

# **Technoarete Transactions On Applications Of Information And communication Technology**

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**JE-18, Gupta Colony, Khirki, Extn, Malviya  
Nagar, New Delhi-110017**

**PHONE : - + 91-8877340707**

**E-Mail : [info@enrichedpublications.com](mailto:info@enrichedpublications.com)**

# **Technoarete Transactions On Applications Of Information And communication Technology**

## **ABOUT THE JOURNAL**

Technoarete Transactions on Application of Information and Communication Technology(ICT) in Education is an International peer reviewed, open access journal aiming to publish high quality original research, review articles, short communications, case reports, technical notes and editorials. We offer a wide range of knowledge on new trends and advances that contribute significantly to further the scientific knowledge related to fundamental and applied research covering all aspects of Information and Communication Technology. The journal also includes various fields of research on Creative usage of digital technologies by educationist, Tools for online learning, Blended learning mechanism, Platform and content authoring, Open access system, Learning data analysis, Educational data mining, Institutional procedures, protocol and assessment methodologies, Outcomes of ICT based education, Game based learning environment, Psychological issues face by students in online learning, Various pedagogical principles of teaching, Lifelong learning, Technologically mediated learning, Educational psychology, Academic and ethical perspectives of online learning, IT Infrastructure for ICT Based education, Role of ICT based education during COVID pandemic, ICT based education for online evaluation and assessment of students performance, Role of ICT based education post COVID pandemics.

## **AIM & SCOPE**

Technoarete Transactions on Application of Information and Communication Technology(ICT) in Education aim to serve as an intellectual platform for scientist, academicians, and researchers to who are interested in applications of recent advancement in information and communication technology in imparting education to school children post school education, higher education, and lifelong learning. Also, the role of using innovative technologies by teachers educating children who are in transition from school to higher education are also included in the scope of this journal. The journal welcomes original research article on adopting innovative approaches for teaching learning process designing the educational outcomes and encouraging qualities quantitative and hybrid approaches of teaching . learning process . Latest innovation and best practices to be followed in online teaching and training , collaborative learning and training modelling higher education based on online learning , various procedures standards and assessment methods to be adopted

for online education are also covered under the scope of this journal . the need for effective IT Infrastructure and services for innovative online education environment is also to be discussed in the journal . The methods of Invocating creativity and curiosity among students by employing ICT in education also falls under the journal scope .

**Technoarete Transactions on Application of Information and Communication Technology(ICT) in Education include but are not confined to the following areas.**

- 1.Creative usage of digital technologies by educationist
2. Tools for online learning
3. Blended learning mechanism
- 4.Platform and content authoring
5. Open access system
6. Learning data analysis
7. Educational data mining
8. Institutional procedures, protocol and assessment methodologies
9. Outcomes of ICT based education.
- 10.Game based learning environment
11. Psychological issues face by students in online learning
12. Various pedagogical principles of teaching
13. Lifelong learning
14. Technologically mediated learning
15. Educational psychology
16. Academic and ethical perspectives of online leaning
17. IT Infrastructure for ICT Based education
18. Role of ICT based education during COVID pandemic
19. ICT based education for online evaluation and assessment of students performance
20. Role of ICT based education post COVID pandemics

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# Effect of E-Learning on Hampering Mental Health of Students

**Dr. Sanjiv Kumar Jain<sup>1\*</sup>, Joey G. Fernando<sup>2</sup>**

<sup>1</sup>Medi-Caps University, Indore, India

<sup>2</sup> Central Luzon State University, Philippines

## **ABSTRACT**

*The core of the e-learning process in the education sector is recognised as the reason behind the success of technology in the present situation. Identifying the negative impacts of e-learning on the student's mental health is the foremost principle of this study. Qualitative research has been selected for getting a favourable outcome from the study which is selected with the help of explanatory research design. Despite the positive impact of e-learning on the development of the learning process, hampering the mental health among the students is considered as the factor which decreases the quality of the technology for educational purposes. Most of the information gathered and represented in this research are from very recent sources which are published in or after 2018 which helps in maintaining the authenticity of the research. Anxiety, stress and lack of interest in the learning process are identified as the negative impacts of e-learning on the mental health of the students. Covid-19 is considered the reason which enhances the negative impacts of technology especially mental health issues among students. The negativity of these technologies in the learning process reduces the implementation of e-learning in underdeveloped countries.*

**Keywords** Anxiety, Communication, E-learning, Lack of interest, Mental health, Mental issues, Stress.

## **INTRODUCTION**

### **Background of research**

Rapid growth in technological advancement and growing users of internet-based applications resulted in the abrupt implementation of e-learning procedures in the educational sectors. The covid-19 outbreak is also considered an issue which has developed the growing rate of implementation of internet-based learning procedures in the educational sectors in the present day. Integration of multiple informations and communication technology and their positive impacts on the learning process is a reason behind the rapid increase in the adoption of ICT or e-learning processes in the organisational culture in the education sectors [1]. A wide range of applications of e-learning in the education sector is an important aspect which enhances learning techniques and processes [2]. The benefits and wide range of applications of these technologies in the education sectors increase the adoption rate in the educational sectors. Multiple challenges and benefits have been described in previous works which enhances the scholarly interest in this particular topic.

### **Aim and Objectives**

#### **Aim**

The main aim of this study is to identify the negative impacts of e-learning on the mental health of

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students.

#### Objective

- To identify the use of “e-learning” in the education sector and its impact on the learning process.
- To recognise the correlation between the e-learning process and the mental health of students.
- To investigate the negative impacts of e-learning on the student’s mental health.

#### Significance of research

The psychological health of students and satisfaction of students from the learning procedure plays a significance activity in the development of their career of the students. Multiple researchers indicate that there are several negative impacts of the e-learning process on the mental health of students. Language difficulties among students are identified as an issue which can be obtained from heavy use of e-learning and can hamper any student's mental health as it can isolate students from social development [3]. Identifying the negative impacts of e-learning can help understand effective measures that can mitigate challenges from the e-learning process. This study also implies the development of processes which can enhance the role of the e-learning process in getting favourable outcomes from the students in the educational sectors. The utilisation of ICT technologies in the education sector refers to the sustainable development of the education system in the present situation [4]. However, the negative impacts of overusing ICT in the education sector are also rising day by day. This specific research provides the information that will be sufficient in understanding the negative impacts of e-learning on students.

### METHODS AND MATERIALS

#### Research design

Selection of the proper type of information that is relevant to the research is an important aspect which mainly gets the proper research design followed. Research design can be defined as the understanding of the researcher on specific phenomena which helps the researcher in selecting the proper types of information gathering and interpretation process in the research [5]. Research design can be categorised into three parts “exploratory research design”, “explanatory research design” and “conclusive research design”. An explanatory research design has been selected in this research for developing information about the negative impacts of the e-learning process on students' mental health. Explanatory research design helps the researcher in obtaining sufficient information from limited sources which enhances the quality of the research [6]. Understanding the proper types of data which are important in the conduction of the following research is another reason behind selecting this specific research design.

#### Research type

The type of research is also an important aspect which influences the researcher in selecting the relevant information which is important for the following research. Research can be divided into two parts including qualitative and quantitative. Qualitative research is the process of completing a study with the help of collecting information from external sources and compiling the sources to get accurate results from the research [7]. Quantitative research is the process which implies collecting information directly from selected populations and compiling the resources for getting favourable outcomes. Qualitative research has been selected in the following study as it will provide better results about the selected topic in the present situation. The availability of previous works about the selected topic of the particular research is another reason behind selecting qualitative research in the following research.

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### **Inclusion-Exclusion criteria**

Inclusion criteria refer to the attributes in research that provides information to the researcher in selecting the proper population for collecting information which is relevant to the topic of the research. On the other hand, exclusion criteria imply the characteristics that help the researcher in identifying potential research participants which are appropriate for providing sufficient information which is relevant for getting a commendatory outcome from the research [8]. As previously mentioned in this study, qualitative research has been followed and resources for getting information in this research are used in authentic and valid journals, articles and databases which are relevant to the topic of the research. Journals and articles have been taken for granted which are published in or after 2018 for maintaining the “authenticity” of the following study. Unreliable data sources are critically avoided in this research as they can hamper the authenticity of the research. Research articles published in the English language have been taken and other languages have been ignored for maintaining the efficiency of the following research.

### **Data collection**

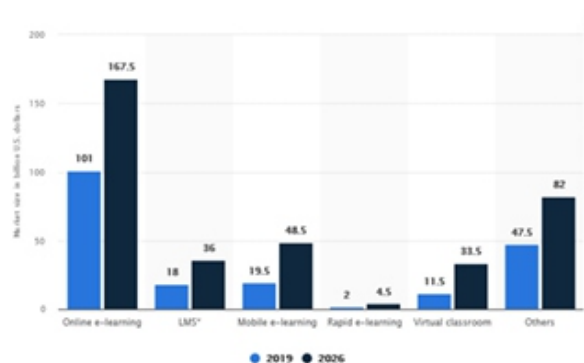
The collection of information which is appropriate for conducting research is one of the most important aspects and the appropriateness of the data gathered in the research can be reflected in the results of the research. Qualitative researchers clearly stated that the pandemic has changed the types of collecting information for conducting research [9]. Qualitative data has been collected in this research mainly from authentic journals and articles which are mainly published in or after 2018. Maintaining the reliability and authenticity of the information gathered and represented in the following research is the most important aspect which enhances the quality of the results and findings of the following result.

## **RESULTS**

### **Effects of e-learning crack-up among students during Covid-19**

Covid-19 is recognised as a critical aspect which dynamically changes multiple social activities in the world. Education sectors are also affected abruptly during the pandemic and have changed their traditional way of providing learning processes to students. “E-learning” is a process mainly adopted in the time of the pandemic outbreak in the education sectors not only in the UK but also all around the world. Internet based education system are found as a substitute to offline classes, especially during the time of pandemic and have changed multiple traditional processes that have been followed in the education sectors in the past decades [10]. Despite the positive impacts of e-learning, many pieces of literature are identifying the process of online classes as a disruption in the education system mainly for the effect of this process on the mental health of the students. The use of electronic resources in the process of education has changed the perceptions of students. However, distance learning also obtained a negative impact of e-learning in the education sector which critically disrupted the psychological health of the students [11]. The term distance learning refers to an instructional study which implies the process of learning in another place rather than in education sectors. Lack of meeting with the teachers and friends is identified as a factor that reduces the mental stability of the students which can affect the learning outcomes of the students in their life. Social distancing has become an essential aspect to prevent the pandemic's spread and forces multiple sectors to adopt online facilities to provide service to consumers. Educational sectors are also forced to implement an e-learning process in the culture which hampers the traditional learning process followed in the educational sectors in the past decades.





