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## Effect of COVID-19 Pandemic on Traditional Teaching

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### Abstract

COVID 19 made a great impact on education system especially on the university education system globally. The purpose of this systematic review of published literature was to trace the history of university teaching and examine the effects of the COVID 19 pandemic on traditional teaching. Systematic review started with 720 articles and ended with the inclusion of 136 articles based on bibliometric search process. Important understandings generated are that educational methods are constantly evolving as what the ruling society values changes and when new technologies that can be used for teaching are invented. Conclusions were that this deadly pandemic overturned the traditional offline teaching and learning process and facilitated the introduction of emergency online educational platforms to be used for university teaching and student learning.

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### Introduction

Education began with parents teaching their children how to survive. As more knowledge became available, as well as being a parental responsibility, education became a community and then a society activity. Socrates (469–399 BC) is one of history's earliest educators whose teachings are known today. He was born in Athens of a stonemason, but grew to become one of the most influential educators of his time. Socrates believed that education helps to mould an individual by providing the knowledge to understand and determine the pathway to achieve goals and destiny. Today's education assists with indoctrinating social responsibilities, developing communication skills, critical thinking and scientific understandings. Learning is the key principal of education that is a progression of obtaining knowledge or expertise through study, involvement, or being taught. Education connects an individual to nature and to the society where the person lives, creates and acts (Radha et al., 2020). The purpose of this systematic review of published literature was to identify how tertiary education has changed from ancient times, using Indian education as an example, to the use of the internet in the times of a global COVID-19 (Corona Virus Disease of 2019) pandemic. Disasters like fire, war, earthquake, flood or pandemic can interrupt teaching and learning for weeks to months, sometimes even longer (Dohaney et al., 2020). Resilience to any kind of disruption can also be identified as institutional (Bates, 2013), instructional, and/or academic continuity (Houston, 2016; SchWeber, 2013). Academic continuity can be defined as the competency of institutions and academics to be able to continue their educational delivery system while undergoing a disruptive incident. In Australia the first COVID-19 cases were reported in end of January 2020 (World Health Organisation [WHO], 2020). Cases were related to people travelling for tourism, work or study.

Most of the universities first adopted a wait and watch approach (Truu, 2020). Social distancing and months-long quarantine forced the academics working in higher education to transition themselves to fully operational online tutors. Due to this pandemic revolutions in academia and higher education, which would have typically taken several years due to the numerous administrative regulations, were introduced promptly within days. This is a clear example of the Schumpeterian ‘creative destruction’ in making that will forever change the status quo in academia and higher education (Schumpeter, 1942; Strielkowski, 2020, p. 5). Academics became responsible for upskill their digital proficiencies, developing new study materials to changeover from traditional face-to-face and blended programs to a distant and/or online education delivery mode (Pather et al., 2020).

Due to the COVID-19 pandemic crisis online teaching and learning became a compulsory component of educational institutions including schools, colleges, tertiary educational institutions and universities globally. The outbreak of this deadly virus forced shut down of educational institutes globally to control the spread of the virus. This situation forced the teaching professionals to come up with an alternative method of teaching during the lockdown period thus the traditional teaching changed to web-based teaching and learning where the teaching academics and students connected virtually (Bakker & Wagner, 2020). The Covid-19 pandemic caused traditional classes to ‘move online’ in an essential high-priority manner (World Health Organization, n.d.), which resulted extra stresses and workloads for university academics who were already struggling in order to balance teaching, research and administrative responsibilities, as well as having work-life balance (Houston et al., 2006; Houlden & Veletsianos, 2020). Educators from all backgrounds and age group were required to develop and implement their scheduled classes from home, while all the practical and technical hurdles had to be overcome without the required technical support from the institution (Hodges et al., 2020). Not all university educators had the pedagogical content knowledge (PCK) required for online teaching (Angeli & Valanides, 2005; Kali et al., 2011; Ching et al., 2018; Shulman, 1987) which included the knowledge of the technical and administrative features of online teaching such as establishing workflows, using particular technical platform and tool etc. Ocak, (2011) and Ching et al., (2018) wrote that the complex nature of the instructional situation and inadequacies in planning and organization are some of the main difficulties described by university teachers with respect to transforming their teaching to web-based courses The COVID-19 crisis has contributed to a profusion of advice to assist teachers (Bates, 2020) with the majority focused on the tools and materials which a teacher can use while replacing their face-to-face classes with online classes (Rapanta et al., 2020).

