Connecting Leaders Online for University Digital Transformation

CLOUD

Building Back Education Better
in the Post-COVID-19 Era

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CLOUD-Connecting Leaders Online for University Digital Transformation

CLOUD is the quarterly publication launched by the International Centre for Higher Education Innovation under the auspices of UNESCO (UNESCO-ICHEI) in 2021. The name *CLOUD* symbolises a global network for knowledge sharing driven by Information and Communications Technology (ICT). *CLOUD* aims to build an exchange platform that connects professionals in the realm of global higher education by sharing knowledge, project updates, data and best practices related to the digital transformation of global higher education.

CLOUD is available in six official languages of UNESCO (Chinese, English, French, Arabic, Russian and Spanish). We hereby thank Kingsoft Office for its support in providing quality multilingual translations of the publication!

CONTENT

Dear Respected Global Partners and Colleagues in Higher Education,

It is my great honour to present to you the flagship publication of the International Centre for Higher Education Innovation under the auspices of UNESCO (UNESCO-ICHEI), CLOUD. The name "CLOUD" symbolises the sharing of global information and knowledge, driven by Information and Communication Technology (ICT). The inaugural issue of CLOUD will be released worldwide on June 8, 2021, the fifth anniversary of UNESCO-ICHEI. The goal of CLOUD is to create an exchange platform for global education leaders and practitioners in higher education.

UNESCO-ICHEI, located in Shenzhen, China, is a Category II centre jointly established by UNESCO and Shenzhen Municipal People's Government in 2016. Over the past five years, UNESCO-ICHEI, relying on Shenzhen's ICT industrial advantages, has established a stable and active partnership network, strengthened exchanges and cooperation with higher education institutions (HEIs) in developing countries in Asia and Africa, and promoted the digital transformation of global higher education through several flagship projects such as the UNESCO-Shenzhen Funds-in-Trust Project (UNESCO-SFIT), the. International Institute of Online Education (IIOE), the Smart Classroom and the capacity building seminars. UNESCO-SFIT has also conducted capacity building in higher education for 12 countries in Asia-Pacific and Africa. The Asian sector has focused on innovation, driven by ICT and the capacity building of colleges and universities. The project has been implemented at the Royal University of Phnom Penh, Cambodia and the University of Colombo, Sri Lanka, and was completed in 2019. Meanwhile, the African sector has focused on the quality assurance of higher education. The project created and strengthened the quality assurance organization and mechanism for 10 countries (Egypt, Gambia, Senegal, Cote d'Ivoire Togo, Mali, Niger, Zambia, Malawi and Namibia), and is expected to be concluded at the end of 2021. UNESCO praised SFIT for its "unique and outstanding efforts in supporting UNESCO with its duties in higher education", and as a model for South-South Cooperation. Additionally, the IIOE, by means of capacity building for online teaching, resource sharing of software and hardware, customized policy suggestions and other measures, has supported developing countries in coping with the serious challenges posed by the COVID-19 pandemic. At present, IIOE has provided online training for over 12,000 higher education professionals from 135 countries in areas including ICT and online hybrid teaching. Relying on the technologies of big data, cloud computing, facial recognition and AI, the Smart Classrooms have established exemplary spaces for digital teaching for partner HEIs. At present, the Smart Classrooms have been successfully implemented in five different countries, and over 13 projects of this kind are under active implementation or preparation. In 2022, 30 Smart Classrooms are expected to be completed. The Smart Classrooms have ensured the production of online courses and continued teaching for HEIs during the pandemic and have compensated for the poor infrastructure and digital divide in higher education in Asian and African countries. Since 2016, ICHEI has held

eight workshops sponsored by the Ministry of Commerce of China, trained over 227 staff, and effectively improved the awareness and capacity of education professionals in various countries to implement online education and build innovate higher education.

At the beginning of 2020, the sudden outbreak of COVID-19 resulted in enormous impacts on over 190 countries worldwide, interrupting the education of nearly 1.6 billion students to varying degrees. To ensure normal teaching activities during the pandemic, colleges and universities worldwide had to take relevant measures to switch to online teaching. However, due to issues such as poor infrastructure and inadequate capacity of online teaching in developing countries, the digital transformation of higher education still faces many challenges. Against the backdrop of the Fourth Industrial Revolution, the rapid development of ICT satisfied the needs of the times, which has deeply affected global higher education in learning, teaching and school administration and has also brought new opportunities to higher education reform and innovation. In the foreseeable future, the "Internet + education" model will become an important means for developing countries to realise equitable and quality higher education. ICHEI will continue its efforts in the post-pandemic era to empower higher education professionals with ICT, actively explore new modes of co-development, help developing countries improve the quality of online teaching, and ensure the equity and sustainability of education.

