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Unleashing Digital Transformation: Reshaping Education for the Future

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Abstract

How did the education sector adapt to the challenges posed by COVID-19? The integration of information technology in education has been accelerated and hybrid learning has eventually become an integral component of academic institutions. In view of the lack of evidence on the effectiveness of hybrid learning, this study aims to explore the underlying principles of hybrid learning and will investigate the benefits and challenges that could accompany the dynamics of this pedagogy. Hybrid learning is also expected to continue after the pandemic ends. With so many educational institutions looking for opportunities to maximize student learning experiences, the incorporation of this new emerging learning environment into the future education system is very high. Furthermore, this study also looks into the possible changes of how this new learning environment could change learning and education in the future.

Keywords: Hybrid Learning, Blended Learning, EdTech Companies, Hybrid Rotational Learning Model, Differentiated Hybrid Model, HyFlex Course Model.

Introduction

The COVID-19 crisis has unreasonably caused severe disruptions to businesses and industries of various kinds across the world. The education sector is not exempted from this (Oyedotun, 2020). Many schools, colleges and universities around the world have been forced to suspend all face-to-face activities and close their doors to prevent the spread of the disease, affecting nearly 1.6 billion global enrolled learners, in more than 190 countries (United Nations, 2020). No one can exactly tell for how long these closures are likely to last (UNESCO, 2020). This mandatory closure has made the governments and educational institutions to find alternatives to traditional in-person interactions to ensure that teaching and learning processes continue amidst the crisis. What lightning arrangements have been made? How do they hope to resolve the individual needs of students by levels and fields of study?

To mitigate the impact of this pandemic, the educational institutions have opted for online learning or e-learning as the media of communication to substitute for the face-to-face

interactions. According to Allen et al. (2016) who conducted a study before the onslaught of the pandemic, on the state of online education among the U.S. institutions of higher learning, almost one-third of educators believe that online education is inferior to traditional in-person teaching, and two-thirds of the chief academic officers state that their faculties do not consider online education as crucial. In fact, the systems of education in some countries also do not inspire confidence in the technology-based transformations (Larbi-Apau et al., 2020). However, this crisis has made many institutions which were previously hesitant to change, to adopt online learning and embrace the use of modern technology for survival. At this point of time, "online learning has become an urgent necessity, rather than an option" (Dhawan, 2020, p. 7). Nevertheless, it is common for educators to be skeptical of new teaching methods and settings, and the acceptance would grow as experience accumulates (Lieberman, 2018).

As the pandemic prolongs, which seems inevitable, the chaos continues to unfold, and the need to balance the educational needs that fulfill the health and safety standard of students, teachers and families is of paramount importance (Bhula & Floretta, 2020). A handful of countries have started reopening their schools, colleges and universities either fully or partially (Wiley, 2020; Wiley & Hadden, 2020). With the staggered return of students to campuses, there is ongoing discussions over how education facilities can reopen safely (Smith, 2020). As social distancing is essential at this stage, many educational institutions have shifted to the hybrid format, leaving millions of children to experience a radically transformed educational practice. In fact, hybrid learning is not really a new concept in education (Miller, 2020). It was adopted by a number of institutions before the pandemic (Bentley, 2020). Now that the educational institutions are seeking safe ways to avoid contacting COVID-19, hybrid learning has become important, leaving the institutions with no better option for continuous teaching and learning. Several sources have also reported that many schools, colleges and universities around the world have adopted hybrid learning at this point of time (Bhula & Floretta, 2020; Lieberman, 2020). According to Pang (2020), Millersville University, a public university in Pennsylvania, adopted the hybrid learning together with other safety measures, to resume teaching and learning amidst this pandemic, have managed to keep their students and faculty members safe. ICEF Monitor (2020) also reported that a vast majority of institutions in the U.S. have adopted this learning approach to deliver course content to their students.

However, there is no evidence to support the effectiveness of hybrid learning, although there is evidence that supports the adoption of the hybrid teaching model as the preferred and low-risk method in achieving both the health and educational needs at this moment. As educators prepare a variety of hybrid models, some express a high degree of anxiety and skepticism in using the new models of learning. However, educators who believe that technology can offer a variety of learning opportunities highlight the benefits of hybrid learning. Yet, some educators argue that the effectiveness of the model can only be accessed based on the quality of its implementation. Since the pandemic has unexpectedly forced the educational institutions to explore the new model that comes with varying details, it is worthwhile to provide more information about this model. Therefore, this study aims to explore the underlying principles of hybrid learning and will further investigate the benefits and challenges that accompany the dynamics of this pedagogy. Consequently, hybrid learning is likely to continue even after the pandemic ends. Many educational institutions are looking for opportunities to improvise current solutions to increase student learning experiences in

hybrid settings. The chance of integrating this new learning environment into the future education system is very high. Therefore, this study also seeks to provide suggestions as to how this new learning environment is likely to shape the education in the future.

Amidst this pandemic, many educational institutions have started to use almost any available digital learning tool to ensure the continuity of high-quality lesson delivery. Short-term solutions are required to help minimize the inevitable damage this crisis will cause, yet these uncertain and challenging times are not the best moment for making investment decisions regarding educational technologies for long-term success. What is important at this stage is a critical analysis of these matters (Teräs et al., 2020). Therefore, this study is important to the educators as it extends the existing knowledge base and provides a better understanding of the paradigm shift that is taking place today. Moreover, the surge in the acceptance of digital solutions at this time and in the near future will most likely mark a turning point for EdTech (education technology) companies. Since this study also envisions the future of education, EdTech companies could grasp the available opportunities to provide the best digital solutions to meet the evolving demands.

Literature Review

During this pandemic, the term that is often used is “new normal.” In the education sector, the new normal now is a transformed version of education with online learning at the core of this transformation. The COVID-19 pandemic has made many educational institutions, all over the world, to adopt this new approach to learning. During these challenging times, the demand for online learning has increased extensively and many are researching new learning models that could work very well with online learning. As a result, several buzzwords are being thrown around. “Blended learning” and “hybrid learning” are the popular buzzwords used interchangeably amidst this pandemic to describe the right mix of traditional face-to-face and online learning. Both these learning models may seem similar from the outside, yet there is a subtle distinction between these terms that is worth exploring.

Blended Learning

What is blended learning? What, why and how are we blending? Although the term blended learning is extensively used, there is ambiguity in its definition and use (Oliver & Trigwell, 2005). There are two most cited definitions of blended learning. Garrison and Kanuka (2004, p. 96) define blended learning as “the thoughtful integration of classroom face-to-face learning experiences with online learning experiences.” According to Graham (2006, p. 5), “blended learning systems combine face-to-face instruction with computer-mediated instruction.” The key ingredients of blended learning are face-to-face class sessions and online instructions. Both definitions highlight that blended learning uses online instruction to complement the traditional face-to-face class sessions, essentially a “blend” of both live and online learning. Figure 1 provides an overview of this idea. The major element of a blended course is that the online instruction is not intended to replace the traditional face-to-face class session, but is meant to supplement and support the lesson taught in the classroom. Students are physically present and meet the instructors face-to-face and the lessons are enriched with online materials, activities and coursework. Instructors post articles, videos, podcasts, quizzes and interactive online activities for students to do during class and out of regular class hours. These materials are made readily available online and students can independently access them at their own convenience. At the same time, blended learning

also encourages students to communicate online, share information and collaborate with other classmates for better performances.

