



Digital Education as a Mechanism for Achieving Sustainable Development

-Digitization of Education During the COVID-19 Crisis as an Example-

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Abstract

In order to advance humanity in various fields, achieving sustainable development was essential, ensuring the rights of individuals at present and those of future generations. This was achieved through activating several strategies, including human development through digital education. This ensures sustainable development and the ability to confront challenges. The COVID-19 crisis may be seen as the biggest challenge to the process of digitizing education as a mechanism for achieving sustainable development.

✓ Digital education, sustainable development, education, COVID-19 crisis.

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1. INTRODUCTION

The technological advancements in the era of the technological revolution have led to the emergence of a new educational model, namely digital education. It has incentivized the consolidation of the individual's educational process, allowing learners to continue their education based on their energy, capacity for comprehension, and learning ability. Moreover, previous experiences and skills contribute to enhancing this type of learning, which serves as a complement to the path of sustainable development as ensured in its programs. This aims to elevate human advancement and progress on one hand, and to guarantee educational rights during crises on the other hand, with the COVID-19 pandemic being a prime example of this necessity. Consequently, the topic of digital education has gained greater importance, especially when linked to addressing the challenge posed by the COVID-19 crisis, and how to achieve this to facilitate the success of sustainable development. Hence, the problem at hand revolves around : To what extent has digital education succeeded in achieving sustainable development amidst the COVID-19 crisis ?

2. The conceptual framework of the study:

E-learning can be considered as one form of distance learning, and it's worth noting that computers and the internet are integral parts of the digital education process to facilitate the transfer of knowledge and skills.

Perhaps the topic of distance learning and education is the best achievement in this field, where the advancement of technology has been utilized and employed in the educational field. Learning opportunities have become available to everyone, through new methods and techniques that meet new needs swiftly. Before discussing distance or digital learning, it is necessary to address its concept first.

- **Digital education, a conceptual approach:** The concept of digital education has emerged in the last four decades, following the growth of technologies and media

in disseminating content rapidly. With the advancement and widespread adoption of electronic devices among people, relying on them in various aspects of their lives. This development has also affected educational devices as one of the societal systems, prompting specialists to capitalize on this technology to facilitate the transfer of learning to students and enhance the efficiency of education. And personal skills, focusing on learner-centered learning as the core of the educational process, considering that traditional learning focuses on building learners with average abilities, as a natural result of facing large numbers of students (Al-Iqbali, 2019, p. 412).

Digital education is the delivery of educational content electronically through multimedia on computers and their networks to learners in a way that enables them to actively interact with this content, with the teacher, and with their peers, whether synchronously or asynchronously. It also allows for completing this education at a time, place, and pace that suits the learner's circumstances and abilities (Yakhlaf, 2019, p. 167).

Hamed defines digital education as electronic generalized content delivered through computer-based media and networks to the learner, allowing active interaction with this content, the teacher, and peers. It aims to create an interactive environment rich in applications, relying on computer and internet technologies, enabling students to access information sources easily and conveniently (Al-Iqbali, 2019, p. 412).

Ibrahim bin Abdullah Al-Muhaisen defines digital learning as education that relies on the use of electronic media in communication between teachers, learners, and the educational institution as a whole (Ali, Ashaalal, 2011, p. 414). Mohammed Saleh Al-Owaid defines digital learning as education that aims to create an interactive environment rich in applications relying on computer and internet technologies, enabling students to access learning resources anytime and

anywhere (Mohtaseb, 2018, p.122).

- **The importance of digital education :** The use of technology by educational institutions has contributed to supporting scientific research through diverse tools, models, and data collection techniques, as well as the possibility of using simulation to understand some scientific theories in laboratories, in addition to experimentation and various methods to explore different concepts and phenomena.

Continuous research on technology and its impact on our daily lives contributes to the emergence of new concepts. There is increasing interest in establishing new curricula and training courses to qualify individuals to benefit from these tools and platforms. For example, there is a growing interest in establishing a curriculum for purposeful and responsible media and digital literacy to play a positive role in education (Yakhlaf, 2019, p. 168).

With the expansion of the internet and the World Wide Web, opportunities for using them in educational purposes have also increased. Some refer to this as online learning. Educators worldwide are now experimenting with various forms of distance learning, open education, and flexible learning. Network-connected computers provide the opportunity to build an educational community, whether at a university or one of the faculties, in a commercial or industrial environment. This may depend more on personal or objective interests than on geographical location (Al-Iqbali, 2019, p. 416).