Since its establishment, UNESCO-ICHEI has been dedicated to building multilateral cooperation mechanisms, improving the inclusivity and sustainability of higher education in developing countries, and popularising digital education among groups where it is most needed. Upon its fifth anniversary, UNESCO-ICHEI wishes to mark our partners' efforts in realizing the UN's Sustainable Development Goal 4 (SDG 4) and the goals of UNESCO's "Education 2030 Framework for Action" through CLOUD and establish a professional platform for communications between global higher education professionals, where they may share relevant knowledge, projects, research findings and best practices in the digital transformation of higher education across the world. On behalf of UNESCO-ICHEI, I would like to thank our global partners and higher education professionals for your strong support and active participation over the years. I believe that with the cooperation and joint efforts of UNESCO-ICHEI and our partners, CLOUD will certainly contribute experience and wisdom to the global digital transformation of higher education in the future.

LI Ming
Director of the International Centre for
Higher Education Innovation
under the auspices of UNESCO
Shenzhen, China

IIOE, WE ARE READY!

International Institute of Online Education (IIOE) - A Booster for the Digital Transformation of Global Higher Education

From Zero to One
International expert advisory meeting - concept creation

Since its inception, the UNESCO International Centre for Higher Education Innovation (UNESCO- ICHEI) has been working with partner higher education institutions (HEIs) through the "Digital Education Link" project to effectively promote the ICT competency building for teachers, Smart Classroom construction, and exchanges between teachers. In the process of implementing the project, ICHEI found that by utilizing the online course management platform to deliver the professional curriculum urgently needed by partner HEIs, it can effectively solve the problems of insufficient teachers, resource shortages and lagged capacity in higher education.

In 2018, when ICHEI held the International Advisory Committee (IAC) Meeting, Professor Zhao Jianhua, Senior Expert at ICHEI, delivered the report titled "Preliminary Design on Establishing an International Institute of Online Education" where he first put forward the concept of "International Institute of Online Education" (IIOE), clearly positioning IIOE as the organizer and provider of professional online courses as well as the operator of the remote professional course platform. At the same time, the IAC also planned for the future organization of IIOE, the construction of the curriculum system, the mode of operation and other implementation details.

The Third Session of the Governing Board Meeting of ICHEI – setting the goal

On October 27, 2018, Professor LI Ming, Director of UNESCO-ICHEI, reported the work plan for establishing IIOE to the governing board members. IIOE will collaborate with partner HEIs in Asia and Africa and utilize the Massive Open Online Courses (MOOCs) from HEIs in China to promote the massification of education in developing countries through online training and education.

Mobile Learning Week - future vision

In March 2019, when participating in UNESCO's mobile learning week, ICHEI communicated with Stefania Giannini, UNESCO Assistant Director-General for Education, Mr Peter Wells, Chief of the Section for Higher Education, UNESCO；on the design specifications of the IIOE platform and further expressed the vision of utilizing the IIOE to promote the development of higher education and improve the education quality in the countries of the partner universities.

Visiting Norway - seeking cooperation

In October 2019, when visiting the Ministry of Education and Research of Norway and the University of Oslo, ICHEI introduced the IIOE project to the Norwegian side, and the two parties held discussions on online education and ICT competency training with the hope for further cooperation in higher education governance, quality assurance and quality improvement.

Small Steps Make Big Changes

Establishment of several working groups - full preparation

Later, ICHEI fully engaged in the preparation of the IIOE project. The cooperation among several working groups, including platform technology, quality assurance and monitoring, curriculum design, administrative support, language service, and training, ensured that IIOE was launched and put into operation in a timely manner.

The platform technology group worked hard to build the IIOE platform based on Internet and cloud service technology, integrating high-quality teaching resources, and establishing an efficient mechanism for mutual construction and sharing.

