

Sustainable Development Goals and Sustainability Teaching through Distance Learning during the COVID-19 Crisis in Thailand

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Abstract

Today, education for sustainable development is considered a new direction in education and training for all, which may be realised through the use of applicable e-learning models. Education for sustainable development helps the formation of a flexible, healthy, and sustainable society by introducing new foundations, quality, value, and goals into the education and training system through a systematic and integrated approach. It is founded on ideals such as justice, equality, tolerance, self-sufficiency, and accountability, as well as the principles and strategies required to effectively respond to current and developing challenges. Education for sustainable development focuses on developing creative and critical thinking skills, as well as expanding options for action in uncertain situations and solving complicated challenges. Globally significant reforms in the educational system were compelled by the COVID-19 pandemic. Both instructors and students have been putting a lot of effort into developing their skills so they can participate correctly in the online teaching and learning strategy. Additionally, throughout a particular course, a strategy like an early warning system for students who have trouble adapting and lack self-discipline might be implemented more frequently. To sustain effective and timely instruction in the wake of the COVID-19 outbreak, the educational system needed to be reformatted. The difficulty of assigning practical work and keeping track of students, and the lack of adequate feedback have been some of the main difficulties in online instruction during the pandemic. This study advises using online instruction during the pandemic and mixed-mode instruction following it. For efficient and seamless e-education, it is also advised that faculty members be trained in online teaching, that e-platforms appropriate for exams be designed, and that stable Internet connections be maintained.

Keywords: COVID-19, distance learning, education, sustainable development goals, sustainability teaching, Thailand.

1. Introduction

As a well-known regional transportation hub that welcomes millions of tourists each year, Thailand enjoys the benefits afforded by its prime location in central Southeast Asia. Although Thailand was able to contain the number of COVID-19 cases brought in by tourists at the start of 2020, the pandemic struck the nation in a significant way in early March 2020 following a Muay Thai boxing match. Thailand's Prime Minister General Prayuth Chan-ocha revealed the country's intentions to tackle the viral outbreak on 24 March of that year; he announced an emergency decree that included curfews, drinking bans, and social distancing advice. The situation was swiftly declared a national emergency, forcing the closure of all forms of entertainment premises, restaurants, as well as schools and other educational institutions. Thailand, along

with most countries around the world, concluded that containment would be the main strategy needed to halt the virus's spread. Since the closure of schools during this time, there has been a substantial change in how students are taught, with online teaching replacing face-to-face instruction. This involved a sudden transition that did not allow much time for planning ahead or gathering materials or tools for the correct development of teaching (Mielgo-Conde et al., 2021). It was essential for both students and school officers at this time to be able to survive solely on available technology. The way that teachers and educational counsellors delivered lessons and interacted with students in the classrooms needed to change. Finding online resources to continue teaching in the best way possible became crucial, especially for educational counsellors who frequently found themselves unable to give the required follow-up to students who needed it. In response to educational problems that arose during the COVID-19 crisis and in support of public-private partnership, General Prayuth's government welcomed assistance from private organisations such as the Asia Foundation to help the country's online education sector get off the ground. In addition, the Office of Private Education Commission (OPEC) created an online learning portal for primary and secondary school students. Due to a shortage of fundamental tools for online learning, including lesson plans, activities, and materials, as well as computers and Internet access, several educational institutions had adopted unique strategies for online classrooms. However, these are developments that must be considered in the context of the United Nations' (UN) 2030 Agenda through its Sustainable Development Goals (SDGs). Introduced in 2015, the SDGs are a strategy for people, the environment, and economic growth. The 17 goals are all-encompassing and interconnected, balancing the three pillars of sustainable development: economic, social, and environmental (Lee et al., 2016). Universities have an unmatched opportunity to conduct research and provide education related to certain SDGs while still pursuing their role in fostering relationships with the society and external stakeholders. However, few universities are aware of this, and many are falling behind the goals as a result.

2. Literature Review

Platforms for online learning are expanding. The COVID-19 viral pandemic became a factor that has accelerated the need for the education sector to modify learning approaches. The use of technology among teachers and students could improve operational procedures and expand the adoption of digital learning.

