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# MODERN TRENDS OF E-LEARNING DURING COVID-19 PANDEMIC

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**Abstract**—Internet has become increasingly important in allowing remote working, e-learning, web conferencing, entertainment, and video streaming, among other things. All of these abrupt developments have put an enormous amount of strain on the network during the Covid-19 epidemic. Especially, educational institutions throughout the world were closed, affecting students and causing widespread interruption in the education sector. This paper analyzes the trends of e-learning during pandemic situation. The positive and negative sides of web-based learning were identified and merged as an impacts in this paper. The data were collected through previous study papers using systemic review approach. Moreover, the quantity of the dataset and the lack of quality attributes were two of the study's limitations. In the end, it is recommended to the study for efficient and effective e- Learning practices for better teaching and learning practices.

**Keywords**—Covid-19, e-Learning, trends, pandemic

## I. INTRODUCTION

Covid-19 has been declared a worldwide epidemic of a particular illness by the World Health Organization. The global population, from the young to the old, is stressed as a result of the crisis [1]. The COVID-19 [2] epidemic is having a significant influence on educational field, research as well as dermatological [3] practices. Web-based education is a technology that is becoming increasingly significant in today's education and training. Not only in educational field but also in other sectors too. In industrialized nations, modern organizations, schools, universities and companies feel that e- Learning is a method to educate a bigger number of pupils in less time and with less resources. Its significance stems from the fact that it makes learning information accessible at any time and from any location. E-learning is likewise quickly evolving, with several sectors and technology continuing to evolve as many new trends

emerge. E-learning is created in a remote media method that can be accessed from any computer terminal, removing the issue of student-teacher distance. Because all communication is done through a networked computer connected to the internet, there is little social connection [4] between students and professors, therefore learning motivation is totally dependent on the students. Based on the dimensions of e-learning, the goal of this study was to establish the elements that contributed to students' satisfaction with e-learning during the Covid-19 epidemic.

Similarly, internet services such as YouTube, TED Talks, and Udemy helped make education more effective and efficient. For e-learning, Learning Management Systems (LMS) are frequently utilized. They are, in most cases, the starting point of an online education program. According to Wikipedia, a learning management system (LMS) is a software application used to manage, document, track, report, and deliver educational courses and training programs [5].

Through virtual environments that allow not only the transmission of information but also the investigation and application of information and the promotion of new knowledge, e-Learning provides new opportunities for both educators and learners to expand their teaching and learning experiences. Any investigation into the state-of-the-art of e-Learning should focus on the combination and convergence of the most advanced features of digital information and communication technologies, such as live broadcasts, mobile video and audio telecommunications, three-dimensional (3D) graphics, email, the Web, and object-oriented interfaces, all of which can be used to support, create, and deliver significant educational experiences [6].

However, this study mainly aims to explore the overview trends of e-learning during covid-19 pandemic. It includes the challenges, tools and techniques used. This study found literature review, methodology are presented first. This study's results and discussion and conclusion are included at the end of the article.



## II. LITERATURE REVIEW

The process of learning in which there is a physical distance between the information source as well as the knowledge receiver is known as Distance Learning [7]. It also known as e-learning or web-based [8] education. While various nations are at varying levels of COVID-19 infection, millions of undergraduates are affected by university closures owing to the outbreak throughout the world [9]. Stakeholders with unique perspectives eLearning's indispensability, as well as the teaching staff's positive attitude and competency with it [10].

E-learning has grown quite common among teenagers all throughout the world, especially during the COVID-19 epidemic lockdown era [11]. It has been defined as the use of telecommunication technology to deliver, assist, and enhance learning and teaching [12]. Particularly in North American location virtual conferences and distance learning via webinar participation, were accepted by the vast majority of dermatologists. Despite this, more than a third of respondents said they lacked processes in place to train residents and fellows during this key period [3]. Especially in Pakistan, Students may learn more successfully with ICT [13] and e-learning resources, which could also help teachers with their teaching process in this contemporary technological era [14]. The much more important benefit of e-Learning was its flexibility in terms of time and place, while the majority's main issue was a shortage of e-Learning abilities [15]. Most probably web-based education has two distinct advantages: classroom freedom and platform independence [16]. The use of digital technologies for teaching and learning is referred to as e-learning. It makes use of modern technologies to allow students to study whenever and wherever they choose. It entails training, information delivery, and encouraging students [17] to communicate with one another, as well as exchange and appreciate other points of view. It facilitates communication and strengthens the bonds that support learning [18].

