

The Impact of Information Technology on Education: A Study with Reference to COVID-19 Pandemic

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Abstract

This study aims to identify online learning activities at home as an effort to support the government program, learning from home during the COVID-19 pandemic. The aim of the study is to obtain an overview of the implementation of online learning in the various fields of Studies, as an effort to reduce the spread of COVID-19 in schools. The majority of data collected on the number of students and learner suggests targeted interventions to create a positive space for study among students from the vulnerable section of society. Strategies are urgently needed to build a silent education system in the state that will ensure to develop the skill for employ ability and the productivity of the young minds.

Keywords: Information, Communication, Technology, Education, COVID-19, ICT

Introduction

Coronavirus is an infectious disease caused by a newly discovered coronavirus. The best way to prevent and slow down transmission is washing your hands and not touching your face. The COVID-19 virus spreads through droplets of saliva or discharge from the nose when an infected person coughs or sneezes (K. McGarry, 1981). Assessed that Information Technology is the product of different human activities and events. Activities are undertaken by individuals or by organisations in pursuance of certain objectives. Events are things that happen, occur or take place. If there has been no activity or an event taking place, there would be no information. Imagine a situation when, on a day, the entire population of the world goes into a slumber. Next day, there would be no news (although subsequently this would be news which would hit newspaper headlines). Information technology is also generated as a by-product from the activities undertaken by different governmental and non-governmental organisations. The most important organisations in this class are the governments themselves and their agencies. They perform their tasks as a matter of routine. For example, the police department has been set up for the maintenance of law and order. It is their routine administrative task. The activities of these departments, in turn, generate information about such burning topics as dowry deaths, terrorism, corruption and the like. The stupendous development planning exercise undertaken in the successive Five Year Plans by the Planning Commission and State Planning Departments of the Government has generated an enormous amount of information on almost all dimensions of socio-economic issues. A major part of the information (both

statistical and descriptive) needed by the social science researchers in academic institutions and decision-makers in governments, business and industry, emanates from the governmental sources. The reasons are obvious. There is no area of activity in the life of a nation in which the government is not involved. Besides these administrative organs of the government, the legislative and judicial bodies also contribute to the growth of information, e.g., the basic sources of legal information are the legislatures which enact various laws and the judiciary which interprets the laws when disputes arise in their implementation and enforcement.

Impact of COVID-19 Pandemic

The full impact of the COVID-19 pandemic on higher education and inter professional education programs, including politic, economy, and culture. Because of this pandemic has impacted human life including education. With principles of social distancing, all face to face classes were suspended so the class needs to change into online. However, students continue their education through online learning and via video calls with their teachers is currently the best alternative as keeping schools open poses a safety risk for students' School closures impact not only students but, teachers and families.

Information

The processed data that is meaningful, knowledgeable and scientific nature. Information is an abstract concept that refers to that which has the power to inform. At the most fundamental level information pertains to the interpretation of that which may be sensed. Any natural process that is not completely chaotic and any observable pattern in any medium can be said to convey some amount of information. Whereas digital signals and other data use discrete signs to convey information, other phenomena and artefacts such as analog signals, poems, pictures, music or other sounds, and currents convey information in a more continuous form. Information is not knowledge itself, but the meaning that may be derived from a representation through interpretation.

Information is Often Processed Iteratively

Data available at one step are processed into information to be interpreted and processed at the next step. For example, in written text each symbol or letter conveys information relevant to the word it is part of, each word conveys information relevant to the phrase it is part of, each phrase conveys information relevant to the sentence it is part of, and so on until at the final step information is interpreted and becomes knowledge in a given domain. In a digital signal bits may be interpreted into the symbols, letters, numbers, or structures that convey the information available at the next level up. The key characteristic of information is that it is subject to interpretation and processing.

The concept of information is relevant in various contexts, including those of constraint, communication, control, data, form, education, knowledge, meaning, understanding, mental stimuli, pattern, perception, proposition, representation, and entropy. The derivation of information from a signal or message may be thought of as the resolution of ambiguity or uncertainty that arises during the interpretation of patterns within the signal or message. Information may be structured as data. Redundant data can be compressed up to an optimal size, which is the theoretical limit of compression. The information available through a collection of data may be derived by analysis. For example, data may be collected from a single customer's order at a restaurant. The information available from many orders may be analysed, and then

becomes knowledge that is put to use when the business subsequently is able to identify the most popular or least popular dish. Information can be transmitted in time, via data storage, and space, via communication and telecommunication. Information is expressed either as the content of a message or through direct or indirect observation. That which is perceived can be construed as a message in its own right, and in that sense, all information always conveyed as the content of a message. Information can be encoded into various forms for transmission and interpretation (for example, information may be encoded into a sequence of signs, or transmitted via a signal). It can also be encrypted for safe storage and communication.