Additionally, blended learning will likely be part of the 'new normal' as the post-COVID-19 way of life. In order to provide instruction in a number of media that can be adaptable and blended to meet learners' disciplines and subject matters, the blended learning process for sustainable distance learning is a teaching model that should be applied in the latter phases of the COVID-19 pandemic (Limna et al., 2022). Learning efficacy could be increased and problem-solving skills could be inculcated, for instance, by integrating online learning from home and school, or through lessons live-streamed by teachers. Flexible and adaptable learning management systems use technology, communication networks, and involve learning to adapt to shifting living circumstances. In optimising the advantages for learners and learning, students can study in the classroom, online, at separate locations, or the same location. In summary, these teaching-learning approaches are all major driving forces in Thai education to address the needs of lifelong learning and skills development for the 21st century.

2.1. Trending Online Learning Platforms

Online education has seen significant evolution in recent years. More people are choosing to pursue their education online since it is markedly more affordable, efficient, and time-effective than traditional forms of instruction. Online education is the only approach that is considered more convenient and effective in this context. The eight online approaches listed below can help students learn more effectively.

1. **Mobile Learning:** A mobile-first platform that prioritises design and usability with a focus on smartphones as the primary device is expected to become the standard in the e-learning community, giving learners better mobility and accessibility to study anywhere. This is in keeping with the lifestyles of the current generation, who can connect their telephones to virtually all of their daily activities.

2. **Micro-Learning (gradual learning through short content):** In order to accommodate the needs of time-constrained workers, a micro-learning platform built by the private sector can offer brief content for professional skills development. Each lesson takes up no longer than two to seven minutes based on the sectioning of the learning material. Learners can apply the information learnt more quickly and easily due to the content's clarity and ease of digestion. Various types of content, including podcasts, games, and films, could be offered.
3. **Social Learning (collaborative learning through social media):** Through features like forums, chats, file-sharing systems, and the creation of learning circles, a social learning platform could be utilised to promote formal and informal learning exchanges.
4. **Learning Experience Platform (LXP):** The classic learning management system (LMS) is increasingly being replaced by the newer LXP, which bases learning on the "learner" in the e-learning sector. The LXP serves as a middleman, supplying content so that students can design their own learning pathways and monitor their own progress. With features to help teachers plan classes, LXP also improves the users' educational experience, allowing them to select their own pace for learning and creating goals that are appropriate for their skill level, which will enable them to share what they learn with other students.
5. **Artificial Intelligence (AI):** Online learning systems are incorporating an increasing amount of AI. AI could serve as a learning management assistant, for example, by easing the load on teachers by managing lessons, content, and reviewing exercises, or by assisting in the matching of teachers with suitable students. As an illustration, China's *VIPKid* platform pairs students with American professors who speak the students' native language. *VIPKid* also employs AI chatbots (i.e., automatic response robots) to respond to the students' simple questions, or provide relevant information and academic publications.
6. **Gamification (game-driven learning):** Teachers can use games to capture student attention. If informational content is incorporated into a game, learning could become more entertaining, less stressful, and more efficient. For instance, two museums in South Korea began using the web-based game *Minecraft* to engage kids in learning when the museums were closed due to the COVID-19 pandemic.
7. **Immersive Learning (learning through virtual technology):** More platforms will use technology that could provide simulations and interactivity, such as virtual reality (VR), augmented reality (AR), and mixed reality (MR). Learning through first-hand experience in a virtual environment with the aid of VR will help students focus and engage with what is in front of them. Engaging a variety of senses helps students better enjoy studying and retain information. Immersive learning opens up new learning horizons, such as through 360°-view videos for medical training, and AR for learning for the blind. It can be used in virtual science experiments, to learn expensive skills like flying, or responding to emergencies like fires and storms.
8. **Video Learning:** The popularity of video learning is still prevalent today. By 2022, it is expected that 82% of Internet traffic will be generated by video content, with platforms like *YouTube* ranking as the second most popular social network worldwide. Videos are typically used in a more personalised and condensed manner to teach knowledge or impart skills. Aside from integrating interactive and VR technology to pique learners' interest, data visualisations could assist in further describing the subject at hand.