- platform technology
- quality assurance and monitoring
- curriculum design
- administrative support
- language service
- training
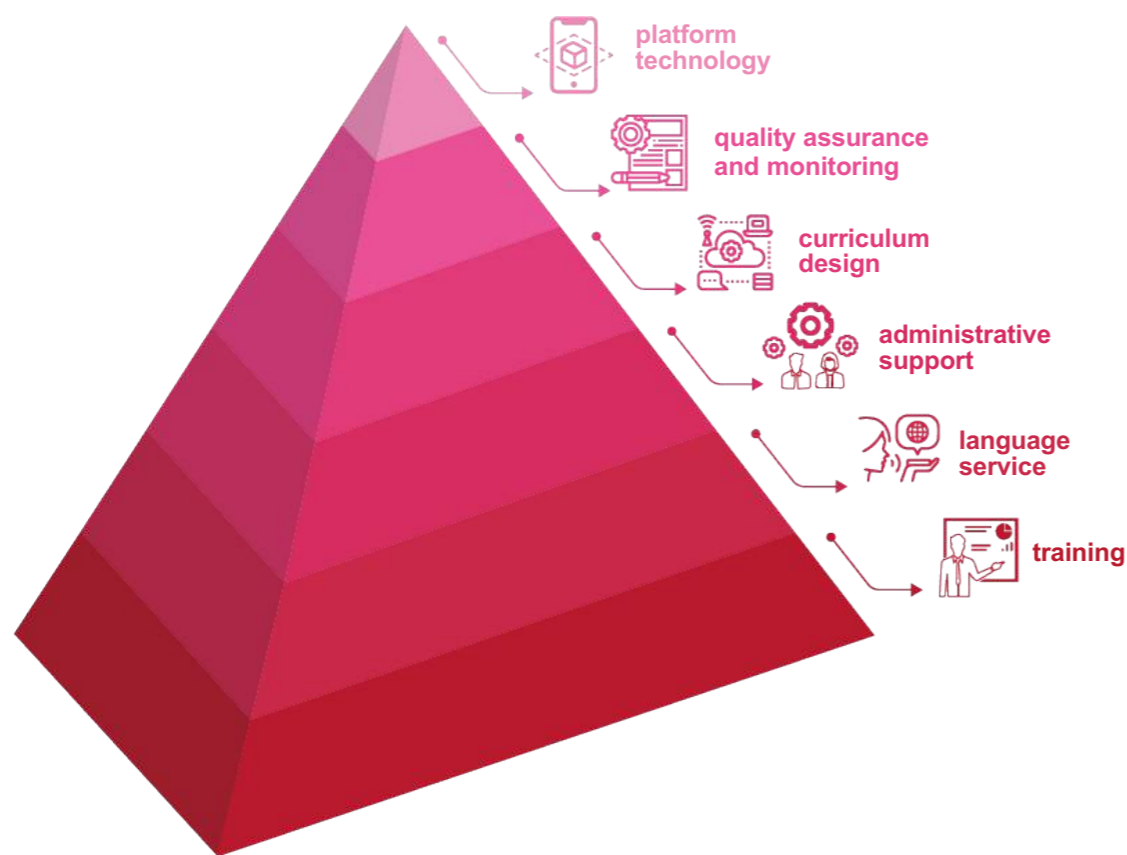
The Quality Assurance and Monitoring and Evaluation group plays a vital role in management, production, and service. At the management level, it is responsible for strategic planning and development; at the production level, it is responsible for curriculum development and implementation; and at the service level, it is responsible for employee and student support. The team also developed an online tool for quality assurance by understanding the needs of partner HEIs in Asian and African countries for a quality assurance system to facilitate their self-assessment.

Lim Cher Ping, Chief Expert at IIOE, positioned the IIOE to be "a cooperation platform for mutual success, where everyone can "benefit from each other, treat each other as equals, and learn from each other".

Bi Xiaohan, head of the Quality Assurance and Monitoring and Evaluation group, said that "The IIOE quality assurance system was proposed based on research on various quality assurance systems, with two main features focusing on online and blended learning and universities in developing countries."

Li Fan, coordinator of the platform development team, said that "The IIOE website currently includes four major functions: an online learning platform, a hands-on training platform for application tools, an information sharing function, and data collection & analysis function."