Despite the numerous guidelines on the vast potential offered by information networks in creating a conducive learning environment, receiving feedback on knowledge, continuously refining comprehended information, conceptualizing concepts, and building knowledge, this type of learning does not guarantee achieving effective learning sought by educators. This is because inappropriate uses of technology can hinder the learning process. For example, when students spend most of their time adjusting word sizes and colors for reports relying on

multimedia, they lose the opportunity to plan, write, and review their ideas. Additionally, much time is wasted on the internet in searching for a specific concept or issue (Mohtaseb, 2018, p.123).

Based on this, Henry Jenkins introduced the concept of participatory culture in 2005 through an article titled "Confronting the Challenges of Participatory Culture : Media Education for the 21st Century." By participatory culture, he refers to a culture of knowledge exchange and sharing in diverse available environments. The research describes how learning has become a product of partnership and knowledge exchange in the information society. The participatory culture can be defined as forms of culture and collaborative production contributed to by the generations of Internet users through websites they establish, forums they create and moderate, and content they produce and oversee (Al-Ballasi, 2021, p. 131).

- **Characteristics of digital education :** According to the United States Distance Learning Association, some characteristics of digital education include :
 - ✓ Supporting individual learning processes and providing connectivity and mutual interaction.
 - ✓ Transitioning from a knowledge transmission model to a guided learning model.
 - ✓ Encouraging dynamic and lively learner participation.
 - ✓ Relying on skills, especially higher thinking skills.
 - ✓ Providing multiple levels of interaction and encouraging active learning.
 - ✓ Focusing on discussing and studying real-life problems as part of the learning process for students (Moatasem, 2015, p.12).

- **Sustainable development, a conceptual approach:** Before addressing sustainable development as a topic, it is essential to discuss its concept, as various definitions have been proposed. The World Bank defines sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." Hence, countries have adopted various mechanisms to achieve this development, including diversifying income sources and enhancing local investment to ensure revenues circulate within the economic cycle and are reinvested in capital projects. Additionally, attracting foreign investment and overcoming its obstacles indirectly contribute to individual development, increasing localization rates, and consequently boosting gross domestic product (GDP) (Abu Zant, Ghoneim, 2006, p.156).

William Ruckelshaus, the former head of the U.S. Environmental Protection Agency, defines sustainable development as the process that recognizes the necessity of achieving economic growth that aligns with the capacities of the environment, based on the premise that economic development and environmental conservation are integrated processes and not contradictory (Moatasem, 2015, p.13).

It can be said that sustainable development seeks to improve the quality of human life, but not at the expense of the environment. In its general sense, it does not go beyond being a process of utilizing natural resources in a rational manner, ensuring that this utilization does not exceed the rates at which nature can renew these resources, especially in the case of non-renewable resources. This utilization must be carried out in ways and methods that do not lead to the production of waste in quantities that the environment cannot absorb, transform, or assimilate. This is because the future and security of populations in any region of the world depend on the health of the environment in which they live.

- **The goals of sustainable development:**

- ✓ All member states of the United Nations adopted the Sustainable Development Goals (SDGs) in 2015, also known as the Global Goals, as a universal call to action to end poverty, protect the planet, and ensure that all people enjoy peace and prosperity by 2030.
 - ✓ The seventeen Sustainable Development Goals are integrated, meaning that they recognize that actions in one area will affect outcomes in others, and that development must balance social, economic, and environmental sustainability.
 - ✓ By committing to leave no one behind, countries pledged to accelerate progress for those furthest behind first. This is why the Sustainable Development Goals are designed to transform the world by addressing and eliminating various changing aspects of life, including extreme poverty, hunger, AIDS, and discrimination against women and girls.
 - ✓ Everyone needs to reach these ambitious goals. Creativity, knowledge, technology, and financial resources from all sectors of society are necessary to achieve the Sustainable Development Goals in every context (Abu Zant, Ghoneim, 2006, p.157).
- **Concept of the COVID-19 Crisis:** COVID-19 is an infectious disease caused by the latest virus discovered from the coronavirus family. There was no prior knowledge of this new virus and its disease before it began spreading in the Chinese city of Wuhan in December 2019. COVID-19 has now become a pandemic affecting many countries worldwide (Boussis, 2020, p. 23). The most common symptoms of COVID-19 include fever, fatigue, and dry cough. Other less common symptoms that some patients may experience include body aches, nasal congestion, headache, conjunctivitis, sore throat, diarrhea, loss of taste or smell, skin rash, or discoloration of fingers or toes. These symptoms are usually

mild and begin gradually, and some people may be infected and experience only very mild symptoms (Boussis, 2020, p. 24).