2.2. Roles of the Ministry of Education in the SDGs

Applicable globally, the SDGs were adopted by all UN member states in 2015. The 17 goals address a wide range of socioeconomic, environmental, and development-related concerns.

As part of its comprehensive mandate, the UN broadened the SDGs' focus on education to include postsecondary education in addition to basic and secondary education. Higher education is essential to achieving the aspirations of the Millennium Development Goals and Education for All, thus this was considered an important step (United Nations, 2020). As a way to widen access to lifelong learning opportunities for everyone, one of these goals, SDG4, calls for equal access to tertiary education, including in universities (United Nations, 2020).

Since 2019, the COVID-19 pandemic has wreaked havoc all over the world, including in Thailand. Among the direct and indirect impact of the pandemic includes public health, economy, society, and education (Panya et al., 2022). The closing of schools, the shift to online or distance learning, and other measures have clear effects on education. These have resulted in a significant shift in the 'new normal' requirements of educational management, forcing teachers to adjust their roles, and educational institutions to adopt new learning styles and methodologies to ensure that students could continue receiving high-quality education in line with the SDGs.

As the principal authority on education in Thailand, the Ministry of Education (MOE) has therefore introduced a new learning method known as "5 On," which consists of five teaching methods: On-Site, On-Air, Online, On-Demand, and On-Hand. These five teaching methods are teaching styles with five different methods that integrate the teaching management of all five styles in order to drive the education system as much as possible.

- **On-Site:** On-site education is comparable to classroom instruction. The numbers of students in each room are often adjusted to reduce class size and prevent crowding. Schools may take measures to increase the number of classrooms, or change the days during which students attend classes. Learning is easier to manage because neither the students nor the teachers have to make too many adjustments.
- **On -Air:** Satellite television, which has a set broadcast schedule, is an example of on-air learning. Thailand's distance education television station via satellite (DLTV) is the main broadcaster, making it possible for lessons to reach schools in remote places and improve access to educational opportunities.
- **Online:** An online teaching and learning paradigm enables teachers to instruct students using websites, online communication tools, or other online services that the educational institution has set up to facilitate learning for students. Today's teaching and learning management practices use this approach extensively, including in e-learning, massive open online courses (MOOCs), and through online learning and videoconferencing platforms like *Zoom*, *Microsoft Teams*, *Google Classroom*, and *Digital Education Excellence Platform (DEEP)*.
- **On-Demand:** On-demand learning can be accessed through websites or other educational applications. These resources may contain ready-made lessons or tools for teachers to create their own electronic lessons. These websites or programmes are then made available for use in the classroom by both teachers and students.
- **On-Hand:** During on-hand lessons, teachers generate worksheets that can be used as exercises or pre-made lessons that students can use to study on their own and complete their homework independently. It is possible for teachers to visit their students in order to help them complete worksheets, or they may ask the students' parents to serve as mentors and provide the necessary assistance.

2.3. Research Question and Objectives

The research question of this study is: What action is Thailand taking to address educational issues brought on by the COVID-19 pandemic, and how does the situation affect Thailand's goals in sustainable development and sustainable distance learning?

The objectives of this research study are:

- i. To investigate how the COVID-19 pandemic has affected educational reform in Thailand, and
- ii. To research educational adaptation utilising diverse platforms to enable distance learning owing to the COVID-19 pandemic.

3. Research Method

With a focus on educational issues due to COVID-19 in Thailand, this paper provides an outline of the SDGs and distance learning instruction for sustainable development. Present events are often evaluated in practice through a realist review, which aims to discover what works for whom, under what circumstances, and how (Pawson et al., 2005). Additionally, a realist review can yield crucial data regarding the relative

efficacy of intervention components, empowering practitioners, researchers, and service providers to design and implement interventions using only the most effective components in a given context. In this study, the realist review was conducted for the following five topics: (1) Thailand's COVID-19 Education, (2) "Thailand 4.0," a programme to transform the educational system, (3) Thai Higher Education's Ecology of Online Learning and Teaching, and (4) Sustainability and Distance Learning. In order to undertake a thorough analysis of the papers, we searched PubMed, ISI Web of Science, Embase, Scopus, and ProQuest without limiting our search to time restrictions. Along with the search using the World Health Organization's official report depositories, Thailand's relevant education statistics, and the SDGs' progress reports, a scoping analysis of the grey literature was also carried out. Following that, an inductive content analysis was used to uncover the elements influencing sustainability teaching of the SDGs and its relevant indicators.

