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Flipping the Script: Post-COVID-19 Opportunities, Challenges, and Threats amidst the Digital Revolution in Higher Education

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Abstract

Once considered a marginal and untrustworthy pedagogical approach by higher education institutions, online learning has become mainstream. Consider this - the entire educational system - at the global level, from P-12 to the college level, shut down following the declaration of the lockdown period of the novel coronavirus disease 2019. Education's long-term effects of the abrupt 2020 closing of schools' and universities' buildings and the transition to online learning environments are yet to be known; the adoption of online learning has exponentially grown over the last decade. Higher education's forced adoption of online learning, with no other limited options in response to COVID-19, has accelerated the curve. With this unanticipated shift from the classroom to the virtual sphere at the global level, some wonder whether the adaption of online learning will persist post-pandemic and what impact such a shift would have on global demand for education and institutional strategic plans. This work aims to formulate and add a new perspective to the growing literature on transitions and sustaining quality education in the post-COVID-19 pandemic era.

Introduction

The coronavirus (COVID-19) Pandemic spread quickly across the world in 2020. It disrupted not only the operations of P-12 schools and institutions of higher learning in executing the mandates but also directly impacted students' lives in unusual ways and many of the traditional teaching and learning practices. This spread brought about a critical situation impacting everything, everywhere, including the educational settings, bringing about unexpected challenges for educators and learners; with the sudden shift to distancing, which moved onsite instructions and services to remote settings, challenges, barriers, and potential concerns on virtual teaching and learning activities. Thus, the global education system is currently facing an unprecedented situation that has proven challenging to manage - closing schools and colleges and identifying alternative options to continue the educational process. The option that both the institutions and the students shared was their use of distance education. The shifting to distance modes of operation has enormously affected 21st-century living, working, and studying. The concept of distance education learning, however, is not new. Distance education began in the mid-19th century when the United States Postal Service (USPS) facilitated long-distance correspondence, eventually creating an array of for-profit and non-profit programs that housed colleges and the commercial worlds.

At the time, USPS distributed massive instructional packages between professors and students. Having outgrown the USPS services, distance education today continues to exist in a more advanced form, courtesy of web and digital technologies. As radio developed during the First World War and television in the 1950s, instruction outside the traditional classroom suddenly found new delivery systems. In its current form, distance education is defined as an education that uses one or multiple technologies to transact instruction with students who are physically separated from the instructor by physical space" (National Center for Education Statistics (n.d.).

Review of Related Literature

Distance education is an interdisciplinary field that has evolved and has served well in responding to learning needs and guiding open educational practices (Bozkurt, 2019; Zawacki -Richter et al., 2020). Various terminologies have been used for online learning, making it challenging to develop a generic definition. Commonly used terms for online learning include: 'online learning,' 'virtual learning,' 'e-learning,' 'Internet learning,' 'computer-assisted learning,' 'distributed learning,' 'networked learning,' 'tele-learning,' 'digital learning,' 'web-based learning,' and 'distance learning,' among others. Often mentioned in dialogues among a wide range of decision-makers, academics, and professionals discussing issues related to higher education is the widespread interchangeability of terms such as "distance education," "e-learning," "online learning," and "online education." This phenomenon highlights how the lines between traditional in-person instruction and online teaching and learning modes are becoming hazier, as Guri-Rosenblit (2009) observed.

In this paper, distance education or 'e-learning' will be narrowed to the online learning modality that delivers course material via the Internet and may use one or more other technologies with an internet association. Drawing from the recent work of Johnson et al. (2023), online learning is "a form of distance education in which a course or program is intentionally designed in advance to be delivered fully online. Faculty use pedagogical strategies for instruction, student engagement, and assessment specific to learning in a virtual environment" (p.8).

Online learning can be offered as synchronous, asynchronous, or a combination of asynchronous learning, an episode "of teaching and learning. That does not happen simultaneously. On the other hand, synchronous learning refers to teaching and learning through technologies such as the Internet. These terminologies imply that the learner is at a distance from the instructor (Wang et al., 2013; Wilde et al.,2019) and that the learner has access to some form of technology to retrieve selected learning materials (Rice et al., 2021), that the learner uses technology to respond and interact with the course instructor and with other learners. In addition, an equal measure of support is available to learners.