The Curriculum Resource Integration Group insisted on the curriculum design focusing on online courses related to ICT, emphasizing the results and evaluation of teachers' professional development training, and fully utilizing relevant support and service mechanisms based on the curriculum provided. This framework allows IIOE to constantly integrate the latest online courses, build an ecosystem for co-development, and fully promote the steady development of the IIOE by curriculum design, quality assurance training and course resources integration.
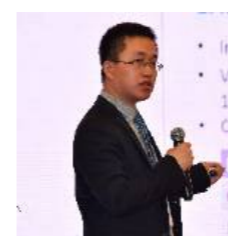
Tang Xiangzheng, coordinator of the backend support system, stressed that " the IIOE platform now also takes into account important aspects such as network acceleration, data security, and copyright protection through technical means."

The launch of IIOE relied on significant support from various departments. The Administrative Support Group, the Training Group, and the French Working Group, provided tremendous support and assistance on launching the courses, coordination with partner institutions, and platform operations and maintenance.

Holding International Consultative Meeting - jointly initiating IIOE

From December 7 to 8, 2019, the International Consultative Meeting on IIOE was held in Shenzhen. In the opening remark, Li Ming, Director of UNESCO-ICHEI summarized the functions of IIOE as "Aiming at universities in developing countries, focusing on improving the ICT application capability of university teachers, gathering a group of high-quality curriculum resources in the ICT field, improving the ICT application capability of teachers in partner institutions through online and offline training in various forms, applying it in cultivation of digital talents, and promoting blended learning that combines online learning and offline teaching". IIOE will respond to the Priority Africa and Priority Gender Equality advocated by UNESCO and contribute to the realization of Sustainable Development Goal 4.

Mr. Peter Wells, Chief of Section of Higher Education of UNESCO Headquarters, stated his belief that the IIOE valued education quality, improvement of teachers' capacities, and the progress of projects on education quality in different areas, and he quoted an ancient Chinese saying: ""accumulate sand grains to make a tower", as long as we stick together, we can achieve success", demonstrating his affirmation of the great importance of IIOE.

Tang Qian, Member of ICHEI's Board of Directors and former UNESCO Assistant Director-General for Education, suggested that "IIOE is a very advanced initiative presenting many innovative concepts and practices from curriculum development to using artificial intelligence and ICT to enhance teaching and learning."

Xu Jianling, Deputy Director of the Shenzhen Education Bureau, said "The Shenzhen Education Bureau supports ICHEI's active and effective support for the countries and regions in need and hopes to further the cultural exchange and mutual development between Shenzhen and Asia-Pacific, African and other countries and regions via the efforts of ICHEI."

In the IIOE co-launching ceremony, 11 partner universities from Asia and Africa, 4 Chinese HEIs and 8 representative enterprises signed the IIOE initiative as co-initiators, witnessed by UNESCO officials, education experts and scholars. Through two months of discussion and negotiation prior to the meeting, UNESCO-ICHEI also agree on the collaboration with every co-initiator of IIOE, and signed cooperation framework agreements, which were released during the meeting. During the meeting, the participants and organizations agreed on establishing the IIOE Management Centre at UNESCO-ICHEI, which is responsible for the coordination of stakeholders and tasks related to implementing IIOE.

After discussions among the participants, Ain Shams University of Egypt was elected as the first rotating presidency unit of IIOE, responsible for organizing the IIOE Annual Meeting in 2020 and building the platform for participating parties to share their annual results in online learning. Dr. Abdel-Fattah Saoud, the Vice President of Student Affairs at Ain Shams University stated that being the first rotating presidency unit carries significant responsibilities, and fulfilling these responsibilities is extremely important to constructing a healthy and sustainable collaboration with IIOE.