There are many reasons why blended learning has gained increased attention in recent years. Instructors, parents and students realise the benefits offered by the mix of in-person instruction and online learning. Firstly, blended learning has a positive effect on the learning process as it enhances students' academic performances. Many studies have revealed that blended and digitally-driven learning models have led to greater levels of engagement and achievement from primary schools all the way up to higher education. Students tend to stay engaged and gain deeper understanding of the topic or subject matter at hand with this learning method. According to Ferlazzo (2020), blended learning empowers students who are shy and introvert to share their ideas and learn from their peers using discussion forums after the class. This is one of the main reasons why students not only do well in blended courses, but they also often feel more motivated and face lower anxiety (Siegelman, 2019). The second benefit is the personalisation of learning. With the help of online technology, students have some control over their learning in terms of pace, path, place and time (Christensen et al., 2013). Usually, in a classroom, students are at different levels of ability and learn in different ways. With blended learning, they can experiment and personalise the lessons according to their own learning capabilities, and are not held back by other students in the classroom. The third benefit is that it prepares them for the wider world. Technological change has reshaped the workplace continually over the past decades and students are required to embrace or depend on technology in the future. Therefore, digital literacy skills are necessary for students to thrive in today's world and this can be cultivated through blended learning. Lastly, it is incorrect to disregard the cost-saving benefits that come with the blended approach to learning (Bonk & Graham, 2012; Davis, 2014). Although educational outcomes are undoubtedly of paramount importance, reduced spending on classroom resources such as paper and books can also lead to significant savings.

Fig. 1 Blended learning
Source: ViewSonic, n.d.

Hybrid Learning

On the other hand, it is necessary to point out upfront that the term hybrid learning has been used to describe many different learning methods recently. There is little consensus on the definition of hybrid learning (Miller, 2020). Nonetheless, the most widely accepted definition is that "hybrid learning combines face-to-face and online teaching into one cohesive experience" (COD Learning Tech, 2015, p. 3). An instructor who uses a hybrid learning model will deliver a live instruction in the classroom and to remote students at the same time. The instructor may teach the students in the classroom and remote students simultaneously based on the needs of both groups of students. Figure 2 provides an overview of this idea. Although it sounds like a simple learning model, a lot of preparation is required to make sure that the hybrid approach works well, allowing its two formats to capitalise on each other's strengths. Similar to blended learning, asynchronous learning materials are available to all students any time they want to use them, and instructors normally post them on a virtual learning platform for ease of access to support the delivery of the lesson. Asynchronous learning is a term used to offer learners the flexibility to study at a self-paced rate. It uses resources that allows learners to learn and share information outside the constraints of time and place (Finol, 2020).

According to Miller (2020), hybrid learning is not completely a new concept. Many institutions have embraced the provision of hybrid courses in higher education due to the changing student demographics and tactics to make courses more accessible to students (Blier, 2008). The hybrid courses seem to be the best option for students living in different locations. They do not have to come to campus to attend the face-to-face sessions due to a full-time job or a busy schedule. They can attend the live sessions remotely and collaborate with other students who are in the classroom. As institutions aim to reach more diverse student populations, hybrid courses have continued to develop and stem the increasing cost of higher education (Woodworth & Applin, 2007). The idea of hybrid learning resurfaced all over again during the COVID-19 pandemic when almost all educational institutions were required to operate and maintain social distancing to ensure everyone's safety.

Fig. 2 Hybrid learning
Source: ViewSonic, 2021

Blended Learning vs. Hybrid Learning

It is important to see the difference between blended and hybrid learning in the context of this study. While both types of learning include an integration of in-person and online learning, the students differ in both situations. In the blended learning set-up, the same students learn both in person and online, and they are not differentiated. Blended learning does not permit students to attend classes virtually and they have to be in class to learn from the instructor. With hybrid learning, the in-person students and the online students are different individuals. Therefore, the hybrid approach is heterogeneous in which a subset learns in person and another subset learns online (Steele, 2020). It allows both groups to learn and share the lesson at the same time. There is a good rule of the thumb when it comes to differentiating between blended and hybrid learning. If online tools supplement in-person frameworks, they can be known as blended learning models. If they facilitate the replacement of face-to-face instructions, they are hybrid (Bonderud, 2021). Figure 3 illustrates the difference between blended and hybrid learning. Both fall somewhere in the middle of the learning spectrum between the completely face-to-face and the online instruction.

Blended and hybrid learning are seen as a shift from the complete traditional in-person instruction. It is not merely the uploading of teaching materials onto a platform that exists online and is referred to as the blended or hybrid learning. It necessitates the instructors to fully reconsider how the courses should be designed so that lessons are delivered effectively both in person and online. Both types of learning have been in existence over the last decade and they are not new to the education sector. However, they only gathered attention and in-depth research over the past few months due to the pandemic. Sometime two years ago, if someone had mentioned that both blended and hybrid learning need to be fully adopted, it would have appeared as impossible and a far-fetched idea (Jayakumar, 2021). Certainly, it has to be agreed that COVID-19 has accelerated and amplified these trends that were somewhat already in action, although the shifts have occurred at different speeds and in different ways. Therefore, an assumption that can be made at this juncture is, the current situation can be an opportunity for the digitalisation of teaching and learning in the education sector.

In a nutshell, now that technology has become an important component of the new learning experience, most modern classes are already blended to an extent. Poirier et al. (2019) stated that an attempt at integrating blended learning among primary and secondary schools has been going on for some time. Similarly, post-secondary academic institutions have also vigorously embraced this revolution in their lesson plans. Likewise, blended learning has been increasingly adopted in higher education as it benefits both traditional and online teaching (Poon, 2014; Singh & Kaurt, 2016). Researchers have also mentioned the “explosive growth of blended learning” that will become the new norm of learning in institutions of higher education (Porter et al., 2014, p. 185). This explains why blended learning has become the sweeping trend throughout the world over the past decade (Werth et al., 2013). While knowing that it is not a totally new concept, this pandemic has made its use popular. However, for effective implementation, it requires an openness and training in the use of the technological tools that can supplement the in-person lesson delivery. Some educational institutions have shortened their face-to-face contact lessons and to make up for the missed class time, online activities are provided. The institutions seem to deliver the same curriculum but in a different way, amidst this pandemic, by using the blended approach.