Online learning coincides with the broader category of distance learning, encompassing earlier technologies such as correspondence courses, educational television, and videoconferencing. Distances in learning, including online teaching and learning, have been studied for several decades. The results of the numerous studies have led to further studies (Garrison et al., 2000; Lisewski et al., 2003; Fredricks et al., 2012; Su, 2014) on models, theories, and evaluation criteria (and standards that focus on Quality online course design, online teaching, and online learning. Research has revealed that carefully designed and practical online learning approaches result from

careful instructional design and planning while incorporating a systematic model for design and development. For example, a meta-analysis study preceded by a systematic review isolating 50 empirical studies found that, on average, students who complete online courses perceive "learning conditions are performed modestly better compared to those used in face-to-face instruction" (Means et al., 2013). The difference between student learned outcomes for online and face-to-face classes -measured as the difference - between the treatment and the control means, divided by the pooled standard deviation, was found to be more prominent in studies contrasting conditions that blended various elements of online and face-to-face instruction with selected conditions taught entirely face-to-face (Hodges et al., 2020). In place of face-to-face contact, time should be compensated for in a carefully designed structure, and additional content would be needed to engage students.

The past ten years have seen steady growth and expansion of online learning, but it has seen significant growth since the advent of COVID-19. While the number of additional students taking online courses increases more than in previous years, no data shows how many students are pursuing their degree programs entirely online. Given the mandated closure, with little to no preparation and training, all levels in the education spectrum transitioned from instructional delivery to online learning platforms. Instructors were challenged to provide students with practical instruction and social and emotional guidance using novel and alien technology. Prior to COVID-19, almost half of the 1.4 million students at for-profit institutions were enrolled exclusively in online learning classes; so were 11 percent of the 15 million students at public colleges and universities. The initial educational policy responses to the first wave of the COVID-19 pandemic involved an unprecedented shift towards online teaching and learning that took the form of "emergency remote teaching," a terminology created by Hodges et al. (2020).

The monopoly of the physical "brick and mortar" lecture halls is beginning to lose its place as the central learning point. Hamilton (2016) suggested that online education offers a solution to many institutions of higher education because "online education promised a solution to economic, organizational, and pedagogical problems in the "traditional" university" (Hamilton 2016. p. 2). Over the past decade, much has changed in beliefs toward online education; thus, an ever-growing body of literature has demonstrated the efficacy of online learning. Research across disciplines has demonstrated that well-designed online learning can enhance students' motivation, satisfaction, and learning (Zheng et al., 2017; Gaupp et al., 2016). Employers are often used to a degree from a land-based brick-and-mortar university as a substitute evaluation of a candidate's potential and capabilities, not necessarily their skills. The Quality of online modalities in higher education is often subject to skepticism and criticism, raising the question of its effectiveness when a comparison is made between the virtual classroom and conventional.

No doubt, switching to digital learning during the global pandemic lockdown not only made a significant contribution to maintaining academic teaching activities but also revealed the usefulness of online learning and the need for its optimization and utilized its potential to offer flexibility in accessing content as well as instruction at any time and from any place (Means et al. 2013). Over the past few years, many globally prestigious universities and colleges worldwide have embraced online learning as a viable option for teaching and learning. Business enterprises, including Coursera, have been embraced, successfully partnering with established universities to deliver high-quality undergraduate and graduate degrees. In addition, more than ever, employers and hiring

managers do not care if a prospective employee earned their degree or credential in a face-to-face or online program. The emergence of the pandemic has presented opportunities, challenges, and threats to higher education institutions worldwide.

Opportunities

In the face of the COVID-19 pandemic, most universities were unprepared to face an exigency of such an extent. The COVID-19 Pandemic opened opportunities for a giant leap realization for the institutions to upgrade educational delivery mode and transfer attention to emerging technologies (Toquero, 2020). Global organizations recognized the interruption of established educational processes and the emergency transition to remote learning during the onslaught of the pandemic.