Name of Organizations	Country	Representatives at the Meeting
Addis Ababa University	Ethiopia	Academic Vice President of Addis Ababa University (AAU), Ethiopia
Ahmadu Bello University	Nigeria	Vice Chancellor of Ahmadu Bello University (ABU), Nigeria
Ain Shams University	Egypt	Vice President of Ain Shams University, Egypt Professor of Public Health at Faculty of Medicine, Ain Shams University, Egypt
Makerere University	Uganda	Vice Chancellor of Makerere University, Uganda
Mongolian University of Science and Technology	Mongolia	President of Mongolian University of Science and Technology (MUST)
Royal University of Phnom Penh	Cambodia	Deputy Director of the IT Centre of Royal University of Phnom Penh, Cambodia
University of Colombo	Sri Lanka	Vice Chancellor of University of Colombo, Sri Lanka
University of Djibouti	Djibouti	
University of Engineering and Technology Lahore	Pakistan	Director of Al-Khawarizmi Institute of Computer Science, University of Engineering and Technology, Lahore (UET Lahore), Pakistan
University of The Gambia	Gambia	Vice Chancellor of University of the Gambia
University of Nairobi	Kenya	Deputy Director of ODeL Campus of University of Nairobi, Kenya
Southern University of Science and Technology	China	Ms. SHEN Hong, Director of Center for Higher Education Research of SUSTech Mr. LIM Cher Ping, Visiting Professor of Center for Higher Education Research of SUSTech
Xidian University	China	Ms. XIAO Song,Executive Vice-Dean of Undergraduate College and Head of Department of Teaching Affairs, Xidian University
Shenzhen Polytechnic	China	Mr. Ma Xiaoming, Vice President of Shenzhen Polytechnic
Shenzhen Institute of Information Technology	China	Mr. Sun Yong, President of Shenzhen Institute of Information Technology
Huawei	China	Mr. Xue Feng, Chief IT Architect & Programme Director of Huawei Technologies
Weidong Cloud Education	China	Mr. SHEN Dai, Senior Vice Chairman, Weidong Cloud Education Group
CreateView Education Technology	China	Mr. Zhang Yu, CEO, CreateView Education Technology
iFLYTEK	China	Mr. Ying Jun, General Manager of IFLYTEK's Shenzhen subsidiary company
UBTech	China	Mr.Wu Peng, General Manager of Overseas Marketing of UBTECH
CIOTimes	China	Mr. Yao Le, President of CIOTimes
CODEMAO	China	Mr. Ma Xiaoming, Vice President of Shenzhen Polytechnic
Jiker	China	Mr. Yao Shanglang, Founder & CTO of Jiker

Connecting the World

Reform accelerated by the pandemic - timely response to the needs of global partners

In 2020, COVID-19 spread across the world, posing unprecedented challenges to education and teaching in schools of all types. According to UNESCO statistics, as of March 26, 138 countries have implemented campus lockdowns, affecting 1.37 billion students and nearly 2 million teachers. UNESCO called upon the utilization of high-tech, low-tech, and non-tech methods to help countries innovate and implement suitable solutions for remote learning. To alleviate the crisis incurred by the pandemic on education and the urgent needs of developing countries, ICHEI developed the mobile and web versions of IIOE within two months from February to April 2020.

138 countries suspended classes

Class suspension affected **1.37** billion students

Nearly **2** million teachers were affected

The development of the mobile and web version of **IIOE**

Cloud release - IIOE goes live

When ICHEI completed the relevant preparations, IIOE was officially released online on April 2, 2020, as a solution to help developing countries innovate in the implementation of distance education. At the release meeting, the Chinese, English, and French version of IIOE online learning platform, main text, monitoring and evaluation plan, training scheme, joining mechanism, etc. were launched simultaneously. Upon official release, IIOE will launch a series of trainings, including regular, advanced, and thematic trainings, at partner institutions in Asia and Africa.

• Qin Changwei, Secretary-General of UNESCO National Commission, suggested that we are ushering in a new round of industrial and technological revolution and are moving towards the era of Artificial Intelligence (AI). Empowering education by ICT and AI is the general trend.

• Zhai Hongxin, Secretary-General of Tencent Foundation, said that via the platform of IIOE, teachers can not only access ICT learning resources of better quality to improve their experiences, but also have more opportunities for cross-cultural exchange and mutual learning.

• Yao Shanglang, Founder of Jiker, said that humans are the masters of knowledge, skill, and ability, and he hoped that IIOE can make learning more effective and talent more valuable.

To help HEIs in Asia and Africa to fight the pandemic, IIOE specially planned a series of training on COVID-19. On the one hand, the trainings enable teachers to quickly understand and master the efficient ICT teaching tools to help realize the suspension of classes and non-stop learning; on the other hand, the effective initiatives and practical experience in preventing and controlling the epidemic are introduced through the provision of scientific lectures on public health and university epidemic prevention and control topics. HEIs all greatly appraised and supported the launch of IIOE.