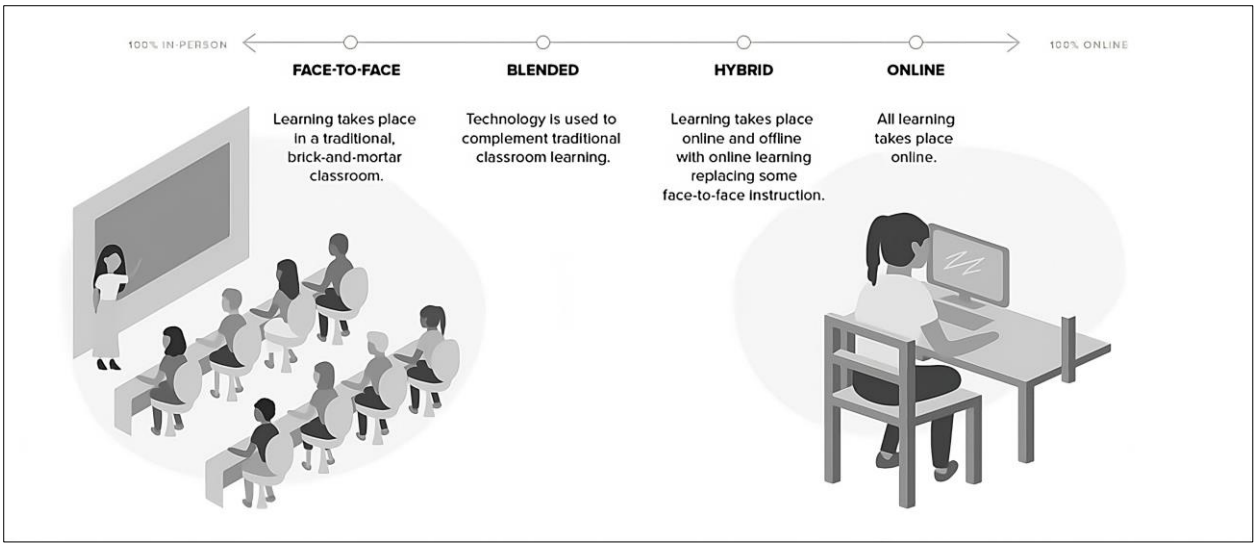

Fig. 3 The learning spectrum
Source: Reed, 2020

Compared to blended learning, hybrid learning had to overcome greater struggle in its implementation. The shift to hybrid is more difficult except for those who had already prepared online modules. Before reopening during the pandemic, all schools and institutions of higher education are required to satisfy the parameter set by each country's Ministry of Education. Social distancing is enforced in the classroom and each classroom is not allowed to have more than one-third or half of its normal capacity (Choon et al., 2020; Guthrie et al., 2020). Institutions are allowed to operate at half capacity with adequate desk spacing for example a session comprising of 25 students can be held in a room meant for 50 students. Thus, institutions have been placed in situations to look for alternatives since adequate classroom space and resources could not be provided to accommodate the large number of face-to-face classes. Since teaching and learning should continue until the COVID-19 situation improves, the best practice that has been identified to meet these requirements is to shift to hybrid learning. Aside from its increasing popularity, hybrid learning faces a lot of challenges and hiccups along the way. Having the know-how to set up the hybrid learning approach is the key to success.

The Hybrid Learning Models

Now that the difference between blended and hybrid learning has been discussed, it is time to talk more about how hybrid learning actually works at the school and higher education levels. There are three distinct models of hybrid learning that have been adopted by many institutions amidst these uncertainties. The first model is known as the Hybrid Rotational Learning Model. This is a more traditional way of doing hybrid learning (Miller, 2020). With this model, the class is divided into two permanent groups and students are rotated on and off campus throughout the week. Students attend the class sessions in the physical classroom with instructors on a particular day while their peers work online synchronously on the same day. The next day, the attendance flips and those working online go to campus while the others work synchronously from the homes (refer Table 1).

Students are more likely to get bored and distracted if they are not engaged with real-time feedback (Hazelrigg, 2019; Licorish et al., 2018). Hence, the groups are rotated and given an

opportunity to meet the instructors face-to-face. However, it is optional to have a Flex Learning Day (FLD) within the schedule (refer Table 1). FLD is referred to a day when instead of attending a physical class, instructors and students from both groups communicate online. Learning expectations are set and the students continue their learning remotely. Most of the time students attend the classes either face-to-face or remotely four days per week with Wednesday or Friday being a flex day. On the FLD, instructors give online activities, interactive digital assignments, group projects or other instructional strategies and make themselves available during the class or office hours to provide learning support to students. Usually, students will be given the opportunity to work asynchronously at their own pace on a flex day.

Table 1
Rotation Schedule

	Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday**
Group A	In person	Online	Flex Learning Day (FLD) (All students)	In person	Online
Group B	Online	In person		Online	In person

The next model is known as the Differentiated Hybrid Model. The idea for this model originated from differentiated instructions and hybrid learning. According to Tomlinson (1999), differentiation is the process of tailoring instructions to meet the needs of individual students and instructors can differentiate the instructions based on content, process, products or the learning environment. Basically, the pandemic has split the students into two groups with distinctive needs. The first group consists of students who prefer the face-to-face classes. In most countries, many parents are skeptical of the quality of online learning offered by high schools and colleges and some parents have decided not to send their children if the teaching and learning is conducted online (Jaschik, 2020; Lederman, 2020). Some of the reasons include poor content, unprepared instructors and students' experiences are not a component of the lesson. They also agree that their children may not stay attentive during online classes. At the same time, there can be no one to look after the children while parents go out to work with no or limited access to formal or informal childcare assistance during the pandemic. Considering each of these concerns, face-to-face class sessions are the preferred choice.

In contrast, there is another group which prefers online classes. Since schools cannot be expected to take full responsibility for each child during the physical classes, parents do not want to put their families at risk of contracting COVID-19 and they are willing to opt for online classes for their children (Saraswathy, 2020). Besides that, the pandemic has also affected the cross-border mobility of international students and they are unable to attend in-person lessons (Tsiligkiris, 2020). It is essential that these students should continue and complete their education, and this reality has been made possible by online learning (Bilecen, 2020). Moreover, based on a recent QS survey, 61% of international students have shown interest in studying online due to the risk related to the spread of coronavirus (Craig, 2021). For this reason, many parents and students are flexible in their thinking to consider online learning.

This is how the model has developed, with distinctive needs of two different groups that want to attend face-to-face classes or learn remotely. This model does not provide the students

with the opportunity to rotate or change the option later. For example, once students select the face-to-face option, they commit to this selection for the entire length specified and have to do their work entirely with the option selected. Although both groups engage synchronously on the same lesson, this model enables the instructors to differentiate class activities or assessments. For instance, both in-person and online students can be assigned different group projects to work on. Other than that, the mode of examinations can also be different as the students could sit for their exams in ways that are in line with the options selected. This option permits collaboration and coordination among students, schools and faculty members, but prohibits the change of option of in-person or remote class once the classes commence. This type of model suits the level of education that goes by semesters or terms. Overall, this model provides freedom to the instructors to select approaches suitable to the two different groups.

The third model is known as the Hybrid-Flexible (HyFlex) Course Model. "HyFlex is a course design model that presents the components of hybrid learning (which combines face-to-face with online learning) in a flexible course structure" (Educause, 2010, p. 1). If adopted, the students will have full control over their decisions to attend the sessions in-person, online, or both. This model offers them the chance to make decisions based on convenience, learning progress, social interaction preferences or other aspects important to them at that time. (Beatty, 2019). Students have the opportunity to move seamlessly from one modality of learning to another weekly, or by topic according to their individual needs and preferences. A HyFlex course is suitable for higher education students who come with varying levels of expertise or possess a great deal of background knowledge in a given subject. HyFlex also empowers students to be in charge of their own learning. This model is helpful for institutions to continue educational and research activities during disruptions. Although online classes can be either synchronous or asynchronous, this is not a self-paced model (Educause, 2010). Despite the differences in both the modalities, all students take the same final assessment.