## **Literature Review Methodology**

To identify the transformation of teaching methods a systematic review of published literature was conducted. The steps suggested by Creswell and Creswell (2017) were incorporated to identify and review the research topic. The methodological procedure contained the following steps:

1. Identify studies and key words; search databases and websites using these keywords
2. Select a minimum of 50 research studies; prioritise them; validate the abstracts, contents and conclusions
3. Plan and design a literature map to visually represent the groupings
4. Review and consolidate the literature into themes and concepts to identify opportunities

## **Literature Identification**

The literature review was initially instigated by evaluating seven articles related to ancient education systems, shifting from traditional education systems to online education systems and how COVID-19 pandemic effected academic systems by promoting physical distancing to help minimise the virus spread (Mefodeva et al., 2017; Harasim, 2000; Radha et al., 2020; Bakker & Wagner, 2020; Strielkowski, 2020; Griffin, 2020; Hodges et al., 2020). While looking for more information about ancient education systems and transition to online education systems the keywords used were ‘Ancient Educational System’, ‘Ancient Education in India’, ‘Traditional Teaching’, ‘Online learning’, ‘Online teaching’, ‘digital education’, ‘online higher education’, ‘online educator’, ‘instructional design’, ‘remote teaching’, ‘work practices of online educators’, ‘Shift from traditional education system to online’, ‘Digitalisation’, ‘COVID-19’, ‘Pandemic’, ‘Social distancing’.

## **Selection and Validation**

The selection process was completed using the following selection and validation steps (see Figure 1):

- Step 1, the abstracts of the research papers and introductions were evaluated based on their concept, e.g. if the literature was not designed to explore the traditional education system or not related to online teaching and learning or not relevant to the pandemic, then it was excluded.
- Step 2, the content of the literature was evaluated for significance to the research topic, excluding those that were not valid.
- Step 3, literature centred on gradual change of traditional education systems through to online education was included, while the literature focused on online students or school level education was excluded.

When selecting the published literature, the focus was to explore the history of traditional teaching in an ancient education system with gradual shifting towards online teaching and learning and how COVID-19 pandemic effected traditional education. The article selection process used a bibliometric search which included:

- (i) Time perspective: The articles chosen for this review process were published between the years 1940 to 2020.
- (ii) Assortment of database: In this study of published literature, papers were obtained from Science Direct, Web of Science, Google Scholar, and for contemporary COVID 19 information newspaper articles and published university communications.
- (iii) Range of journal: Journals chosen focused on relevant areas, including Traditional education, tradition teaching methods, history of online education, online teaching, effect of COVID-19 pandemic on educational institutes, emergency remote teaching and learning. At the end of this process a total of 256 peer-reviewed journal papers were selected for further analysis.
- (iv) Selection of articles: The following title and keyword search functions were used. “Traditional teaching vs online teaching” OR “Transformation of learning” OR “Impact of COVID-19 pandemic on education” OR Keywords “e-learning” AND “history of education” OR “COVID-19 impact”. Initially, a total of 615 articles were found while searching by title. The following flow chart shows the method of published literature selection, quality assessment, data extraction and analysis for this review.

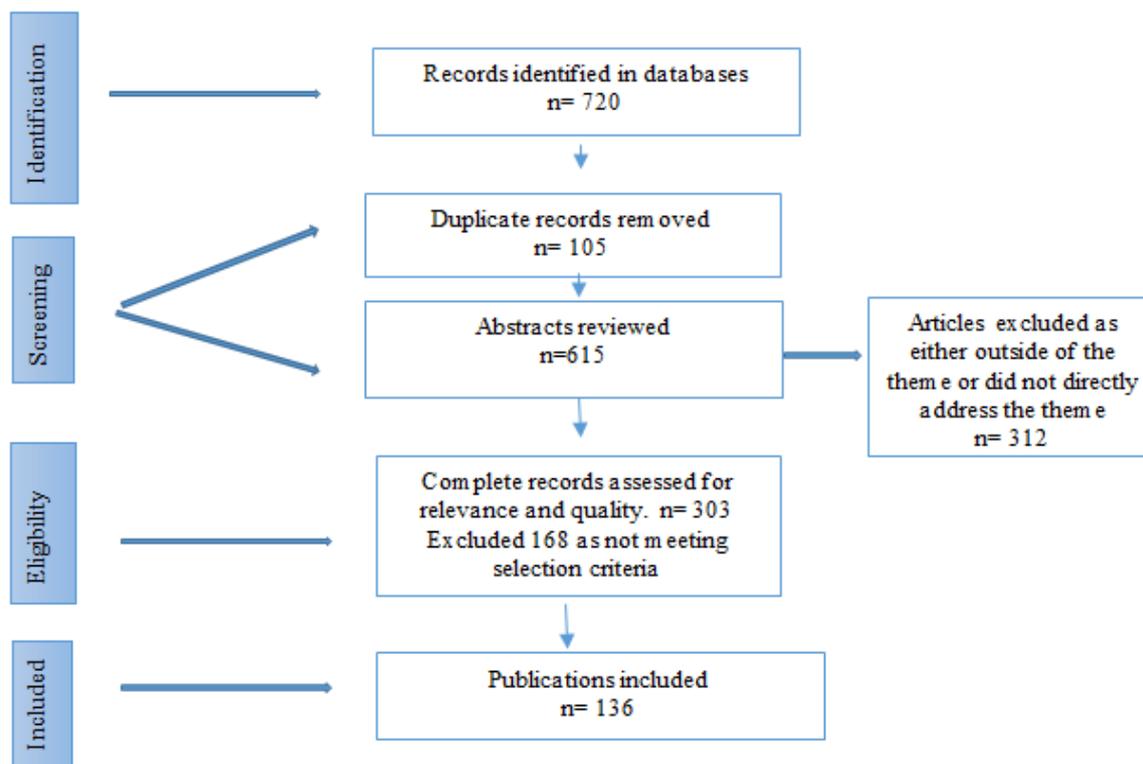


Figure 1. Flow Chart Depicting the Article Search and Selection Procedure

The first section of the review describes the history and gradual transformation of education using the country of India as an example for past educational practices.