Mahmoud El-Metini, President of Ain Shams University, Egypt, said that online education has become the only solution to provide quality education at all levels during the pandemic and "in the past, remote technology was merely a choice. But now, it has become a necessity".

As the first rotating president of IIOE, he looked forward to seeing IIOE play a vital role in improving the quality of higher education in partner HEIs of Egypt and countries in Africa and Asia-Pacific.

• Waqar MahmoodDirector of Al-Khawarizmi Institute of Computer Science, University of Engineering and Technology, Lahore (UET Lahore), Pakistan, suggested that though online education in Pakistan was still in its infancy, UET Lahore, as a partner HEI of IIOE, will support IIOE with its best efforts.

Online discussion between partners - preliminary results of IIOE begin to emerge

On 8th June 2020, the IIOE Global Partnership Webinar hosted by UNESCO-ICHEI was held in the International Conference Hall of Southern University of Science and Technology. During the case sharing session, representatives of partner HEIs in Asia and Africa elaborated on the implementation of IIOE in their universities and how IIOE forms an organic linkage with Smart Classrooms. After two months of operation, the IIOE platform has been visited by 5,721 users, covering more than 120 countries and regions around the world. Upon its launching, IIOE immediately organized a series of training events with the theme of university management and teaching in response to the COVID-19. In two months, it organized 10 online training events which were attended by over 2,100 teachers and university management staff from 233 HEIs and organizations in 46 countries. Cooperative enterprises providing IIOE with curricula and technical support all summarized the best solutions. Huawei Technologies Co., Ltd., Qingdao Weidong Cloud Education Group, and other companies all supported IIOE by providing course development and building training centers.

Key Timeline

In 2018

the concept of "International Institute of Online Education (IIOE)" was first proposed.

October 30, 2019

the International Advisory Committee verifies the establishment of IIOE

From February to April 2020

ICHEI developed the mobile and web versions of IIOE.

On June 8, 2020

the IIOE Global Partnership Webinar hosted by UNESCO-ICHEI was held.

On April 26, 2021

IIOE launched the advance training for Artificial Intelligence (AI).

In March 2019

when participating in UNESCO's Mobile Learning Week, ICHEI communicated with Stefania Giannini, Assistant Director-General for Education, on the design specifications of the IIOE platform.

December 7 and 8, 2019

the International Advisory Meeting of IIOE was held in Shenzhen, and IIOE was jointly initiated by global partner higher education institutions and enterprises.

On April 2, 2020

IIOE was officially launched on cloud.

In September 2020

IIOE for the first time launched the advanced class with the theme of Big Data.

Initiating advanced courses -
bright future for education

With big data technologies transforming higher education around the world, college teachers still face the challenges of developing data literacy and teaching students' new skills. In September 2020, IIOE for the first time launched an advanced class with the theme of Big Data. The training helped college teachers and faculty learn the basic concept of big data in education by three modules in three weeks and familiarized them with basic tools including Microsoft Excel and Hadoop. Upon completing the general training, trainees may continue with the intermediate and high-level training to apply data analysis into their teaching and research. As of now, English courses with the theme of Big Data have reached 107 countries, benefiting 2,446 trainees; the related French courses have reached 44 countries, benefiting 562 trainees.

