Analytical Study on Student Progression in Higher Education During and Post COVID-19

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Abstract

The sudden outbreak of the COVID-19 pandemic forced the education sector to extensively use digital technologies in imparting education and in students' assessment. The integration of Information and Communication Technologies (ICT) has been put to the test. With the use of ICT, flexible education is an upcoming option to assist uniform, accessible, and innovative educational systems. While learning in such a covid scenario technical constraints, use of appropriate devices, uninterrupted network and bandwidth have created challenges in student progression and the teaching-learning process. The goal of this research is to determine the impact of digital technology on student growth and to investigate the factors that influence it. The usage of digital technology in teaching/learning before and amidst the spread of pandemic have been compared to appropriately assess the implications of these unique educational circumstances in student progression. The study's goal is to determine how digital technology affects student performance. Secondary data was used in conjunction with survey methods. Researchers have also studied the various platforms used in imparting education as well as in assessment. A questionnaire with self-reporting instruments and a scale for describing student progress through continuous evaluation with ICT was used. Evidence from secondary data reveals that despite facing many challenges during covid, students have shown considerable improvements and progress. Though the exams used artificial intelligence-based algorithms for proctoring, there exist loopholes and huge dependency on tools required and bandwidth to support efficient assessment during the examination. The suggestions and recommendations are made to enhance current online teaching methods to reach a larger number of students and to enrich the teaching/learning experience to ensure better student progression.

Keywords: student progression, tools, online education, COVID-19 pandemic, assessment

Introduction

The COVID-19 pandemic majorly affected all areas of society and so the education ecosystem. To combat the spread of COVID-19, governments around the world stopped face-to-face instruction in all educational institutions and started imparting virtual education —the biggest disruption in education history. Online-based solutions for teaching have been challenging to implement by schools, institutions, and teachers. The COVID-19 pandemic has compelled all learners around the world to rely exclusively on online distance learning.

Offline education before pandemic had more student-teacher and student-student interaction. This had led to higher levels of engagement among them (Fadhilah et al., 2021), leading to more understanding of the subject for students. New patterns of behavior evolve via direct interactions with peers or from observing peers' actions, according to Sociocultural Theory with the learning aspect. (Martin & Guerrero, 2020).

Online education initially started with sharing notes over email, social media platforms, and eventually usage of various videoconferencing tools to impart education. Teachers have begun to use web-based learning platforms to promote self-directed learning and assessment over the last decade. By offering both synchronous and asynchronous learning options, online education allows for the constant engagement of many learners (where lectures may not be possible). (Sinclair P, Kable A, Levett-Jones T.,2015)

Web-based or online digital learning tools included everything from instructional content that students could explore at their leisure to formalized learning programs that they could finish at their own pace, as

well as real-time lessons led by their teachers via virtual meeting platforms. Comparative analysis of online learning tools has been studied by the researcher to understand the learning experience. After the extensive use of these tools, educators can evaluate these tools and find the problems related to it.

During the COVID-19 pandemic, researchers focused on analyzing and developing the online examination experience. This study investigates students' opinions and concerns Using an e-proctoring tool in their final exams. It also emphasizes the impact of e-tools on student performance, as well as student satisfaction with the tool to lead educational institutions toward suitable practices in the future, especially given the pandemic's predicted global impact. In this paper, an attempt has been made to conduct surveys through forms by collecting opinions from various stakeholders viz., academicians, and students within the educational institutes in India.

Literature Review
● Digital Tools
The use of Online tools for teaching-learning has increased over the period. These tools were used for the assessment /evaluation of the students.

Platforms for video conferencing have become an important aspect of online education. (García et al., 2019) The teaching-learning process went on as usual, but it was moved to a new era of virtual and online learning. In the face of the pandemic, this new era of teaching-learning incorporates a wide range of innovative teaching-learning techniques that have filled the void left by traditional teaching. Various technological behemoths have presented a slew of technology-driven novel teaching-learning solutions to help all aspects of the teaching-learning process. (N. Upadhyaya et al., 2022)

The academic assistance tools were well received by student teachers, who saw them as useful in their online learning, especially in the developed countries where there was very good infrastructure and network support. (Van Wyk, 2020) The students and teachers preferred discussion forums as they were able to communicate with stalwarts across the globe and seek best possible solutions to their problems.