**Figure 1:** Segment wise global e-learning market in 2019 and 2026 [12]

The above statistics showcase the rapid growth in the implementation of the e-learning process in the global market which indicates the effectiveness of this technology for educational purposes. The global e-learning market could increase by about 400 billion U.S. dollars in 2026 which is a rapid increase in online education purposes [12]. Increasing e-learning implementation for educational purposes also has multiple negative impacts on the student's mental health and future of the students. Lack of interest is identified as a critical outcome of implementing an e-learning platform in the educational sectors which affect the mental health of the students. Keeping distance from friends and respected teachers are recognised as the reason behind increasing the number of students who face a lack of interest during the online class procedure [13]. Lack of interest in the learning process can also hamper the future opportunities of the students which are also considered an effective outcome of the implementation of e-learning in the education sector.

Communicating with the students is a significant item of the learning process especially, in the higher education system. “E-learning” became a problem for the student's perception in the higher education systems which are also considered a factor that enhances mental illness among students. In underdeveloped countries, it has more negative impacts on the students, as the lack of updated technologies hampers the experience of using e-learning procedures among the students [14]. Lack of communication and gathering of knowledge is results in the disruption of mental health among the higher education sector's students, which is considered one of the most critical aspects of the presentation of the e-learning process in the educational sector. Connection and update issues lead to anxiety and stress formation among the students which is also identified as a critical aspect in the implementation of online education systems in the education sectors.

### **Correlation between the student’s mental health and the development of e-learning for educational purposes**

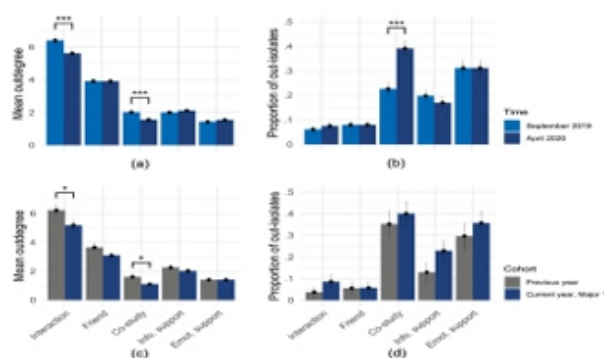
Using advanced technology is becoming a trend in the present situation and education sectors are not the exception. The E-learning platform is implemented by multiple education sectors especially due to the pandemic outbreak and has multiple benefits and difficulties among the students. Despite the various benefits of this application, mental health issues are recognised as one of the most critical aspects in the involving of the “online class” process in the “education sector”. Heavy use of online platforms for any aspect can result in a reduction in the mental health condition which is also a reason behind increasing mental health issues among students due to the rapid growth of e-learning processes for education purposes [15]. Mental health-related issues are considered the factors which inhibit various organisations from implementing e-learning for education purposes.

Stress and anxiety became more frequent among students mainly during the pandemic as lack of communication with other persons increase mental illness among people. The cross-cultural education



environment is identified as most affected due to the pandemic and the implementation of e-learning procedures in the education sectors. Anxiety is one of the most critical psychological effects that depart from other issues in the development of the e-learning process [16]. Most of the students face a lack of interest in the learning process which ultimately leads to increasing anxiety among the students. The increasing anxiety level in the students also failed future opportunities among the students. Distance e-learning is also interrelated with the increase in mental illness among higher education students in the world. Mental health-related factors are considered an important aspect which indicates the negative impacts of e-learning among students. Multiple researchers implied both Covid-19 and e-learning increase as the factors which increase the issues of mental health among students. Rapid growth in the Covid-19 spread in the world forced the education sectors to implement an e-learning process for continuing the education system. However, lack of social activity among the student's leads to affected mental health and decreasing interest in the learning process for educational purposes.

Virtual learning fatigue is an outcome of rapid growth in the “e-learning” process in the education sectors mainly during the Covid-19 outbreak. Spending a rapid amount of time in the virtual world is resulting in the formation of zoom fatigue which is a critical mental health issue in students. Zoom fatigue is also considered an issue which emerged from the rapid growth in the e-learning process in the education sectors during the pandemic. Figure 3.2.1 showcases the factors which increase mental health issues among students due to the implementation of e-learning procedures in the education sectors. Social networks and mental health are critically related as it is found that rapid staying in the world decreases the efficiency of thinking and learning [17]. Mental health markers represented in the following figure are considered as the aspects which increase mental health issues among students, especially during the pandemic.



**Figure 2: Interrelation between mental health and e-learning among students [17]**

### E-learning as an independent predictor of the readiness of it

Rapid growth in the pandemic is identified as the reason behind the growing involving e-learning in the education sectors and has multiple negative impacts on students in terms of their future. “E-learning stress” is identified as a factor that increases the negative impacts of these technologies on students' careers and their future opportunities. Lack of communication with friends and teachers is recognised as a critical result of these technology implementations. However, several positive impacts which are far higher than the negative impacts attract the education market in adopting e-learning processes for continuing the activity in the market [18]. Accessibility of information on the internet and the authenticity of that information is also identified as another reason which enhances the growth of internet-based learning among students worldwide. E-readiness is the process of designing one's perspectives in adopting the process of e-learning for educational purposes. Managing one's learning is one of the main aspects of e-learning which is a part of e-designing which enhances the prediction of the

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outcomes from the intervention of classes in the education sector [19]. E-learning is considered the predictor of e-learning procedures for educational purposes. E-learning programs are becoming successful in the education sector which enhances the adoption of e-learning processes for education purposes. Identifying the results of the outcomes of the process is an important aspect in the development of learning processes which are internet driven. Digital transformation in the education sector resulted in rapid growth in the development of education systems. Recognising the role of the “e-learning” process in the education sector plays a crucial role in the development of internet-based classes in the organisational culture. Designing the process which will be used in the learning process is also an important aspect which is considered as the factor in improving the quality of the learning process driven by the use of internet-based applications. Distance learning in higher education is recognised as an emerging and successful concept in the era of the pandemic and the use of e-learning processes enhances the quality of distance learning [20].

Despite the positive results of the implementation of these technologies, increasing mental health issues are identified as the factor which inhibits the growth of implementing digital technologies for educational purposes. Lack of meeting friends and teachers results in the formation of frustration among the students which is considered a critical aspect in the development of the “e-learning” process in the education sector.

## **DISCUSSION**

The present study mainly focused on the identification of the negative impacts of online classes, especially on students. Increasing anxiety, stress and lack of interest among students are identified as the critical outcomes of e-learning in the education sectors [21]. Enhancing the mental health problems among the students resulted in a decrease in the future opportunities of the students which resulted in the limited implementation of the e-learning process in the educational institutions in the market. Recognising the mental health issues among students also increases the concerns among the education authorities about overusing these technologies in the educational sector. Identifying the negative impacts also helps in getting better solutions for the implementation of e-learning processes implemented in the education sector. Positive impacts are also found in the following study which enhances the quality of these technologies in developing the process of learning for educational purposes. Availability of information and authenticity of the is considered as the positive impacts which enhance the results of the research. Distance learning has been most impacted due to the intervention of e-learning procedures for educational purposes as it enhances cost-effectiveness and decreases the time lapses in the learning process [22]. The positive impacts are found as higher than the negative impacts. However, the negative impacts of e-learning on the student’s mental health are considered as the factor which decreases the quality of these technologies for educational purposes. Recognising the impacts of the technology refers to the downside of the implementation of the technology in the purpose of educational improvement. Negative impacts drive the students in getting affected health especially mental health due to the rapid growth in the implementation of online education in the education sectors. The online education system has become a trending method in the education process. On one hand, the students remain interested in this kind of learning system. On the other side, the students face many mental issues because of the e-learning system. The online learning system is used as the predictor of student engagement in the education system [23]. As the students are interested in the online learning system then it also increases the engagement of the students with this system. On the other hand, as the students remain isolated in the online education system thus it negatively impacts the psychology of the children [24]. This kind of learning method increases absenteeism and anxiety among students. As the educator cannot equally see the students in the e-learning mode, thus it creates depression among the

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students about the carelessness of the teacher. The e-learning system also increases fatigue among the students and that also is regarded as a mental issue which is created by this kind of learning system.

In e-learning, the students also face issues in communication and that also negatively affects their mental health of the students. In the e-learning system, the students cannot get a convenient learning environment [25]. This also creates issues in the mental health of the students. As the students face issues in the interaction in this kind of learning system thus it creates a knowledge gap among the students. This kind of problem also affects the mental health of the students. The students lost their ability to communicate with unknown people and this learning method increased inertia among the students. The students also face issues of depression, anxiety and other negative mental issues and this also decreases the interest of the students in the e-learning system. The lack of interaction also makes the students accept the isolation and they become detached from society. This also negatively affects the mental health of the student.

## CONCLUSION

After the entire discussion it can be concluded that though the e-learning system has become more interesting to the students, it has huge negative impacts on mental health of the students. In one word it can be said that the e-learning makes the students handicapped in their mental health. In this kind of learning system, the student needs to sit in front of a camera or screen for a long time and there is variety in the class, thus it becomes boring to the students. The students do not get any interest in this kind of learning. The students become distressed with the e-learning system because there is no chance to communicate with their classmates which entertains the students. Apart from that it also can be said that in the online learning system, the students do not get opportunities to speak and that also makes the student depressed. After the entire discussion, it also can be said that the e-learning system has a huge impact on hampering the mental health of students. During the pandemic situation, the use of e-learning systems has increased and initially the students were interested in this kind of learning method. The main factor is the lack of opportunity in the communication system which negatively affects the mental health of the students. The findings of the present study can give references to educators to become more conscious regarding the mental issues of the students which come from the e-learning system. With the findings of this, educators also can make decisions regarding the changes in the education system through an online system as the students do not face these mental issues. After the entire discussion, it can be said that the students get huge mental issues from online education and that needs to be reduced to increase the mental strength of the students.