## Results and Discussion

### Method of Education and Role of Educators in Ancient Times in India

Developing the students to be useful and spiritual member of the society was the main aim of ancient Indian education (Rangachar, 1964). Teaching them about the community and societal responsibilities was also a part of the ancient Indian education system. Students were constantly reminded that they are an integral part of the society thus they have some duties towards the society and they should not live a self-centred life (Mookerjee, 1989). The main aim of the ancient India's education system (Taittiriya Upanishad) was to help developing the mind and soul of individuals as well as human values such as faith, admiration, trustworthiness, self-respect, and politeness which were a very important part of their free and advanced society (Markandan, 2001). The convocation address mentioned in Taittiriya Upanishad provides an idea on the specific qualities needed for students to graduate. It is significantly similar to the requirements of modern educational systems (Markandan, 2001).

The Indian history of education can be distinguished with seven time periods as follows:

- i) 2000 – 1400 BC – The Vedic education system (Chand, 2000; Sharma & Sharma, 1996). In this era the main belief of education was to develop learners' ethical, intellectual and physical abilities in such a way

that they can be an essential part of the community. In ancient epics such as “Bhagavata - Purana”, “Mahabharata,” “Bhagavad - Gita”, comprehensive characteristic of Vedic education can be found.

- ii) 1400 – 600 BC - Post-Vedic system of education (Chand, 2000; Sharma & Sharma, 1996). The main objective of post-Vedic education system was to transfer skills and knowledge to new generations through rituals, which included studying sacred materials such as the Brahmanas and the Upanishads (Sharma & Sharma, 1996; Singh, 2008), also maintaining a strict lifestyle. The main role of education was to provide for the mental, spiritual, moral and physical development of the learners. The streams of the educational program were divided on the basis of the caste of the students. Brahmins were authorized to receive intense academic and spiritual knowledge and their starting age was to be 8 years. Kshatriyas and Vaishyas started their educational journey by 11 and 12 years of age accordingly. Their educational program was less intense and professional oriented. Military discipline education was for the Kshatriyas, whereas agriculture, trade and commerce education was for Vaishyas (Dzhurinsky, 1998). The students studied in teachers’ residence which were generally built in an order to make the students feel at home and part of the family. This way teachers could be able to help in all round developments including good habits, feeling of sacrifice, social service and develop skills that would be useful in life. Students were responsible for helping with the household chores of their teacher, which was described as the internship part of their study. This internship structure was constructed to provide maximum spiritual closeness of a teacher and a student (Albedil, 2003). The educational syllabus was predominantly religious in nature, but it also had subjects like astronomy, geometry, philosophy, mathematics, etc.
- iii) From approximately 600-500 (200) BC – was the Brahmanic system of education (Chand, 2000; Sharma & Sharma, 1996). It was an advanced form of Vedic education. Subjects like Sanskrit, Arithmetic, Geometry, Astrology, Economics, History, Politics, Agriculture, Military science and Philosophy were instigated, on top of the ‘Vedas’ education system. Sanskrit language was taught as the main language of communication and at that time scientists wrote many sacred literatures (Chandra & Sharma, 2006; Singh, 2008).
- iv) 500 (200) BC -1200 A.D. – The Buddhist system of education prevailed (Chand, 2000; Sharma & Sharma, 1996) and a new era started in the Indian history. A significant change was noticed in spiritual and economic life of the population due to emergence of this new religion which was against the inflexible caste system and supported equal birth rights of all individuals born in India (Antonov, 1973). New educational institutes were introduced for higher education like modern universities where students at the age of 16 could enrol, irrespective of any caste. Buddhist monks provided the education. Though the Brahmanic and Buddhist systems were different the Buddhist education system did not overpower the Brahmanic system; rather they admired each other and established an integrated system.
- v) 1200 - 1700 A.D. – was the time of the Muslim system of education (Chand, 2000; Sharma & Sharma, 1996). A new era emerged with the Muslim/Mughal rule in India, and the Brahmanic and Buddhist systems of education were phased out. The Muslim and Mughal rulers introduced makhtabs, madarsas and libraries. The Mughal emperor Akbar was considered to be the most important personality in terms of development of literature, culture and civilization. He put education at the forefront irrespective of religion. The main purposes of education during this period were to help the rulers to strengthen their position in the social and political circles (Chandra & Sharma, 2006). Generally, schools and madrasas

were the places for education. Students were provided with primary education along with the study of religion, reading, writing, arithmetic, Arabic and Persian languages. Schools were only for boys but in royal and wealthy families the boys, as well as girls, received education at home from a home tutor (Fakhrudinova & Kondrateva, 2016). The extended syllabus included Grammar, Logic, Philosophy, Literature, Medicine, Astronomy, Greek, Agriculture, etc. Information was communicated verbally (Singh, 2008).