The recording option is available with most of the tools. In the event of a connection failure, downloading and sharing the file is extremely beneficial to the students.

Technology-enhanced assessment is frequently associated with on-screen testing or automated scoring and replies to student tests (commonly referred to as 'computer-assisted assessment,' or CAA). Matter of fact, onscreen testing is the most widely used and technologically evolved form, with most questions using multiple-choice questions (MCQs) and automated scoring. On-screen evaluation, which is seen as efficient and more reliable, has been used in office situations for many years and has only recently begun to occur in the education system in the last few years (Winkley, 2010)

The advancement of digital technologies facilitates the transition from traditional learning to learning embedded in our daily lives. Because of the physical location and time factor limitations, students were not able to get an education. E-learning ensures that anyone with a mobile device can access knowledge (Sharma &Alvi, 2021). Now with the internet facility penetrated rural areas, e-learning is available to all strata of the population.

● Student Progression
The literature review was carried out to check what can be the different factors that will affect different groups of students. "Because online courses offer more flexible study hours, a student with a job may prefer to take an online course or a complete online-based degree program. For example, a student with a job could attend the online class after working hours by viewing the instructional film and watching live videos of lectures. (Handy, 2020)."

Student progression is a method of ensuring that all students complete the required courses to graduate. Student grades are assessed at the end of each semester to see if you are earning adequate credits in your course. Any student's life revolves around evaluation. The student's future is determined by the marks he/she receives in the examination.

"Factors Affecting Student Performance: A Case of Private Colleges," recruited 300 students (225 males and 75 females) from several colleges affiliated with Pakistan's Punjab University to carry out a study on student performance. Students' attitudestoward class attendance, hours spent studying every day after college, students' family income, students' mother's age, and their mother's education are all major characteristics associated with student success, according to the research. The author's purpose was to quantify the relationship between the many elements assumed to influence student performance, as well as to demonstrate the impact of those factors on student performance. (Rasul&Bukhsh, 2011)

When determining a student's academic achievement, several factors need to be considered. Previous academic background, regularity, number of backlogs, degree of intelligence, working nature, discipline, social activities, and grade must all be considered when predicting student achievement. When evaluating

student development, information about the student's past understanding of the subject as well as his ability to tackle a question will be critical.

Digital tools play an important role in online education and assessment. In the educational environment, there are numerous digital assessment tools that serve various purposes. Teachers are getting benefited from these tools because these tools will allow them to monitor their students' growth and provide input for improvement in grades. The effectiveness of these tools and their impact need to be found. (Ye et al., 2020)

Based on the findings of these related studies, it has been established that more research into the factors that influence online education from the standpoint of students is required. Many publications have explored the difficulties that students and teachers experience when it comes to studying settings such as equipment, a peaceful area to study, internet connections, and the environment. Researchers have also discussed students' inclination, interest, scores, etc. towards academics. (*Telehealth Devices & Equipment - Vici | InTouch Health*, n.d.)

In a science concepts course for non-STEM majors, there has been no statistically significant difference in grade-wise accomplishments between online and in-person face-to-face classroom students based on modality, gender, or class rank. (Paul & Jefferson, 2019)

If we consider the reliability of the examinations while finding out the impact of end term exams as compared to midterm exams in traditional teaching, final exams have a greater impact. (Yilmaz, 2017)

The integrity of online assessments is one of the key problems for the educational system; that is, there is a problem with the requirement to conduct exams using the appropriate instruments and procedures. Universities have used various e-proctoring tools to supervise online exams in response to the unexpected surge in online distance learning and the necessity to safeguard academic integrity. To prevent cheating, this technology verifies students' identities and indicates unusual activity during the exam. The quick digital shift during the COVID-19 pandemic has been amazing. (Rasul&Bukhsh, 2011)