The philosopher and sociologist **Edgar Morin** presented in his book "Changing Course - Lessons Learned from the Coronavirus," released on June 17, 2020, fifteen lessons. He opened them with an introduction : "A hundred years of fluctuations" in a clear and explicit reference to the title of Gabriel García Márquez's novel "One Hundred Years of Solitude." These lessons are reflections and conclusions of a thinker born at the beginning of the twentieth century following the outbreak of the German influenza in 1921 and who is now witnessing the fullness of the current social and historical moment with questions and repercussions experienced during the decline of the twentieth century under the name of "COVID-19 crisis" or "coronavirus pandemic" that shook humanity since the end of December 2019. These lessons are summaries of nearly a century of fluctuations in societies and systems and about reviews and analyses of the social and human situation in light of the media, scientific, political, and security discourses that accompanied this situation.

Edgar Morin says : "It is time to change course to protect this planet and to humanize human societies." In this regard, Morin proposes a new roadmap rather than inciting a revolution because revolutions, which initially undertake the mission of "liberating humanity," ultimately end up with the opposite result of "oppression." Therefore, along this ecological, economic, and social political path outlined in his book "The Path," published in 2011, lies the solution (Sabry, 2020, p. 440).

3. The role of digital education in achieving sustainable development during the COVID-19 crisis

With the advancement of electronics and the emergence of "artificial intelligence" in information processing, especially since the beginning of the twenty-

first century, dealing with information has become "smarter" as well. This has opened the door to many applications such as "robotics systems" and "control systems" built into various systems to regulate their operation, as in control systems within aircraft, cars, and factories. Additionally, there are "big data systems" that extract useful knowledge from information data distributed across networks, not to mention the emergence of "the Internet of Things" and its applications. Thus, all the technologies mentioned above are now referred to as "digital technology" because they are based on "digital electronics" that store, process, and transmit information electronically using the binary digital system with two states, "zero and one".

- **Digital education and sustainable development:** If digital transformation is associated with the use of "digital technology" and leveraging its advantages to "activate development processes in all its fields and enhance its sustainability globally," then this transformation is not new. Rather, it has begun some time ago. Looking back to the beginning of the third millennium, i.e., the start of the twenty-first century, there are two significant events worth noting to track what has been done regarding the role of digital transformation in development worldwide until 2015, on one hand, and what is supposed to be achieved by 2030, on the other hand (Boussis, 2020, p. 25).

Among the 17 Sustainable Development Goals adopted in 2015, "Goal 4" was dedicated to education. Higher education was specifically mentioned within Goal 4 of Sustainable Development, which by 2030, calls for Ensuring equal access for all women and men to affordable and quality technical, vocational, and tertiary education, including university education. Higher education also contributes significantly to other goals related to poverty (Goal 1), health and well-being (Goal 3), gender equality (Goal 5), decent work and economic growth (Goal 8), responsible consumption and production (Goal 12), climate action (Goal 13), and peace, justice, and strong institutions (Goal 16) (Sabry, 2020, p. 441).

The roadmap for Sustainable Development Goal 4, as outlined in the Education 2030 Framework for Action, includes two fundamental policy pillars focusing on monitoring and improving learning outcomes and addressing the needs of those left behind. The Education 2030 Framework for Action calls for progress regarding existing international agreements in favor of higher education. It acknowledges that a well-established and organized higher education system can improve opportunities for success, equity, quality, and relevance. Moreover, it can also reduce the mismatch between what is taught and what needs to be learned to ensure sustainable development and benefit from technology, open educational resources, and distance learning (Al-Ballasi, 2021, p. 137).

- **The importance of information and communication technologies in achieving sustainable development:** Due to the importance of Information and Communication Technologies (ICTs) in development, world leaders convened twice, first in Geneva in 2003 and then in Tunis in 2005, under the slogan "World Summit on the Information Society (WSIS)". They set goals to enhance the use of ICTs to benefit sustainable development by 2015. The objectives of this summit included providing the necessary information technology infrastructure for education, scientific research, libraries and knowledge centers, health, and government services. It also aimed to ensure global information communication, with a focus on remote areas, and support radio and television services (Abu Zant, Ghoneim, 2006, p.160).