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# Evaluating the Virtual Local Network's Effectiveness at Enhancing the Performance of the Local Network

Hadya S. Hawedi 1, Turkia M. Belhassan 2, Elham A. Egfier 3,  
Abdulghader Abu Reemah A Abdulla 4\*, Adamu Sa'ad Madaki 5

1 Faculty of Information Technology Alasmarya Islamic University, Libya

2, 3 School of Applied Sciences and Engineering, IT Dep, Libyan Academy, Libya

4 Faculty of Education, Computer Dep, Bani Waleed University, Libya

4, 5 Faculty of Information Science and Technology University Kebangsaan Malaysia, Malaysia

## **ABSTRACT**

*Institutions use local networks for communication, information exchange, and service facilitation, but these networks often experience performance and instability due to various factors such as poor network design, increased traffic, and a lack of reliability, privacy, and security. To address these issues, the virtual local network (VLAN) is employed. The purpose of this research is to highlight the importance of VLANs. The performance of VLANs is evaluated by reviewing previous studies and highlighting its key features and services, such as security, scalability, and segmentation of the broadcast domain into multiple areas where each VLAN has its own broadcast domain. To improve the capacity and efficiency of the local network, it is recommended that network engineers and organizations adopt VLAN technology.*

**Keywords** Access, Broadcast, LAN, Trunk, VLAN.

## **INTRODUCTION**

Networks are a collection of hardware and software components that are connected to each other through various transport methods in order to exchange data and share resources and information. Networks can be categorized based on their form, geographical location, and type. Local Area Networks (LANs) are a specific type of local network [1]. These networks used by businesses, universities, banks, and other organizations can have one user or thousands, which can cause bottlenecks and packet collisions due to data flow in a single broadcast field, resulting in data loss and network resource waste, and lowering the efficiency of data transmission. To maintain data and authenticate files, VLAN networks are required. Local networks lack a high level of security and privacy, and if they are physically divided, it would require more equipment and cables, which would increase the cost and alter the network's structure [2]. Due to these and other reasons, local networks are not commonly used by organizations. Many network engineers use virtual VLAN networks to increase the performance of local networks. In these networks, the local network is divided into several virtual or fictitious networks, and the number of virtual VLAN networks divides the broadcast area into smaller areas, each of which has its own broadcast area.

## **THE RESEARCH PROBLEM**

The local network is commonly used by organizations to facilitate communication and internal processes. However, because the local network only has one broadcast field, this can lead to collisions, congestion, and increased network traffic. Additionally, due to the different departments within an institution, there is a lack of privacy, reliability, and security on the network. Despite having adequate

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bandwidth, the network may appear slow and unreliable due to issues with network design, a high number of connected devices, local network protocols (MAC protocol), and resource abuse from accessing websites and programs that consume a lot of bandwidth. Poor network design is a major challenge that modern enterprises face and it affects various services, which motivates responsible groups to focus on improving local network performance by evaluating the network's service quality [3].

## **RESEARCH OBJECTIVES**

- A. To clearly define the concept of a virtual local network.
- B. To show the significance of a virtual local network in enhancing local network performance effectively.

## **RESEARCH METHODOLOGY**

This research has employed both the content analysis method and the descriptive methodology in previous studies.

## **PREVIOUS STUDIES**

The study of [4] found that the use of virtual local area networks (VLANs) can improve the performance of computer networks by providing more stability in terms of throughput, latency, jitter, and packet loss compared to traditional local area networks (LANs). Another study [5] aimed to improve the performance of business networks by modeling and correcting an existing local network using VLANs. Another study [6] found that VLANs can help to reduce network traffic load, expenses, and improve reliability. A study [7] found that VLANs can reduce the impact of denial of service (DoS) attacks. Study [8] found that the use of VLANs in wireless networks can decrease delays and increase productivity. Study [9] aimed to improve LAN performance by using IEEE 802.1Q VLAN switching techniques. Overall, all the studies indicate that VLANs can significantly enhance the performance of local networks in terms of stability, security, and network traffic load.

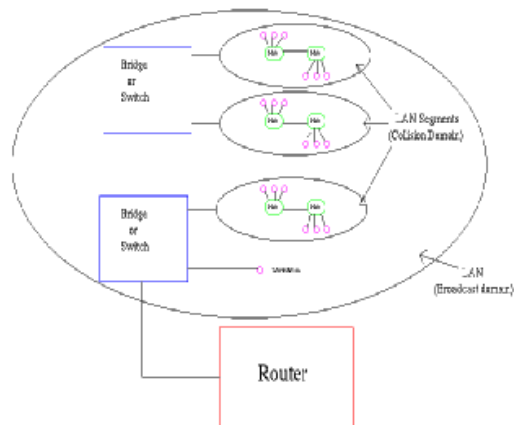
## **Virtual Local Area Network VLAN**

Virtual Local Area Network (VLAN) is a type of sub-network that logically isolates different IP networks and subnets within the same switched network. This allows for multiple IP networks and subnets to exist on the network, and enables network administrators to create separate groups of devices that operate independently of one another, but still share the same infrastructure. VLANs offer benefits such as security, scalability, and broadcast mitigation, as well as simplifying troubleshooting and maintaining network integrity [10]. Additionally, VLANs allow for the creation of specific access and security policies for different user groups within the network.

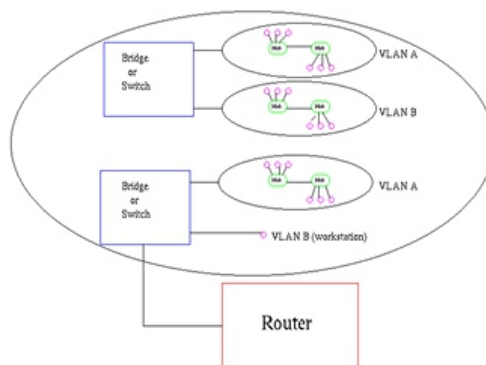
## **LAN & VLAN with Network Protocols and Design**

VLANs are a way to divide a LAN into multiple broadcast domains, allowing for better organization and security of a network. VLANs can be connected through access links, which connect a single VLAN to end devices, or trunk links, which can carry traffic from multiple VLANs between network devices. Cisco's Packet Tracer is a tool that allows users to simulate and emulate network configurations, including those utilizing VLANs [11].

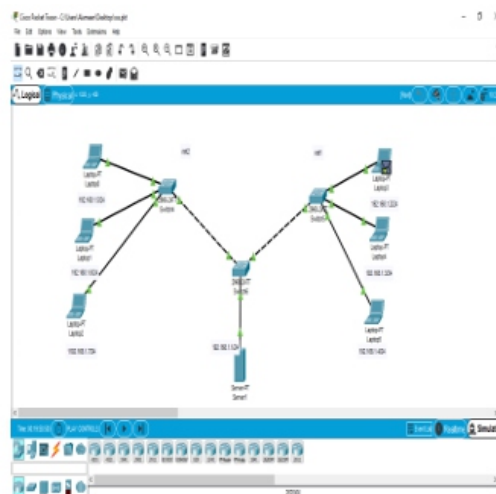




**Figure 1.** Physical view of a LAN.



**Figure 2.** Physical view of a VLAN.



**Figure 3.** Lap3 sends message into lap 4



**Figure 4.** Lap1 send message into lap 5



**Figure 5.** Lap0 send message into lap 4

Also, VLANs are used as an alternative approach to limit broadcast traffic by breaking up a larger network into smaller, logical sub-networks. These sub-networks, or VLANs, limit the broadcast range and improve network performance by reducing the amount of unnecessary traffic. VLANs can be configured by allocating specific workstations or devices to different virtual local networks, creating separate broadcast zones. This can help to improve the overall performance and efficiency of a local area network (LAN). It is also VLANs are used to improve network performance by reducing unnecessary broadcast traffic and providing better security by logically separating users and departments. VLANs enable administrators to control traffic between virtual local area networks and provide flexibility by removing physical restrictions of the network. They are commonly used to separate the user network from the server network and to prevent unauthorized access to crucial application servers, databases, and other private information. VLAN networks divide a large broadcast range into smaller broadcast areas, providing a more secure and efficient network structure compared to a flat local network.



**Figure 6.** Three Vlan Networks send message inside Vlan 2

## CONCLUSION

In conclusion, the use of virtual local area networks (VLANs) allows for the separation of a single local network into multiple sub-networks based on tasks rather than location. This allows for communication within a single network without the need for a router and offers protection and privacy by segregating a portion of the network from the rest. VLANs also provide flexibility and ease in managing the network by allowing for the addition and removal various devices and reducing traffic flow and network congestion by having separate broadcast domains for each VLAN. Overall, VLANs can improve network performance by reducing the quantity of broadcasts and increasing privacy and security.