4. Findings and Discussion

4.1. Thailand's COVID-19 Education

Federal officials have used "proactive school closures" in Thailand during the COVID-19 pandemic. As was the case in the majority of other countries, schools were closed before it was certain that infection was being transmitted on school grounds (Munasinghe et al., 2019; Brooks et al., 2020). The goal of this approach was to keep the community safe as a whole, not just children who attended schools. When schools were closed, there was a significant drop in contact related to education. According to research, influenza transmission decreased when schools were closed, especially among students of school age (Cauchemez et al., 2008). General Prayuth's government established the Remote Learning Foundation to help the Ministry of Education implement distance teaching and learning programmes via television broadcasts after realising the need to close the digital divide in Thailand. The broadcast strategy enabled students in rural Thailand and families from lower socioeconomic backgrounds to continue their education during lockdowns. However, students and their families must have a digital cable box in order to access the educational channels. As a result, there are still logistical challenges and resource shortages that hinder Thailand from ensuring that all students can continue to study. However, simply distributing gadgets and providing Internet access will not be sufficient to resolve the issue. It also does not qualify as a complete reaction to educational system reforms. In addition to logistical issues like distribution and operations, a shortage of tech-savvy teachers who can show youngsters how to use specific devices, particularly for learning, is another source of worry. The persistent problems Thailand has had with technology and education hint at a serious issue related to the nation's lack of high-quality programmes, training, curriculum development, and management. Thailand must take a holistic approach to address these issues by assessing the demands and challenges experienced by various groups in order to solve current and future obstacles. While students and their families are crucial in the COVID-19 education response, they are simply one part of the challenge. Empowered instructors are also necessary for a remote education solution to succeed. However, up to 60% of teachers have claimed to face problems using Wi-Fi and the Internet when using tools in the classroom, with the major problem being that these connections were not always available (Khamprem & Boonmoh, 2019). In the current circumstance, this adds to the pressure that educators face to become more tech-savvy in order to use smart devices for remote learning. Similarly, when teaching online, educators must also cope with significant challenges in managing remote classrooms and unmotivated students.

4.2. "Thailand 4.0" to Reform the Educational Landscape

As the country embarks on its 20-year "Thailand 4.0" national development strategy for an innovation-driven economy, Thailand faces a number of challenges related to shortfalls in human resources. The COVID-19 pandemic has served as a wake-up call for educational transformation in addition to exposing the drawbacks of Thai-style rote learning. To maintain its national purpose of empowering children for the country's future, Thailand must transform its educational system. Credentials for teachers, training programmes, curriculum design, teaching methods, and testing policies are all included in this transformation strategy. With the emergence of Industry 4.0, digital skills in particular are at the forefront of future employment. According to Thai officials, the public and non-governmental organisations must have more opportunities to contribute to the promotion of higher education standards across the nation. Making

a concerted effort to raise Thailand's educational standards requires cooperation between numerous actors, sectors, and stakeholders. Additionally, in this age of globalisation and technological advancement, citizens should be urged to take charge of their own destinies by collaborating with policymakers to push for real answers to pressing problems. Students now have a fantastic opportunity to take charge of their own educational content and delivery thanks to the situation surrounding COVID-19. The Thai government must also increase transparency as part of its strategy on good governance if the authorities want the people to hold them responsible for the country's policy execution and monitoring. Thailand will be better able to respond to the continuously changing global environment if it embraces a growth mentality and is more adaptable to existing and future problems.