A primary goal of education is to arouse students' enthusiasm to obtain meaningful learning experiences. Assessments help to find out the student's progression, evaluate achievements and monitor growth. Before we go into the online form of assessment, let's have a look at the various modalities of evaluation available prior to COVID-19. Teachers used to assess students using traditional pen and paper methods, surprise class quizzes, open-book exams, or practical-based evaluations. The offline assessment mode has the advantage of allowing you to check for student wrongdoing. Furthermore, students in offline mode did not have to deal with technical issues, we were able to manage their time, we were able to readily engage with teachers, and were more familiar with the teaching and learning ecosystem. Without a choice at this moment, the only viable option is to use online teaching-learning and examinations. Examples of such commonly used assessment tools are Google Form-based quizzes, Kahoot, WAC (World Assessment Council), Educanon, to name a few.(Handy, 2020)

A variety of online assessment tools are available. It's simple to use and understand. The quiz can be accessed by mobile phones, tablets, laptops, and PCs. Students are free to use whichever gadget they like. Basic versions are available for free. Teachers can save the report card for later use after the evaluation is completed and download it. Also, students can get immediate feedback and outcomes on their performance.

Despite various advantages, the most reported issue is internet connectivity for both instructors and learners in the online manner of teaching, learning, and evaluation. In the basic free version of these tools, only a small number of participants can be accommodated, and only limited facilities are available. Teachers have really no control over student wrongdoing. Because students are unfamiliar with the functions of these instruments, it takes time for them to get comfortable and accustomed to them. Although it has some drawbacks, the positives outweigh the drawbacks. To take the best possible advantage of the internet tools and their features, it is essential to enhance the knowledge of the instructors and students.

Significance of the study

E-learning is a major issue in the world today, especially among young people, because the digital space and social media are the only way to continue with education due to the COVID-19 disease outbreak. It is a very major concern that the distance learning adopted by major students will be the only choice of education left for them. It is critical to provide the same or a similar level of education as was provided in the offline mode of instruction. For both professors and students, switching from traditional face-to-face education to e-learning can be a completely new experience that they must adjust to with few or no other options.

Through various online platforms, the education system and educators have accepted "Education in Emergency" (WHO report), compelling them to use a system for which they were unprepared. Students with fixed exams were also given online, which has an impact on the students' level of knowledge.

Students do not study and instead use the online platform to cheat on exams instead of studying hard and obtaining scores.

Objectives of the Study
After studying and reviewing different research papers and books we identified the following objectives of our study.
1. To conduct a comparative study on different online platforms for teaching, learning, and evaluation.
2. To study the pedagogical changes caused during and post-pandemic.
3. This research analyses the impact of E-learning on the students and the repercussions of the same on the study and knowledge acquired in general.

Comparative analysis of online learning tools
Some of the online platforms used include Microsoft Teams, Google Classroom, and others, which made it easier for educators to create educational courses and deliver lectures. For example, virtual meetings and file storage that includes notes and makes it easier to study. These also offer online assessments by requiring the submission of assigned tasks in pdf format.
Here in this paper researchers have tried to bring about the differences and challenges of different online tools from students' and academicians' perspectives. The previous studies carried were focusing on social, behavioral, and educational parameters. But study related to the impact of technology and digital tools on student progress needs to be addressed more intensely. Researchers have tried to cover maximum parameters related to digital tools.

Based on secondary research data available from different sources like journals, newspapers, and articles a comparative analysis has been done. The findings are as follows:

1. **Zoom**
Zoom allows people to stay connected so that they may do more as a group. Zoom handles everything from meetings, chat, phone calls, and webinars to conference room systems and online events. Our safe, dependable video platform provides a high-quality, easy-to-manage, utilize, and personalized experience.
Zoom offers several handy features to help consumers with their video calling and conferencing needs. Following are the few advantages and disadvantages of Zoom:

Advantages	Disadvantages
Most popular among different stakeholders in different domains Easy to Use and Deploy Wide range of features Breakout rooms to ease discussions in separate groups Screen sharing Platform independent Works even with slow connections	Security - Outsiders' Interference Free subscription offers only 40 minutes of usage with a maximum of 100 participants