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# Investigating the Learning Attitude of Undergraduate Students by Analyzing the Effectiveness of User Interfaces for M-learning

**Ranita Ganguly**

Department of Education, Delaware State University, Dover, United States

## **ABSTRACT**

*While Mobile learning referred to as M-learning has mounted to prominence in higher education and has directed exponential growth in research areas, there seems to be insufficient empirical evidence from wide experimental findings to vouch for its learning effectiveness. This concern is addressed in this article by steering randomized experimentation on undergraduate students. This study examines the effectiveness of various user interfaces of mobile devices on the M-learning attitude and perception of undergraduates registered in a graphic design course at a public learning institution. Students took part in three consecutive study sessions. A session comprising a demonstration of the perception of M-learning and an outline of associated mobile applications with their primary course of graphic technologies was organized delineating the scope and functionality for Mobile learning in the line of instruction of 2D and 3D Design at the university level. It was assumed that M-learning with iPad could lead to identical learning attitudes and perceptions among students as that by using an Android tablet, but students were found to have an enhanced learning attitude towards M-learning with iPad as compared to a tablet. Mlearning can lead to the modeling and progression of mobile-based instructive curricula. This article aimed to provide several recommendations regarding improving the usability of the applications and enhancing readers' knowledge to enable future researchers to identify the emerging practices of mobile learning.*

**Keywords** M-learning, usability, effectiveness, device compatibility, user interface

## **INTRODUCTION**

M-learning scientists endeavor to expand the utility of mobile technologies in higher learning establishments while retaining the educational mission. In the existing literature, specialists have defined M-learning from separate viewpoints. M-learning is the education that is exercised using miniature computing mobile devices [1]. The definition comprises of smartphones and small handheld gadgets. Mlearning can be described as a specific theme that has emerged from distance learning [2]; M-learning can be considered as the next generation of E-learning using mobile technology [3]. More elaborately, M-learning is the expertise that alters the method in which the students connect, and work out with each other and their experiences [4]. In addition, it was supported that M-learning accelerates knowledge sharing among learners and educators interaction with each other [5]. M-learning is not only the erudition that is grounded on the application of mobile devices but also the erudition that is reconciled across multiple contexts handled by portable mobile gadgets [6]. Briefly, M-learning benefits learners and educators to operate their daily chores in a limited period using miniature technological gadgets (tablets or smartphones) in an anytime anywhere environment. A need for an extensive user requirement analysis was investigated to explain the functionality and scope of the M-learning applications used with the capability to enhance the learning perception within the Bachelor of Arts

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cohort in the ‘Studio Art’ course at the Department of Visual and Performing Arts, at a public University in the United States. The study involves 16 students attending a course for undergraduate studies. All participants performed their assigned task using their personal mobile gadgets which run on iPad or Tablet. Mlearning facilitates learning flexibility in discrete classifications of activities, inclusive of behaviorist, constructivist, situated, collaborative, personalized, informal learning [7][8]. However, with the affordability of telecommunication services and the vast availability of a wide range of user interfaces for end-user devices, Mlearning content. M-learning has undisputedly gained momentum in becoming the potential mainstream of the current generation. The Technology Acceptance Model (TAM) has been designed with a motive to determine how end-users could recognize or decline a specific technology [9]. Further, it was claimed that attitudes concerning any educational technology might be treated to quantify with usability analysis of mobile interfaces for M-learning [10]. This is becoming extensively significant in handling high-end extent consumers of the technology (learners and educators) who have the ambition of technology use and determine if mobile technology has conducive or adverse influences on the environment. Furthermore, it was empirically determined that Technology Aided Modelling (TAM) provides the to determine the impacts of the variable on attitudes. Users' attitudes indicate the intent of use and the real use of the latest system. By this means, the attitude of learning can provide a perspective framework for comprehending the learner’s intention to use and acceptance of new technology [11]. The successful proliferation of the mobile learning community needs consistent action to examine the requirements and preferences of theoreticians as well as practitioners through usability analysis towards grounding a framework of broader comprehension of M-learning users’ attitudes and perceptions.

## **THE RESEARCH PROBLEM**

The screen size requires a particular layout of information to be displayed to convey the information in an effective manner. There are major limitations arising due to implementation problems of different user interfaces in Mlearning for different mobile device platforms as the learning perception of potential end-users of M-learning are not extensively captured using direct practical engagement and participatory usability analysis across a wide range of university-level curriculum in the educational spectrum, which this study aims to achieve.

## **Problems Found in Past Research and Practice**

Usability analysis of user interfaces before the advancement of M-learning applications has a major role in determining the learning attitude and perception of end users. Most of the M-learning applications have device compatibility issues occurring due to variations in the user interface from different manufacturers leading to further usability issues that make M-learning unfit for the purpose [12]. The overall issues comprise too much variation in the interfaces (e.g., keyboard size and arrangement) by diverse manufacturers, innovative copies of devices being released too repeatedly (which enforces adverse side-effects on the interface learnability), the requirement for quite often recharging, frugal memory processing capability of the devices (resulting the applications to function too sluggish), etc. A few discipline-specific issues, for instance, accountancy (spreadsheet display or data entry) and music composition instructions are too small and poorly lit monitors and keyboards that are heavily compacted. Due to these hardware problems, many of the devices are exceedingly portable and commonly come with tiny display screens and keyboards that do not fit to handle complex user interaction and navigation systems without disappointing the user. There were several deficiencies in existing knowledge about the problem. Systematic quantitative analyses on the effects of M-learning due to differences in user interfaces based on different mobile device platforms were lacking in the



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existing literature. The lack of proper usability analysis based on the ease of use for M-learning applications arising due to user interfaces inspires to fill the void in the existing literature. Future efforts were required to broaden and systemize the expertise related to usability issues during the advancement of M-learning applications. The audiences benefit from the study of this problem in several ways. The findings could become a layover platform for future researchers, mobile developers, educators, practitioners, and policymakers for future reference in the realm of M-Learning regarding the latest trends of usability analysis before the deployment of M-learning apps.

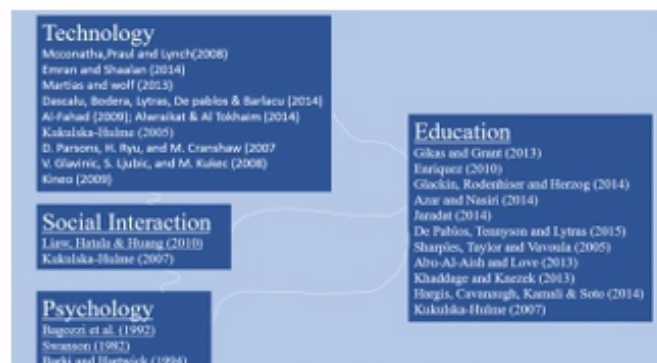
### **The Purpose Statement**

Higher education establishments are accountable for supplying convenient infrastructure for every student and must highlight collaborations that revolve around a substantial alteration in an information and communication-oriented society. Mobile technology is an exceptional for outdoor lesson engagement. With a swelling number of educational applications, improved user experience during application usage was essential. Therefore, the rational justification for the research problem was the need for the application's usability to remain judged with appropriate usability estimation methods. Both the efficiency and effectiveness of the application's usability could influence user satisfaction for any mobile application. The assessment of usability involves evaluating with an impartial approach to consistency. Usability evaluation relies on the magnitude of how people converse with a particular product or service. Thus, usability evaluation or usability testing was primarily employed in calculating the client interaction using a specific application or product. The purpose of the study was to evaluate the application's usability to be evaluated with appropriate usability assessment methods. The challenges of design for user interfaces revolve around a wide scope of usability aspects including navigation, content usefulness, and user experience. The researcher's purpose was to determine how different types of user interfaces based on the mobile platform used in M-learning can enhance learning attitudes and perceptions for students following the 'Graphic Design' curriculum of respective undergraduate-level courses of university studies by performing a usability analysis of multiple user interfaces used in M-learning using both Apple iOS and Google Android platform. Moreover, research has found that M-learning produces a substantial impact on the learning attitude of students [13]. The independent variables to be used while conducting the randomized experiment is the device features based on the mobile platform used in the M-learning mode of instruction delivery while the dependent variable is the learning perception of university students.

### **Review of Literature**

Mobile devices offer individualized and personal experiences. Mobile devices offer five benefits for the learning industry: portability, accessibility, learning opportunities, connection, and personal experience [14]. Mobile-Assisted Language Learning (MALL) delivers students rich, real-time, convenient, social contact, collaborative, and contextual learning [15]. The Interactive Learning Network (ILN) model, which involves both PCs and wireless technology has been executed for pre-and post-tests to gauge the student's learning performance [16]. The impacts of mobile technologies on teaching and learning under social media in the format of Skype, Twitter, and were in limelight [17]. The amalgamation of mobile devices and E-Books to build the student's acquaintance with a digital library was addressed [18]. Two studies were conducted to assess the usage of iPads through one semester in Mathematical course [19]. It was emphasized how learning context encounters different trials in relationship to user interface design of mobile devices have various constraints i.e., small screen size, varying screen width among devices, touch screen capability, text typing difficulties, and limited attention to the user and physical environment [20]. Besides, there are a few specific hardware problems like limited battery power,

limited computing ability, limited bandwidth, and limited storage or memory which affect the designing of mobile learning applications. Such challenges constantly impact the design of M-learning applications. The learning content needs to be in a small layout to fit on the device's screen without sacrificing any quality information using an accurate user interface. General indicators like the linearity and significance level of information are applied to evaluate the quality of any user interface. The user interface needs to adapt to different sizes of the device's display.



**Figure 1.** Literature map derived based on literature review

Figure 1 in the article indicates that the study employs a systematic literature study procedure by extracting understandings from already circulated research efforts. This research article on usability analysis and testing of mobile applications used in M-learning will help to extend the literature by helping future researchers and developers to ensure that the M-learning application under consideration is used by different types of persons ranging from IT experts to students and disabled.

## MATERIALS AND METHODS

It was hypothesized that mobile device user interfaces that provide better ease of use, flexibility of usage, along with immediacy of information acquisition leads to better learning attitudes and perception among undergraduate university students. To address the hypothesis, it was sought to answer the research question of how the different features of a user interface applied in M-learning affect the factors - like the ease of operation, the flexibility of usage, and immediacy of information acquisition which are used to judge the learning attitude and perception. Additionally, the researcher qualitatively determines how the form of the mobile device applied in M-learning can cause an alteration in the effectiveness and availability of learning activities. Determining the compatibility of M-learning applications with a wide variety of potential device configurations is of major significance as some M-learning application features are not available on every device. For instance, some devices may not incorporate a compass sensor. If an M-learning core functionality expects the use of a compass sensor, then the app is compatible only with a device that incorporates a compass sensor. In determining the usability of quality attributes for any mobile applications, the application developers should determine whether the end-user finds the application user-friendly and attractive, and the extent to which the product is understood, and simple to operate. Determining usability also involves functional testing. Inspection, review, and evaluation, which are to be performed on the M-learning applications as a part of the usability testing technique. This qualitative study utilizes content analysis methods to evaluate and acquire insight from the literature. The research design involved a qualitative coding methodology to search for the interrelated keywords and detect themes linked to keywords, followed by categorizing the keywords into themes. The extraction process is instinctively done using macro add-ons for word processors. Open coding involves finding a descriptive concept for sentence. The concepts were then coded into three themes based on the three concepts of M-learning such as mobility of technology, mobility of



learning, and mobility of learner. Every sentence was paired with one of these specified concepts. Lastly, the framework was formulated grounded on the output of the coding procedure and related literature. The sampling process consists of extraction from 42 papers, 222 valid sentences that contain “interface” words were chosen and coded. The data collection source for analysis was previously published works in a journal enabling the researcher to conduct the study enabling further research ability to duplicate the outcome in a higher education

## Data Analysis

The papers under review were sorted into categories. The study of mobile learning began to surface in 2012 upwards. In 2015 the number subsided faintly before reaching a summit a year later. Largely, the volume of investigation on this Mlearning is still mounting every year. Students were the most regular users of M-learning as nearly 40 percent of the articles were examined in this context. To give these study findings better content validity, suitability, dependability, and quality, triangulation of data was performed using students’ feedback on i) ease of use ii) flexibility of usage iii) immediacy of information acquisition for the selected user interface design based on two different device platforms for comparison. From the data depicted in Table 1 below, it is evident that when the quasi-experiment was done based on measure design for the target group of 16 students, the iPad depicted better adaptive capability due to a better user interface and students had a better learning attitude with iPad devices.