Communication

The action and interaction that is transfer or exchange of information from one corner to the destination corner. Communication conveys complex, sensitive and controversial information. It is critical that those responsible for facilitating information dissemination receive training in handling sensitive or controversial issues in order not to diminish the possible gains from communication. Ultimately, credibility of the source of information is highly correlated with achievement of desired behaviour outcomes. Those involved in communicating vital health information should ascertain that they are credible sources of information among the public. All content to be communicated should be thoroughly verified in order to avoid misinformation or sending conflict misinformation or sending conflict messages because once something is communicated, it cannot be recalled 'excommunicated'. In other words, a retraction of a statement or any apology does not mean that communication did not take place or what was communicated has been erased. It remains as a record despite the retraction. Guarantee freedom to communicate by not allowing any form of put-down or unconstructive criticism before, during and after communication.

Technology

The collection of scientific knowledge i.e. techniques, skills, methods that processes used in the access of services to overcome the environmental hindrance. Technology is the result of accumulated knowledge and application of skills, methods, and processes used in industrial production and scientific research. Technology is embedded in the operation of all machines and electronic devices, with or without detailed knowledge of their function, for the intended purpose of an organization. The technologies of society consist of what is known as systems. Systems operate by obtaining an input, altering this input through what is known as a process, and then producing an outcome that achieves the intended purpose of the system. The earliest and simplest form of technology is the development of knowledge that leads to the application of basic tools. The prehistoric invention of shaped stone tools and the discovery of how to control fire increased the sources of food that were available to human beings. The invention of the wheel led to the travelling technologies that helped humans to further increase the yield of food production, travel in less time, and exchange information and raw materials faster. Humanity then progressed to the development of the printing press, the telephone, the computer, and then the Internet.

The Information and Communication Technology (ICT)

ICTs are referred to as the varied collection of technological gear and resources which are made use of to communicate. They are also made use of to generate, distribute, collect and administer information.

ICT is a force that has changed many aspects of the way we live. ICTs consist of the hardware, software, networks, and media for collection, storage, processing, transmission and presentation of information (voice, data, text, images), as well as related services. ICTs can be divided into two components, Information and Communication Infrastructure (ICI) which refers to physical telecommunications systems and networks (cellular, broadcast, cable, satellite, postal) and the services that utilize those (Internet, voice, mail, radio, and television), and Information Technology (IT) that refers to the hardware and software of information collection, storage, processing, and presentation. The concept of a “Digital Divide” has been around almost as long as ICT has been publicly available. While traditionally it has come to mean a division in society, based on socioeconomic factors, this does not ‘paint the entire picture’. Introducing ICT as a tool to support the education sector has initiated substantial discussions since the late 1990s. A decade ago the emphasis was on Technical and Vocational Education and Training and training teachers. During the last few years, an increasing number of international development agencies have embraced the potential of ICT to support the education sector. UNESCO has played a major role in spearheading the Education for All initiative to harness the potential of ICT. The widely subscribed Dakar Framework for Action recognizes that, ‘these technologies (ICTs) have great potential for knowledge dissemination, effective learning and the development of more efficient education services’. When looking at the integration of ICT to support the achievement of educational objectives, it can be found that after almost a decade of using ICT to stimulate development, it is not yet fully integrated in development activities and awareness rising is still required. The main objectives of the paper are to evaluate the importance of ICT in higher education and to analyse the government initiatives for development of ICT in higher education.

Education

Educational technology is revolutionizing the way students learn right in front of our eyes. The most recent and obvious example of the rapid evolution and integration of technology and education happened with the onset of the COVID-19 pandemic when schools pivoted from in-person to online learning nearly overnight. However, technology has played an increasingly important role in education since long before COVID-19 hit.