Table1: Advantages and Disadvantages of ZOOM

2. **MS Teams**
Microsoft Teams is a purely commercial medium of communication developed by Microsoft and included in the Microsoft 365 suite of products.
Following are the few advantages and disadvantages of MS Teams:

Advantages	Disadvantages
Most popular in the educational ecosystem as the notes, documents are readily available anytime Learning Management System - allows users to be more productive by centralizing all their collaboration– discussions, chats, online meetings, shared files, Assignments, Quizzes, Grades, and tasks– in one place. Breakout rooms to ease discussions in separate groups	System Requirements are Extensive Wide range of features Notifications are missing. Only a few channels are available.

Secured for educational login Easy Implementation Hardware and software limitations aren't an issue. No additional cost for most Microsoft 365 users	

Table2: Advantages and Disadvantages of MS Teams

3. **Google Meet**

Google Meet is a video-communication service created by Google. The following are some of Google Meet's benefits and drawbacks:

Advantages	Disadvantages
The app is useful for talking with clients, friends, and small groups. Easy to use	The app's drawback is that video conferencing is only available if you have a Gmail account.

Table3: Advantages and Disadvantages of Google Meet

Research Methodology

In this study, we present evidence on the pandemic's effect on student progression. The present research will use Secondary data which is available from various books and from articles published regarding the issues related to the impact of online learning on education, online journals available on the web, and online resources of websites as Wikipedia, Google Scholar, etc.

In this study, we used a unique set of data from higher education students and academicians to answer these questions. Data were collected using an electronic questionnaire for exploring factors that affect the acceptance and use of digital tools as a learning platform among the students. Students' perceptions about assessment tools and e-learning platforms were taken. A quantitative study of the survey questions was used to analyze the data.

Overall, 48 students and 85 teachers gave their opinions about e-learning platforms and assessment tools. The study also discusses the difficulties in implementing the e-proctoring technology and its impact on student performance.

After obtaining the data, the researcher evaluated and processed it using software to arrive at certain numbers. Following that, the converted numbers were utilized to make inferences and validate the hypothesis.

Findings

133 participants from higher education located at different locations in Maharashtra India (85 teachers, 48 students,). Teachers and students were from different institutions including postgraduate and undergraduate institutions. At the time of the study, students studying undergraduate programs from BBA (3 years), B. E (4-year course), BA LLB (5 Years), and postgraduate programs MBA (2 years), MCA (2 years) have participated in the survey.

The teachers from different universities and affiliated institutions (state university 4.8%, private university 4.8%, Deemed University52,4%, affiliated Institutes 38.1%) have given their views/opinions on the questions asked through surveys. 60 assistant professors, 8 associate professors, 4 directors of the departments, and 12 Visiting faculty have contributed.

Statements were assessed on a five-point Likert scale to analyze and summarize the perception (five being most satisfied and 1 being the most dissatisfied). To summarize the data, frequency and percentage were calculated for the majority of the questions.

When asked about their experience while using digital tools such as Microsoft teams, Zoom, google meet, etc. Students rated Teams as excellent with Zoom with second ranking.

Students Data	Demographic variables	Percentage
Degree	UG	81.3
	PG	18.8
Sex	Female	45.8

	Male	54.2
Place of Residence	Urban	93.8
	Rural	6.3
Type of Institute	State University	10.4
	Private University	52.1
	Deemed University	14.6
	Affiliated Institute	22.9

Table 4: Demographic data of the students

Students' rating for support and evaluation process		Percentage
Do you get the necessary support	yes	85.4
	no	14.6
Is the evaluation Process fair	Very accurate	12.5
	accurate	37.5
	neutral	35.4
	inaccurate	10.4
	completely inaccurate	4.2

