.20	< 0.001**
Virtual tours will replace excursions and school picnics	3.28	1.27	4.05	< 0.001**
Overall	3.38	0.87		

Individual games will be favoured over team sports (M=3.45) and activities like debate, discussion, and performances will be relocated entirely to the internet media (M=3.29), according to Table 5. Annual functions, which have the highest mean value of 3.53 with a standard deviation of 1.20, will be replaced with virtual tours, while field trips and school picnics, which have the lowest mean value of 3.28 with a standard deviation of 1.27, will be phased out. Students' perceptions of co-curricular activities differ considerably from their peers', according to a p-value of less than 0.001 in this study. According to the general mean and standard deviation of 3.45 1.25, School students have a positive outlook on education and learning in the classroom.

Perceptions of appraisal among students

During the pandemic, assessments and evaluations emerged online, however the accuracy of online evaluation is often questioned. Some students may find the online evaluation procedure inconvenient, but others may find it simple (Ramesh, 2020). Because of this, it is critical to examine students' views on the evaluation method. Descriptive and t-test results for students' evaluative perceptions are shown in Table 6.

Table 3: Descriptive Analysis of Students' Perception on Evaluation

Statement on evaluation	Mean	SD	t value	P value
Offline exams will be replaced by online tests as these are more convenient to attempt	3.73	1.08	12.41	< 0.001**
Open-book tests are an effective way of evaluating the students as there are no issues of cheating	3.84	1.05	14.76	< 0.001**
Online assignments will be preferred because they increase punctuality in schoolwork submission	3.95	1.01	17.53	< 0.001**
Overall	3.83	0.81		

School students (M=3.95) and teachers (M=3.73) in Table 6 agreed that online assignments would be favoured because they encourage on-time submission of coursework and that offline exams would be replaced with online assessments. Because of the lack of cheating, School students generally feel that open-book exams are an effective method of assessing students. We can infer from the fact that p 0.001 that the mean of students' assessment perceptions differs significantly from the average of students' evaluation perceptions. This suggests that School students have a favourable attitude regarding the evaluation system in the post-COVID-19 period.

Perception of the School and administration by students

Students' perceptions of the School and administration are critical to their learning behaviour, hence it is important to conduct an analysis of their perceptions. Table 7 shows how students feel about the university and its HIGHER SECONDARY Education Sector.

Table 4: Descriptive Analysis of Students' Perception on School and Administration

Statement on School and administration	Mean	SD	t value	P value
Students and School administration will be more cautious of sanitation	3.91	.95	17.85	< 0.001**
School timings (School hours) will be reduced	3.91	1.04	16.09	< 0.001**
School will include protective gear such as masks and gloves as part of their compulsory uniform	4.07	.92	21.31	< 0.001**
Private transports will be preferred over School transports for the commute	3.84	.96	16.14	< 0.001**
The teacher-student ratio will decrease in classes to UP hold social distancing guidelines	3.87	.98	16.34	< 0.001**
I feel comfortable in this School	3.92	1.02	16.72	< 0.001**
Students are accepting of each other in this School	3.87	.96	16.60	< 0.001**
School treats students fairly in post-COVID-19	3.86	1.00	15.76	< 0.001**
Overall	3.87	0.71		

That the School Higher Secondary education sector will be more careful about sanitation and school schedules was shown in Table 7 (M=3.91). According to the article, School students are in agreement that safety gear like masks and gloves would be required as part of the required uniform. M=3.84 and a lower student-teacher ratio in the classroom were also agreed upon by School students (M=3.84 and a lower student-teacher ratio were also agreed upon by School students). Since $p < 0.001$, we may conclude that the mean of perceptions of students on School and administration is considerably different than the average perceptions of online class of the students. Post-COVID, the aggregate mean and standard deviation is 3.870.71, which suggests that School students have a positive view of their institution and administration.

Students' perception towards teachers

As role models for their charges, teachers play a critical role in shaping their charges' social and behavioural norms. Teacher's action and demeanour in the class directly impact the level of motivation to learn among School students (van Wyk 2020). (Van Wyk 2020). Students' perceptions of teachers are summarised in Table 8 by a descriptive analysis and a t-test.

Table 5: Descriptive Analysis of Students' Perception on Teachers

Statement on perception of students on teachers	Mean	SD	t-value	P value
We get assignments from the subject which we study at present from our teachers	4.11	.81	25.56	< 0.001**
Our teacher teaches us to learn new things using our already learnt concept	3.96	.86	20.81	<0.001**
Our teachers use a variety of resources to conduct classroom activities	3.59	1.00	10.95	<.001**
Our teachers encourage us to look at the problems from a new perspective and to find the optimal solution	3.79	.99	14.89	<0.001**
Overall	3.63	0.75		

Table 8 reveals that School students strongly agree (M = 4.11) that they receive assignments from their teachers related to the subject they are currently studying, and they also agreed (M = 3.96) that their teachers help them to implicate what they learn and how it can be used for learning in new directions. Most students (M=3.59) agreed that teachers employ a range of tools to carry out classroom activities, and they also believed that teachers inspire their pupils to think positively and come up with creative solutions to issues (M=3.79). Students' impressions of co-curricular activities differ considerably from their peers' opinions of co-curricular activities, according to a p 0.001 statistical significance level. School students had a favourable view of their teachers, with an overall mean of 3.63 and a standard deviation of 0.75.

Based on those numbers, we know that the null hypothesis that says both face-to-face and online education necessitate equal preparation on the part of students and teachers is wrong. The t value is -2.01, and the p value produced for the test is less than.05. A hypothesis that suggested that online and face-to-face education does not require equal preparedness on the side of the learner and teachers can be accepted in this situation.