Distances and consequent commutes are eliminated with e-learning, making it more efficient. Because the e-learning content is developed using media that can be viewed from suitably equipped computer terminals as well as other Web reachable equipment, distance is reduced [19]. Whereas e-learning allows for multi-institutional conferences and makes meeting participation more convenient logistically, it cannot fully duplicate the dynamic exchanges of in-person education [20]. For e-learning, Learning Management Systems (LMS) are frequently utilized. They are, in most cases, the starting point of a virtual learning program [5].

Using the multi-criteria Analytic Hierarchy Process (AHP) and Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) methodologies to optimize the learning system during COVID-19, significant success factors for E-

learning were identified [21]. A highly interactive e-learning module improves asynchronous distant learning and National Institutes of Health Stroke Scale (NIHSS) knowledge acquisition in senior medical students as compared to standard didactic video [22]. The paper also includes the smart learning techniques of Middle Eastern nations and the Technology- Enhanced Learning (TEL) efficacy of utilizing Google Meet, online communication, blogging, PDF reports and presentations, and free learning and teaching tools in boosting learning behavior intention [23].

Ontology is a method of modeling learners and learning materials, among other things, to aid in the retrieval of information [24]. Although medical school education is essentially theoretical, residency and fellowship programs place a greater emphasis on hands-on/technical abilities. Nonetheless, e-learning methods, like as the IRCAD/IHU experience, can assist any surgical learner, regardless of their learning objectives [10].

However, there are numerous obstacles that operate as a deterrent to using electronic technology in medical education [25]. Similarly, due to poor e-Learning technologies and the dread of losing an academic year, college students are experiencing psychological discomfort [26]. Also there are some problems are arising such as administrative problem, technical and most importantly academic problem especially at the university of Bisha [27]. As a result, learners will have access to more relevant content. Reusability, reasoning ability, and support inference procedures are all advantages of ontologies, which aid in providing better suggestions.

## III. METHODOLOGY

This study was written utilizing a qualitative method known as systematic review, which included an examination of previously published research and review articles since 2019, after the covid-19 outbreak. The study was conducted using qualitative method and analyzed the trends of e-learning. Mainly the required obligatory information were gathered from relevant sources. The main trends are identified and pointed in this study.

To shortlist the downloaded publications from reputable publishers such as IEEE, Sage, Springer and Emerald, the following important factors were evaluated. Figure 1 also shows a flowchart of the systematic literature review classification method. Especially this study includes, the articles with English language, new trends in e-learning, high indexed articles with open access, full length paper, published after 2019 as well.

The following tables demonstrate the formulation of research questions (RQ) for the article completing to describe the needed data for this study's analyzing goal. According to the below figure 1.



Table -1 Develop Research Questions

No	RQ	Motivation
1	How covid-19 influence in direct class studies?	Identifying the pandemic affect the direct studies.
2	How generalizable trends appeared to e-learning environments?	Identifying suitable trends in e-learning due to covid-19 outbreak?
3	What are the major challenges and obstacles in using e-learning?	Find the research to identify the obstacles in e-learning.