Table5: Students' Percentage rating for support and evaluation process

The majority percentage of students have stated that the evaluation process is accurate. To improve the quality of the evaluation, an appropriate tool for evaluation based on the students' personality and behaviour should be used.
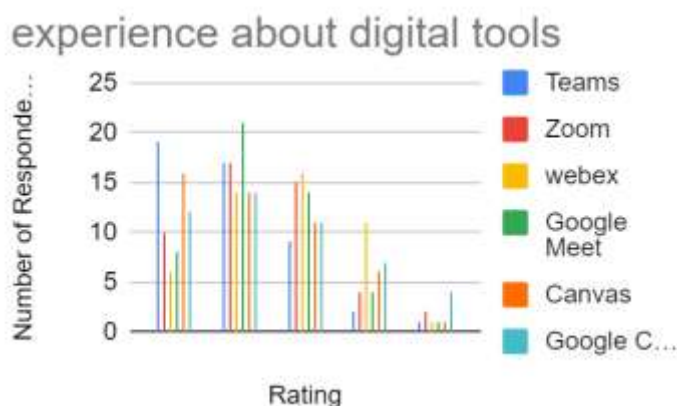

Figure 1: Students' experience with digital tools

Among the respondents, 93.75% have chosen Teams as an excellent tool and 89.58% have chosen Google Meet as the second option while using online tools. When a question was asked about how you would rate the tools on parameters like ease of use, the majority of the respondents 88.19% indicated that the experience is good and they are highly satisfied with the tools, whereas 11.81% of the students were dissatisfied.
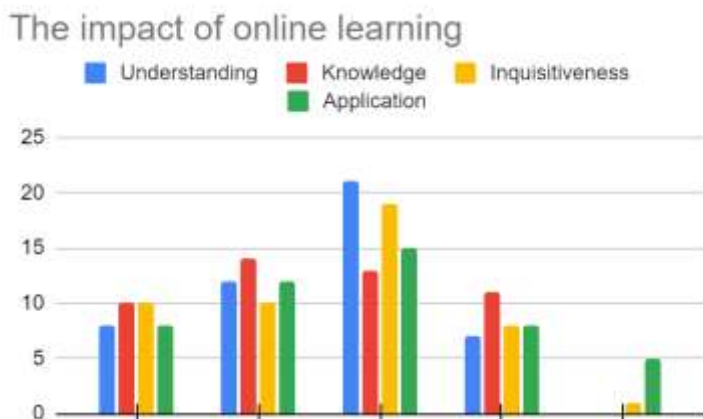
Figure 2: The impact of online learning

Figure 2 shows the impact of online tools on the teaching-learning process. It was evaluated based on understandability, knowledge, inquisitiveness, and application of the knowledge. The percentage of satisfaction is 79.16%. With the graph, we can observe that based on these parameters some changes can be made to improve the rating. Further investigation is required for understanding the reason for the same.
37.5% of students said the online evaluation procedure is accurate. whereas 35,4% have a neutral opinion. More research and study need to be carried out to improvise the evaluation procedure in online mode.
Students' perception of the mode of learning tells us that 47.9% of students are interested in a hybrid model, which is a combination of offline as well as online teaching. 35.4 % of students prefer to learn in offline mode. With this, academicians and university authorities can further decide the mode of the teaching-learning process.
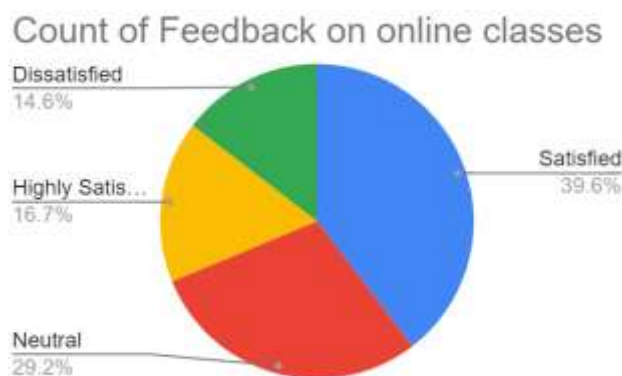

Figure 3: Feedback on Online classes

Figure 3 focuses on the satisfaction of the number of students on online teaching. Students' feedback about online teaching is important and only 16.7 % of students are highly satisfied so the teaching mode, delivery of the contents, tools used, frequency of the assessment, and many parameters need to be studied further for better satisfaction.