A published study released by the U*nited Nations Educational, Scientific and Cultural Organizatio*n (UNESCO, 2020) estimated that 90% of the world's student population was impacted. In addition, the International Labour Organization (2020) reported the extent to which COVID-19 had an impact on education as unprecedented, considering how much of the education sector has been disrupted, its implications for the employment of education personnel, and how much the schools needed to transform in response to it. The impact is also considered exceptional because of the rate at which technology, distance, and virtual learning have been adopted to minimize the closure and use virtual strategies to address the challenges in education. Before the onset of the COVID-19 pandemic, many college faculty were reluctant to accept the validity of distance education (Lederman, 2020a).

Flexibility and Self-Regulation

Remote teaching and online learning are not new curriculum design or pedagogy approaches but have taken on renewed salience. Within the science of learning, the context of education has extended the learning environment beyond the formal classroom setting to include digital classrooms. Over the last two decades, various studies have concerned challenges that may hinder student learning in virtual environments. Most often than not, these challenges emerge in the absence of the active voice of the course instructor in a virtual space (Jaggars et al., 2016). In addition, the literature is not depleted of mentions regarding distractors in online instructional settings (e.g., home) where the learner has to deal with noise and other common distractions in a home or work environment.

Prior studies give credit to online learning on its potential to offer flexibility to the learner (Collis et al., 1997; Naidu, 2017; Soffer et al., 2019;); augment the learning experience and opportunities for interactivity (Tissenbaum et al., 2017; Leszczyński et al., 2018); and, self-regulating (Zimmerman, 1990; Lawson et al., 2019). In addition, online learning permits learners to pursue learning opportunities within familiar environments. Also, help the learner to develop the ability to muster self-directed learning. Collis et al. (1997) defined flexible learning as a didactic approach that allows students to learn what, when, and where. Contemporary theories of learning and instruction emphasize the value of learners' knowledge and ability to regulate their learning effectively. A large

body of research suggests that effective regulation of learning is beneficial for achievement. Soffer et al. (2019) describe flexibility as a vital component in supporting personalized learning, wherein learners' needs, interests, backgrounds, and varied learning styles. Likewise, it indicates a swing from conventional instructor-centered pedagogies and practices to more innovative learner-centered approaches. Naidu (2017), on the other hand, considers flexible learning as a state of being in which learning and teaching are regularly freed from time, place, and pace of study limitations. Naidu further argues that flexible learning is a value principle rather than a mode of study. Close to three decades ago, Schunk et al. (1997) defined self-regulatory processes as

> ". . . attending to and concentrating on instruction; organizing, coding, and rehearsing information to be remembered; establishing a productive work environment; using resources effectively; holding positive beliefs about one's capabilities, the value of learning, the factors influencing learning, and the anticipated outcomes of actions; and experiencing pride and satisfaction with one's efforts" (p. 195).

Unlike in face-to-face learning environments, where time is typically structured around classes and everyone follows a fixed schedule, learners in online environments need to establish when, where, and how to engage with course content and achieve their goals with minimal support (Lajoie et al., 2006). Distance learning requires a large amount of self-regulation, potentially putting students at risk of missing out on broader learning opportunities and being overwhelmed by the expectation to obtain and understand academic content with minimal support from the instructor. Following the pandemic lockdown (mass quarantine), students suffered a lack of physical presence and a lesser extent of informal discourse and spontaneous interaction with classmates, course instructors, and friends, increasing the risk of developing negative emotions and feelings of loneliness.

However, the effectiveness of online learning has long been recognized by an even more significant number of proponents in the education community. The emergence of COVID-19 forced institutions to implement some form of remote learning and base their actions on aligning with local and global policies and orders to overcome the spread of the Covid-19 pandemic while maintaining the academic calendar. Self-regulation is seen as a dynamic and cyclic process involving the active interpretation of goal setting, tasks, making plans, identifying strategies that ensure success, and constantly monitoring and readjusting one's leaning toward attaining set goals.