Subsequently, in the field of AI, IIOE further enhanced the effectiveness of the training through seminars followed by advanced courses to improve the AI literacy of the audience and provide more possibilities for future educational applications. On April 2, 2021, IIOE launched its first special Webinar Series of "Let's Talk AI in Education" to share knowledge, exchange ideas across disciplines, and critically discuss AI ethical concerns, in order to further explore the world of AI, and its implications in Higher Education. On April 23, 2021, IIOE launched the second special AI Webinar with leading scholars and experts discussing the theme "Higher Education with AI: Global Perspectives & Local Challenges", guiding us to explore innovative aspects and future educational possibilities through the lens of AI. On April 26, 2021, IIOE launched the advanced training on AI where scholars from Peking University and Tokyo University designed the courses and corresponding exercises of three modules including AI concept, basic theory, and AI ethics to help trainees gain a systematic and preliminary understanding of AI and build a relatively comprehensive understanding of AI applications. As of now, English courses with the theme of AI have reached 74 countries, benefiting 1,933 trainees; the related French courses have reached 47 countries, benefiting 383 trainees.
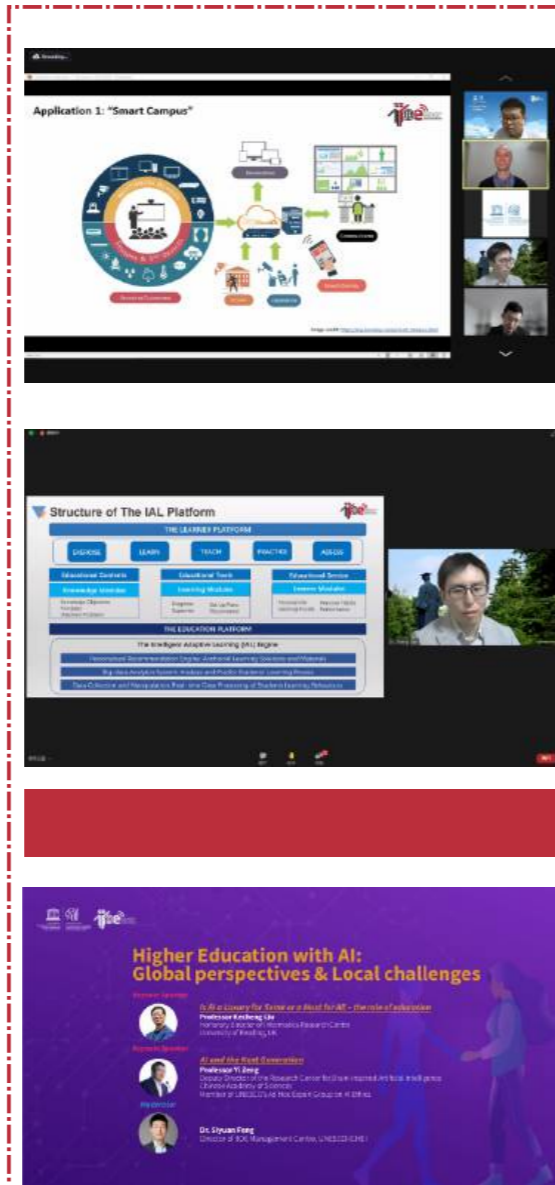
Build Back Education Better in the Post-COVID-19 Era

After nearly a year of practice and exploration, IIOE and all its partners jointly issued the Recommendations on Accelerating the Digital Transformation of Global Higher Education during the COVID-19 Pandemic in December 2020. UNESCO-ICHEI invite professionals in higher education, policymakers, enterprise partners and other stakeholders around the world to take the following actions to strengthen the online and blended teaching capacity of higher education and broaden opportunities for developing countries to access quality higher education.

I. Online Education for Equitable and Quality Higher Education

Clarify the mission and vision of HEIs for the development of online teaching and learning levels, strengthen HEI-industry collaboration to inform and drive curriculum reform, and support HEIs in fulfilling their roles of driving digital economic growth and cultivating digital talents for their countries.

II. Capacity Building of Higher Education Professionals for HEI Digital Transformation

Strengthen teachers' online education competency through a systematic teacher professional development pathway and quality resources. Encourage teachers to develop high-quality and localized online curricula and courses for knowledge production and shared benefits.

III. Multi-Stakeholder Partnerships for Philanthropic Resource-Sharing

Establish multi-stakeholder partnerships among governments, enterprises and HEIs to bring hardware and software and open educational resources to universities. Focus on supporting countries, HEIs, and populations with the greatest needs and allocate resources in accordance with the Priority Africa and Priority Gender Equality stated by UNESCO.

IV. Evidence-Based Policies for Online Education Quality Assurance

Develop a national strategic plan for the cultivation of digital talents based on the needs of future economic development and industry standards set by employers, to serve as a guide for ICT-related curriculum design and skill-based certifications and develop a national quality assurance system.

In the post-COVID era, online and remote teaching will become an important way for developing countries to achieve equity and quality in higher education. IIOE will work closely with global partners and enterprises to summarize advanced experiences of global HEIs in keeping the continuity of education during the pandemic, and formulate more detailed mechanisms for cooperation and framework for action, so as to continue strengthening the online teaching capacity of higher education teachers in Asia and Africa, jointly develop and share software and hardware resources, help developing countries cope with the regular online and blended teaching in the post-COVID era and accelerate the digital transformation of global higher education.

