

THE ROLE OF DIGITAL TECHNOLOGY DURING THE PANDEMIC IN ONLINE TEACHING LEARNING IN HIGHER EDUCATION

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ABSTRACT: This study aims to determine the relationship of digital technology in online teaching-learning in higher education during the pandemic. The objective of the study is to analyze and understand the role of digital technology during the pandemic. The purpose of the study is to explore the diverse literature available worldwide for understanding the role of digital technology and is to provide an up-to-date and comprehensive review of empirical studies on digital technology in online learning and teaching. During this pandemic situation, teachers need to realize the potential of digital technology in their daily practice and use them very well manner. However, the initial stage of usage of digital technology may create a lot of issues but even though teachers and students have taken that as the task to upgrade themselves for using the technology-based skills for the teaching-learning process. The literature reviews aimed to find out, how the role of digital technology plays a vital role in the current scenario. For that, they trained themselves and offered more help to the administrating, student's technology skills and teacher technician skills will give more efficient and effective results during this pandemic situation. After all the reviews, we can come across that digital technology will be more effective for the current lifestyle, even students and teachers will be lacking somewhat issues, even though they may provide their full effort to get adopted this technology-based skill. The reviews of the paper may give a clear view to the people whether digital technology will be more effective and efficient for the future life in online teaching - learning in higher education. It may give more creative ideas while teaching as well as a learning process and can create a more advanced level of technology-based skills in the teaching-learning process under higher education level.

Keywords: Digital Technology, Teaching-Learning in Education, School and College Culture, Digital Competence....

INTRODUCTION:

The role of digital technology during the pandemic in an online pedagogy program in higher education. The education system in our country is drastically increased to an upper level technically because of the pandemic situation. Before in our country students are not that much used to technology but after the pandemic situation using technology for studies are become mandatory nowadays students are attending online classes, they are attending online workshops and certificate courses, etc.... from a Smartphone, laptops, and tablets along with a technology students use for to study. And also, not only students are using technology for online classes. And also, they are using technology to teach and learn in direct classes also that classroom advancements are smart boards and computer labs, etc. while implementing something new that

has both advantages and disadvantages. This digital technology makes students and teachers teach and learn in an advanced way and it also increases the level of the students and teachers and it finds common things between life at school and home for both students and teachers. In addition, the role of digital technology during the lockdown in online teaching education in secondary education.

OBJECTIVE:

To analyze to comprehend the position of digital technology during the lockdown. To explore the various publications known worldwide for apprehending the function of digital technology. To deliver an up-to-date and general assessment of observed contemplations on digital technology in online education and pedagogy.

RESEARCH METHODOLOGY:

In this examination, we used the empirical method of a literature review for the year 2002 to 2022, has been found. The articles were published in different online portals and search engines such as SSRN, NBER, EJTL, EISSN, JSTOR, OECD library EJEL, SAGEPUB, IJEAST, IJESC, MDPI, IJEDICT, EDUCSCI, Future lab, ASTESJ, IJIET, IJI, Sensors, PROJECT, International Journals, and Google scholar was reviewed. The study has been measured viz, the objectives, research methodology, a sample of reviews, and the factors that influence online teaching-learning technology in the digital technology in the current situation. This study was conducted to identify the research gap and the diverse literature and proposes an empirical study to determine the online pedagogy and understanding of digital technology during the pandemic.

REVIEW OF LITERATURE:

There exist numerous empirical studies on digital technology in online pedagogy understanding in secondary education. One of the notable victory sites of technology adoption is the usage of e-learning and pedagogy in instruction. One of the triggers is the requirement and effortless entrance to education scope and education will be better clever. In this review of literature, we analyze many past reviews under the circumstance of the pandemic and technology-based reviews in that we may see different views and the methods that have been used under their particular reviews. The table shows the Existing Empirical Literature review on online pedagogy discovering in secondary education the function of digital technology during the lockdown:

NO	AUTHOR	YEAR	RESEARCH OBJECTIVES	SAMPLE	RESEARCH METHODOLOGY	RESULT OF THE STUDY
1	Meredith Weaver Kier & Lindy L. Johnson	2022	This study inspected how cooperation between junior and secondary school tutors in a city school, district, and bachelor's degree STEM mentors of color manipulated digital technology and conjoint instruction to educate science, technical skills, and engineering during a universes lockdown.	3 cases of STEM TEACHER	Qualitative Multiple Case Study	Markdowns delivered intimated for community partnerships and digital technology to forward conjoint and traditionally relative STEM educational opportunities in the pre-pandemic period. Tutors and bachelor's degree holdas intentionally channeled artificial intelligent use and coverage applications while furnishing endless possibilities for learners to acquire feedback and

						deliberate on their wisdom.
2	Na Li, Henk Huijser, Youmin Xi, Maria Limmiau, Xiaojun Zhang and Megan Yih Chyn A. Kek	2022	The industrial revolution, digitalization, and globalization have constructed a necessity for an increasingly adaptive higher instruction strategy in the current ten years.	Secondary Data	Conceptual Study	It concentrates on the crucial position of self-directed wisdom and digital solidity of both educators and learners in the digital knowledge ecology across the microsystem, mesosystem, ecosystem, macrosystem, and chronosystem. This analysis donates to the speculative publications connected to adaptable understanding ecologies by assuming and comprising the Chinese HaXie idea into such ecologies.
3	Afzalur Rahman	2021	The study intends to chuck lamp on the performance instrument of COVID-19-lockdown-induced trouble online comprehending at undergraduate rank in Assam, evaluate its significance, and eventually, the difficulties met therein, from the outlook of learners' understanding and fulfillment.	132	Descriptive Survey Research	The outcome of this study indicated an imperfect portrait of crisis online education executed overnight. Bad Internet academic. Organizations must take cognizance to incorporate flexibility in their system to ensue the existence of this skillfulness. The above mention; details show that in the coming days in India, higher education online is going in a positive attitude and an effective manner.
4	Hynd Kaid Slimane	2021	The contemporary issues overlooked by educators and students of English in distance education pedagogy content in Algeria, additionally particularly in secondary education.	60	Exploratory Case Study Quantitative & Qualitative Exploration	To explore the challenges encountered by them and to supply some techniques for practical digital academic procedures. Therefore, despite the requirement for advancement, the hereafter of online education appears brilliant.
5	Najihah Mafrudloh Fais Wahidatul Afritin Uswarun Chasanah	2021	The purpose of this study was to determine the teachers' perceptions of online language learning. It is aimed to observe the teachers' perception towards online language teaching practices and changes in teaching to online teaching.	50 English Teacher	Questionnaire-Survey & Interview Qualitative data	The discoveries reinforce preceptors' perception of the most reasonable approaches and attribute results. Based on the determination, educators were innovative established that tutors are interested in several elements of the pedagogy approach. The consequences of this investigation will be purposeful for online vocabulary educators, organizations, and all aspects interested in teaching.
6	Sumitra Pokhrel & Roshan Chhetri	2021	The study desires to deliver an exhaustive statement on the consequence of the	Secondary Data	Literature Review	The examination on the influence of the COVID-19 pandemic on pedagogy and
			COVID-19 pandemic on online pedagogy and wisdom of different compositions and reveal the pathway presuming			comprehending across the globe terminates that although different contemplations include existed brought out, in the possibility of producing sticks, proper education and venue for various category ranks of higher secondary, middle, and primary education need to be explored additionally. Behind the COVID-19 pandemic when the normal courses restart, educators and trainees should be encouraged to continue operating such online instruments to improve pedagogy and education.