60 assistant Professors, 8 associate professors, 4 professors/ Directors, and 12 Visiting faculties have contributed to the survey. 4.8% of teachers from state universities, 52.4% from Deemed universities, 4.8% from private universities, and 38.1% of teachers from affiliated institutes completed the survey. Out of 84 respondents, 60 teachers are teaching MBA, 8 to MCA, and 8 only undergraduate courses.

Figure: 4 Teachers' experience with digital tools

When asked about their experience with teachers about digital tools, 90% of respondents stated their experience in using Webex is good,71% stated that Google meet is at the second level, then 64 % Zoom.
As depicted in figure 5, Easy availability of contentand ease of student control were the topmost chosen parameters by the respondents. Maximum teachers have given good ratings for understanding.
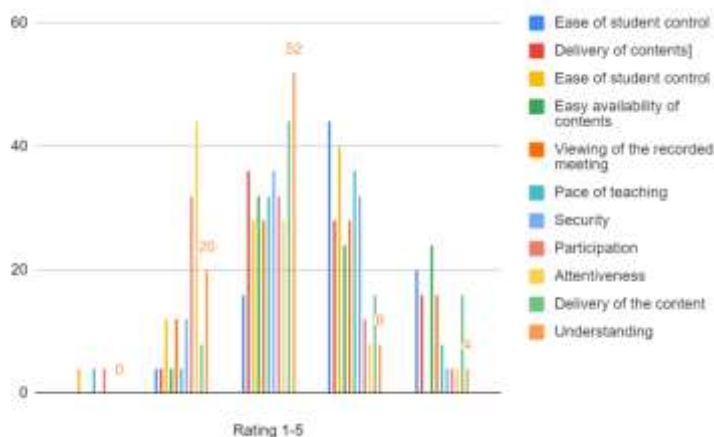

Figure 5: Rating of digital tools based on different parameters.

Factors affectingstudents' preference for online learning tools were studied and the chi-square analysis shows that there is a strong correlation between understanding, and knowledge of canvastools. Other tools are having less significance with these parameters.

Factors that affect students' preference for online learning tools			
	[Microsoft Teams]	[Canvas]	[Google Classroom]
[Understanding]	0.087	0.291	0.004
[Knowledge]	0.064	0.529	0.014
[Inquisitiveness]	0	0	0.027
[Application-oriented / Practical approach]	0.014	0.126	0.133

Table 6: Chi-Square test analysis results for factors affecting students' preference of online learning tools
A Chi-square test was applied to the parameters to find out its correlation with online video conferencing Tools. The results of the test are shown in table 7 below.

Factors that might affect students' preference of online conferencing tools			
	[Zoom]	[WebEx]	[Google Meet]
[Understanding]	0.185	0.006	0.026
[Knowledge]	0.005	0.125	0.002

[Inquisitiveness]	0.078	0	0.002
[Application-oriented/ Practical approach]	0.024	0	0.037
Statistically significant (P ≤ 0.05)			

Table 7: Chi-Square test analysis results for factors affecting students' preference of online video conferencing tools

Open-ended questions were asked to all respondents to point out any specific inputs/ opinions or suggestions for online learning.

Based on the open-ended questions

I.   Academicians' perspective Because of the limitations of the online platforms and the increased screen there is a resistance to the continued usage of online platforms. The limited use can still happen if the following features are included in different tools:
- Inclusion of discussion forum polls to enhance the learning experience
- Interactive sessions are ineffective due to the large number

II.   Students' perspective
One of the main reasons why many students prefer online learning is the independence it affords.
- Improving the digital literacy of both students and teachers is essential.
- Low bandwidth tools must be designed with more security features to take the benefits of online learning.
- Enhanced security features need to be implemented.