4.3. Online Teaching and Learning Ecology in Thai Higher Education

The influence COVID-19 has had on Thai higher education is discussed, as well as government and university responses and policies in dealing with the crisis. Due to changes in learning settings and students' learning styles, most universities have been seeking to encourage online teaching in tandem with the technological disruption, but faculty members remain hesitant (Somabut & Tuamsuk, 2021). The COVID-19 pandemic has unavoidably changed the way faculty members manage their classes. Students were compelled to study from their dormitory, home, or apartment during COVID-19 lockdowns, as they were unable to study in traditional classrooms or on-campus. For many students, online learning was a novel experience. Most had never had any experience with online learning. Some of the challenges that learners faced include developing a sense of responsibility, regulating themselves, planning for their studies, performing self-assessment, and allocating time for studying. However, because the majority of students are digital natives, using technology and learning tools is rarely a problem. The impact of disruptive technology has resulted in a lot of changes in Thai universities' education and instructional operations. To speed up reforms, many institutions have turned to education transformation initiatives.

Since 2010, the Expertise Research Center in Communication and Development Knowledge Management (CCDKM, accessible at www.ccdkm.org) under Sukhothai Thammathirat Open University (STOU, accessible at www.stou.ac.th) has developed a *Smart MOOC* to provide educational opportunities to all Thai people as well as residents of other ASEAN member countries. STOU is the only unique public-owned open and distance learning (ODL) university in Thailand. STOU establishes strategic educational transformation by strengthening outcome-based curricula rather than the previous content-based curricula, and shifting the instruction system from teaching to learning. Distance-learning universities, in particular, are important players in education for sustainable development because of the flexibility of the distance learning process, the use of technology, and the inter-disciplinary approach to teaching and learning. A new type of graduate project has been created by the Ministry of Higher Education, Science, Research and Innovation (MHESRI) to address the need for workers in the industrial sector at the national level (Sinjumasak, 2020). This is also a key mechanism for the nation's economic propulsion, and has been put into practice through the evolution of pedagogical and curriculum approaches, as well as cooperation between institutions of higher learning and the business world, the public sector, civil society, or the local community in the interest of future university education. The aforementioned sectors worked together, for instance, on a prototype programme design that focuses on content, elements, and curricular structure reform. A component of the partnership is instructional management, which entails developing learning opportunities by working in a "real-world" environment. Constructivist philosophy continues to support the development and promotion of learning despite the paradigm change in curricular design and instruction. This theory contends that learning or knowledge is created by an individual from new information or data perception, which is then interpreted using the individual's previous schema or experiences as the foundation to create new meaning. Constructivists believe that even when individuals get the same information from various sources, their interpretations or constructions of new knowledge, as well as their experiences with prior knowledge, may differ. In the current era, classroom management has turned to the so-called virtual classroom, which has now been in use for some time. Now it must be put to practical use, in the form of a virtual classroom on the Internet. Various functions must be accessible from an online virtual classroom, just as they are in traditional classrooms (Schunk, 2012; Srivastava & Mishra, 2021). Assignments, grading, exchanging comments, presentations, creation of media, content, or information useful for learning, for example, must all be possible for both the teacher and students. The content and learning materials should align with the

current students' behaviours, needs, and learning contexts. The statements below are suggestions for preparing technology and instructional tools (Rahman, 2020; Varghese & Mandal, 2020; Walker, 2020).

1. The following modules should be included in any technology that promotes and facilitates learning: managing user accounts, assigning, grading, and commenting, presenting content and resources, discussion, and exchange of opinion (forum), announcements related to instruction, assessment tool, and collaboration tools.
2. Learners and teachers must be able to talk, share experiences, and collaborate without difficulty on learning management platforms.
3. Information source and content should provide both the primary source and content summarised by the teacher.
4. Information should be prepared and made accessible in a variety of formats depending on the type and feature of the information, such as video, text, audio, graphic, or animation, in order to cater to the interests and learning behaviours of a diverse group of students.
5. In addition to content and learning resources, the instructor may need to choose problem instances that are related to the lesson's content in order to assist students with limited expertise with the material.
6. If a video clip is required for instructing the material, each clip should be no longer than 20 minutes. If there is a lot of content, it should be broken down into several sub-topics.

In a traditional face-to-face learning environment, classes are scheduled and structured according to a predetermined schedule. As a result, this educational strategy is more organised. Classroom instruction also occurs in a group setting, which could further promote discussion, involvement, and interaction.