Research and Development

All intellectual activities consciously pursued and systematically completed generate useful information. Research (also Research and Development) is such an activity. Research organisations in science, technology, social sciences and humanities have been established specifically for this purpose (B.C. Vickery and A. Vickery, 1987). Research is a creative work contributing to the growth of knowledge for the benefit of man and society. It is a highly organised activity throughout the world which continuously creates a large mass of new information. There has been a dramatic increase of both research institutions and researchers in all branches of knowledge. More and more funds are now allocated for conducting research. The progress of a nation is often judged by the percentage of national income that is spent on R&D. The output of research constitutes a major part of information handled by the library and information centres. Since the industrial revolution in the late 18th century, there has been a large-scale growth in this organised body of information and to this is continuously added the output of current research activities. This phenomenon is characterised by the term "information explosion". Research activities are not restricted to research institutions alone. Academic institutions - colleges and

universities - also undertake research and consider it as one of their major tasks, besides imparting formal education.

Surveys and Censuses

There are also organisations which have been set up specifically to gather statistical information through censuses and surveys. This may be considered an auxiliary research activity. One of the most important examples in India is the Office of the Registrar General which was established to conduct decennial censuses to collect population data which form the basic information about the demographic characteristics of the country.

Accessibility

Many people are unable to receive an education because of their location. They may live in a remote town far from a school, or maybe they are an adult with a full-time job yet eager to better their education but don't have the extra time to travel to the nearest school.

Affordability

Also ties in directly with some of the accessibility benefits of technology in education, like not having to pay for expensive textbooks, spending money on transportation to and from school, or purchasing extra stationery supplies.

COVID-19

The COVID-19 has changed the view of education around the world. During the mid-march all the schools and colleges were shut down to save faculties and students from infection. It has been around two years of lock down; still we are fighting with COVID-19. Since school colleges are the places where social distancing is little tough due to the presence of number of students, those cannot be opened by the government until the pandemic comes under control. In this situation, education is shifted to the method of home-schooling and home-college. Although this is too early to pass the judgment on how corona pandemic will affect the education in long term, there are indications suggesting that it will have great impact on teaching learning methods. Information technology is playing a great role to support the education during COVID-19 lockdown. Due to use of Information technology at large scale in various countries, this is the best time of innovation of new ideas on the digital platforms for delivering the education. This paper presents various tools and techniques to continue quality education while lockdown through digital media. These platforms would definitely continue even after the pandemic get over.

Impact of Information Technology on Education during COVID-19

Its outbreak in late December 2019, COVID-19 has wreaked havoc across the world and like any critical sector, education has been hit hard. Students, schools, colleges and universities have been deeply impacted. According to the United Nations Educational, Scientific and Cultural Organisation (UNESCO), over 800 million learners from around the world have been affected, 1 in 5 learners cannot attend school, 1 in 4 cannot attend higher education classes, and over 102 countries have ordered nationwide school closures, while 11 have implemented localised school closure. Globally, over 200,000 cases of the coronavirus have been reported in more than 160 countries, which have resulted in more

than 8,000 deaths and left several States dealing with severe outbreaks. The COVID-19 pandemic will adversely impact the progress some governments were making around increasing the education budget. Therefore, this is a crisis that requires urgent attention and collective action by all Governments, stakeholders and communities. Each day millions of children do not go to school due to emergencies and on-going humanitarian crises. The outbreak of COVID-19 has compounded the plight of learners in countries affected and or emerging from conflict and disaster. While the Global Campaign for Education (GCE) acknowledges the public health decision to close schools, we believe that contingency plans should be in place to ensure the right to education even in times of crisis. GCE is convinced that all learners no matter where they live and circumstances have a right to education. Education is an essential right for children, young and adults in emergencies and must be a priority from the very beginning of any and all emergency responses.

“Governments and civil society concerted efforts that mobilise resources, and expertise to address the impact of COVID-19 on education is urgently required. This process should include developing long term strategies to address the needs of education in emergencies”

- Grant Kasowanjete, GCE Global Coordinator

Refat Sabbah, GCE President, further added:

“All GCE members around the world, INGOs, regional networks and national education coalitions, stand in solidarity to those affected by the COVID-19 pandemic. GCE reaffirms its willingness to work in close collaboration with governments and world leaders to find appropriate solutions and mitigating measures to ensure the right to education throughout these challenging times.”