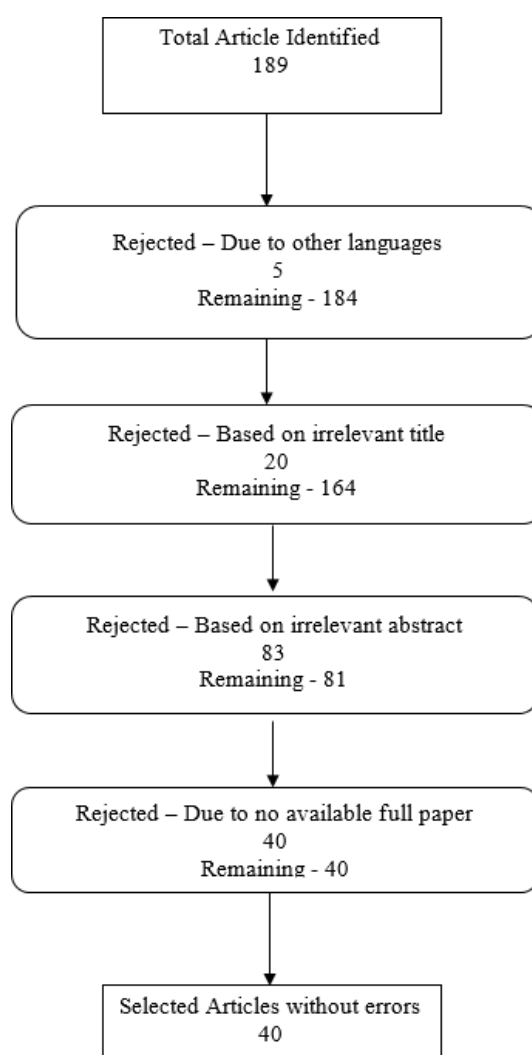


Fig. 1. Categorization of selected studies



Almost 41 article were reviewed out of the 189 articles for this study. The reason for deduction are given above figure 1.

#### IV. RESULT AND DISCUSSION

The effective integration of ICT's in teaching and learning process includes, pedagogical, ICT tools, ICT competency, e- learning, infrastructure support, instance messaging tools, positive attitude towards use of ICTs and also evaluation [14]. During the lockdown, students did not prefer e-teaching over face-to-face instruction. During lockdown, administration and faculty members should take the required steps to improve e- teaching for improved learning at private medical college [28]. TEL in helping pedagogy, eliminating technophobia among undergraduates, overcoming the pandemic, and preventing the near-total collapse of educational institutions especially in middle east [23]. TEL promotes and encourages the use of e- learning and technology as a behavior. Especially in Malaysia this study has achieved the objectives and discovered new findings on the effects of ICT skills- time management, resources and learning techniques, on the effectiveness of e- learning tools in teaching and learning approach, among higher education students [29].

This study found that students can learn independently even when school is out, yet class is on, and (ii) the school's self-developed e-learning platform based on tailored learning materials may greatly increase students' academic performance in China [30]. It appears that the implementation of E-learning at the University of Bisha is beset by difficulties, including but not limited to academic, administrative, and technological difficulties [27].

When a kid uses the Internet, they must be monitored, especially if they are under the age of seven, since they have a limited capacity to distinguish between adverts and legitimate material, and they do not understand the advantages and downsides of using the Internet. Adults should supervise and help kids to pick the appropriate content for their age in this circumstance, but this was more difficult to achieve during the epidemic because many children were alone at home. Another disadvantage of using the Internet is that it may inhibit creativity and inventiveness. Because it was simpler for them to get knowledge from the Internet, they no longer socialized, could not recognize and identify actual emotions, and did not do their school responsibilities with the same vigor during online sessions. Absenteeism—there have been instances where students did not engage in online courses due to a bad Internet connection, resulting in the loss of valuable knowledge during working hours with the teacher. Because the teacher/colleagues were beyond the screen, some students created a safe haven that meant they were isolated from their families, they didn't have to deal with real-life problems, they didn't have to find real solutions, they didn't have to discuss with colleagues, they didn't have

to summarize the schooldiscussions [31].