Engagement in Teaching & Learning Transactions

Course instructors found the pandemic-imposed changes challenging, but so did students, who had to transition and conform to the various learning modes and struggle through other factors that affected their learning experience. A long-standing criticism of online learning is the irreplaceability of face-to-face modes, as the former lack the capacity for the unrestrained communicative processes that occur with a physical presence; and processes through which the cognitive, the meta-cognitive, and social/interactive features of learning occur. In addition, the interaction levels between instructor-students and student-students are much less relative to that offered in traditional classrooms (Roblyer & Edward, 2000). Also, a growing body of evidence in the literature reveals that sound designs in online learning courses that promote 'active learning' and a "high perceived level of leadership" (or presence) of the course instructor (McLaughlin et al., 2013); is sure to achieve learning outcomes comparable or exceed those achieved in the face-to-face teaching. Means et al. (2009), the most extensive available meta-

analyses study for multiple disciplines and courses, determined no differences between teaching modes. Hodges et al. (2020) stress that the need for careful planning for online learning must include identifying the content to cover and carefully tending to how course instructors will support a variety of essential interactions in the learning process. A suggested tactic identifies information transfer, learning, and social and cognitive processes. Online learning promotes a pedagogical focus from didactic instructor-centered to participatory learner-centered learning. Much has been published (e.g., on the indispensable place of interaction within the learning environment.

Researchers and practitioners (e.g., Vygotsky 1978; Swan 2001) consider interaction a critical engagement in a teaching and learning environment. Vygotsky, for example, encouraged more interactive activities to promote and achieve cognitive growth, such as productive discussions, constructive feedback, and collaboration. Improving the Quality of teacher-student interactions within the classroom depends upon a solid understanding of the nature of effective teaching, particularly in the digital environment.

Swan (2003) proposed the three dimensions (see Figure 1) of the interactivity constructs central to mediating learning. Interactions with interfaces thus refer to the use learners must make of specific technologies, platforms, applications, and course templates to interact with course content, instructors, and classmates. Student engagement, which may be defined as "student involvement in educationally purposeful activities, has been examined as a predictor of students' learning and personal development (see, for example, works from (Swan 2003; and Perry 2022) and their understanding of how the online environment affects engagement and how it should inform the implementation of online programs).

Institutions must consider learners' exposure to new technologies and their various constituencies. These include technologies to support chat group activities, video conferencing, voting tools, and others that document-sharing spaces make it more effective and efficient for instructors to reach out to students. A thriving online instructional environment requires learners and instructors to be familiar with and proficient in utilizing those devices for learning. Further, and even more fundamentally, it requires that the devices exist.

Strategic Planning and Coordination

Following the World Health Organization's declaration of COVID-19, a deadly threat to humanity, and thus a global emergency requiring shutdown, learning institutions were compelled to shift the teaching and learning mode to remote. This declaration brought about a dramatic scale of changes for all stakeholders (e.g., students, teachers, educational leaders, educationalists, etc.) tremendous crisis-response activities that led to the migration of universities to consider online learning modalities that will adequately serve as the remote educational platform, thus adopting a digital academic experience as a new normal in teaching and learning. Until recently, higher education was an in-person institution. Learners either commute from their homes to nearby campuses, live on campus, in campus accommodations, or private residential housing - all so they can access and spend time on campus. Furthermore, this careful design process will often be absent in these emergency shifts - a reassessment of business models and how universities generate value. In contrast, literature has limited empirical studies supporting online education expands the higher education enrollment base.

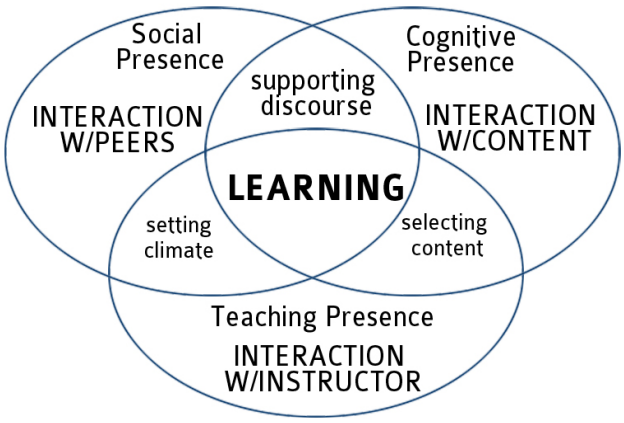

Figure 1. Interaction with Interface Conceptualized (Swan 2003)

Strategic planning is critical for every organization -regardless of size, service areas, or location. It is also an ongoing process by which the university, or any organization, charts out its forward course through a collaborative effort that brings all its stakeholders together to examine current realities, priorities, and resources as it defines its vision for the future. As institutions of higher education emerge from the vail of the global pandemic, consideration must be placed on establishing a culture of trust, collaboration, and shared leadership and giving thought to broadening partnerships (Gigliotti & Fortunato, 2021).