- vi) 1700 – 1947 A.D. – was the period of British colonialism (Chand, 2000; Sharma & Sharma, 1996). This period was considered as the British invasion period. Students continued getting traditional education as well as being prepared to be able to work for the British government (Chaube, 2005). Indian nationalism started in the period of 1901-1920. The situation of India then tensed until independence in 1947, so there was very little improvement in education. With independence India inherited the British education system, which had a lack of philosophy and mechanism so reorganizing the educational system became the main focus of the Indian Government (Subramanian, 2001).
- vii) In 1948 when India achieved independence the modern Indian education system started (Chand, 2000; Sharma & Sharma, 1996). Committees on education and training for primary, secondary, high school and universities were formed by the Indian government which established curriculums for the restructuring of education, allocating education into five-year periods.

Table 1 describes the basic differences between ancient education system and modern education system.

Table 1. Difference between Ancient and Modern Education System in India

Ancient Education System	Modern Education System
i) Bachelor students (Brahmachari) used to learn under the observation of Guru while residing in Gurukul	In modern days the majority of students travel approximately 25 to 50 km or more daily to attend school or university
ii) All the education was taught orally and transmitted from one generation to next generation.	From early childhood students need to carry heavy bags filled with learning materials
iii) There was no compulsory regular fee structure to attend gurukul but after finishing their education students used to offer Gurudakhina as per their affordability to show their respect.	A fee is compulsory for private education. Students must pay a small amounts to public educational organisations, which is not always affordable for everyone.
iv) The educational system required an open environmental set up. The environment was not competitive, so students were not bothered. They received educational knowledge, social skills as well as job skills while attending Gurukul.	There is competition with each other which affects the students as well as their parents. In educational institutes developing job skills are not always part of mandatory education.

Note: Adopted from “Education System in Ancient India”, by Dr. J. C. Tamboli, 2015, *Thematics Publications Pvt. Ltd.*, Copyright©Vishwbharati Research Centre.

Worldwide educationists are struggling to find solution of a central and comprehensive question which is ‘what kind of education is needed for what kind of society of tomorrow?’ (Bhatta, 2009, p 2). Due to global economic, environmental, and social accelerating change and tension, there are constant changes in educational systems. Some principles which are common and universal for everyone such as the educators, citizens and policymakers include the United Nations values of constitutional rights, acceptance, understanding, equality, accountability, universality, cultural integrity, the search for harmony, conservation of the surroundings and sharing of knowledge (Bhatta, 2009; Kapur, 2007; Mukhopadhyay, 2008; Pankajam, 2001). The Swiss humanitarian Johann Pestalozzi, the transcendentalists of America, Upanishadic philosophers of India and many advocates of the ‘progressive’ education movement have made it clear that education should be treated as the art of nurturing the ethical, emotional, physical, psychological, artistic, and spiritual—above all intellectual—scopes in the process of developing a young human being (Scott and Martin, 2004). The teacher in holistic education systems is often treated as a friend and mentor rather than a person of authority who has all the controls (Bhatta, 2009).

### **History and Gradual Transformation of Education to Modern Day Online Education**

Traditionally, higher education institutes were developed to educate learners for lives of public service, provide advance knowledge through research, and to cultivate leaders for various extents of the public service (American Council on Education, 1949). Modern day universities, however, are mainly focused on preparing graduates with the knowledge/information, skills, and ethical accountability to fulfil the future workforce requirements to their society and to contribute fully to the global economy (Spellings Commission, 2006). The rise of new privatization, commercialization and corporatization of education are the result of the twofold role which has changed the higher education’s traditional duty and has amplified the mission diversity in the process of preparing all graduates for independent contribution, dynamic social responsibilities and personal development (Kezar, 2004; Lambert, 2014). Tertiary education institutions and universities are under constant pressure to endorse the access and affordability to university/other tertiary institution education as well as to improve individuals’ basic aptitudes and personalities (i.e., “noneconomic” benefits), which can be described as: the capability to think rationally, the ability to experiment the eminence quo and the aspiration to develop cultured values to enable the student to enter into the extremely competitive employment market (Brennan et al., 2013; Selingo, 2016; Tilak, 2008; Washburn, 2005). To deal with rapid change in environments of industrialization, today’s workforce requires skilful employees at all levels (Ramley, 2014b). To achieve present requirements higher education institutions are re-examining and regenerating their programs of study, pedagogy and assessment policies to ensure that all students get their preferred aspects and proficiencies to contribute to the global economy and participate efficiently in social equality (Fein, 2014; Kirst & Stevens, 2015; Roksa & Arum, 2015).