Virtual conferences and distance learning, particularly via webinar participation, were accepted by an overwhelming majority of dermatologists. Despite this, more than a third of interviewees said they lacked processes in place to train residents and fellows during this key period. Video conferences, webinars, and other online training were all linked to TD usage and future use, indicating that these technologies are here to stay[3]. To establish the scale of "e-Learning crack- up" and "fear of academic year loss," an online focus group discussion (OFGD) with the target demographic was conducted [26]. Vietnamese higher education will settle into a 'new normal' once the COVID-19 epidemic has passed, with flexible, updated, and reformed teaching and learning methods[32].

ASP.Net, SQL, XML, and the Unified Modeling Language (UML) computer languages were used to construct and design the website. UML (Unified Modeling Language) is a graphical programming language for visualizing, specifying, building, and documenting software-intensive system artifacts [12]. According to the findings of this study, all pandemic-affected professors utilize a Learning Management System (LMS)- based website for online learning. The most popular platform is one based on a learning management system (Google Class and Edmodo), with video conferencing coming in second (Zoom and Skype). What's noteworthy is that the on-campus LMS is less appealing to instructors [33].

This system, which is based on time, mouse interactions, and grades, is not limited to a single course or area and may be used to various e-learning platforms and Massive Open Online Courses (MOOC). An interactive tool, a timeline, is included with the e-learning platform. The system works like this: during an e-learning course, a mechanism monitors student behavior and gathers data on student interaction patterns. Quizzes based on the content of the lectures are used to collect student marks after the course. These patterns, as well as the grades associated with them, are evaluated in order to determine each student's flow state. When compared to other existing dimension reduction approaches, the suggested deep learning model serves to minimize the dimensions of the activity patterns in this system and has by far the greatest performance (Deep Learning Techniques) [34].

The respondents stated that (1) self-efficacy factors, (2) trust factors, (3) cultural aspects, (4) technological factors, and (5) e-learning system quality factors were the critical factors that affect the use of e-learning systems and should universities take them into future plans based on the results. Furthermore, the findings revealed that there are three major obstacles to using an e-learning system: (1) e-learning system technical issues, (2) financial support issues, and (3) change management concerns [35].

Furthermore, the data support the Technology acceptance model (TAM), which states that new technology usage and



acceptability are influenced by the user's (educator/student) attitude, experience, and beliefs, especially when the technology is already in use. This study confirms that, despite some of its benefits for e-learning, social media is a negative influencing element that prevents educators from fully using any bespoke education management system platforms that provide increased learning capabilities. This result can be linked to the fact that Moodle's perceived ease of use and utility are inferior to that of well-known social networking programs [36].

## V. CONCLUSION

This paper examines the role of students' behavior intentions in using an e-learning system as an alternative to battling the COVID-19 epidemic.

From our study, we have found the global trends about the e-Learning during pandemic. According to the review papers virtual conferences and distance learning are used to educate learners especially dermatologists. Also Vietnamese higher education will settle into a 'new normal' once the COVID-19 epidemic has passed, with flexible, updated, and reformed teaching and learning methods. LMS is one of the most popular platform in e-learning [37]. Especially, website was built and designed using the computer languages ASP.Net, SQL, XML, and the Unified Modeling Language (UML). UML (Unified Modeling Language) is a graphical programming language that may be used to visualize, design, develop, and record software-intensive system artifacts. When compared to other current dimension reduction algorithms, the proposed deep learning model is the most effective in reducing the dimensions of the activity patterns in this system. The perceived ease of use and value of Moodle [38] are lower than those of well-known social networking tools. However, there are trends that identified as issues. The e-learning technical issues, financial issues, change management concerns as well.

Finally, the trends of e-learning technology has identified as different perspectives respectively. The age of the students, the relevant subject, The perceived ease of use and value of Moodle are lower than those of well-known social networking tools. And the environment of students are impacted in trends as well. The quantity of the data as well as the lack of quality attributes are two of the review's limitations.

The study's conclusion is that more research should be done into the elements that influence students' attitudes regarding e-learning. The degree of specialization of instructors in ICT use, identification of the existing level of knowledge of students in ICT use, and approaches to develop ICT skills for teachers, students, and even parents through promoting the process of lifelong learning are all areas that require more investigation.

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