As institutions move through the recovery and repositioning of their efforts following a global pandemic, strategic planning efforts will imperatively require a focus on innovation, along with leadership transparency that includes an expanded vision and broader inclusion in shared governance that identifies milestone markers for accountability. With the rapid switch to online teaching and learning from traditional face-to-face instruction, questions on structured versus self-directed and self-regulated learning activities. It is important to note that group versus individual tasks complicate an intricate area of online delivery and practice. Gillett-Swan (2017) points out challenges in providing support to individual learning needs, and individual differences of each learner may present additional challenges than in a face-to-face context. Gillette further notes the difficulty in identifying a struggling learner within the online environment who may benefit from additional support. In contrast, a fraughted face-to-face student may attend class and not ask questions. However, the course instructor can still determine that they need support by observing the interactions, participation, and circulating learning activities.

On the one hand, leaders of institutions of higher education who invested in online infrastructure before the pandemic not only weathered but continued to evolve this strategy. As a result, higher education institutions relatively moved out of panic mode and figured out - to some extent - how to cope with the change and develop more sustainable systems. On the other hand, institutions that either overlooked or resisted online learning for years or invested only in isolated instances found themselves less prepared. They suffered steeper enrollment and budget declines than their counterparts. Many resist online learning today, issuing requirements that faculty must teach face-to-face and actively disallowing faculty to choose the modality (or modalities) for their classes. Face-to-face teaching and learning is a transactional activity where the instructor and the learner meet in an established space at a scheduled time for one-on-one learning or, most commonly, in group sessions (Arja, 2022).

As colleges and universities reopened their campus to bring back their students to campus, many have replaced or created parallel sections of courses previously taught in physical lecture halls with online courses as a long-term strategy to address this. Institutional concerns include faculty and classroom space constraints, increasing enrollment size, and many adult learners with other responsibilities. Most higher education institutions require a new approach to how campus leaders interact with each other and an approach that focuses on progress toward broadening the instructional mode. The Quality of these modes creates the institution's agility that allows flexibility to meet the changing needs of students, re-examine and re-write institutional goals, and place a broad emphasis on change management. In addition, higher education's culture requires campus leaders to form new and re-imagined partnerships across institution constituencies to identify and work collaboratively to meet business and academic needs and consider frequent reassessment of business models and how their respectful institutions generate value.

From these different publications, although by no means exhaustive, A body of publications (Brown, 2003; Hearn, 2013; Sambhanthan et al.; 2017) argued that institutional leaders often perceive the delivery of online programs as a revenue-producing channel and, indeed, a channel for "delivering instruction to a large number of paying customers without the expense of providing things such as temperature-controlled classroom and parking spaces" (Brown, 2003, p. 148). Indeed, there is a need to reassess business models and how universities generate value. The design process and the consideration of distinctive design decisions impact the Quality of instruction.

Partnership Strategies

Online learning is expanding at an astounding rate. Along with the growth of e-learning is a widespread consensus about the numerical growth and role of multisectoral partnerships interested in higher education in general and e-learning. Choosing and establishing a harmonious collaboration relationship is at the heart of a successful university partnership. Corporations with partnerships across universities must create internal structures and processes to drive success. Research highlights deficiencies such as the weakness of the online teaching infrastructure, the limited exposure of instructors and learners to online teaching and learning, the information gap, unfavorable learning environments at home, and equity and excellence.

Moreover, it is a self-defeating effort to plan and design effective instruction for online learning without an institutional framework to accommodate both content and student access and the inclusion of support systems - weak support systems, including. appropriate and meaningful structured professional development activities. There is. However, a plethora of arguments associated with online teaching and learning exist. These include the dynamics in pedagogy, flexibility, convenience, policies, and the focus on lifelong learning; these are only a handful of arguments related to online pedagogy.