In addition to developing educational curricula and linguistic content related to information and communication technologies, efforts to achieve the Millennium Development Goals (MDGs) and the goals of the World Summit on the Information Society (WSIS) have witnessed high levels of success. The Sustainable Development Goals (SDGs) issued by world leaders in 2015, to be achieved by 2030, consist of "17 targets". These goals include three objectives related to "basic human needs" and three objectives focused on "enabling human

activities" through education, decent work, industry, innovation, and infrastructure. They also encompass four objectives related to "justice and responsibility", addressing responsible production and consumption, peace, justice, and strong institutions, gender equality, and reducing inequalities. Finally, there is a goal calling for international partnership in achieving the objectives. A study on "digital transformation," released in Germany in 2017 by "the G20 countries", emphasized the role of information and communication technologies in contributing to the achievement of each of the Sustainable Development Goals, underscoring the importance of this role (Sabry, 2020, p. 442).

The use of certain digital learning strategies such as "virtual classrooms", "web-based projects", "web-based learning journeys", "flipped classrooms", "collaborative learning", "synchronous and asynchronous discussions", focuses not only on technology but also on restructuring the educational process in a way that aligns with the requirements of the Fourth Industrial Revolution. This involves reconstructing scientific concepts systematically in the learner's mind by linking methods of researching, revising, analyzing, and synthesizing information with critical and creative thinking. The Blackboard system, among other electronic, communication, and technological systems, plays a crucial role in facilitating these processes (Al-Ballasi, 2021, p. 140).

- **The role of digital education in facing the Corona “Covid-19” crisis:** The discussion always highlights the importance of digital education globally, as a solution to face challenges and crises, especially as most countries, particularly advanced ones along with some Arab countries, focus on advancing and developing this sector by introducing new teaching methods relying on advanced technological devices. Given that global competition now revolves around knowledge and innovation, many countries are focusing their educational goals in this direction. Numerous studies emphasize the importance of digital technology in providing better learning opportunities for students. However, despite the

advancements digital technology can bring, the role of the teacher remains fundamental in terms of the guidance they provide, monitoring students, and developing their skills (Sabry, 2020, p. 445).

Looking deeply into the Fourth Industrial Revolution, despite its positive impact on achieving high rates of economic, social, and human development overall, there is widespread concern about the disappearance of jobs, especially those that do not require high scientific and technological expertise suitable for robots and artificial intelligence. This leads to widespread unemployment. Therefore, the jobs of the future will be those that machines cannot do. Comparing between humans and machines, we find that there are key areas where humans excel over machines, like creativity and innovation, such as scientific discoveries, and emotional intelligence, including interactive social relationships (Zayed, 2020, p. 498).

Digital learning is based on an integrated methodology to utilize advanced technology to bring about positive changes in traditional teaching methodologies. This creates a stimulating environment to build creativity, social participation, intellectual culture, and effective communication among the elements of the educational process, including teachers, administration, parents, community, and effective communication among students themselves, enabling them to effectively integrate into the digital age, which represents one of the prominent features of the current era. The COVID-19 pandemic has caused the largest disruption to education systems in history, affecting approximately 1.6 billion learners in over 190 countries across all continents. The closure of schools and other learning institutions has impacted 94% of the world's student population, a percentage that rises to 99% in low-income and middle-income countries.

Every crisis has its benefits, and with the spread of the coronavirus worldwide, the pandemic has revealed numerous advantages of remote learning

systems, especially for countries that implemented this system at the onset of the viral outbreak, according to testimonies from experts in virtual education. Many countries hastened to adopt remote learning systems during the COVID-19 era, resulting in beneficial outcomes. One of these positives is that students have become more advanced as they started to apply modern educational aspects using various technological tools. Additionally, students at all educational stages have become accustomed to delving deeper into scientific research (Zayed, 2020, p. 500).

The French newspaper "Le Point" pointed out in a report that the COVID-19 pandemic, which caused unprecedented disruption to education worldwide, revealed a significant level of inequality, as clearly indicated by United Nations statistics. And according to a report by the United Nations Children's Fund (UNICEF) published last Wednesday, the COVID-19 pandemic and the closure of schools have deprived at least one-third of students worldwide, which is equivalent to 463 million children, of education due to the inability to access it remotely (Ouannoghi, 2022, p. 950).

Amid the series of the COVID-19 pandemic and higher education, the United Nations Academic Impact (UNAI) continues to engage with students, teachers, and researchers worldwide to understand the impact of the novel coronavirus on them and how they are adapting to the changes that have occurred in the world. The series also highlights the lessons learned and the potential positive outcomes of the global lockdown on higher education. The United Nations Educational, Scientific and Cultural Organization (UNESCO) reported that more than 1.5 billion students in 165 countries were forced to discontinue attending schools and universities due to the COVID-19 pandemic. The pandemic compelled academic institutions worldwide to explore new patterns of learning and teaching, including online education and distance learning (Hallis, 2022, p. 250).