On the other hand, an online learning session tends to move along more quickly than a scheduled in-person session. Students have the choice to sign up for an online course or study module whenever they find it suitable or convenient. The fact that they can do so whenever they want and at their own pace is the finest part of online learning. Because there is no live instructor present in this setting, students learn on their own. Table 1 lists the salient features of both face-to-face and online education.

Table 1. Highlights of online learning versus face-to-face learning:

e-Learning	Face-to-Face Learning
<ul style="list-style-type: none"> • Saves on costs for development, travel, and time. • Suitable for learning specific, concise information. • Students can learn anywhere and anytime. • Reduces study time by 40% to 60%. • Suitable for people who are traveling, or distance learners. • Students can easily take a break, review the lesson, or take a quiz. 	<ul style="list-style-type: none"> • Suitable for learning complex content. • Suitable for subjects that require collaborative learning. • Students can ask questions, or learn through role-play. • Helps students to feel more encouraged. • Encourages students to learn from each other. • The curriculum can be modified by highly qualified teachers to fit the needs of their student groups.

In the creation of a national digital learning platform, one of the major turning points has involved the influence of the COVID-19 outbreak in the country. The 2019 plan reported that little progress had been made in the country's original education reform approach. However, because of COVID-19, the Thai government had to push for the use of online learning platforms during the 2020 school closings. In terms of online learning, schools had adopted readily existing platforms from the private sector, like *Google Classroom* and *Microsoft Teams*, and introduced *DEEP*, which aims to be another mechanism to push Thai education towards lifelong learning and the development of 21st-century skills. Table 2 shares examples of Thailand's online learning platforms from 2011 to the present.

Table 2. Samples of online learning platforms in Thailand

Year established	Platform name	Target group	General information
2011	<i>Zoom</i> (Qureshi, n.d.)	Working-age people, students	<i>Zoom</i> is a unified communications platform including chat tools, webinar videos, audio- and video-conferencing, and more. <i>Zoom</i> offers a wide selection of application connections, like <i>MailChimp</i> , <i>Zendesk</i> , <i>Marketo</i> , and even <i>Microsoft Teams</i> , to boost extensibility.
2013	<i>Thai MOOC</i> (Thailand Knowledge Park, 2021)	Working-age people General public	More than 140 subjects from the universities that took part in the <i>Thai MOOC</i> project are available on the government's open education platform under the Thai Cyber University project. These subjects are taught primarily using video-based media by the universities. Similar to what takes place in a traditional classroom, learning exercises focus on compiling lists of students who attend classes online.
2016	<i>Google Classroom</i> (Learn Corporation, 2020)	Students, university students and teachers	Google Thailand's platform offers a number of free tools, including <i>Google Assignments</i> , <i>Google Meet</i> , and <i>Google Classroom</i> . These tools employ integrated information technology systems to improve teaching and learning and create 'smart classrooms' that meet the needs of various educational levels, ranging from pre-kindergarten to postgraduate study.
	<i>Mahidol University Extension: Mux</i> (Mahidol University, 2016)	University students	The online learning platform at Mahidol University provides free courses as another educational strategy emphasising the development of graduates' capacity to satisfy future societal needs. Students can use a number of communication devices to learn anytime they wished. The Personal Message system allows for communication between students and teachers as well.
2017	<i>Chula MOOC</i> (Chulalongkorn University, 2017)	Working-age people, university students	The Chulalongkorn University-founded platform is an online subject marketplace with a focus on informal learning and lessons created by several university departments. Business management, computer science, languages, the arts and personal development, and health are the current five primary topics. Each lesson culminates in a certificate of completion given to the students. Some current programmes are in health insurance and fundamental business law.
	Microsoft Team (Qureshi, n.d.)	Working-age people, university students	A communication tool called <i>Microsoft Teams</i> is included with <i>Microsoft 365</i> . Even though <i>Teams</i> includes video-conferencing, it is far from the platform's only application; it also supports chat and voice calls and enables teams to share and edit files in real-time via a shared virtual workspace. <i>Teams</i> is a true collaborative platform because it is strongly connected with other <i>Microsoft</i> products like <i>Word</i> , <i>PowerPoint</i> , and <i>Excel</i> .
2018	<i>YourNextU by SEAC</i> (Thailand Knowledge Park, 2021)	Working-age people, university students	This is a platform for the centre for development and promotion of lifelong learning in the ASEAN region, which concentrates on building skills in line with the requirements of the modern labour market, levies an annual membership fee. With more than 1,500 courses accessible, students can study whenever and wherever they want. They can choose from four different teaching strategies: in-person instruction, online instruction, social learning, and