Nevertheless, there is no one-size-fits-all model because what works in one institution or course may not work so well with another. There are numerous ways in which institutions can develop and implement hybrid learning, depending on factors such as their goals, technology and classroom designs. There are on-going systematic and extensive researches into the quality of hybrid learning and institutions devise and adopt the best models based on their specific requirements and conditions. Considering the evolving nature of the pandemic, there are no perfect solutions to this dilemma.

Benefits and Challenges

By weighing the benefits and challenges of hybrid learning models, institutions and educators can select the best approach that suits their requirements and needs. One of the best things about hybrid learning is that it permits educators to implement instructional methods that are suitable for both in-person and online learning. This permits the hybrid learning proponents to design courses and activities that suit students with different abilities (Raes et al., 2020). Not everyone learns the same way as every student has different learning preferences. Moreover, it is truly difficult to meet the requirements or needs of various types of learners in a traditional class setup. For example, students with special educational needs and disabilities (SEND) are not much active in classroom academic activities as they cannot adapt to the rigid and fast-paced lessons. However, the online mode enables the learners to

have greater control over the information they receive and provides them with the opportunity for deeper learning by being able to pause, rewind, fast-forward, and replay the lessons multiple times. It encourages personalised learning and the learners can learn at their own pace. On-demand video recordings, web conferencing, interactive whiteboards and breakout rooms are some of the tools and practices that would provide them with the freedom to alleviate their learning experiences. Likewise, hands-on learners might struggle in online classes where everything takes place remotely. The hybrid mode, however, permits the hands-on learners to take advantage of the benefits of face-to-face instructions. This is one of the reasons why hybrid classes can often be more helpful to diverse groups of learners.

Next, hybrid learning provides a high level of flexibility that is becoming gradually crucial to the education sector (Carlton, 2021; Raes et al., 2020). At times, students might favour the chance to switch from face-to-face to online learning and if this flexibility is not provided, students will choose to study at a different academic institution. The COVID-19 pandemic had made the need for flexibility within education much more relevant and obvious when all academic institutions had to close at short notice or reduce the class size. However, flexibility is very important even when the pandemic is out of the equation completely. Students usually demand freedom to learn in an environment that promotes individual learning. In some instances, students might feel tired to be present in a class and would prefer to join a remotely delivered lesson. For adult students who are juggling family responsibilities and work schedules that are irregular, the online facet offers the chance to make it work. Simultaneously, the hybrid mode can also provide those who prefer to learn from home with the possibility to take part in some of the social aspects of learning.

Increased access to learning is also a key feature of hybrid learning. Institutions can attract students from a broader geographic area. The remote learning option within the hybrid mode means academic institutions are no longer restricted to recruiting local students but have the potential to offer courses to international students, without having to relocate. More importantly, both in-person and remote students can work together collaboratively to build great learning experiences.

Apart from the above-mentioned benefits, hybrid classes also face many challenges. At the core of hybrid learning is the technology that supports it. Digital inequalities can be a major issue of hybrid courses. Not all the instructors and students have access to all the digital supports. Absence of proper digital devices, tools and internet connections could result in students becoming demotivated and lose learning opportunities. For some students, taking a hybrid course might require them to purchase a new computer. Depending on the programme, some students may also need to upgrade or buy software programmes (Carlton, 2021). Therefore, ensuring digital equity is crucial to the conduct of hybrid courses. Academic institutions must ensure that all students and instructors have access to the required resources and all other technology-related matters. Instructors need to be extra mindful of the learning constraints their students experience in a hybrid class. They must be prepared and willing to step in to reduce the unequal access to the new information communication technologies. While there are a number of technology components that must be considered when adopting the hybrid learning model, Reed (2020, p. 1) has highlighted a few key questions that every institution must answer:

- Can the network accommodate an influx of off-campus traffic?
- Is there an effective way for students to collaborate online?
- How will faculty manage assignment submissions and grading?
- What videoconferencing options are available?
- What integrations are available to create a streamlined experience?
- Is security in place to protect student information and course materials?

Once the right combination of technology is determined, the next challenge is to train and educate the instructors and students on how to use it. Many instructors and students are unfamiliar with hybrid teaching and learning and grapple with how to function effectively using the new technology. Training on how to get started and the specific uses of devices, platforms and tools need to be provided to make the instructors feel comfortable in the use of technology. It is important to understand that the hybrid classroom combines in-classroom and virtual learning. In this setup, some of the students follow the lessons in the classroom while the others follow the lessons from home. Therefore, instructors need to be well trained so that they are able to provide hybrid instructions effectively (Dorn et al., 2020). When instructors comprehend and have confidence in the use of technology, they will be able to deliver the lessons well. During the first class, instructors should also provide students with instructions and guidance to ensure the successful adoption of the technology (Raes et al., 2020).

Subsequently, every academic institution needs to understand that hybrid learning is not simply about uploading in-person lesson plans onto a platform that exist online and is referred to as hybrid. It necessitates instructors to fully reexamine how courses are designed and the modules moving online may need to be restructured to be useful. Lab-intensive courses cannot be taught fully remotely and will need greater supervision. Instructors have to prepare learning materials and activities for both in-person and remote class sessions. This explains why a hybrid class is simply going to take up more time than the traditional class (Duffort, 2020). Breunlin (2020) reported that schools that have opted for the hybrid mode of learning, amid the pandemic, have left the teachers to cope with the extra workload. When teachers are required to spread their attention over different sets of students, their workload multiplies. This means that the managements of educational institutions must provide adequate time and support to instructors to shift to the hybrid mode without overburdening them with huge tasks.

The Future of Learning after COVID-19

The pandemic has caused educational disruption across the world, as nationwide lockdowns have forced higher learning institutions and schools to temporarily shut their doors. UNESCO (n.d.) reported that the closures have affected about 70% of the entire student population worldwide. Online learning has emerged as the safest and the most viable option for education to continue during the COVID-19 pandemic and it is here to stay for good. This does not however replace the importance and the necessity of physical learning space that higher learning institutions and schools have to offer. It is in this physical context that learners develop their social skills and personalities, and therefore, the collocation of peers and their educators would remain important although no longer necessary. The recent pandemic became a catalyst when schools and higher learning institutions were forced to lockdown and migrate their teaching and learning activities onto online platforms. The online learning

industry has witnessed a massive annual global growth prior to the pandemic and is expected to exceed $370 billion at the compound annual growth rate (CAGR) of 9.1% from 2018 to 2026 (Syngene Research, 2019). The adoption of online education, largely in the form of blended learning by eight highly prestigious universities in the U.S., (Harvard University, Yale University, Princeton University, Columbia University, Brown University, Dartmouth College, University of Pennsylvania & Cornell University) also known as the Ivy leagues, could further gather momentum (TheBestSchools.org, 2019).

Figure 4 below shows the percentage of higher learning institutions around the world, involved in online delivery and virtual lectures, during the pandemic period. This is being adopted by every continent, with Europe being the highest (60 percent), for enabling every course to be delivered online.