7	Carmen Carrillo Maria Assunção Flores	2020	This commentary delivers a deliberation of the publications on online pedagogy and wisdom procedures in educator education. This investigation holds supplied an examination of the writings on online pedagogy and knowledge procedures in instructor education and owns examined them regarding sociable, mental, and education actuality according to the CoI framework.	134 Empirical Studies were analysed.	Literature Review	The determinations emphasized the necessity for a complete sight of the education of online instruction that incorporates technology to sustain pedagogy and wisdom. The importance of this investigation for the blossoming of online pedagogy and understanding techniques concerned. Recommendations for additional analysis studied. As an outcome of the closure of academies and academies, educators and learners rapidly adjust to outlying pedagogy.
8	Kayode Emmanuel Oyetade, Traos Zava, Anneke Harmsse	2020	The goal of this examination stands to discover topical and appropriate contemplations that keep lived executed on technology adoption in instruction.	17 Articles	Systematic Literature Review	The results emphasize that technology exists as a suitable instrument in academies to provide the knowledge requirements of 21st-century learners as students ready to replace academies with the lifting of obacles to educational movements. It acknowledged that the present COVID-19 challenge determines the transformation in academic curricula and guides the overall use of technology in the fortune.
9	Kumi-Yeboah, A. Sallar, A.W.	2020	The report surveyed how digital technologies improve the academic	46	Qualitative Research Methods &	This paper arranges a release to develop our familiarity with the
	Kiramba, L.K. Kim, Y.		affairs and accomplishments of ethnically various trainees in online instruction. It furthermore discuss the challenges culturally multifarious students overlook regarding their educational attainment in online education.		Semi-Structured Interview	applicability of how digital technologies are most suitable to advance the academic understanding and attainment of various students in online education. Therefore, online preceptors should stand conscious of their learners and enclose materials that exist culturally suitable to construct affluent educational background
10	Lina María Castro Benavides, Johnny Alexander Tamayo Arias, Martin Dario Arango Serna, John William Branch Bedoya & Daniel Burgos	2020	The main goal of this report stands to translate the unusual elements of the digital transformation (DT) undertaking procedure that contains holds a position in HEIs	Web of Science (WoS) & Scopus	Systematic Literature Review (SLR)	The leading decisions indicate that it's an emerging specialization. None of the discovered DT in HEI propositions include stood materialized in a holistic measurement. This condition names additional analysis measures on how HEIs can comprehend DT and encounter the present necessities that the fourth industrial trajectory pushed.
11	Marta Pinto Carlinda Leite	2020	The digital technologies utilized to sustain higher education learners' comprehension and focus of research stand miscellaneous and vary from the multiple accustomed LMS to the slightly habituated mobile applications.	Scopus Database	Literature Review	The general effect of the help of technologies in pupils learning approach and results stood uncovered to stand promising utilized to enable learners pledged arrangement and participation in the education procedure inside and beyond the classroom separators.
12	Martin Ting Sun Carl D. Westine	2020	The ambition of this examination is to study publication tendencies in online education examination carrying establishment during the previous ten years and correspond them with the earlier compositions	619 Research Articles	Systematic Review	The study emphasizes a chance for the pastureland to describe vocabulary regarding online education examination, especially in the student results where there stands a movement to categorize

			determined in an additional reevaluation of contemplations.			examination better commonly (e.g. engagement). They constantly a necessity for better study on organization-level subjects such as oversight, guideline, management and admission, civilization, equity, inclusion, and standards, and even on online educator aspects
13	Montgomery Van Wart, Anna Ni, Pamela Medina, Jesus Castelon, Melika	2020	The reviews of the literature on online education quality, focusing on the student perspective and factors derived from it.	60	Exploratory Factor Analysis Study, ANOVA analysis & Regression analysis	The findings show the consequence of the COVID-19. Many universities around the world jumped from relatively low levels of online instruction in the baseline of earlier 2020 to nearly 100% by mandate by the end of the spring term. There are several study limitations are <ul style="list-style-type: none"> It does not include a sample of non-respondents It derived vary significantly of student It importance of online course elements
	Kordrostami, Jing Zhang Yu Liu					Continuous reform and transformation are necessary for the teaching-learning process through using modern technology for ensuring education for further purposes.
14	Md Nazimul Islam Sarker, Min Wu, Qian Cao, GM Monirul Alam, and Dan Li	2019	The study is to explore and highlight recent literature addressing the problem of effectively integrating digital technology into educational system.	43 out of 164	Systematic Literature Review	It should maintain the equilibrium between the personal and social needs of the individuals; both the result-oriented skill and development are mostly related to professional achievement towards primary education.
15	Areti Chaikradaki	2018	The study examines the current situation of 21st century skills in primary education.	40	Comparative Analysis	The study findings of the DC area can serve as indicators to measure the effective use of technology, as analyzing these areas can provide evidence of the teacher's performance on digital technology. It's continuously evolving, trainee in the new tools.
16	Marhese Spiteri & Shu-Nu Chang Rundgren	2018	The results of studies from the international studies show that they are not effective against students' educational achievement.	Secondary Data-Academic Database	Quantitative, Qualitative & Mixed Methods	and challenging for the teacher's skills, as they need to adapt their new teaching skills from the new digital technological tools.
17	Norvig, A. M. Petersen, A. K. Balle, S. H.	2018	The purpose of identifying papers that may contribute answers to the research question on the following: Which factors are found to influence e-learning and blended learning to learn the outcome, student satisfaction and engagement in collaboration in higher education and particularly in professional education?	135 Articles	Literature Search	The literature reviews confirm that there is an intense interest within the field of educative research to determine that factors affect learning outcome and student satisfaction in e-learning, online learning and blended learning in higher education, but further research is needed to better understand what influences students' learning experiences in