Year established	Platform name	Target group	General information
			remote learning. With online learning, self-directed learning is possible at any time and from any location.
2020	<i>DEEP</i> (Thailand Knowledge Park., 2021)	High school students, teachers	<i>DEEP</i> is an educational platform for excellence supervised by the Ministry of Education. Learners can choose topics to study according to the competencies they want to develop. <i>DEEP</i> 's initially focusede on improving English language skills and digital skills.
	<i>Cisco WebEx Meeting</i> (Matchon, 2020)	University students	<i>Cisco Webex</i> provides remote collaboration and the exchange of documents, programmes, or spreadsheets with participants or students by sharing the entire screen or only the relevant application. The host may record the meeting so that attendees can listen to it later.

4.4. Sustainability and Distance Learning

According to the UN's 2030 Agenda for Sustainable Development, every person should have access to lifelong learning opportunities. This new aim expands and deepens the reach of system-wide education systems, building on the preceding Millennium Development Goals. Although included as a significant component of the Dakar Framework for Action (Education for All) in 2000, higher education was not specifically listed as an objective. Instead, the Framework leaned in the direction of other goals, including developing children's skills or finding a competent teacher (Owens, 2017). The overarching achievement of SDG4, i.e., inclusive, equitable, and high-quality education for all, now depends heavily on higher education. It could be said that open learning is primarily concerned with disruptive technology and sustainability, two of the most important challenges of our day.

First and foremost, there is the issue of long-term viability. Because this covers such a broad range of concepts, we agree with the World Commission on Environment and Development, which in 1987 defined sustainability as meeting "the requirements of the present without jeopardizing future generations' ability to satisfy their own needs." In this view, sustainability entails the quality and availability of higher education in the global context of educational need, which includes problems related to globalisation. The importance of informed sustainability in a global environment is evident in the cut and thrust discourse at the UN Framework Convention on Climate Change's 21st Conference of the Parties debates held in Paris in December 2015.

Second, the very models that are trying to deliver this learning are being disrupted by disruptive technologies. On the one hand, disruptive technologies could give the global learning community more and more access to the knowledge of global scholarship but also, on the other, could themselves disrupt those models. MOOCs are a well-known illustration of the efforts towards democratising education that have gained popularity outside of higher education. The effectiveness of MOOCs in comparison to conventional educational systems, however, is still up for debate.

Distance learning universities appear to have the capacity to serve large numbers of students, but this is subject to drastic changes and disruptions that have emerged as a result of the use of digital technology. In addition, higher education institutions face a separate but equally significant set of possibilities and disruptions due to technological advancements, environmental change, and the effects of globalisation. Because of this, learning processes at distance learning universities during the COVID-19 pandemic have been of a different kind, which may show that distance learning has the potential to support various learning processes even in times of emergency. This suggests that traditional classroom instruction would do well to incorporate elements of online education (Daher et al., 2022).

It is necessary to create a widely adaptable model of remote education for sustainable development that relies on self-regulatory learning strategies and smart technologies. According to Zhang et al. (2020), learning success can be attributed to an optimised level-based structure of the learning content, strong learner involvement, the right format of content delivery, focus on practical competencies, a flexible approach to social interaction,

individualised guidance, user-friendliness of advanced technologies, and a progress-centred approach (Zhang et al., 2020). In their case, adopting the self-regulatory strategy appeared effective, since all students completed the course developed in this study. However, in order to embrace a systematised range of digital instruments and fit a specifically constructed, autonomous online platform, the paradigm of self-regulated e-learning must be expanded.