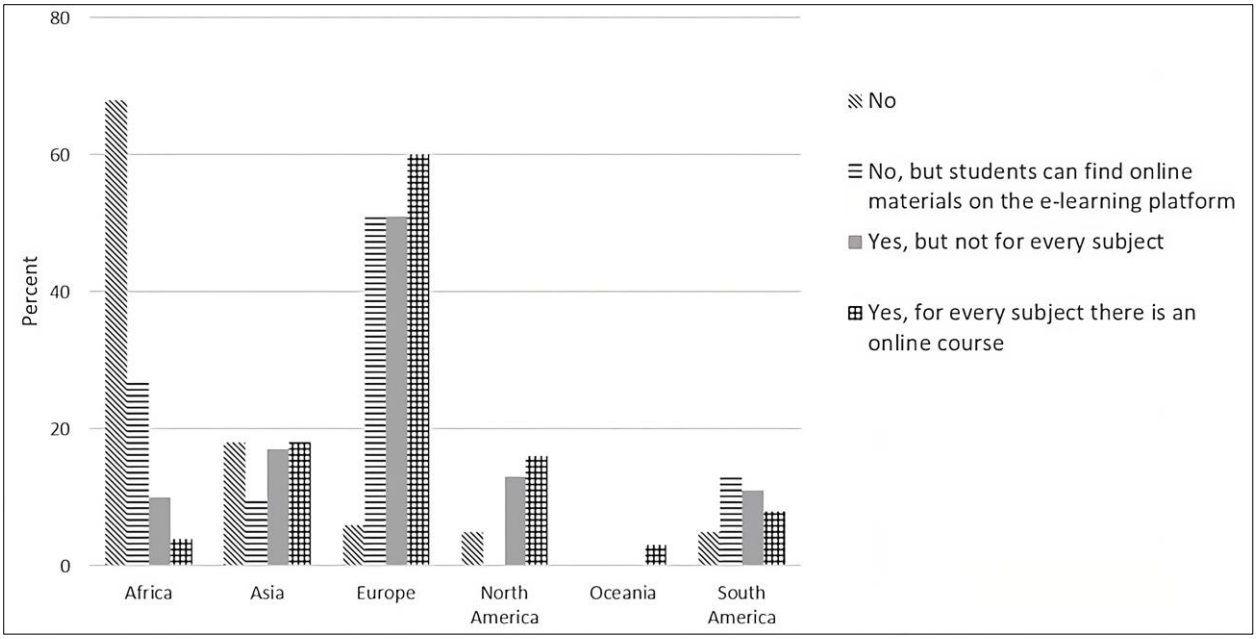

Fig. 4 Institutions offering online delivery and virtual lectures
Source: Iseki Food Association, 2020

What would have taken years for universities to develop and offer was accelerated by the pandemic within months. Transitions were made in a hurry due to the compulsion, however, schools and universities made the necessary changes along the way to perfect the online learning. Prior to the pandemic, online courses were predominantly targeted at the adult learners and faculty members were not necessarily keen on engaging in these. However, in 2019, 46% of faculty members in the U.S. universities had taught an online course as compared to 39% in 2016 and developed 70% of the online course contents (Review42, 2021). The role of educators is expected to remain the same despite the changes in the delivery mode and curriculum, as learners of all ages and generations would still need strong instructional guidance for knowledge acquisition. Availability of information and prior knowledge of leaners are not good reasons to reduce instructional guidance by educators. Unguided education often leads to learners' misconceptions, insufficient information, and knowledge disarray, according to Kirschner et al. (2006).

Students enjoy many advantages when they engage in online learning, whether blended or hybrid. Digital learning technologies that are used in online learning have been reported to

be extremely useful in completing homework (Review42, 2021). Blended learning also offers student empowerment (Ferlazzo, 2020), higher motivation (Siegelman, 2019) and learning personalisation (Christensen et al., 2013). Educationdata (2021) reported that Fall 2020 and Spring 2021 witnessed a 7% increase in the enrolment of primarily online institutions, compared to the 5% in Spring 2020. Duffin (2019) reported that 52% of graduate students in the U.S. found that their online college-level education provided better learning experiences than their college-level classroom education. Learners should be empowered and learning should be truly learner-centred in the new era, as learners will get to decide what, where, when and how they would be obtaining knowledge and skills needed. Adoption of personalised learning through the use of Artificial Intelligence has aided online learning in the higher learning institutions by improving student retention, engagement, tracking of learning progress and outcomes, and these in turn have encouraged the development and use of more effective teaching techniques.

The rise of online learning has witnessed an increase in the diversity of learners by age groups, backgrounds and learning abilities. Institutions of higher learning have begun to experience increased enrolments and earnings, increased student technical capabilities, minimum use of educators, elimination of overcrowding in classrooms, reduction in infrastructure costs, students learning at their own pace and style, reduction in faculty bias and enhancement in student retentiveness (Popovich & Neel, 2005). These are the benefits resulting from the use of online programmes.

Interactions and discussions are far more interesting and learning is truly more meaningful as students hear ideas, experiences and suggestions of peers who are from entirely different backgrounds. Educators have incorporated the use of different teaching methods to cater for the different types of learners in their classes. While this could increase the workload of the educators, it would certainly enable a better understanding of the subject matter, which could lead to the generation of better ideas and decisions. Synchronous and asynchronous approaches enable the diverse learners to grasp the materials better. Learner diversities have generated new opportunities for universities and schools when the right approach is used. Diversity among learners would provide variety of experiences and appreciation of multiple perspectives (Cunningham et al., 1993), encourage testing ideas and solutions of alternative views and contexts (Savery & Duffy, 1995) and help generate multi-world views (Duffy & Cunningham, 1996).

This internationalisation of learners has helped to further develop global education. Higher learning institutions and schools have experienced escalation in the enrolment of international students and faculty members that offer online courses and programmes, whether blended or hybrid. Global education involves learner-centered and culturally enriched teaching and learning practices as it engages diverse learners and educators in the same learning space. Learners are exposed to peers and faculties of different nationalities who would bring in their experiences into classroom discussions and research shows that when students learn content through authentic tasks and real-world experiences, they are more likely to actively participate in the learning process and this will lead to higher attendance and achievement. Global education promotes self-learners' personalities, communities, and values, as well as relate it to the larger world. It enhances social awareness, such as empathy, better perceptions, appreciation of diversity, respect for others, and build

relationship skills among diverse individuals and groups through constructive communication and collaboration. Apart from that, it also improves knowledge of economy, culture, politics and environment that influences our lives in collective communities. Higher learning institutions and schools that offer global education equip learners with the competitive edge through the development of transversal skills such as interpersonal skills, intrapersonal skills, critical thinking ability, digital literacy and global citizenship apart from attitudes, and values that allow individuals to collaborate to effect change and take charge of their lives. This is a value-added service to the learners, in a world that is highly interconnected, and promote sustainable world, where power and resources are more equitably shared.