Today university educators are expected to have competency-oriented skills and ability to empower the students to actively participate in learning process (Santos et al., 2019). The teaching methods are created by conception and strategy (Prosser & Trigwell, 2000). From a knowledge transmission standpoint, teaching normally has a content approach, where students are observed as passive receivers of knowledge (Santos et al., 2019). Universities have evolved in four generations to reach their present state. As stated by Wissema (2009), the

evolution of universities can be described as commencing as medieval type and progressing to research universities (Humboldt-type universities) and then to the high-tech, science and technology driven entrepreneurial teaching and research universities. The latest new stage of the evolution in academia and higher education is online and digital educational universities (Wissema, 2009; Strielkowski, 2020) as shown in Figure 2.



Figure 2. Stages of Evolution

Note: Adapted from “COVID-19 pandemic and the digital revolution in academia and higher education,” by W. Strielkowski, 2020, *Preprints*, (doi:10.20944/preprints202004.0290.v1), © 2020 by the author(s). Distributed under a Creative Commons CC BY license.

The internet plays a very important role in availability of the resources for research and learning for both educators and learners to be able to share and gain information (Richard and Haya, 2009). Technology-based e-learning incorporates learning by using the internet, intranet and other technologies to prepare study materials for learning, teach the learners and to standardize courses in an organization (Fry, 2001). The long history of gradual development of online learning is shown in Table. 2.

Table 2. Computer Networks and Online Education: History and Overview

Year	Commencement
1861	Telegraph is invented
1969	Advanced Research Projects Agency Network (ARPANET) begins. This was the technical foundation for the Internet.
1971	Email is invented
1972	Computer conferencing is invented
Mid-1970s	University courses are supplemented by e-mail and computer conferencing
1981	First totally online course (Adult education) called The Source.
1982	First online program (Executive education). Titled Western Behavioural Sciences Institute [WBSI] Executive Education (IEIS)
1983 -1989	Networked classroom model emerges (Primary and secondary education) 1983 InterCultural Learning Network [ICLN]: Research Project in 4 countries 1983 Réseau d'Ateliers Pédagogique Pilote [RAPPI]: Canada-X-Cultural Project in 5 countries 1985: National Geographic Society Kids Network 1987: American Telephone & Telegraph Company [AT&T] Learning Network 1988: Writers in Electronic Residence (WIER) 1989: NUC in British Columbia, Canada

<b>Year</b>	<b>Commencement</b>
1984	First online undergraduate courses. Called Virtual Classroom (NJIT)
1985	First online graduate courses. Nova South Eastern University Connect-Ed (New School of Social Research) OISE (University of Toronto)
1985	First labour education network. Titled Solinet and was for Canadian Union of Public Employees
1986	First knowledge building network and was called CSILE (OISE)
1986 - 1992	Online professional development communities emerge 1986 OISE Ontario Educators Online Course 1990 Global Lab, Lab Net And Star Schools, Technical Education Resource Center [TERC] 1992 Educators Network of Ontario
1986 -1989	First online degree program 1986 Connect-Ed (New School of Social Research). 1989 University of Phoenix Online
1989	Internet in launched.
1989	First large scale online course. Open University (UK)
1992	World Wide Web is invented. Conseil Européen pour la Recherche Nucléaire [CERN (Switzerland)]
1993 - 1998	First national educational networks. 1993 SchoolNet (Canada). 1995 Tele-Learning Network of Centres of Excellence [TLNCE (Canada)]. 1998 CL-Net (Europe)
1996	Virtual-U Research Project .
2000	COVID 19 pandemic with physical distancing requirements.

Note: Adapted from 'Shift happens Online education as a new paradigm in learning,' by L. Harsasim, 2000, *Internet and Higher Education*, © 2001 Elsevier Science Inc. All rights reserved

The telegraphy 150 years ago and now computer communication were revolutionary changes. E-mail and online learning platform discussion boards are the main individual communication networking application used in the field of online education while computer conferencing is used for group communication in online education for a collaborative learning environment. Computer conferencing was designed by Murray Turoff to be a "collective intelligence" system to be able to structure group communication for problem solving as well as for exchanging information within the group (Hiltz & Turoff, 1978).

In mid-1970s the adoption of computer networking for educational purposes began, after the invention of packet-switched networks in 1969 (Harasim, 2000). Scientific researchers, the majority of whom were from academics' backgrounds, were involved in experimenting with ARPANET, introduced e-mail and computer conferencing in their courses and by involving their students with the larger information community extended the opportunities for the student communication, interface and for teamwork (Harasim, 2000). K-12 schools started adopting network communication in the early 1980s and initiated an exclusively new methodology in online education where teachers and learners jointly launched writing and research projects (Harasim, 2000). The first fully online courses commenced in 1981 with non-credit "mini-courses" and executive training

programs (Harasim, 2000). The Online Executive Education program was one of the first online program launched in 1982 by the Western Behavioural Sciences Institute (WBSI) (Feenberg, 1993). The first WBSI-associated faculty experienced many difficulties while trying to master the online environment as no one had tried to teach fully online courses before, nor had anyone studied in an online environment (Feenberg, 1993). Educators were proceeding blindly without having any background, base of knowledge or guidance (Feenberg, 1993). Relevant important matters surfaced from the failures such as long word-based "lectures" are not suitable for online studies, also questions and answers do not appear on their own resulting long virtual silence due to non-participation of the students (Feenberg, 1993). Finally the group learning activities, such as discussions were introduced by the faculty and this proved to be an effective way to promote online learning (Harasim, 2000).