GCE calls on the national governments, and donors:

1. To prioritise education in the first phase of all emergency responses with immediate effect, and to include education in their COVID-19 response policies.
2. To dedicate appropriate resources, financial and technical, to ensure the right to free, quality public education for all is maintained during the COVID-19 crisis. To increase funding and support to education in crises to a minimum of 4.2% of emergency assistance in line with its needs.
3. To minimise the pressure on teachers, schools and school systems that remain open or volunteer to offer extra support.

Challenges

Educators do support online learning as an initiative to support students learning from home during the COVID-19 outbreak. Educators are trying their best to ensure the learning process continues despite the pandemic. However, educators face challenges in conducting their online classes successfully. One of the most difficult challenges is the level of preparedness of higher education in handling online learning during the pandemic and the closure of higher education. Poorly managed online learning coupled with underprivileged students with a lack of devices or internet access has reflected how higher education responds to learners' needs and its inability to engage in an online learning environment (Zhong, 2020).

Another challenge that stems from online learning is the quality of education provided during the pandemic. The decision of higher education to move toward online learning raised questions on the education quality due to limited or inadequate access to technology (Anderson, 2020). Past research indicated that students from the underprivileged category struggle to participate in their online courses and achieve positive learning outcomes (Barshay, 2019).

Another challenge is related to the success of online learning delivery. Most higher education turned to alternative forms of learning, while some have temporarily halted learning to design and transition to online learning. Others have decided to continue face-to-face learning with supplement online resources such as recorded lectures while still following the needed social-distancing guidelines. In this sense, educators in higher education are facing difficulties in engaging students in online learning and getting their attention as in a regular face-to-face classroom. In addition, not all higher education possesses the necessary resources or the academic capabilities to make the transition from traditional learning to online learning (Leung & Sharma, 2020).

Opportunities

Some studies stated that prolonged higher education closures and home confinement might have negative effects on student's physical and mental health (Brazendale, et al., 2017). The psychological impact of quarantine is wide-ranging, substantial and can be long-lasting (Brooks, 2020). The COVID-19 pandemic has given a lesson that may pave the way for new solutions for the existing education system where countries, educators, students, and parents will be more prepared than today. The pandemic gave ways for educators to re-arrange exams and home assignments, which is more like the open book principle. The open book principle is not popular at the moment for students studying in schools. Educators need to rethink to provide new assignments for subjects that need additional work. While grading assignments, teachers need to consider cheating or plagiarism. The current situation is just to keep the learning going in any possible format. This is the best time to look into online learning methods to be incorporated into current traditional learning. As stressed by Zapalska (2006), a student who learns best in a particular way must be exposed to a variety of learning experiences to become a more flexible online learner. According to Basilaia and Kvavadze (2020), the system and skills gained by the educators, students, and administrations during the pandemic can be used in the post-pandemic period in case of missing lessons or other similar special cases like the current one. Educators have "re-realized" distance learning in a new way, and they have adapted the assignments to the new format of the lessons that will be positively reflected on their qualifications (Basilaia & Kvavadze, 2020). Online learning can be quite useful especially in the post-pandemic phase to educate students with special needs. Thus, post-pandemic is the time when education could comprise face-to-face education, blended education, and online education (Zhu, 2020).

Conclusion

More than 285 million students have been affected by school and university closures due to the COVID-19 outbreak. During Lockdown, ICT prevents the learner from deprivation of the right of their education and also helps to maintain social distancing. To make a better community, ICT has become almost a prime necessity. ICT bridges the rural-urban divide in a more subtle way. During the lockdown, ICT has been facilitating the teacher for opening new vista of education. The use of ICT in education not

only facilitates classroom teaching learning process, but also provides the environment of e-learning. ICT helps thousands of learners who can not avail of the benefits of higher education due to several constraints, such as, time, cost, geographical location, age etc. Hopefully, this article will be sensitize the stakeholder, the students, the teacher, and policymakers to originate path-breaking strategies to handle unprecedented challenges

Recommendations

Training and equipping the students and teachers with the essential ICT & techno-pedagogical skills can be a welcome step to prevail over the pandemic situation. Make provision of the internet for using ICT in teaching learning and other educational communication like a web page, blogs, social media, etc. Computer Assisted Instruction can be a powerful weapon to overcome the challenges. Awareness of both students & teachers regarding the various educational portals to learners for free accessing educational content and videos.

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