Conclusion

During the pandemic-induced lockdown in 2020, many countries were forced to close educational institutions for extended periods of time. Knowing whether learners can fulfil their academic goals in these circumstances, as well as identifying those who are at risk, is important policy information. There is strong evidence that students gained less during lockdown than they could during the traditional teaching approach. This is concerning, especially given the substantially higher losses expected in countries that are less prepared for the pandemic. This research is aimed at the issues and factors that affect the impact of adopting e-learning as a teaching and learning tool on student education during the pandemic. As a result, it will help in the creation of a growth strategy for the successful implementation of E-learning, as well as the technology acceptance as a positive development towards evolution and change. More study is needed to evaluate the effectiveness of such activities and to address the pandemic's long-term effects on student progress. The concern is that their inability to cope with the curriculum in later years will be hampered by a lack of foundational skills, which are the building blocks for subsequent learning. Despite having substantial reservations about the overall experience with e-proctoring technologies, most students performed well on their online tests. Academic integrity and dishonesty appeared to be important to students as well as academicians.

The research aims at how COVID -19 affects students' learning. It concludes that, while various studies have been conducted, in the cases of developing countries, the suitable platform for multiple categories such as university education reveals a need to be analyzed further.

Future Scope

What is the real meaning of student progression? Is it only the marks reflected on the grade cards or is the knowledge acquired and the way it is implemented in real-life situations? A thorough investigation of the options and various assessment tools is required. Data mining techniques may be utilized to construct a system that can be used as a strategic management tool in education and corporate systems in the future.

References

Fadhilah, M., Sutrisna, S., Muslimah, S. N., Ihsan, M. T., & Info, A. (2021). *an Exploring Methods in Online Learning:1*(1), 74–81.

García, M. V., BlascoLópez, M. F., &Sastre Castillo, M. Á. (2019). Determinants of the acceptance of mobile learning as an element of human capital training in organisations. *Technological Forecasting and Social Change*, *149*. https://doi.org/10.1016/j.techfore.2019.119783

Handy, I. M. (2020). *Online Assessment Tools for E-Teaching and Learning : Making. October*.

Martin, J. J., & Guerrero, M. D. (2020). Social cognitive theory. *Routledge Handbook of Adapted Physical Education*, *6*, 280–295. https://doi.org/10.4324/9780429052675-22

N. Upadhyaya, D. A., Dave, J. R., Gamit, N. C., & Shah, Z. R. (2022). Comparative Analysis of Innovative Tools and Technologies for Online Teaching-Learning Process. *SSRN Electronic Journal*, 152–

156. https://doi.org/10.2139/ssrn.4027371

Paul, J., & Jefferson, F. (2019). A Comparative Analysis of Student Performance in an Online vs. Face-to-Face Environmental Science Course From 2009 to 2016. *Frontiers in Computer Science*, *1*(November). https://doi.org/10.3389/fcomp.2019.00007

Rasul, S., &Bukhsh, Q. (2011). A study of factors affecting students' performance in examination at the university level. *Procedia - Social and Behavioral Sciences*, *15*, 2042–2047. https://doi.org/10.1016/j.sbspro.2011.04.050

Sharma, A., &Alvi, I. (2021). Evaluating pre and post COVID 19 learning: An empirical study of learners' perception in higher education. *Education and Information Technologies*, *26*(6), 7015–7032. https://doi.org/10.1007/s10639-021-10521-3

Telehealth Devices & Equipment - Vici | InTouch Health. (n.d.). Retrieved June 16, 2020, from https://intouchhealth.com/telehealth-devices/intouch-vici/

vanWyk, M. M. (2020). Academic support under COVID-19 lockdown: what students think of online support e-tools in an ODeLcourse.*Interactive Technology and Smart Education*, *18*(2), 137–157. https://doi.org/10.1108/ITSE-08-2020-0121

Ye, Q., Zhou, J., & Wu, H. (2020). Using Information Technology to Manage the COVID-19 Pandemic: Development of a Technical Framework Based on Practical Experience in China. *JMIR Medical Informatics*, *8*(6), e19515. https://doi.org/10.2196/19515

Yilmaz, R. (2017). Problems experienced in evaluating success and performance in distance education: A case study. *Turkish Online Journal of Distance Education*, *18*(1), 39–51. https://doi.org/10.17718/tojde.285713