Canadian Réseau d'Ateliers Pédagogique Pilote (RAPPI) network (1985 ±1987) was one of the earliest examples of a network which connected the teachers and students of around 70 secondary schools in Canada, England and Italy (Harasim, 2000). With continuous growth in accessibility to computers, educators acknowledged that a wide range of activity can be performed by moulding the cyberspace according to the need (Harasim, 2000). It had also been realized that online education was a distinct field and educators started exploring how it could empower students to socialize in this new domain (Harasim, 2000). From the early 1980s, a powerful new mode of learning: online collaborative learning was developed as a result of creative applications of computer conferencing in university courses (Bradsher, 1996; Feenberg, 1993; Harasim et al., 1995; Hiltz, 1994; Hiltz & Wellman, 1997; Khan, 1997; Mason & Kaye, 1989). In 1989, the first application of computer conferencing was launched by the Open University in a large-scale distance education course which allowed access to 1,500 students with their tutors and supported peer discussions online. By mid-1980s many other experimental online applications surfaced with Solinet as one of the first wide-scale online labour education programs (Harasim, 2000). A variety of professional development networks were launched, which acted as a base for online learning environments (Camarinha-Matos & Afsarmanesh, 2005). In the 1990s other significant firsts in online educational activities surfaced. For example, Canada's SchoolNet, (a national educational networking programs) which was a first step in networking all schools, museums, libraries, and aboriginal communities in the country (Harasim, 2000). In 1995 major online research programs, such as the Tele Learning Network of Centres of Excellence (TLNCE) were launched (Harasim, 2000). In 1996, field testing, such as Virtual-U field trials were introduced (Weiss, et al., 2007). Distance education was introduced around two centuries ago and within this period of time it had changed significantly in how learning occurs and information is communicated (Spector et al., 2008).

### **Transition from Face-to-face Traditional Education towards Online Education**

Distance learning started as basic correspondence course through postal service, which then started using a wide variety of tools to improve (Moore, et al. 2010). Distance learning generally describes providing access to education to people who are geographically or physically distant (Moore, et al. 2010). The development of the World Wide Web in 1992 made online education increasingly accessible and permitted new pedagogical models to emerge (Harasim, 2000). An enormous expansion as well as innovations in distance education were seen to

emerge in the years between 1980 and 1990 in online education and networking fields (Harasim, 2000). Due to increasing accessibility of new technologies the term 'distant learning' then evolved to define other forms of learning, such as, e-Learning, online learning, mediated learning, learning through technology, online collaborative learning, virtual learning, web-based learning, etc. (Conrad, 2006). The cohesions found within all the definitions is that they are a form of instruction which occurs between two parties (a learner and an instructor) and are held at different times and/or places, and use different forms of instructional materials (Moore, et al. 2010). In the 21st century, there has been a paradigm shift in attitudes towards having an online education system so online learning is no longer peripheral or auxiliary but a vital part of today's conventional education system (Al-Samarraie et al., 2017).

The origin of the online education system was believed to have commenced in the late 1960s to 1971 with the development of network communication, invention of e-mail, packet-switched networks and these technological inventions open up a unique opportunity to be able to communicate and cooperate with peoples in different places and different time zones (Harasim, 2000). The 1980s and 1990s symbolized as an era of powerful improvement and growth in online education system and networking within schools and tertiary educational institutions, professional fields, workplaces and mature educational facilities (Harasim, 2000). Electronically supported learning (e-learning) provides a learner-oriented teaching/learning processes which is an internet-based education method that was first introduced in 1999 in a computer based training program seminar and was made popular as an educational tool in the 1970s by the Open University in Britain (Ong et al., 2004). E-learning teaching and learning systems can be used anywhere and anytime, with the use of the internet and allows diverse and geographically dispersed students to be provided with education in a cost-efficient manner (Ong et al., 2004). The changing mindsets towards online education and affordability of it helped in developing new pedagogical models in early 21st century (Harasim,2000). A vital transformation in learning environment emerged, and this change became global as educators and learners worldwide accepted and helped implementing e-learning through networking (Harasim, 2000).