FIGURE & TABLES

Table 1. Response of students based on closed-ended questionnaire.

iPad Features / Characteristics	Type of Device Service for iPad	Student Count	Student Percentage
The immediacy of information acquisition due to the adequacy of memory	Very prompt delivery	12	75
	Prompt delivery	2	12.5
	Not prompt delivery	2	12.5
Flexibility of usage due to Battery Life	Very flexible to use	12	75
	Flexible to use	3	18.75
	Not flexible to use	1	6.25
Size of Display /Screen is attractive to accessing learning content like video, audio, and text	Very Attractive to Use	11	68.75
	Attractive to Use	3	18.75
	Not Attractive to Use	2	12.5
Keyboard Size and arrangement in ease of usability	Best Ease of Use	10	62.5
	Easy to Use	4	25
	Poor Ease of Use	2	12.5
Android tablet Features / Characteristics	Type of Device Service for Tablet	Student Count	Student Percentage
The immediacy of information acquisition due to the adequacy of memory	Very prompt delivery	9	56.25
	Prompt delivery	4	25
	Not prompt delivery	3	18.75
Flexibility of usage due to Battery Life	Very flexible to use	8	50
	Flexible to use	4	25
	Not flexible to use	4	25
The size of the Display /Screen is attractive for accessing learning content like video, audio, and text	Very Attractive to Use	7	43.75
	Attractive to Use	4	25
	Not Attractive to Use	5	31.25
Keyboard Size and arrangement in ease of usability	Best Ease of Use	5	31.25
	Easy to Use	6	37.5
	Poor Ease of Use	5	31.25

Note: The table identifies the percentage of students who accept the user interface based on the mobile platform

Grounded on the questionnaire facts, this study used the Friedman Test to compare students’ attitudes toward Mlearning using the iPad’s user interface and the Android tab’s user interface. The iPad user interface of M-learning mode achieved higher rankings on learning attitude and the results suggested that the iPad user interface was superior in content organization and fostering better learning attitude among undergraduate students. However, it is interesting to note that the Android tab user interface received significantly lower learning attitude ratings on some items indicating students preferred the iPad user interface for M-learning instruction delivery. The Friedman test was employed for one-way repeated measures investigation of variance by ranks and this technique assumes that the primary observations are rated on an ordinal scale at the minimum

The source of analysis was primarily based on the conclusions of a 5-point Likert scale questionnaire. The evaluation acknowledged several positive opinions from the respondents concerning their issues

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for improvement purposes. Usability was analyzed by determining the ease with which the students could access the service with the slightest complexity and finest fulfillment while experiencing the desired objective. The efficiency of the mobile application was found to be at a moderate level and most of the participants were satisfied with using the same application.

## **DISCUSSION ON FINDINGS**

The initial phase of the coding procedure generated 91 open codes from 221 sentences. These 91 concepts were then plotted into three scales of M-learning. The codes categorized as dimensions for learners, learning, and technology. The sentences on the 'user interface' topic was then coded to detect the themes. The result depicted that there were 4 scales of the user interface founded on 4 themes generated – i. Design Principle ii. Hardware specifications iii. Context of usage, and iv. Modeling Language to support the researcher's argument. The practice of modeling language in constructing a M-learning application's user interface is critical. It is concerned with the model amendment during the development along with the enhancement stage of the application. An object-oriented method was proposed as modeling language in the design of the user interface. There are certain modeling languages that generally help in designing user interfaces, like the Data Flow Modelling Language and Unified Modelling Language (UML). The findings depicted an extent of visualization of the outcome to strongly support how it correlated to the aim of this study. Some concerns arose due to the unsupported platform of operating system and the condition or age span of mobiles.

## **REFLECTION AND SUMMARY**

Recent technology supports collaborative work among users which is becoming a more eminent feature in Mlearning. Furthermore, the design of any user interface for any type of mobile platform should highly consider the monitor size of the gadget so that it can be exhibited neatly. Learning behavior through mobile gadgets is not determined by time and place. It has restricted attention from the users which affects the level of the user's attention in doing tasks. Thus, the interface must be created grounded on the mobility of the user. The app was considered good in terms of effectiveness. This article shall be useful to future researchers on how user interface plays an effective function in M-learning app design while reflecting on the way the user interface of the application could be designed and the user acceptance. Further investigations are needed to specify comparative results on interface upgrades based on behavioral intention to apply in higher education mobile apps. Depending on the time to finish each chore, it may be deduced whether the app was efficient for use.

## **ACKNOWLEDGMENTS**

The researcher requested participation from the participants after explaining the purpose of the study. Due credit was given to all research subjects in writing after the research data collection. All communication with research subjects was conducted via institution-affiliated email/video chat under 2021 COVID-19 social distancing recommendations to prevent legal risks of participation. Funding was not applicable for this research study. The author has no conflict of interest relevant to this article and hereby declares that the information furnished above is true, to the best of her knowledge. To ensure compliance with the current regulatory requirements set forth by the place of research, an application to request approval from the review board was submitted. To ensure confidentiality, all respondents provided their electronic consent before participation in the study. The name of the app used for evaluation was kept confidential to avoid legal issues. During data collection, the researcher asked only protocol interview questions and avoided leading inquiries. Throughout process, multiple diverse

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perspectives were reported, and data was kept transparent.

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# Pedagogical Principles in Learning and Its Impact on Enhancing Motivation of Students

Hayath T M1\*, Dr. Shashi Kant Gupta2

1Ballari Institute of Technology and Management, Ballari, Karnatak, India

2 Ph.D. & Researcher, CSE, Integral University, Lucknow, UP, India

## **ABSTRACT**

*Pedagogical principles are an important part of the learning and teaching process that is important for students to perform effective and efficient learning activities. The pedagogical principles are important for students to learn the curriculum more effectively and also help them to learn new skills conveniently. Implementing pedagogical principles in learning helps to motivate students towards their academic careers. There are different types of pedagogical principles that help to improve the overall learning process of students and help them to get success in their academic and professional life as well. Pedagogical principles enable students to think in different ways and act beyond the traditional method to get benefited in the academic field. Pedagogical principles are important to enhance productivity and creativity and increase critical thinking among students. This study aims to evaluate the pedagogical principles of learning and their impacts on enhancing motivation among students. This study also emphasises the importance of motivation among the students and also tries to determine different strategies to increase motivation among the students. Secondary qualitative research is followed here in this study to improve the authenticity of the study. Thematic analysis of the topic also gives a clear understanding and that helps to make decisions more relevant.*

**Keywords** Academic Field, Enhance, Learning, Motivation, Pedagogical Principle, Students.

## **INTRODUCTION**

Pedagogical principles consist of different methods and techniques of teaching that are important for students to perform meaningful learning activities. The pedagogical principles are important for students to learn the curriculum and other skills more conveniently. Integration of pedagogical principles in learning helps to improve the overall learning process of students and that is important to enhance motivation among the students [1]. It also enhances students' level of participation and contribution during the learning process. A well-structured pedagogy is important for students to get an education using a range of learning styles. Consequently, it improves motivation among the students and ultimately helps them in their future [2]. There are different pedagogical principles that are interconnected with each other and provide a framework for a great learning process for students that are important to enhance learning motivation among students. Hence, the purpose of the study is to find out the key principles of learning and their impact on enhancing motivation among people.

## **AIM OF THE STUDY**

Pedagogical principles are important in the learning process of students and that helps to enhance motivation among the students. The aim of the study is to understand basic pedagogical principles and their impact on enhancing motivation among people.



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## **Objectives**

- To evaluate pedagogical principles of learning
- To identify the impact of motivation to enhance learning among the students
- To determine different strategies to enhance motivation among the students
- To understand the impact of pedagogical principles in enhancing motivation among the students

## **RELEVANCE OF THE STUDY**

Pedagogical principles play a significant role in improving the overall learning process of students and it is important for students to learn their curriculum and other skills in an easy and convenient way. Pedagogical principles are focused on "teaching and learning arrangement" and methods that are important to improve the learning environment for the students and it is also useful for students to learn different skills and improve their attitude toward students. Pedagogical principles are concepts of education that refer to the basic framework or structures that need to be followed during the learning process of students. Well-structured pedagogical principles are required for every student to improve their learning ability and get success in the academic field. Pedagogical principles deal with the overall learning of students and it has a huge role in enhancing confidence and motivation among the students and which makes this research relevant in the educational context.

## **MATERIALS AND METHODS**

### **Research Design**

The research design refers to the structural framework of research that is helpful to perform the research study in a systematic way. It is also an integral part of a research methodology that is important to formulate and structure the research study [3]. A well structured research design is helpful for the study to improve the overall effectiveness and improve the efficiency of the study. It is also important to improve the relevance of the study. The exploratory research design is followed here in this study to formulate and make an outline of the research study. The exploratory research design through a secondary data collection procedure improves the efficiency of the study along with the effectiveness of the research.