						the online formats of professional bachelor programs.
18	Kanika Budhwar	2017	The study shows the possibility through digital technology, not the barriers, and brings education towards the student's lives. The consequence of technology can be felt in every possible field in education too.	Secondary Data	Traditional & Modern Education of ICT	The study explores the new roles of digital technology in the education systems that have increased. It takes an exciting time to teach and to challenge ourselves, our students, our administrators. The policymakers of the country to help all the teachers to make use of new technical tools.
19	Maya Escueta Vincent Quan Andre Joshua Nickow Philip Oreopoulos	2017	The aims to contribute to these efforts in two main ways. The existing reviews have covered subsets of ed-tech; no recent review has attempted to cover the full range of ed-tech interventions.	Secondary Data	Synthesizes & Discusses Experimental	The literature review will advance the knowledge base of how technology can be used to support education, new experimental research areas; and improve the policies, programs, and structures that contribute to a successful educational system. Finally, it should not be the most popular product or the technology itself, although it helps all the age levels of students to learn.
20	Zahoor Ahmad Lone	2017	To analyze the current situation and the future of online education in India	Secondary Data Books, Periodicals, Journals	Conceptual and Exploratory	The study shows the technology in society has been tapped by innovations and
				Published Material		discovers the concept of online education. It is an effective tool for development of the Indian educational sector in India. The technology will extend and access the socio-economic difference in the Indian learners. It challenges are: <ul style="list-style-type: none"> Lack of Infrastructure and hardware facilities Problem in finding and training the illiterate. Very few computer based courses skills.
21	ICF Consulting Services Ltd	2015	The study aims at digital technologies that can support and contribute to some specific educational priorities: raising attainment, tackling inequalities, promoting inclusion, improving transitions to employment, and improving the efficiency of the education system.	600 Items	Research Protocol & Literature Search	The study has a similar approach to digital tools and resources, systematically reviewed or measured by a large amount of evidence from various studies, and may have conclusive evidence. The possible way to determine the indicative evidence or promising evidence.
22	Pei Zhao, Sara Sintonen, Heikki Kynälähti	2015	This study aims to investigate the pedagogical functions in the second version of Google Art Project and FINNA.	Secondary Data: Google Art Project FINNA	Case study Descriptive analysis Exploratory analysis Explanatory analysis	This study investigates the pedagogical function of the online-teaching resource, virtual museum, virtual learning environment and art, and culture-learning community. It provides high-resolution images in
						Google Art Project, allowing users to build their virtual museum based on their favorite collections; it helps users in their turn with self-directed learning skill. At last, this paper will give the recommendation of digital museums and websites development to the pedagogical functions for future purposes.
23	Jo Shan Fu	2013	To achieve the successful integration of technology require an effort into three sides are teachers, students, and school administrators.	Secondary Data	Literature Review	This study considered the current situations, barriers, and solutions for ICT integration in the classroom. Further, the possible gaps between the existing literatures are shown to provide lucid directions for future