Online learning means, first and fundamentally, the shift from face-to-face teaching and learning to the use of devices of various sorts to deliver content and effect learning. Over two decades ago, Donlevy (2003) asserted that online education might help educational institutions expand curricula offerings at a lesser cost while helping their students gain far-reaching technology skills to improve their marketability. Successful online learning thus

requires that the students (and course instructor) be familiar with and proficient in using those devices for learning. Historically, some employers often used a degree from a land-based brick-and-mortar university as a proxy assessment of a candidate's potential and capabilities, not necessarily their skills.

The Quality of online modalities in higher education is often subject to skepticism and criticism, raising the question of its effectiveness when a comparison is made between the virtual classroom and conventional. Quality, as used in this study, is how an internet-based online program meets the benchmark criteria established and propagated by the Institute of Higher Education Policy in 2000 (IHEP 2000). Studies aimed at academic achievement have shown mixed reviews, but some researchers point out that online learning can, at least, be as effective as traditional classroom instruction.

Education-in-emergencies research highlights that "contingency plans" are vital to dealing with emergency and post-emergency situations. Specifically, during crises, natural disasters, war and conflicts, and pandemics, a population is often displaced as homes, neighborhoods, and educational centers are destroyed and rendered unusable. A certain level of preparedness is critical to provide an adequate response at the onset of a crisis and to "prepare, cope, and recover" (Anderson, 2020; Azzi-Hucktigran et al., 2020). Periodic evaluation is a vital element of an efficient university-industry engagement. However, as with any essential activity, the success metrics must be carefully defined to ensure that what has been measured and tracked is closely aligned with the business goals, including the key performance indicators (KPIs) associated with online teaching and learning. Thus, KPIs, institution selections, and other evaluation processes are fundamental to ongoing effectiveness.

Threats

With the emergence of COVID-19, it is evident that most higher education institutions are neither susceptible to external threats and adversities nor have demonstrated a level of preparedness to confront them when they occur. COVID-19 altered institutional operations and affected administrators, staff, instructors, and students. While pandemics of the magnitude of COVID-19 occur decades apart, institutional plans of preparedness require a response to other events that occur more frequently, including calamities such as extreme weather, wild or act of terrorism, which has required hospitals to rapidly and significantly expand capacity and resources to provide medical care.

As institutions of higher education transition to recapture normalcy within their physical campuses, they confront a new environment and paradigms with varying degrees of enthusiasm and concern. Several questions appear. Is there optimism or skepticism among institutions' constituencies (students, faculty, administrators) about Online Learning? Is there an interest in how online courses can improve their teaching and offer unprecedented learning opportunities for students, or do faculty and administrators want to know what will be up against their plan and deliver their classes online? It is essential to consider both the pros and cons of online learning to be better prepared to face the challenge of working within the existing digital environment and embrace identified opportunities.

Both administrators and faculty need guidance in acquiring, designing, and implementing meaningful online

courses to meet identified student learning outcomes and the associated assessments. Instructors "need to add details and clarity to syllabi and organize disciplinary content into sequential learning modules, each filled with online resources, including videos, discussion groups, and other meaningful learning activities and assessments" (Lumpkin 2021). These teaching strategies should foster regular and substantive interactions; course instructors must provide interactive lecture notes interspersed with engaging learning activities to expand and strengthen student learning.

Instructional Material

The importance of integrating technology into education has emerged again with the unexpected disruption of face-to-face education because of the COVID-19 pandemic. The cost is one of the enormous obstacles to producing multimedia-rich learning materials. Designing an intentional learning environment that focuses on student engagement requires careful consideration of all course activities; for example, how instructors partner with learners to construct meaningful activities, assignments, and assessments.

Whether instructional material and course content is developed at the instructor's level or at the institutional and beyond, the instructional component is best to design pedagogically meaningful courses to earn resources to help students acquire facts and skills while developing their cognitive processes. In addition, the development material must provide opportunities for interaction with content, learners/peers, and the course instructor or facilitator, the product of the learning process. Creating concepts and digital multimedia content together is based on various theories. The transition from print to digital instruction material entails much more than scanning books and uploading them to tablet devices, computers, or eReaders. Published works (Junco, 2015) describe a wide-ranging shift to immersive, online learning experiences that engage learners. Instructors improve learners' online learning experience by utilizing effective pedagogical methods. Choppin et al. (2017) noted that instructional materials developed for and made available to students in online spaces are vastly different in format from traditional materials. They further explain that digital instructional materials have the potential for increased individual interactivity. Finally, digital instructional materials have a more significant occurrence of built-in assessment programs (Choppin et al., 2017).