### **Research type**

The selection of research type is an important part of a research study that has the ability to formulate overall procedure and improve the effectiveness of the research. An effective research type can improve the productivity of research and that is important to make research study more time efficient. Qualitative and quantitative are two major types of research that are widely used by researchers [4]. The qualitative research type is adopted in this study to enhance the efficiency of the research. Additionally, it also gives a clear understanding of pedagogical principles and their impact on enhancing the motivation among the students.

### **Research duration**

This research has been conducted by understanding the main topic and collecting secondary qualitative data and analysing them with topic-oriented thematic analysis. However, while attaining the objectives, the entire process of research has been completed within 45 days.

### **Inclusion and Exclusion criteria**

Inclusion and exclusion criteria are important for any research study which helps to improve the

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authenticity of the research and also makes the data collection process easy and convenient. It gives a clear understanding of which data need to collect and which data need to neglect during the data collection process.

### **Inclusion criteria**

- Journals, articles, and newspaper articles are collected from authentic sources and date of publication for data collection.
- Sources that are published before 2018 are taken here for data collection.
- Exclusion criteria
- Personal articles and blogs written in other than the English language are excluded from data collection.

### **Data collection and analysis procedure**

The data collection process is the most important part of a research study that is also essential for the research. The result of the research study totally depends on the data collection and analysis procedure [5]. Different types of data collection and analysis processes are there in the field of research. The qualitative data collection and analysis process is followed in this study to improve the effectiveness and efficiency of the study. Secondary qualitative data collection and analysis gives a clear understanding of pedagogical principles and considering this the collected data have been evaluated for attaining the objectives.

## **RESULTS**

Evaluation of pedagogical principles of learning Pedagogy is an important process and technique that deals with learning and teaching procedures. Pedagogical principles are important to guide and develop structures of learning among students. It helps to improve the overall learning process among the students and makes an ideal environment for learning. There are different pedagogical principles that are useful to strengthen the teaching and learning process among students.

**Motivation** is the reason that drives students and teachers both in educational institutes. The motivations can be internal and external, internal motivation impulse comes from ourselves and external motivation impulse comes from another individual and is accepted by us [6]. External motivation in students is directly related to the skills of teachers and the student-teacher relationships. Teachers have to motivate students in learning by understanding the students' points of view and their interests.

**Exposure** is a process to transmit information among students. Positive exposure improves confidence among the students. In positive exposure, teachers have to give a wide range of knowledge about students' interests and that can help students to gain confidence in the classroom. In this principle, teachers need to introduce new content or summarise content that is already learned to improve the understanding of the students.

**Practical activities** are also important to improve the learning process of a student. Practice is one of the teaching-learning processes that help to strengthen the learned content and facilitate the process of memory [7]. Teachers are required to involve students in different activities practically that are learned before theoretically. It improves the understanding of topics more easily and conveniently.

**Variation** is also an important principle of pedagogy that teachers need to implement in their teaching process to improve students' engagement in the class. Sometimes teachers have discussed different concepts of students' interest in the classroom along with the curriculum to improve students' engagement in the classroom.

**Positive relationships** between students and teachers are also an important principle that is helpful to the overall learning process of students [8]. Good student-teacher relations and good collaboration of



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teachers with the students help to improve motivation among the students and that helps to change the attitude of students towards learning.

**Relevance of content** is also an important principle that teachers have to follow during teaching. Teachers have to focus on topics that are related to the life of students and that are linked with knowledge of previous lessons otherwise students may feel isolated and lose interest in the class.

### **Impact of motivation in enhancing learning among students**

Motivation is the first and foremost important aspect that leads people to perform any task or activity. Motivation has also a huge impact on the learning process of students. It is important for students to pursue activities of their choice and also helps them to learn their curriculum more effectively. Motivation is traditionally two types which include intrinsic motivation and extrinsic motivation. In the case of students, extrinsic motivations are affected more in their way of success.

**Motivation is important to foster critical thinking and creativity:** Students who are motivated enough can think more critically about a particular matter and that leads them to formulate creative ideas [9]. Motivated students are not more intelligent than other students but their need to find the answers pushes their thinking and leads them to produce creative ideas.

**Motivation cultivates self assurance among the students:** When a student is truly motivated by an activity they have the less emotional and cognitive energy to focus on other social images. Motivated students are more likely to bounce back emotionally from low grades on tests or harsh criticism by teachers. Students with intrinsic motivation are not driven by criticism or fear of failure. This attitude helps the motivated students to cultivate themselves and ultimately helps to improve the learning process among the students.

**Motivation is important in improving a sense of purpose among the students:** Motivation among the students helps to improve a sense of purpose. When motivation comes intrinsically it always has a purpose to perform the activity and that builds a sense of purpose and leads students to their future [10]. This sense of purpose leads students to give motivation in the learning process and improves the learning process of students.

**Motivation enhances the determination and efforts of the students:** When a student is motivated whether it internally or externally they give their best effort to perform any task. This determination and effort give them ultimate success in their goal [11]. In the case of learning when a student is motivated enough they try to focus on study and give extra effort in study to perform well in academics and that helps to improve the overall learning process.

### **Strategies to enhance motivation among the students**

Motivation is important to improve the learning process among students and it plays a significant role in improving confidence among students. Motivation is generally useful to encourage students to apply efforts in learning tasks and trying new approaches. There are different strategies that can improve motivation among students.

**Build strong relationships:** positive relationships between students and teachers significantly lead to positive motivation and to greater achievements [12]. Students, who believe that teachers are not interested in learning report, have the more negative motivation and experience achievement in academic life. Hence, motivation among students can be improved by maintaining strong relationships between students and teachers.

**Enhance task engagement and interest:** Motivation among the students can be enhanced by increasing engagement towards the task. Students who are engaged with tasks and activities of their interest find learning easier. Engagement in tasks improves the motivation among the students which leads them to learn more easily. Therefore, teachers need to formulate activities and curriculums

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according to students' interests to motivate themselves in the academic field and help them to get success in the future.

**Making students aware about the relevance and importance of learning:** Motivation in a student can be improved by different procedures or strategies. Making students aware with relevance or importance of learning the major strategy to improve motivation among the students [13]. Teachers have to be aware students about importance of learning to motivate them in the learning process. The increasing challenge, of inviting students to personalise a topic and discussing universal human experience is the way to aware students of the importance of Teachers also need to help students to explore their communities and have to tell them how their knowledge and concepts are used in the community. This gives students a purpose for learning and improves motivation among them.

**Connect with students' values, identities and goals:**

Every student has their own personal identity, vision and goals. Teachers have to help students to connect their learning curriculums with their identity, vision and goals to motivate them towards the learning procedure [14]. When students see their learning tasks and activities are relevant to achieve their goals they feel motivated and engage themselves in learning.

**Impact of pedagogical principles in enhancing motivation among students**

Pedagogical principles are important for improving the overall learning process among the students and it has a huge impact on enhancing the motivation among the students. Pedagogical principles also help to improve confidence among the students and also help them to enhance the overall learning process. Exposure to knowledge is a pedagogical principle that has a huge impact on motivation along with the learning process of students. With the positive exposure to knowledge, teachers can motivate students to learn new skills and get success in academic and professional careers as well [15]. Repetition and revision is also a pedagogical that leads students towards academic success. Teachers and instructors repeat important topics and activities and revise them multiple times to improve the understanding of the students. A good understanding of a topic motivates students towards learning and consequently leads students towards academic success.

**Practical activities and practice** is a pedagogical principle that is beneficial for enhancing motivation among the students. Practical activities on theoretical knowledge help to understand the topic clearly and practising it multiple times also improves the understanding. Improved understanding of any topic increases interest and also motivates students towards learning. Constructive criticism is also an important principle of pedagogy that helps to motivate students [16]. Some people consider criticism to have a negative impact on student's motivation but that is not true. Criticism impacts positively when it is justified and constructive. According to pedagogy teachers can constructively criticise a student and point out errors and drawbacks to make them perfect. It helps students to understand their errors and shortfalls and consequently motivate themselves towards learning.

**Positive relationship management** between teachers and students is a pedagogical principle that has the ability to motivate students towards learning. Students feel free to ask their study related doubts about their teachers without any hesitation when they have a good relationship with teachers. It helps them to motivate towards learning and gives them opportunities in the later future. Satisfaction is also a principle in pedagogical principle that has a direct relation with motivation. Following this principle teachers and school authorities develop a system of rewards for the students. That increases the sense of satisfaction among the students and consequently increases their motivation towards the learning process [17]. Creativity is a fundamental factor in pedagogy that describes teachers or instructors as having to be creative at their work. They can organise different other activities in the classroom to motivate students towards learning.

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## DISCUSSION

Pedagogy is an important technique or pattern of learning and teaching that is important to guide and develop structural learning processes for students and give benefits to them to get success in academic and professional fields. It is also important to create a suitable learning environment for students. Different pedagogical principles are present to improve the learning process of students. Motivation is the main reason that drives students and teachers both in an educational institute [18]. Teachers need to motivate students in learning by understanding the viewpoint of students. Exposure to knowledge is also a principle of pedagogy that helps to change the learning process of individual students. In positive exposure, teachers give a wide range of to the students and that enhances confidence among the students. This principle is to summarise the content that is already learned to improve the understanding of the Practical activities are also important to improve the learning process of the students. Practice and practical activities are important to understand the topic deeply and also help to strengthen the learned content and facilitate the process of memory. Teachers are also required to involve students in different activities practically that are also learned before theoretically. It improves the understanding of the topic more easily and conveniently. Positive relationships with students and teachers are also an important principle of pedagogy that is helpful to the learning process of students [19]. Good students-teacher relationships and good collaboration of teachers with the students also help to improve motivation among the students and that helps to change the attitude of students towards the learning. Relevance of content is also an important principle that teachers have to follow. Teachers also have to focus on topics that are related to the life of students and that is linked with knowledge of previous lessons otherwise students can feel isolated and lose interest in the class. Motivation is the first and foremost important aspect that leads people to perform any task or activity. Motivation has a huge impact on enhancing the learning process among the students. Motivation is important to foster critical thinking and creativity among the students. Students who are motivated enough can think critically about different study related matters and that leads them to creative ideas. Eagerness to find answers to the questions of motivated people leads them to think critically and produce creative ideas. Motivation cultivates self assurance among the students [20]. Motivated students are more likely to bounce back in difficult situations such as low grades on tests and criticism by teachers. Motivation is important in improving the sense of purpose among the students. When motivation comes intrinsically it always has a purpose to perform the activity and that builds a sense of purpose and leads students in their later future. Motivation helps to improve the determination and efforts of the students. In the case of learning, when a student is motivated enough they try to focus on studying and give extra effort to perform well in academics and that helps to improve the learning process of the students. There are different strategies to improve motivation among the people and these strategies include managing a good relationship between teacher and students, enhancing the interest in a given task, awaring students about the importance of learning and connecting students with their values and goals. These strategies help to enhance motivation among the students and that is important to improve the learning process of students. Pedagogical principles have a huge impact on enhancing the motivation among the students and it is helpful to increase confidence among the students. Exposure of knowledge, repetition and revision is the most effective pedagogical principles that help to improve the learning process among the students [21]. Practical activities and practices are an important pedagogical principle that is beneficial for enhancing motivation among the students. Practical activities on previously learned topics help to improve the understanding of students and that is important for increasing motivation among the students. Positive relationship management is also an important principle that has a huge impact on increasing motivation in learning among the students. Students feel free to ask their doubts to the teachers and that helps to improve their motivation. Satisfaction of students, creativity in teaching and constructive criticism by

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teachers also help students to improve motivation and these factors help students to get success in their academic and professional life.