						research into ICT used. To discuss the gaps between the literature and directions of future study.
24	Cheryl A. Franklin Cheryl Mason Belick	2007	The study analyzes the new technologies to understand the technical impacts, society, and culture and to identify technology that can be used to overcome the patterns of injustice.	176 Articles	Quantitative Methodology	The study requires collaborative efforts among educators, researchers, policymakers, and representatives from the technological field. The research should be used not only to evaluate the technology but also to give the guidelines for the future development and implementation.
25	Avril M Loveless	2002	The study has been designed to enable both rapid identifications of the findings and in-depth exploration of the literature.	Secondary Data	Empirical Analysis	The study has indicated that these are factors that support the creative processes and the effect on the success of teaching in a creative. The new digital technologies can play a particular role in both the aspects of creativity and the learning skill process.

LIMITATION OF THE STUDIES:

- Time is limited for the study.
- The study is conducted on the time of covid-19.
- The literature review was taken limited.

FINDINGS AND SUGGESTIONS:

In this study, we have been taken the literature reviews of technology-based skills of online teaching-learning as a suggestion for understanding and analyzing the importance of digital technology during the pandemic in the online teaching learning in higher education. From the diverse literature views are:

- Kier, M.W.; Johnson, L.L (2022) discoveries furnish essences for neighborhood collaborations and digital instruments to boost combined and culturally applicable STEM understanding possibilities in the post-pandemic period.
- Li, N.; Huijser, H.; Xi, Y.; Limniou, M.; Zhang, X.; Kek, M.Y.C.A (2022), the examination donates to the speculative books related to adaptable education ecologies.
- Afzalur Rahman (2021) disclosed inadequate scenery of crisis online comprehending executed overnight.
- Hynd Kaid Slimane (2021) studied the challenges encountered by them and furnishes techniques for adequate digital academic traditions.

- Naajihah Mafruudloh, Fais Wahidatul Arifatin, Uswatun Chasanah (2021), tutors perception towards online vocabulary education approaches and differences in pedagogy to online education.
- Sumitra Pokhrel & Roshan Chhetri (2021), Ordinary courses restart, educators and students should live nurtured to persist utilizing such online mechanisms to improve pedagogy and education.
- Carmen Carrillo & Maria Assunção Flores (2020), a consequence of the closure of institutes and academies, tutors and learners included rapidly acclimate to slight pedagogy.
- Kayode Emmanuel Oyetade, Tranos Zuva, Anneke Harmse (2020), the existing COVID-19 challenge intention difference scholastic curricula and guide to the predominant use of technology in the fortune.
- Kumi-Yeboah, A., Sallar, A.W., Kiramba, L.K., & Kim, Y. (2020), online educators should exist conscious of their learners and contain materials that live culturally appropriate to make a prosperous education background.
- María Castro Benavides, Johnny Alexander Tamayo Arias, Martín Darío Arango Serna, John William Branch Bedoya and Daniel Burgos (2020), it is a new field, and none of the existing DT in HEI ideas have been created holistically.
- M.Pinto & C. Leite (2020), the digital technologies utilized to subsidize secondary instruction learners' understanding, and stress of examination are miscellaneous and running from the considerably utilized LMS to the most smallish accustomed nomadic applications.
- Martin, Ting Sun, Carl D. Westine (2020), a prospect for the occupation to clarify vocabulary regarding online education study, especially in the spaces of apprentice outcomes where there is an inclination to categorize examination further naturally.
- Montgomery Van Wart, Anna Ni, Pamela Medina, Jesus Canelon, Melika Kordrostami, Jing Zhang, and Yu Liu (2020), the review of literature on online education quality, focusing on the student perspective and reviewing eight factors derived from it.
- Md Nazirul Islam Sarker, Min Wu, Qian Cao, GM Monirul Alam, and Dan Li (2019), the perpetual reform and transformation are necessary for the educational purpose through using modern technology for ensuring education.
- Chalkiadaki, A. (2018), it should maintain the equilibrium between the personal and social needs of the individuals; both the result-oriented skills and development are mostly related to the professional achievement towards primary education.
- Marthese Spiteri, Shu-Nu Chang Rundgren (2018), it's continuously evolving, training in the new tools, and challenging for the teacher's skills, as they need to adapt their new teaching skills from the new digital technological tools.
- Nortvig, A. M., Petersen, A. K., and Balle, S. H., (2018), the field of educative research to determine the factors that can affect learning outcome and student satisfaction in e-learning, online learning and blended learning, but further research is needed to better understand what influences students' learning experiences in the online formats of professional bachelor application.
- Kanika Budhwar (2017), this moment to challenge our teachers, our students, our administrator and the policymakers of the country to help all teachers to make use of new technical tools.
- Maya Escueta, Vincent Quan, Andre Joshua Nickow, Philip Oreopoulos (2017), it should not be the most popular product or the technology itself, although it helps all the age levels of students to learn.
- Zahoor Ahmad Lone (2017), the technology-led will extend and access the socio-economic difference in the Indian learners.
- ICF Consulting Services Ltd (November 2015), the possible way to determine the indicative evidence or promising evidence.