The term online learning surfaced in the beginning of 1980, however there is no clear disclosure of the origin of the term E-learning (Harasim, 2000). Due to the continuous evaluation of learning technology and the fields associated with it, the researchers are still struggling to settle on a common definitions and terminologies (Lowenthal & Wilson, 2010; Volery & Lord, 2000). As a result, the terms are often interchanged between distance learning, E-Learning and online learning (Moore, et al., 2010). According to Dublin (2003) the existing definitions were inclined to acknowledging the specialization and interest of the researchers. A range of applications, learning methods and processes are described as an E-learning concept (Rossi, 2009). Therefore, it is not easy to locate a mutually accepted definition for the term E-learning, as stated by Oblinger and Oblinger (2005) and Dublin (2003), as cited by (Arkorful and Abaidoo, 2015, p 1). Majority of the authors describes online learning as access to learning experiences through the use of some technology (Benson, et al. 2002; Carliner, 2004; Conrad, 2002). Benson, et al. (2002) and Conrad (2002) both recognize online learning as a more recent version of distance learning with an improved access to educational opportunities for learners identified as both non-traditional and marginalized. Whereas other authors argue that it is not only the accessibility of online learning but also its connectivity, flexibility and ability to encourage diverse

communications (Ally, 2004; Hiltz & Turoff, 2005; Oblinger & Oblinger, 2005). Most of the authors believe that a relationship between distance education and online learning exists but seem unsure in their own descriptive descriptions (Moore et al., 2010).

Online education was one of the first users of the e-mail invention and the development of email is entangled with the history of computer networking. Network communication was the result of the research performed to form wide-ranging opportunities for 'meetings in mind', participatory government and interrelated social and cognitive communities (Hafner & Lyon, 1996). Online education has been criticized with tough questions during its 25-year history and this led to innovate numerous models of online education to develop new approaches for teaching and to make learning more effective (Harasim, 2000). From 1980 to 1990 the educational field experienced revolutionary changes that caused the media and some faculty members who felt that less well-trained staff were appointed to replace them, to raise questions about the quality and the value of online education (Harasim, 2000).

According to Bonk and his colleagues (1998, 2000), online teachers and mentors provide cognitive support to students by providing educational courses which includes acknowledgement, interrogating, providing direct instruction, use of different illustrations, acclaim, restructuring assignment, seeking explanation, investigation and instigating conversation. Teachers also help to build up the social presence and teaching presence in online teaching environment (Dunlap and Lowenthal. n.d.). Generally verbal and nonverbal teaching behaviours are referred as the physical and psychological (e.g., compliment, using humorous comments, sustaining physical immediacy, making eye contact etc.) link between teacher and students in face-to-face teaching platform (Christophel, 1990; Weiner and Mehrabian, 1968). However, as identified by LaRose and Whitten (2000), online teachers use different types of media settings such as text-based, audio and video to improve their immediacy due to the absence of physical proximity. In the text-based platform the instructors use examples with personal experience and ask questions, etc., whereas in video they use movements, smiles and have a comfortable attitude. Originally social presence theory (Rice, 1992; Short et al., 1976) defines 'how students could connect socially and emotionally with their instructors and peers in an electronically mediated course despite physical distance' (Whipp & Lorentz, 2009, p 4).

### **Differences between Emergency Online Education as a Response to Pandemic and Typical Online Education**

During March 2020 almost all countries globally replaced traditional face to face education delivery system with online distance education delivery mode as an infection control measure against the spread of the COVID-19 virus which is mainly spread by respiratory droplets breathed out by the infected person (CSIRO, 2020). At 20<sup>D</sup>C COVID-19 survives for more than 28 days on nonporous surfaces such as stainless steel, glass, vinyl, paper, polymer banknotes and survives for even longer at colder temperatures (CSIRO, 2020). Though many countries have been encountered a number of natural and man-made disaster prior to this pandemic, online distanced learning was not implemented as a solution for that particular crisis. Crisis distance education (CDE) is exceptional by both in its philosophies as well as in its procedure. The main differences can be described as

- i) The unexpectedness of shifting traditional education mode to online distance education mode. Crisis distance education has been introduced in schools and other institutions without any previous regulations or procedures. It has been ‘pushed’ into the society without providing necessary skills and knowledge (Rangiwai, 2020).
- ii) Internationalisation was another difference where crisis distance education was imposed globally as a non-pharmaceutical intervention. It was an international concern rather than institutional concern (Bates, 2020).
- iii) Online learning became popular as a noncontact way of continuing education (Dohaney, et al., 2020).
- iv) Expansion of online distance education was huge as it reached out to all schools and other educational institutions beyond its normal zone. Online education was common in the higher education field, but it was new for other school levels of education, especially for the primary schools. In the COVID-19 pandemic online distance education became mandatory for students of all age group, from kindergarten to doctoral level in many countries (Adedoyin & Soykan, 2020).
- v) Fifth difference is imposition. Crisis distance education was enforced in many countries as a national, top-down ‘draconian measure’ (Taylor et al., 2020, p.1). Distance education became ‘mission-critical’ by shifting from its original state as being ‘good-to-have’ to ‘mission-critical’ (Cornock, 2020). Distance learning was enforced as a primary means to complete individuals’ educational needs.
- vi) The medical emergencies were the sixth difference. Generally, the main reasons for distance education depend on geographical isolation, flexibility, disability etc. but during the global COVID-19 pandemic it was used as a tool to deal with medical emergencies and tragedy (Al Lily et al. 2020).