The main goal of the UN Decade of Education for Sustainable Development is to bring about changes in beliefs, attitudes, and lifestyles in order to secure a sustainable future and the growth of just societies (Contreras et al., 2015). This perspective has been helpful in igniting and fostering curricular improvements. As a result, higher education institutions across the world are becoming more interested in education for sustainable development. In this regard, inculcating sustainability through distance learning represents an important initiative to enhance the reach and standard of higher education as well as support education for sustainable development. It is unquestionably worthwhile to try, even though the learning outcomes are still unknown. The inclusion of social, economic, and environmental aspects in the curriculum is a crucial aspect of sustainable development. Employers prioritise experts with a strong foundation of knowledge and abilities in sustainability, such as engineers, managers, administrators, architects, economists, and other professionals, thus developing curricula without such basis would be problematic. The concept of competence has been crucial in defining the outcomes of this curriculum, but there remain topics that need to be included in order to meet the challenges posed by the UN's Decade of Education for Sustainable Development. Admittedly, this has not been adopted because doing so would inordinately extend the duration of any degree programme.

When it comes to long-term sustainability, learning techniques may differ, but the goal of competency development remains the same. For the creation of a virtual classroom or virtual university, instructional management methods that strive for sustainability should rely on technology. This is akin to what takes place in the virtual world, in which teachers and students can engage in learning activities, interact, and discuss while also providing facilities to support the activities and work. Technology is merely a facilitator; the core of learning is the design of virtual classroom learning activities that correlate to the curriculum's aims, students' learning styles, and context. Numerous studies have shown that highlighting sustainability initiatives, well-planned strategies, as well as creative process and ecological system redesign are important for sustainable development and transformations (Leal Filho et al., 2021; Suriyankietkaew & Nimsai, 2021; Wang & Huang, 2021). To effectively manage and address problems arising due to the COVID-19 pandemic, all stakeholders must work together in synergy and share the same goals. There are various steps that can be taken to mitigate the effects of COVID-19, even though educational institutions have been affected by the pandemic in different ways. According to the findings of one Australian study, attempts to promote sustainable development must take higher education into account (Gowan, 2021). The study implies that COVID-19 may likewise endanger the accomplishments of the SDGs because of their spheres of influence, and issues a cautious warning about the need to continue emphasising education for sustainable development in order to ensure that the advancements made thus far are not jeopardised. During the pandemic, students at a pharmacy school in Thailand reported satisfaction with the current online teaching technique, according to a study on students' perceptions and success towards the online teaching of courses in medicinal chemistry (Phattanawasin et al., 2021). However, the emotional limitations brought on by the new learning situation necessitated greater assistance and comprehension. Although successful teaching that supports student learning is primarily the duty of the teacher, students' accountability and capacity for online learning are equally important to the overall achievement of higher education in the face of academic disruptions brought about by COVID-19.

5. Conclusion

Universities in Thailand are seeking to respond to arising educational issues in order to survive the COVID-19 pandemic. Actions taken include moving instructional channels to the Internet in order to transfer bodies of information and facilitate communication with students. Learning and adaptations to learning methods are being sought to get through the crisis, even though the execution of the new methods may not be particularly good. Learning activities must also be designed to make use of the capabilities of modern tools and technology. Furthermore, individuals who are directly involved in teaching and learning, such as teachers and students, must accept virtual classroom conditions and any of their inadequacies. There are numerous advantages to virtual training, including the freedom to schedule one's own study, the ability to seek and quickly access

multiple sources of information, as well as speed and convenience of communication. As a result, in addition to having the ability to use digital technologies for teaching and learning, both teachers and students must adapt their mindsets towards online learning. Physically conducting practical tasks and exams in a classroom is possible within the right setting and space. Because the present online platforms cannot be properly used to assess students, creating new platforms that can be used for exams may be the answer. All academic staff members need to be trained on how to use online teaching platforms in order to use technology in an optimal way. The most critical factor in providing efficient and seamless e-learning is ensuring that both teachers and students have steady Internet connections. Otherwise, online teaching will not be able to provide any kind of quality education. However, according to the study the COVID-19 pandemic may undermine the process of meeting the SDGs because of their broad scope and significance.

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