The pandemic has affected the learning ecosystem. An "ecosystem" is a network of interactions between organisms (living and non-living) and their environment. The living component includes learners, educators, employers, professionals, family members, peers, researchers, society and HR specialists while the non-living component comprises of curriculum or content, learning technologies, internet and connectivity, learning space, digital learning tools, learning resources and learning devices (EdTech, 2019). Educators and students need to develop new sets of skills and competencies to teach and learn the use of remote online learning method. Initially, learners may be disheartened, but the acquisition of these skills and competencies will see exponential growth in the years to come, not just in the education sector but also in workplaces as well. Therefore, the existing learning content would have to be modified to meet the current and future needs of industries. With the increasing use of digital learning technologies and devices, universities would have to collaborate with educational technology providers and other non-traditional educational players. Higher learning institutions and schools that make excellent use of technology such as interactive whiteboards and visualisers create stimulating and engaging learning environments in which young people thrive and achieve goals (Hannon et al., 2011).

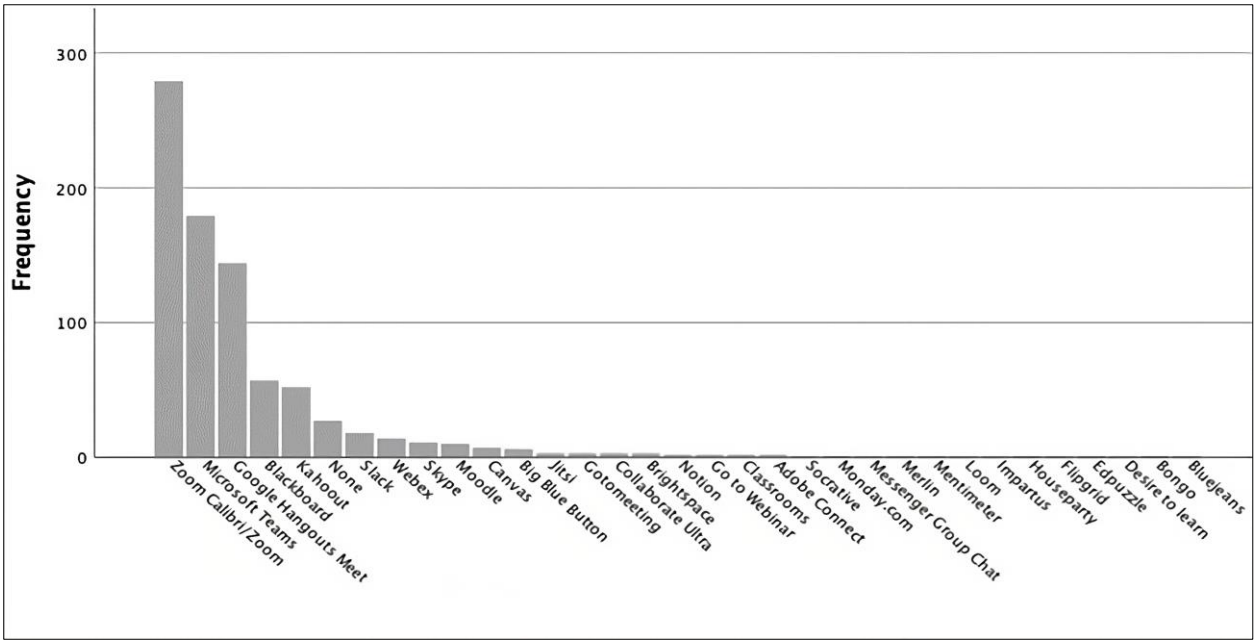

Fig. 5 Online web tools used in education
Source: Iseki Food Association, 2020

The educational landscape will see collaborations between (i) universities (ii) universities-industries (iii) university-policy makers and (iv) universities subject matter experts among

others. Collaborations between universities have already started and we are beginning to witness such arrangements made possible through the use of various platforms such as EdX, Coursera, Udemy, Udacity, Future Learn and Kadenze to name a few. The year 2018 saw a proliferation of MOOC and online courses around the world. Number of learners in 2018 for Coursera: 37 million, edX: 18 million, XuetangX: 14 million, Udacity: 10 million and FutureLearn: 9 million (IBLNews, 2018). Universities are incorporating new courses from other universities into their very own educational structures. A Master's programme offered in a university in Malaysia for example can be built using several courses from Australia, China, the U.S. or the U.K. universities. This would not only enrich the learners' experiences but also provide instant global recognition.

There is large scale collaboration between universities and industries in developing skills, technologies and learning devices. Industries need skilled manpower, market aligned courses, solutions to their personal needs, R&D, training for employees and product commercialization, while universities require funding and infrastructure, placements, technology transfer and equal partnerships. In emerging countries where education is predominantly provided by the government, this might become a prevalent and consequential trend in the education of the future. In China, the Ministry of Education and Ministry of Industry and Data Technology have assembled diverse constituents to develop a cloud-based replacement, online learning and broadcasting platform, while in Hong Kong, readtogether.hk forum is a consortium of more than 60 educational organisations, publishers, media, and show business professionals, collaborating to provide over 900 educational materials and services for free (Tam & El-Azar, 2020). This reciprocal relationship will continue in the future but on a larger scale. The current trend of industries partnering with STEM faculties in universities would experience expansion in Social Sciences as human and behavioural related aspects are becoming just as important.

Consolidation of small and lesser-known higher learning educational institutions would be unavoidable in the future landscape. These consolidations would leave only a few but strong market leaders in the industry. Higher learning institutions that were financially fragile prior to the pandemic are now worst off. The globalisation of education has accelerated the mobility of students, researchers, programmes and this has further enhanced competition among the institutions, in the educational landscape. This is a strong incentive for the institutions to forge strategic alliances with each other through mergers and acquisitions.