According to Gossenheimer et al. (2017), online teaching increases accessibility to education. For many adult learners, pursuing a degree program while juggling work and family commitments may be daunting. However, online degree programs provide increased flexibility, allowing students and instructors to access course materials whenever and wherever is most convenient. In addition, while traditional students are limited to the instructor's teaching style, online students can interact with course material in ways most compatible with their learning style. Visual learners, for example, will grasp the information best by watching a technology-mediated presentation, such as a slideshow or a "whiteboarding" video on the material. At the same time, strong readers may opt to leverage the textbook or print out a lecture transcript. For learners who crave an interactive experience, there is the option to frequently participate in online forums and discuss lecture materials with peers. It is noteworthy that adult education literature supports using interactive learning environments as contributing to self-direction and critical thinking.

Digitize Learning and Technical Issues

It is established from previous research studies that instructors count on learning. Although measuring the influence of instructors is not straightforward, there seems to be some agreement about the significance of instructional Quality. Instructional Quality is the essential variable for evidence of learner success learning (Hattie, 2009; Scherer et al., 2016), more so than other instructors' characteristics analogous to qualifications or background. In other words, what matters further for student issues is what instructors do in the lecture halls, as it is inside the lecture where instructors and learners interact and where learning eventually takes place.

Students need to be technically and technologically supported to fulfill expectations from online learning environments. Institutions and instructors should create opportunities and devote resources to assist learners in developing their computer skills and expertise needed for online learning. Before offering a distance education course, the instructor should ensure that the learners have basic computer skills so they will not be frustrated and discouraged by using the tools and environments of the online class. If necessary, students with low computer proficiency should be provided with a training program at the beginning of the semester to ensure they gain the computer skills required for online teaching and learning.

Infrastructural Adaptability and Accessibility

Adaptability constitutes another major challenge. Shifting from a face-to-face to an online environment requires time to allow students to adapt and get accustomed to the new setting. Again, the unexpected shift to online mode may not offer sufficient time for such adaptability, especially for students with traditional mindsets who typically resist sudden changes (Kebritchi et al., 2017). Often, challenges in providing support to individual learning needs and individual differences of each learner may present additional challenges than in a face-to-face context. Gillette-Swan further notes the difficulty in quickly identifying a struggling student within the online environment who may benefit from additional support. In contrast, a fraughted face-to-face student may attend class and not ask questions. However, the course instructor can still determine that they need support by observing the learners' interactions and participation during the learning activities.

The critical factor for the effectiveness of online learning is the accessibility and affordability of up-to-date computer hardware and software, including speed and stability of Internet access (Billings et al., 2001; Scollin, 2001; Cragg et al., 2003;). A review of several published studies (Mohd Najib, H., 2017; Hong et al. (2022), Fauzi et al., 2020; Hazwani et al., 2020) on the effectiveness of online learning and the possible challenges and obstacles faced by students and instructors point out the need for collaboration and team effort between course instructors, technical support, and instructional designers in the development of a student-center learning environment.

Hazwani et al. (2020) add that internet connection is a factor that influences the effectiveness of e-learning, and Internet connection must be moderated. Both management research and community-based participatory research suggest and promote collaboration as an asset that allows teams to do more together than they would otherwise do alone, thereby increasing efficiency and extending productivity in the work of an organization. Thus, the

development of online courses requires participation beyond the course instructor (Brown et al., 2002; Zhao et al., 2015) and must consider innovative ways to deliver content, connect with students, establish connections with students, help students connect, and assess student learning.

As the concept of learning in an online environment increase, some questions are raised. The lack of network infrastructures, computers, and internet access will always remain, not only as a challenge to distance learning for college students. Students from less advantaged backgrounds suffered more during COVID-19 than advantaged students (Mustafa, 2020). Therefore, the Covid-19 pandemic has significantly widened the digital divide; many students cannot equally engage in online learning simply because they do not have home-based access to adequate technological devices and/or stable internet connections. The convenient metaphor "digital divide" has typically explained inequalities in accessing computer devices and the Internet between groups based on various dimensions of social or cultural identity (Gorski 2005). More recently, Chan (2021) defined the "digital divide" as the gap separating those who would potentially gain from the "digital age" and those who would not.