The crisis also highlighted some weaknesses in education and training systems in the technical and vocational fields, including deficiencies in digitization levels and structural shortcomings that have persisted over time. Disruptions in workplaces made it difficult to implement industrial apprenticeship systems and apply work-based learning methods, which are essential elements of any technical and vocational system capable of performing its functions and responding to market demands. While online learning in higher education was generally facilitated through recorded lectures and internet platforms, some universities postponed teaching and learning until further notice due to a lack of necessary information technology infrastructure for both students and teachers. There are still questions about how to align classrooms and academic schedules, as some programs were successfully implemented online while others faced difficulties (Hallis, 2022, p. 255).

Education is not just a fundamental human right ; it is considered an empowering right that has a direct impact on achieving all other human rights. Education is a universal common benefit and a key driver of progress towards all seventeen Sustainable Development Goals, serving as the foundation upon which peaceful, just, equal, and inclusive societies are built. When education systems collapse, maintaining peace and thriving, productive communities becomes impossible. Even before the pandemic, the world was already facing enormous challenges in fulfilling the promise of providing education as a fundamental human right (Saker, Bouatet, 2021, p.45).

Despite almost universal enrollment in early childhood education in most countries, there has been an astounding number of children, -over 250 million- out of school, with approximately 800 million illiterate adults. Furthermore, learning was not guaranteed even for those enrolled in schools. It is estimated that about 387 million children, or 56% of primary-school-age children worldwide, lack basic reading skills. From a financial standpoint, the challenge was already

daunting before the COVID-19 pandemic. Early 2020 estimates regarding the funding gap needed to achieve the Sustainable Development Goal of quality education in low and middle income countries indicated a staggering annual amount of \$148 billion. The COVID-19 crisis is expected to widen this funding gap by up to one-third (Hallis, 2022, p. 257).

The COVID-19 pandemic has revealed disparities in educational systems in many countries, increasing psychological pressure on learners across the board. Education is no longer equally and readily accessible to everyone. Additionally, individuals with special educational needs have been overlooked, with no official state programs observed to support remote learning for them. Adding to the worsening situation are countries experiencing conflicts, turmoil, or economic downturns, along with weak infrastructure and limited access to necessary devices for remote learning. Moreover, there are challenges in practical and laboratory educational fields (Saker, Bouatet, 2021, p.48).

4. Challenges facing digital education during the COVID-19 crisis:

There are many reasons that hindered the digitization of education during the COVID-19 crisis, thus hindering the development process. Among these reasons:

- ✓ The lack of actual readiness of teachers for this sudden transitional phase, as a significant proportion of teachers did not have the necessary means to support remote learning.
- ✓ Some teachers lack sufficient experience in the technical aspect, which enables the effective management and implementation of remote learning, or in creating suitable educational content.
- ✓ The lack of preparedness of learners and students for the principle of distance learning, and then their rejection and unacceptance of it.

- ✓ Disruptions resulting from existing disparities in educational systems, which primarily affect learners from low and middle income families with limited resources.
- ✓ The inability of vocational and technical learners to engage in virtual learning in certain specialties that require practical work, hands-on training, and direct assessments in workshops, necessitating the use of tools, materials, and equipment.
- ✓ A shortage of digital resources and educational applications tailored for learners with special needs and learning difficulties.
- ✓ Technical challenges in infrastructure and weak communication networks, as well as the lack of access to technology that enables all segments of society to access information.
- ✓ Simultaneous pressure on internet networks from a very large number of both teachers and students, along with the problem of accessing virtual classrooms.
- ✓ Mechanisms for managing and monitoring the educational process by administrative and supervisory bodies overseeing educational institutions.
- ✓ Global organizations concerned with education have also strived to provide educational resources for free and offer educational services online while ensuring access to information and open educational resources (Al-Hammami, Hijazi, 2020, p. 4).

5. CONCLUSION:

The COVID-19 crisis has significantly altered social patterns, including education. The resurgence of online education, which was previously controversial and unrecognized by many academic institutions, has gained momentum. It was once

considered superficial and unproductive. However, after the closure of educational institutions, current data indicates a shift towards blended learning, which will become a cornerstone of the educational process.

Deepening this path shouldn't mean turning it into a model that negates a mature educational journey under the guise of keeping up with developments. Imposing its application to ensure its benefits requires easing social distancing and distinctive electronic maturity from both teachers and learners. It also demands digital and electronic requirements, along with qualified human resources and infrastructure that many of our educational institutions in Arab countries currently lack.

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