## CONCLUSION

Pedagogical principles are an important technique of learning and teaching that is important to improve the learning process of an individual. This principle also helps to increase creativity, productivity and critical thinking among the students. Pedagogical thinking also helps to improve motivation among the students towards learning and get benefits in their academic and professional life. Motivation, exposure to knowledge, practical activity, variation, and strong relationships between teacher and students important principles in pedagogy that is important to formulate the learning process of students. These are important to change the way of learning and give students an advantage in their academic and professional Motivation is an important factor in learning that has the capability to improve the learning process among the students. Motivation is important to foster critical thinking and creativity, cultivate self assurance among the students, improve a sense of purpose among the students motivation enhance determination and efforts of the students. strategies are also there that can motivation among the students. Creating strong relationships with students, enhancing task engagement, awaring students about the importance of learning and connecting students' values and goals with learning are the main strategies that can increase motivation among the students.

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# Physical Health Issues of the Students Faced by Online Learning and Its Impact on their Growth

Arepalli Sathibabu<sup>1\*</sup>, Dr Komarasamy G<sup>2</sup>

<sup>1</sup>Kare, India

<sup>2</sup> VIT Bhopal University, India

## **ABSTRACT**

*The present study has started with the background of the research on the physical health issue of the online learning system and its impact on the growth of children. The purpose of the research with its aims and objectives is present. The entire method of the research is also described in this study. In the part of the results, three themes have been developed based on the objectives of the study and then those are discussed. This study has discussed the negative aspect of the effectiveness of online education. The present study also has given a discussion regarding the physical health issues of the students for online education. A brief overview regarding the impact of e-learning processes that can affect various sectors of a student's life has been Important factors such as technical knowledge, economic capability, technical issues and other aspects have been discussed in a proper manner which is relevant to the process of online learning. An overall discussion regarding the findings has also been portrayed that is meant to provide a summarized view of the research findings. The overall idea and concepts on which the entire study is based have also been included in a brief manner.*

**Keywords** Covid-19, Eyesight Issue, Online Learning, Personal Development, Physical Issue, Student Engagement.

## **INTRODUCTION**

### **Research background**

An online learning system is when a student takes courses online instead of in a physical classroom. The concept of online learning method was not famous before the “Covid-19 pandemic” [1]. During this pandemic, the country faced a lockdown situation and in that situation, all the organisations were closed as well as the educational institution. In the difficulties, the experts decided to give learning materials to the students through an online system. It was thought that online learning media can make students more enthusiastic to attend lectures [2]. These kinds of thoughts were effective and the use of online learning systems has drastically increased during the pandemic situation. The number of UK people who said that they had received an online course that grew from 4% to 17% [3]. It also is observed that the excessive use of online learning systems negatively affects students. This kind of learning system also is making various kinds of physical issues among the students and from that perspective, this topic is selected for research to know the negative impacts of e-learning on the health of students.

### **Aim and Objectives**

The aim of this research is to acknowledge the physical health issues of the students faced by the students and their impact on their growth. The objectives of this research are:

- To understand the negative aspect of the effectiveness of online learning systems
- To evaluate the impact of an online education system on the growth of the students

- To identify the physical health issues of the students created through the online education system

### Research purpose:

This study is selected to research the negative impacts of the students' excessive using the online learning system. This kind of learning system has become interesting to the students and most of the students are enthused to accomplish their classes online. This kind of educational system has become more flexible than the conventional educational process. The perception of the students' online learning systems increases the e-learning methods [4]. The main purpose of this research is to present a discussion regarding the negative effectiveness of the online learning process and the impact of the online learning system on the growth of students. Another purpose of this study is also to identify the health issues of the students which are created by the excessive use of online mode in the learning system. The suggestions about the use of online learning system as it becomes effective for the learning system but does not affect the health of the student, are also included in the purpose of the study.

## METHODS AND MATERIALS

### Research design

The design of research is considered as the overall strategy which is selected by the researcher for the integration of different kinds of components to accomplish the study is a logical process. The design of the research is affected by the types of research [5]. The research design is also impactful in ensuring the research problem. Various kinds of research designs may be used for completing a study and among various kinds of designs; four are popular such as experimental, explanatory, exploratory and descriptive. The present study is accomplished based on secondary data and it also explores some information related to the topic of the research. Thus the exploratory research design is appropriate for the present study. researcher interprets the data which are collected. The interpretivism research philosophy is also impactful in explaining the interests of the researcher for the study. This kind of research philosophy is also selected while the research of the study discovers a deep understanding of the subject matter of the study. As this study is completed based on the secondary qualitative data thus the selection of interpretivism research philosophy is appropriate for this research.

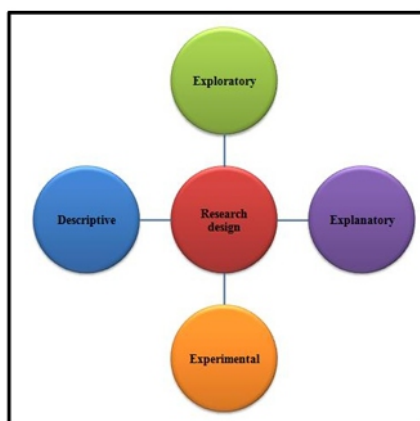


Figure 1: Research design (Source: Self-developed)

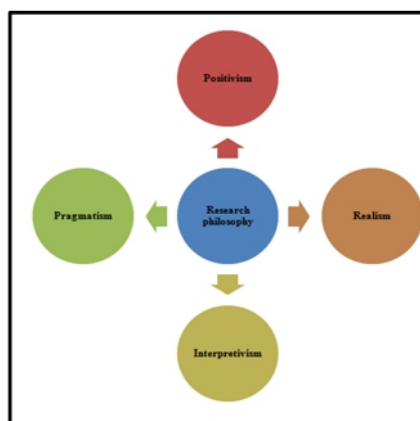


Figure 2 Research philosophy (Source: Self-developed)

### Research type

Research type is regarded as an integral part of the research methodology. The quality of the study also depends on the types of research. Types of research depend on data and techniques which are used in the study [6]. Thus the types of the present study also are decided based on the type of data those are used for the accomplishment of the study. Two kinds of research types are known to the researcher such as

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qualitative research and quantitative research. Among these two kinds of research, anyone can be followed or both types of research methods also can be followed. The present study is driven by using secondary qualitative data and the type of this research is qualitative.

### **Research philosophy**

Research philosophy is a large topic of the research methodology and in the part of research philosophy; the researcher does not discuss the research topic in detail. The philosophy of the research is connected with researcher's knowledge and the study's nature. The philosophy of the research can be used in major milestones such as pre-tenure review and appointment [7]. The researcher of any study uses any one kind of research philosophy among "pragmatism, positivism, realism and interpretivism". The "interpretivism" research philosophy is selected for this study as the

### **2.4 Inclusion and exclusion criteria**

Exclusion and inclusion criteria are important for selecting journals, articles, and many other sources to collect data for the accomplishment of the study. The inclusion and exclusion criteria are: Inclusion criteria

- Those journals selected which are published after 2019.
- Some authentic websites are selected and the data which are provided after 2018 are taken for the accomplishment of this research.
- Those journals and articles are selected for taking information to complete the present study which is written and published in the English language.

### **Exclusion criteria**

- The journals are not in PDF format and have no volume number.
- Published articles after 2018 are not included in the resources of data.
- The resources which are not in the English language are also not selected.
- Blogs are excluded from the resources of information for this research.

### **Data collection and data analysis method**

Data collection processes are selected according to the type of data those are used in the present study. The data collection method is regarded as the tool for completing the study [8]. As the present study is completed based on secondary qualitative data thus secondary qualitative data collection method is useful. The relevant data for this research is collected from scholarly articles, relevant newspaper articles and information from the authentic website such as Statista. The success of a study depends on the data analysis style many times. The explanation of information which is collected is known as data analysis and the data analysis process develops the quality of the study [9]. It is previously mentioned that the present study is accomplished based on qualitative data and to analyse secondary qualitative data, a thematic analysis style is followed. Some themes are made according to the objectives of the study and then those are discussed in the data analysis and result in part of this research. Thus the secondary qualitative data analysis method is used for the present research and that is appropriate for this.