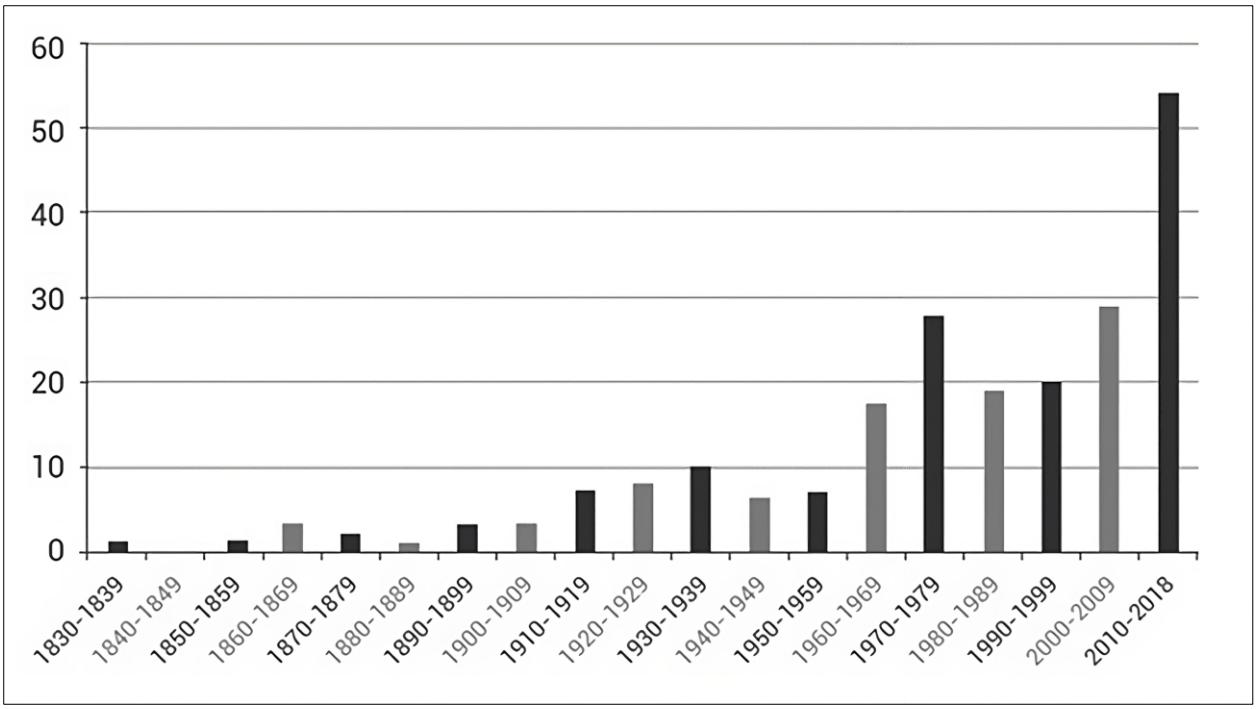

Fig. 6 Mergers of universities and colleges
Source: Inside Higher Ed, 2018

The Inside Higher Ed (2018) reported a sharp increase in mergers among higher learning institutions in the U.S., in the current decade. This trend is expected to continue to spiral upwards with the pandemic. With total lockdowns, travel bans, movement control together with the reduced purchasing power, the higher learning institutions can expect a reduced enrolment. The U.S. National Center for Education Statistics predicts a four percent decline in high school graduates from 2018 to 2027 which would contribute to lower enrolment in higher learning institutions. The rapid adoption of online learning, financial stress and the freedom to choose any university via educational platforms for free or for an affordable fee have made it hard for small higher learning institutions to recover. To add to this woe, the ranking of universities has made some universities highly preferred while others the least preferred. More than 90 nonprofit U.S. universities and colleges have shut their doors or announced their intentions to close between January 2016 and February 2020, and more than 230 institutions, almost 10% of the 2,300-plus researched over eight years, could close or merge, given the stress they face during the COVID-19 pandemic (Fierce Education, 2020).

Formation of regional education blocs would be a norm in the future educational landscape. Just like economic blocs, education blocs would benefit member countries in terms of technology, knowledge and skill transfer, easier exchange of students and faculty members, funding for regional development related research, reduced or special tuition fee for learners of member countries and the offer of greater employment opportunities. Regional education blocs would also ease the standardisation of learning content for quality assurance and accreditation while helping to retain culture and beliefs of the region. This is important as online education is seen as “educational imperialism” where transnational institutions expect students to conform to western models of education without incorporating the cultural traditions (Ziguras, 2001). Regions need locally rooted leaders with global perspectives and skills for sustainable development.

Recommendations

As the online education, blended or hybrid is going to be a part of the educational landscape, higher learning institutions would need to look into the following:

Improvement in the online education is a must. Learners must perceive that the online learning courses offered are equal in quality to the face-to-face lessons. There should be no difference in the credentials offered to students through any mode of learning. Higher learning institutions must undertake necessary steps to achieve this. Substantial investments in digital education technology and related devices should be a must, as without these, conducting online lessons would be a challenge. An online learning platform that supports recorded and live lectures, uploading of learning materials, assessments, conduct of online quizzes and exams would be the threshold that must be available to all higher learning institutions. This would be followed by improving educators' competencies through trainings as many educators have been thrown into the ocean of online education during the pandemic and are expected to master the requisite skills for survival. While many have grasped the technicality of keeping online lessons engaging and active, yet for some it remains a challenge.

Lessons and teaching strategies need to be revisited to avoid fatigue and boredom among learners. Haider and Al-Salman (2020) in the analysis of 775 Jordanian university students found that more than 80% suffered from sleep disorders; more than 90% indicated tiredness and exhaustion; 89% complained of boredom, nervousness, and tension; and 73% did not recommend the online learning model. To cope with the increasing demand, and to provide continuous support and reduce boredom, higher learning institutions will have to incorporate Artificial Intelligence (AI) and Augmented Reality (AR) tools into their programmes. AI could help to personalise interactions with students, and ease the stress and workload of faculty members, whose services are needed to continuously provide support to the diverse learners. Physical discomfort such as eye strain, neck pain and back pain due to hunching over smart-devices could be addressed through frequent breaks during lessons. Harvard Medical School (2020) reported that bending the neck when using digital screens and smartphones will progressively lead to a condition known as "iHunch" or stress on the cervical spine. Educators should incorporate palming exercises and getting up and stretching at various intervals during their lessons. Higher learning institutions should encourage the use of recorded lectures that would allow learners to view them in smaller bytes and engage in discussions through online sessions with peers and lecturers.

Higher learning institutions that are serious about remaining engaged in online learning must be ready to take a hard look at their business models and adjust outdated and dysfunctional practices, policies and strategies. Key partners in higher learning institutions include competitors, complementors, industrialists, society and policy makers. Support and feedback from these stakeholders must be incorporated in developing industry relevant courses and programmes. Adjunct professors and Industry advisers will play a large role in advising the development of new courses and programmes. These partnerships are important in ensuring that the courses are relevant, match industry requirements, employability and in line with the UNESCO's Sustainable Development Goal 4 (SDG, 4) which focuses on inclusive and equitable quality education and lifelong learning opportunities for all. SDG 4 is one of the 17 Sustainable Development Goals developed to alleviate poverty, safeguard the earth, and enhance people's lives. It strives to increase relevant skills, including technical and vocational skills for

employment, decent jobs and entrepreneurship. Small and medium-sized enterprises (SMEs), Multinational Corporations (MNCs), manufacturing and for-profit or nonprofit financial institutions, public or private organisations would also benefit from such partnerships as they would need their employees to be upskilled and reskilled in the constantly changing business environment.

Key activities of higher learning institutions would see an expansion in the micro-credential courses, professional courses and the traditional academic courses with the inclusion of massive online open courses (MOOCs). With online education, higher learning institutions will witness an increase in enrolment. This would enable working adults, retirees and categories of people who previously have been denied education for various reasons to obtain skills and qualifications. Value for learners would be the consequential result from the affordable course fees, reputation and employability as shown in Figure 7. Duffin (2020) in a 2019 survey of 1,500 online student respondents showed that the top reasons for choosing online programmes include the affordability of courses, the reputation of the school/programme, and how a programme offers the quickest path to acquiring a degree.