6. CONCLUSION

The empirical study on online teaching and learning in higher education in Maharashtra has provided valuable insights into the impact and effectiveness of online education in the state. Through a mixed-methods research approach, combining qualitative and quantitative data collection methods, the study has shed light on various aspects of the online learning environment.

The findings of the study indicate that online teaching and learning have become an integral part of higher education in Maharashtra, particularly accelerated by the COVID-19 pandemic. The transition to online education has presented both opportunities and challenges. On the positive side, online education has provided flexibility in terms of time and location, enabling students to access education remotely. It has also facilitated the integration of innovative pedagogical approaches, such as multimedia resources, interactive learning platforms, and collaborative tools, enhancing student engagement and participation.

However, the study also highlights certain challenges associated with online education. Issues related to technological infrastructure, access to devices and reliable internet connectivity, and digital literacy have been identified as barriers to effective online learning. Moreover, some students and educators have reported difficulties in maintaining motivation, personal connections, and a sense of community in the online learning environment.

Based on the empirical evidence gathered, it is evident that there is a need for continuous improvement and enhancement of the online learning environment in Maharashtra. Policymakers, educational administrators, and institutions should focus on addressing the identified challenges and maximizing the benefits of online education. Efforts should be directed towards improving technological infrastructure, ensuring equitable access to devices and internet connectivity, and providing comprehensive support and training to students and

educators in utilizing online learning platforms effectively.

Furthermore, the study suggests that pedagogical strategies need to be tailored to the online environment. Educators should employ active learning techniques, foster collaborative learning experiences, and incorporate interactive and engaging multimedia resources to enhance student motivation and learning outcomes. Building a strong sense of community and facilitating communication and interaction among students and instructors are crucial elements to foster a conducive online learning environment.

In conclusion, the empirical study on online teaching and learning in higher education in Maharashtra provides a comprehensive understanding of the opportunities, challenges, and recommendations for improving the online learning environment. By acknowledging the strengths and weaknesses of online education and implementing the suggested strategies, Maharashtra can leverage the potential of online teaching and learning to enhance the quality, accessibility, and effectiveness of higher education in the state. This study serves as a foundation for further research and the continuous evolution of online education in Maharashtra and beyond.

References

1. Muthuprasad, T., Aiswarya, S., Aditya, K. S., & Jha, G. K. (2021). Students' perception and preference for online education in India during Covid-19 pandemic. Social Sciences & Humanities Open, Volume 3, Issue 1, 100101

2. Wikipedia.org. (2020). Covid-19 pandemic in India. Retrieved from Wikipedia.org: https://en.wikipedia.org/wiki/Covid-19_pandemic_in_India#Education

3. Educationasia. in. (2020). Effect of Coronavirus in Indian Education System. Retrieved January 2020, from educational.in: https://educationasia.in/article/effect-of-coronavirus-in-indian-education-system

4. Wikipedia.org. (n.d.). Covid-19 pandemic in India. Retrieved and, from wikipedia.org: https://en.wikipedia.org/wiki/Covid-19_pandemic_in_India,

5. Research Paper Astronomy E-ISSN No: 2454-9916 | Volume: 3 | Issue: 8 | Aug 2017.

6. Paudel, P. 2021. Online education: Benefits, challenges and strategies during and after COVID-19 in higher education. International Journal on Studies in Education (IJonSE).

7. https://indianexpress.com/article/cities/mumbai/maharashtra-only-half-of-students-in-state-have-access-to-onlinelearning-finds-survey-6515552/ Hindustan Times, Mumbai ByAnkitaBhatkhande.

8. Introduction to Online Teaching and Learning Joshua Stern, Ph.D. online education sites.https://www.loksatta.com/desh-videsh/online-education-how-many-students-study-online-shocking-statisticsgst-97-2587636/

9. Moazami F, Bahrampour E, Azar MR, Jahedi F, Moattari M. Comparing two methods of education (virtual versus traditional) on learning of Iranian dental students: a post-test only design study. BMC Med Educ. 2014; 14:45.

10. Zehry K, Halder N, Theodosiou L. E-Learning in medical education in the United Kingdom. Procedia -Social and Behav Sci. 2011; 15:3163-7.

11. Fidalgo P, Thormann J, Kulyk, O. Students' perceptions on distance education: A multinational study. Int J Educ Technol High Educ. 2020; 17:18.

12. McGee JB, Neill J, Goldman L, Casey E. Using multimedia virtual patients to enhance the clinical curriculum for medical students. Stud Health Technol Inform. 1998; 52(2):732-5.

13. Baczek M, Zaganczyk-Baczek M, Szpringer M, Jaroszynski A, Wozakowska-Kapłon B. Students' perception of online learning during the Covid-19 pandemic: a survey study of Polish medical students. Medicine. 2021; 100(7):e24821.

14. Golchai B, Nazari N, Hassani F, Bahadori MH. Computer-based E-teaching (Virtual Medical Teaching) or Traditional Teaching: A Comparison BetweenMedical and Dentistry Students. Procedia -Social and Behav Sci. 2012; 47:2080-3.

15. Jiang Z, Wu H, Cheng H, Wang W, Xie A, Fitzgerald SR. Twelve tips for teaching medical students online under Covid-19. Med Educ Online. 2021; 26 :(1):1854066.

16. O'Doherty D, Dromey M, Lougheed J. Barriers and solutions to online learning in medical education –an integrative review. BMC Med Educ. 2018;18:130