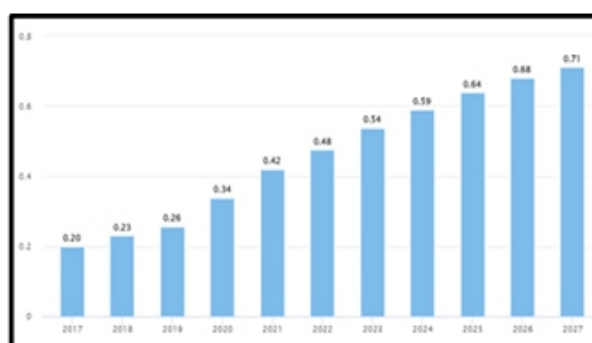
## **RESULTS**

### **Negative aspects of the effectiveness of the online learning system**

The use of online learning systems has increased during the "Covid-19 pandemic". The students easily

adopted the online mode of the learning system and they are enjoying this kind of learning method. Revenue in the online education system is projected to reach \$0.54 billion in 2023 [10]. Apart from this kind of forecasting, it is identified that the use of the online education system is increasing and for excessive use of the online learning method students are facing huge issues. As for the negative effects of the online learning system, first of all, it is mentionable that a sense of isolation is created by the online education system [11]. In the conventional learning method, the student went to the educational institutions and communicated with other students and teachers about not only the subject of the study but also many things outside of their subject. In the online education mode, the students can communicate with teachers through technology and it does not give them any chance to communicate with other friends. This kind of learning system makes feel the students lonely and they become isolation centred.

In the conventional learning method, the students are taught about discipline and those are practices also in the educational institutions. On the other hand, through the online education system, students can learn about the discipline but they cannot get a chance to practise those disciplines [12]. Online learning method also requires much additional training which is important for adopting the online education system. That becomes time-consuming and that makes it late to complete the syllabus for the students. In this perspective, the online learning method is considered inconvenient for a long time. The online teaching and learning system is completely dependent on technology [13]. Thus during the class, if any technological fault occurs then it causes disturbance in the class and many times the classes are postponed. The students become discouraged by this kind of situation and these are also negative effects of the online education system.



**Figure 1:** Revenue forecasting in the online learning platform of the UK [10]

In the online education system, the students do not get chances for body movement and scope for playing with classmates. In the online education system, students need to sit for a long time in front of the screen [14]. This is also not good for the health condition of the student. These kinds of issues also create mental problems as well as physical problems among the students and these are also considered the negative impacts of the online learning method. In the online education system, the exams also happen online and in this kind of online exam, the students get opportunities for cheating [15]. This also creates a knowledge gap among the students and that decreases the capabilities of the student to develop a good career for the future. After the discussion, the negative impacts of the online education system may decrease the strength of the students in any arguments.

### Identification of physical health Issues for online learning

The online education system has become interesting for students but it creates physical issues among students. The online education system has created issues in eyesight among children [16]. In this kind of education system, the students need to sit in front of the screen and they also have to keep their sights on



the screen continuously for a long time. That creates eyesight problems among the children. A survey was conducted among the people of the UK regarding the eyesight problem during the lockdown of 2020. In the survey, most of the people agreed that the eyesight problem has increased during the lockdown situation [17]. Apart this, it can be identified that in the lockdown situation, the use of the online system increased the eyesight problem among the students.

In the online learning system, the students miss various kinds of physician activities on the grounds of educational institutions such as walking, running, skipping and many other sports. Online education does not allow students to practise physical education [19]. The physical activity of the students increases their physical strength and immunity power. The online education system stops the students from playing in the schools and that also contributes to decreasing the physical strength of the students. As the students need to sit in front of the screen for a long time thus it also creates physical issues such as pain in the spinal cord and pain in the knees. The online education system also insists that students do not do body movement and from this kind of tendency, the student becomes lazy. The online education system also protects the students from the direct sun rays and which causes the deficiency of vitamin D in the health of the students.

Characteristic	Share of respondents
Strongly disagree	9.1%
Disagree	15.8%
Don't know	15.5%
Neither agree nor disagree	20.8%
Agree	27.1%
Strongly agree	11.7%

Showing entries 1 to 6 (6 entries in total)

**Figure 3: Results of the survey [17]**

The lack of physical activity in the online learning system and the health of the students also faces the deficiency of calcium. Initially, the students became interested in the online education system but later they started to become bored with the online learning system [19]. As the students lose interest in the online education system thus they face depression and anxiety. The excessive depression and anxiety of the students also create physical issues. The students lost muscular strength due to excessive depression in their studies. After the discussion, it is also identified that the online education system also is involved in decreasing the strength of the students.

### **Impact of online learning on the growth of students:**

In the online learning system, the students do not get opportunities to interact face-to-face. The online education system negatively impacts communication among students [20]. That also is considered an obstacle to the growth of the students. These kinds of issues do not allow the student to develop communication skills and interpersonal skills. This issue also insists the student go into isolation and feel demotivated. This is a big issue in the growth of the students. In the online education system the students are tied up in their rooms and which increases inertia among the students and the students also cannot know about the acts which are occurring outside of them. As the students get negative results from the online education system then the educational authority needs to focus on the minted use of the online system. It needs to schedule a particular time for using the online education system as the students are not much affected by the negative results of this method.

Online Learning or e-learning can be considered an effective process which uses digital technologies along with a mix of conventional methods for learning. It can be useful for distant learners who can indulge in this process to fulfil academic needs through the use of hardware and software [21]. Important

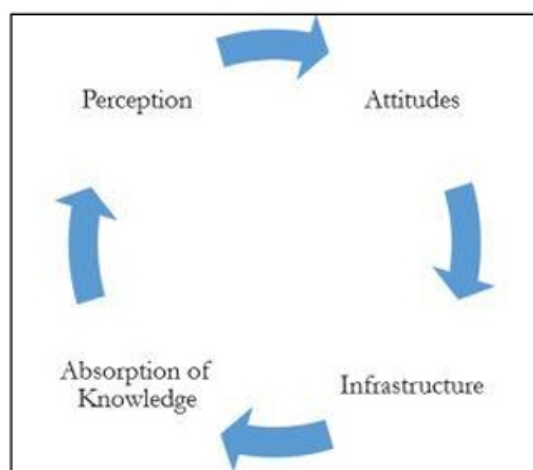
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technologies such as computers, the internet and several electrical peripherals are used in the online learning process that can help learners to participate in this type of program regardless of their location and time. The collaboration between several conventional and modern technologies can be reflected in the process of e-learning where a mixture of videos, sound, text, interactive graphs and charts can be observed. The implementation of these types of learning processes can ensure the growth of technical knowledge along with engagement levels that can be beneficial for a learning program.

The reduced requirement for long-distance travelling, options for flexible scheduling and other types of beneficial features have made it preferable among learners from different regions and backgrounds. The rise of online learning can also be perceived as a drawback for students belonging to weaker economic backgrounds. The essential equipment and facilities such as personal computers, laptops, stable internet connection and other electrical equipment may cost higher depending on the region. Reasons such as this can cause students with poor economic backgrounds to fall back into the race of the learning process where offline learning is not available as an option [22]. Apart from that, technical issues, poor network level and complex applications can often create issues for learners and teachers to indulge in the learning programs. The rise of fatigue levels is also evident in the process of online learning which can hinder the learning outcome or growth of a student at a significant level.

## DISCUSSION:

The rise of the pandemic has made it necessary for learners around the world to implement modern effective methods that can be useful for maintaining a steady flow in the learning process. Several medical guidelines formulated by the governments of different countries have made it essential for citizens to maintain physical distance which can hinder the learning process of students. Indulging in the online learning process can help individuals to maintain distance along with continuous involvement in the learning process at the same time. It is essential to break the chain of covid-19 virus among learners which can be formulated through the use of online learning. The usage of online methods such as Google Hangouts, Skype, Microsoft Team and other video calling applications has increased dramatically during the pandemic period [23]. Important aspects such as Attitude, perception, infrastructure and the process of knowledge absorption can be considered accountable for creating a significant impact on the students in terms of e-learning.



**Figure 4:** E-learning cycle [23]

The negative impact of the pandemic has made it necessary for learners and teachers around the globe to incorporate modern techniques in their learning process. The implementation of online learning is considered a necessary measurement for overcoming these issues which occurred during the pandemic era. During this type of participation, it can be necessary for participants to stare at the computer screen

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for a longer period [24]. This kind of activity can cause eye strain which can create further health complications. Higher amounts of screen time are often considered inappropriate due to its involvement in several health complications which makes it essential for learners to limit their screen time for overall health maintenance. During an online learning program, the movement of a learner often gets decreased due to circumstantial requirements. Lack of outdoor activities and a limited amount of interaction with peers can also cause students to feel trapped [25]. Lack of physical activities can degrade bodily motor functions that can decrease physical efficiency. Apart from this strain and pain in several body parts due to lack of movement can also be portrayed as physical complications which have been observed in several cases [26]. The impacts of online learning can also be observed which are known to create a significant impact on several factors of student life. As per the results, it can also be stated that online classes can be considered liable for improving the learning process along with providing scope for enhancing the existing knowledge base. Online learning methods are also known for providing a broader area to the students for exploring further which might not be possible in offline classrooms [27]. Apart from that it can also reduce the learning cost by mitigating several aspects such as expenses for travel, food and others [28]. The modernization of the learning process and implementation of effective strategies can help students to improve their knowledge base and skill-set that can be useful in both personal and professional life. The overall findings further suggest that although online learning can enhance the learning process and broaden the knowledge base, it can also cause physical issues to occur due to longer exposure to electrical equipment.

## **5.0 CONCLUSION:**

The overall objective of this study is to portray several health issues which can be considered as expected results of online learning. The rise of online learning practices in modern era can create both positive and negative impacts on several aspects that are relevant to physical complications and personal growth. A brief overview of the aim of this study along with relevant objectives has been portrayed that can provide a direction to this paper. Several areas such as health issues, negative aspects and different areas which can get impacted through the promotion of the e-learning process have been discussed. Apart from that a brief overview of the selected methods and materials with their selection have been provided which are meant to shed light on the perspectives of the researcher. The results which were gathered during the construction period of this study have also been explained in an effective manner that can justify the objectives. Providing proper justification and explaining the findings in a brief manner be useful to highlight the importance of this study in the current era. . By providing an evaluation of the potential health issues along with several positive aspects of development process of a learner, the results also facilitate the needs of the objectives. This paper can also be used as guidance for papers which include similar types of research issues. The overall study or findings of this study suggests that the factors such as physical issues, skill development, and student engagement are interconnected which makes it necessary for learners and teachers to take a proper measurement before indulging in learning programs that are based on online portals.

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## Note

[illegible]