- Pei Zhao, Sara Sintonen, Heikki Kynäslahti (2015), this paper will give the recommendation of digital museums and websites development to the pedagogical functions for the future purposes.
- Jo Shan Fu (2013), to discuss the gaps between the literature and directions of future study.
- Cheryl A. Franklin and Cheryl Mason Bolick (2007), the study requires collaborative efforts among educators, researchers, policymakers, and representatives from the technological field of education.
- Avril M Loveless (2002), the new digital technologies can play a particular role in both the aspects of creativity and learning skill process.

CONCLUSIONS :

From the various reviews, we concluded that the role of digital technology during the pandemic in online teaching-learning has been considered. To provide the implications for community partnerships and digital tools to promote STEM learning opportunities and to contribute the theoretical literature related to flexible learning ecologies, to reveal an unsatisfactory picture of online learning implemented overnight to examine the challenges faced by teachers and students, and to provide strategies for effective digital educational practices, Teachers' attitudes toward online language teaching practices and encouraged to continue using such online tools to enhance the teaching and learning process. As a result of the closure of universities and schools, teachers, and students had to rapidly adapt to remote teaching technology skills. The current COVID-19 challenge will change academic curricula and lead to the prevalent use of technology in the future. Online instructors should be cognizant of their students and include culturally relevant materials to create a rich learning environment. DT in HEI proposals has been developed in a holistic dimension. The digital technologies used to support higher education student's learning and on research are diverse and range from the most used LMS to the least used mobile applications and an opportunity for the field to clarify terminology concerning online learning research, particularly in the areas of learner outcomes where there is a tendency to classify research more

generally to the online education quality, focusing on the student's perspective and to continuous reform and transformation is necessary for the teaching-learning process through using modern technology for ensuring an educational environment. The current situation of 21st-century skills in primary education and technology is continuously evolving, training for new tools must continuously be provided, and it's quite challenging for the teachers and students as they need to adapt their new digital tools in the field of educational research. To determine which factors affect learning outcome and student satisfaction in e-learning, online learning and blended learning in higher education, further research is needed to better understand what influences students' learning experiences in the online formats of professional in bachelor application. This moment to challenge our teachers, our students, our administrator and the policymakers of the country to help all teachers to make use of new technical tools and to discuss the gaps between the literature and directions of future study. It requires collaborative efforts among educators, researchers, policymakers, and representatives from the technology field. So, digital technologies can play a particular role in both aspects of the creativity and learning skills processes. We can conclude and come across with the different terms of the reviews that like STEM learning, ecologies, the standard of education through digital technology, students, teachers, and administrative bonding through technology are effective and efficient, while digital museums, website development, pedagogical functions, technology in the literature, creativity, and the learning process have been raised through digital technology. It may give more creative ideas while teaching as well as a learning process and can create a more advanced level of technology-based skills in the teaching-learning process at a higher education level. And also, we can promote our society towards a digital society for advanced higher education culture.

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