Charge of Responsibility to Learn

Colleges and Universities are comprised of various complex components, including instructors, students, administrators, curriculum, educational services, and others that must be fostered and resourced to achieve identified institutional and program goals and outcomes. At the onset of COVID-19, higher education institutions worldwide mobilize remote learning solutions to ensure educational continuity. Institutions, private and governmental, were swift in their response and provided multiple modalities of remote learning to reach students while campuses were closed while being mindful that faculty limitations in providing optimized instruction; economic and digital inequalities found among students' populations presented significantly disproportionate gaps in services (Gonzales 2018; Lederman, 2020b; Katz et al., 2021; a talked, 2022). Further, computer and internet access do not ensure effective distance learning. Online learning requires students to have good independence and be self-regulated.

Online learning has both promise and potential to reach a wider audience, in a sense leveling the playing field for students who are usually at a disadvantage in access to education; In addition, online learning and virtual schooling products experience both a proliferation in kind and a surge in the public interest (Barbour et al., 2013). However, there is also concern that online learning lags in interactivity (Barbour et al. 2009); limited access to technology or good internet connectivity impedes learner retention for students from disadvantaged backgrounds (UNICEF, 2020), which requires a significant time investment from learners (Blau et al., 2012). Alongside the increasing digitalization of many workplaces, new "types" of learners with higher digital proficiencies than previous generations. Additionally, the continued growth in the proportion of university instructors who have previously taught an online course online more likely to embrace online learning to reach students they previously could not otherwise enroll and, at the same time, respond to calls from students for more flexibility in when and how academic programs are offered. Both synchronous and asynchronous types of remote teaching are essential for students' academic outcomes, and university connectedness is critical in fostering students' meaningful learning experiences and achievement.

Conclusions, Suggestions, and Recommendations

The shift to online classes was an unprecedented experience and brought priceless lessons. A blended model that combines online and face-to-face classes could be adopted to boost students' preparedness for unexpected circumstances during emergencies, enhance students' familiarity with the online learning style, and allow the online teaching and learning culture to thrive gradually. Researchers might consider developing digital teaching and learning platforms and apps that feature personalization and contextualization to suit students of different capabilities and to fit the requirements of different subjects. Researchers and campus administrators are encouraged to update the currently used live-streaming applications (apps) and platforms to make them more academic-oriented and in a way that features extensive communication between students. Improvements are needed at distinct levels to guarantee a sustainable and adequate online model in the post-pandemic era. Online teaching experience and formal training in online modes affect an instructor's teaching performance and self-efficacy.

Enabling an online course requires the instructor to be engaged, innovative, and creative and to have an impactful online presence. Learners must be attentively motivated and engaged, and it requires that the instructor fosters a safe, non-judgmental environment whereby students' views, perspectives, and personal and professional experiences are encouraged and acknowledged. The instructor must display an instructor-facilitated active role and create a student-centered learning process. Also, the instructor must be able to hold students accountable to guide them and embrace their roles as active participants in learning transactions and self-directed scholars (Moate et al., 2015).

The shift to online teaching and learning after COVID-19 will continue to become ubiquitous for instructors and institutional leaders who must discover that multimedia enhances teaching and learning. These advantages can target either active learning, delivery, or learning enhancement. Like distance correspondence before it, online learning is burdened with proving its effectiveness concerning traditional practices. Despite research showing otherwise, institutions must recognize the unpardoning flipped script as online learning will continue, for a while, carrying its 'emblem stigma' of lower quality by employers vis a viz traditional face-to-face learning. This burden has taken many forms. Most visible are the meta-analyses, aggregating data from dozens or hundreds of studies exploring various metrics of "effectiveness." While several systematic reviews of studies have examined specific disciplines and student satisfaction levels during the pandemic, mixed results have been reported. Prior studies have reported students' positive attitudes toward online learning (Schlenz et al., 2020, Bowen et al., 2023). Online learning has both promise and potential to reach a wider audience, in a sense leveling the playing field for students who are usually at a disadvantage in access to education; In addition, online learning and virtual schooling products experience both a proliferation in kind and a surge in the public interest (Barbour et al., 2013).

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