### **Online TEACHING during COVID-19 Pandemic**

The announcement on 30<sup>th</sup> January 2020, from World Health Organisation (WHO) of COVID-19 as a pandemic (Sohrabi et al., 2020), affected many global sectors and global systems which included, but was not restricted to, healthcare systems (Holshue et al., 2020; Peng, et al., 2020), agricultural sectors (Bhosale, 2020), manufacturing (Knieps, 2020), energy (Mohamed, 2020), socio-economic systems (Buck et al., 2020; Nicola et al., 2020) and the global education systems from pre-school to the university level followed by cancellation or postponement of various academic conferences world-wide (Impey, 2020; Panesar et al., 2020). Social distancing measures were introduced to minimise the spread of the virus which resulted complete closure of schools and other academic institutions (Alsafi et al., 2020; Harvard University, 2020; Pather et al., 2020), which affected approximately 900 million students world-wide (UNESCO, 2020). In order to cope with the situation all educational institutions, from pre-school to university switched their instructional platform to a remote learning/online platform so that students could study from their home while maintaining the social distancing and avoid the spread of COVID-19 (Ribeiro, 2020). Switching from traditional face to face instructions to online or remote delivery was not easy, a number of challenges had to overcome. The first one was the logistical challenges while another major issue was the essential amendment in the outlooks of education administrators, educators and students required for implementing compulsory amendments for the switch (Ribeiro, 2020). Transforming traditional teaching to online teaching at the time of a sudden interruption like the COVID-19 pandemic involved imaginative and flexible thinking from the educators on how to support students in attaining the learning objectives so most of the educators worked hard to respond creatively in order to teach

their students in the same manners and standards as before, though they themselves faced disruption in their lives (Cohn & Seltzer, 2020). The process of transformation was efficient for some institutions, while some had to respond with crisis-response migration process due to the pandemic (Hodges et al., 2020; Manfuso, 2020).

Covid-19 pandemic made people realise that education system is vulnerable to external dangers (Bozkurt & Sharma, 2020). The challenges limited to emergency digital transformation of instructional operations during the period of Covid-19 pandemic included the following.

*Technology.* The reliance on technological equipment and the requirement of the proper equipment of online learning was a big challenge for institutions, faculties and students (Adedoyin, and Soykan, 2020).

*Socio-economic factor.* The inequality of socio-economic status within students were a big challenge as some students depended on school or university computers and free internet (Demirbilek, 2014) which they were unable to access that due to their school closure.

*Human and pets intrusions.* Family members, friends or pets caused unexpected interruption or diversions for both the students as well as the educators while working in online classes from their home environment (Adedoyin & Soykan, 2020).

*Digital competence* Digital competence can be refer as a set of skills, knowledge and attitudes required for using Information Communication Technology (ICT) and digital devices to complete responsibilities, including problem solving, information management, teamwork with respect to effectiveness, proficiency and ethics (Ferrari, 2012). Everyone was not digitally competent not only in academic field but also in other spheres of life which make digital transformation of traditional education system difficult for some people (Bennett et al., 2008).

*Assessment and supervision.* In the online education platform assessments are conducted online. Proctor tools are used to supervise students completing online assessments. These tools monitor the students lap top computers, or electronic device that the student completes their assessment on. Proctor tools record students' screens, key strokes, eye movements, home environment, physical behaviour and more, during the exam or other assessment and allow the assessor to watch this (Amigud, et al., 2017).

*Heavy workload.* The emergency digital transformation process includes building e-platforms, cohesive existing peripheral applications into their system resulted heavy workload for ICT units of the institutions as well as for the educators. This heavy workload ended up causing unanticipated financial and time cost (Akkoyunlu & Soylu, 2006).

*Compatibility* The compatibility of online learning with all subjects like social science, humanities, as well as the subjects needs hands-on practical experiences e.g. sports sciences, engineering and medical sciences are required as part of instructional activities (Leszczyński et al., 2018). Remote laboratories are used as alternative laboratories in online education settings and virtual laboratories are used by online education platform to be able to fill the theory-to-practice hole (Iqbal et al., 2015).

*Opportunities.* There are many advantages associated with online education platform, such as flexibility (Smedley, 2010), interactivity (Leszczyński et al., 2018; Wagner et al., 2008), self-pacing (Amer, 2007) and opportunities.

*Cybersecurity* The computers and other portable technological devices are used daily as online educational tools which exposes the devices to various viruses and potential hacking and other cybersecurity threats (Nam, 2019).

## **Conclusions**

The concept evaluated has been how, and why, education methods have changed from early times to the time of the COVID-19 pandemic. The important understandings generated through this review of published literature are that educational methods are constantly evolving as what the ruling society values changes and when new technologies that can be used for teaching are invented. The sudden outbreak of COVID-19 pandemic in 2020 forced the education sector to shift to fully online delivery as limited social contact was implemented to stop spreading this deadly virus. The educational institutions had to implement sudden emergency online course delivery. Published literature has identified that the majority of the students from developed and rich countries were satisfied with real-time online classes, whereas the students from developing and poorer countries suffered, mainly due to lack of computer literacy of students and educators, poor digital infrastructure, cost of internet and the digital devices required in order to continue online classes (Aristovnik, et al. 2020).

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