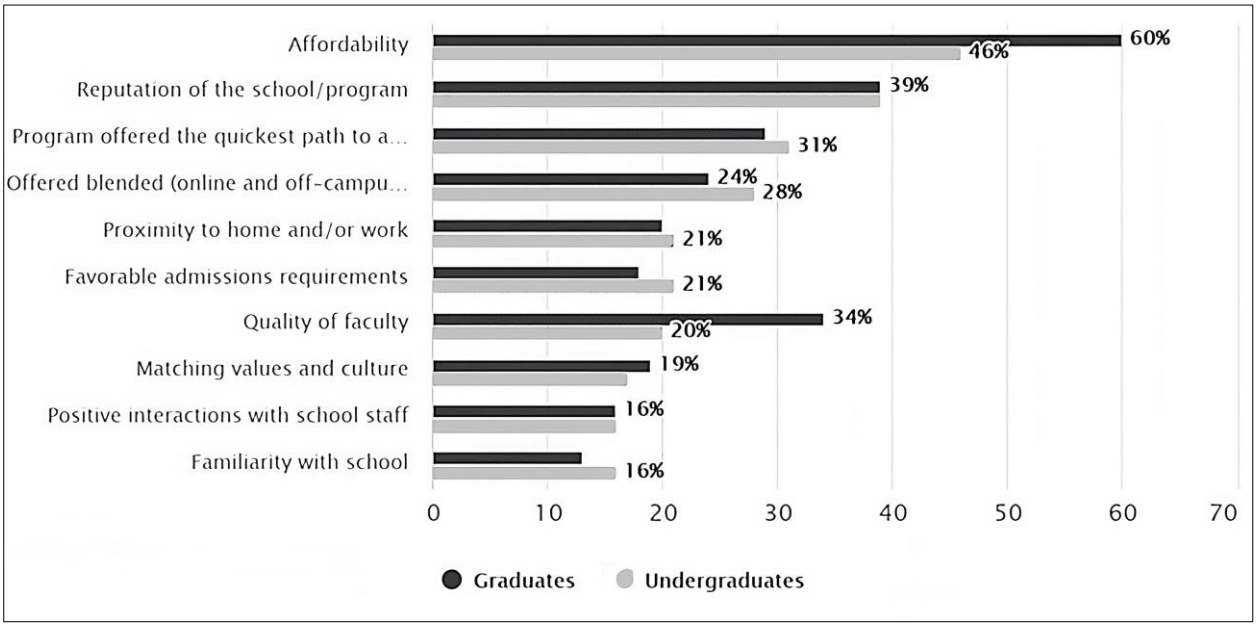

Fig. 7 Factors that determine university/college selection
Source: Statista, 2020

In the era of online education where learners are not attending lessons physically at campuses, courses and programmes must be made affordable to retain their attractiveness as learners now have plenty of options to choose from. Administrators must deliberate and seek an answer to the question “Why should I enrol for this programme at this higher learning institution?’. The uniqueness of the programme or the tradition of the university itself could be one of the answers. Uniqueness or differentiation would help higher learning institutions’ programmes and courses to stand out in a relatively homogeneous market. This uniqueness must be communicated to learners and public through branding. In the academic world, the brand and reputation of a university is extremely important (Aula & Tienari, 2011). This is evident in figure 7 where reputation comes second after the affordability of the programme,

as learners would always like to associate themselves and their qualifications, with a higher learning institution that is known for its tradition, culture and identity.

The next important element that higher learning institutions need to address is the issue of quality assurance. This would include both internal and external quality assurances. The course content and learning outcomes should be distinguishable between the conventional and the online mode. The content should not be watered down when lectures are conducted online. It is understandable that educators and leaners may not be able to sit through long hours of lectures in front of their devices as they would experience fatigue, and therefore the elements that are not covered in lectures must be compensated through recorded sessions, videos, tutorials and discussions. Compromise on the learning outcomes actually compromises the quality of the course and the programme that it belongs to. Therefore, the internal quality assurance team of the institution needs to ensure that all learning outcomes are covered appropriately through various methods and offer advice and guidelines to educators on achieving it. With the rising popularity of micro-credential programmes that allow learners to stack micro-awards from various higher learning institutions and eventually redeem a relevant academic qualification when the entry and graduate requirements are met, is creating the need for regional and global quality assurance process. Without this in place, universities that operate in different countries may not be able to evaluate and recognise programmes that are done by their learners elsewhere due to the different systems used. Many governments owned accreditation bodies have started working with similar agencies in their regions to make this possible. As such, higher learning institutions would need to standardise the content and the methods to enable truly regional or global qualifications to materialise. Palvia et al. (2018) states that globalisation of e-education is bound to happen and bodies such as United Nations, World Bank, and World Trade Organisation (WTO) would have to get involved to establish meaningful standards in curriculum, certification, student screening, faculty selection, and learning management systems.

Conclusion

The COVID-19 pandemic has undeniably caused disruptions in different businesses and industries around the world. To alleviate the current predicament, educational institutions have turned to online teaching and learning activities. There are many advantages to online learning as it provides learners with greater autonomy, altered the role of instructors, reduced the industry-academia gap, prompted higher education institutions to rethink their current practices and has succeeded in bringing education out of the ivory tower, thus making it accessible to diverse range of learners. Although blended learning and hybrid learning have been around for a while, they are currently gaining prominence as they provide the low-risk approach to addressing both the health and educational demands. For successful implementation, both the models necessitate significant investments in terms of selecting the appropriate teaching-learning platform, fine-tuning the content, and training the instructors. These are some of the factors that should be taken into consideration. Following its acceptance by prestigious colleges and universities in the United States, blended learning appears to be the model of choice for many higher learning institutions around the world, although its effectiveness is still being researched.

It can be concluded that online learning, regardless of the model, has established a significant presence in the educational arena and will continue to do so in the future. It is also important to note that online education is not the panacea for all problems although it offers many practical remedies. For instance, during the recent pandemic, it provided a great alternative to conventional learning and enabled learning to continue without having to wait for situation to return to normal (Kumarasamy et al., 2023). However, there are some issues that are not addressed completely by any mode of online learning, for example elitism in education. Although online learning provides greater flexibility to learners and allows many to return to universities and colleges for skill upgrading or simply engaging in lifelong learning, the fact remains that some groups are denied access to education due to lack or absence of digital technology, appropriate infrastructure or some other reasons. At this instance, the digital divide will remain and online education will not be all that inclusive as it is intended to be. Higher learning institutions and nations must embrace all the advantages and limitations of online learning methods and employ them judiciously.

Research Contribution

Contextually, this study offers valuable insights into the practical realities and emerging trends in higher education, particularly during and after the COVID-19 pandemic. It provides a timely exploration of the challenges faced by smaller institutions in a highly competitive global education market, including financial stress, declining enrollments, and the rise of mergers and acquisitions. The study also highlights the role of industry-academic collaborations in shaping curriculum development, as well as the need for quality assurance in the rapidly growing field of online education. Furthermore, it addresses the importance of regional educational blocs and micro-credentials, which enable greater access to education and foster cross-border collaboration. Finally, it underscores the persistent issue of the digital divide, showing that while online learning expands opportunities, it also raises concerns regarding equity and access, offering practical recommendations for addressing these challenges.

This study also contributes to the theoretical understanding of the evolving landscape of higher education by offering a comprehensive analysis of the shift toward online learning and hybrid models. It deepens the theoretical discourse on the interplay between education, technology, and industry, highlighting how universities are transforming into collaborative hubs that engage with external partners such as industries, policy makers, and subject matter experts. The study expands on the concept of educational ecosystems, where universities no longer function in isolation but are part of a larger, interconnected framework. Additionally, it emphasises the growing importance of digital education, blended learning, and MOOCs, which challenge traditional education paradigms and necessitate new theories on how learning is designed, delivered, and evaluated.

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