A Promising Future

What are the most important values of IIOE? What are your expectations for IIOE?

Li Ming Director

The rapid development of ICT not only drives the digital transformation of the society as a whole, but also puts forward new requirements for talent cultivation, professional standards, teaching and management models in various countries. IIOE focuses on the urgent needs of developing countries in Asia and Africa in undertaking online and blended teaching of higher education in the context of the pandemic. IIOE takes root by empowering the ICT capability of teachers and by integrating multilingual curricula, establishing QA mechanism, encouraging strategies such as multilateral cooperation for public welfare, and providing HEIs in developing countries with an open, convenient, and customized solution for education in a rapid manner. We hope that IIOE can, based on the efforts of last year, deepen the co-development model with partners, contribute more high-quality, multilingual open educational resources to the world, and establish IIOE as a global network and alliance shared by universities in developing countries.

Han Wei Executive Deputy Director

IIOE reflects China's awakening to its responsibility as a major developing country. Through the platform of IIOE, China can share its development path and experiences since the Reform and Opening-Up with developing countries, and encourage IT enterprises to actively join this initiative and jointly follow the Education 2030 Agenda advocated by UNESCO. More importantly, the co-development upheld by IIOE is not a mere output, but a calling for interaction with global partners through this system as well as the realization of quality higher education on a large scale across the globe by strengthening online education. With great support from UNESCO, partner HEIs and organizations, IIOE will gather more resources and energy for co-development in the future, realize our primary expectations for it and become a platform to support the educational development of developing countries.

Wang Guobin Deputy Director

From platform building to curriculum resource integration and from financial guarantee to personnel support, the rapid development and success of IIOE are closely linked to the support of global enterprise partners. IIOE is not only the result of South-South Cooperation, but also a model of public-private partnership. The successful practice of IIOE has provided new ideas for pursuing UN's SDG4. How to mobilize the resources and technology of enterprises to serve global educators via publicly benefiting and sustainable multilateral cooperation has been the unchanging aspiration of IIOE since its establishment. IIOE will continue to deepen and expand its cooperation with more enterprise partners to create an innovative model for industry-university cooperation and make quality education resources accessible to the public.

Li fan Assistant Director and Chief of the Asia-Pacific Programme Office

Higher education assumes an important role in knowledge creation and value creation for a country. The opportunities and challenges brought by modern technology have also brought about changes in labor market demand, thus constituting a new requirement for higher education talent output and teacher training - IIOE emerged as the times require. As an innovative product of UNESCO, IIOE took advantage of the development trend of digital information and intelligent era to help with the digital transformation of HEIs and their teachers in developing countries of Asia and Africa; its unique ecosystem of co-development can encourage universities in different regions and countries to share their fine teaching and practical results to the greatest extent and build the sustainable teaching and learning community of IIOE. The value of IIOE lies in the formation of an extremely practical professional development standard and path for improvement of ICT capacities for college teachers.

Bi Xiaohan Assistant Director and Chief of the Western Asia and Africa Programme Office

The establishment and development of IIOE are the integration and upgrade of UNESCO-ICHEI over the years in actively exploring and practicing the ways to realize reform and innovation of higher education with ICT in developing countries. Since its establishment, UNESCO-ICHEI has been exploring the ways to improve information literacy and ICT application ability of leaders and teachers in higher education settings in Asian and African countries. UNESCO-ICHEI also improves the digital infrastructure and environment of HEIs and undertake research in higher education empowered by new technology, accumulating rich experiences and establishing a wide and firm network of cooperative HEIs. In the future, UNESCO-ICHEI will provide more customized and quality projects for teacher capacity building for HEIs in Asian, African, and Arab countries, and continue to build and enrich the online teaching resources of IIOE based on the mode of co-development, improve the quality assurance system supporting HEIs in undertaking online and blended education and help realize UN's SDG4.

Feng Siyuan Chief of the IIOE Management Center

IIOE is the first non-profit e-learning platform for teachers, connecting the support for the development of information literacy of teachers from all over the world. In the future, IIOE will definitely take root in each and every HEI in developing countries. When teachers improve their information literacy and acquire digital teaching capacity via IIOE, they will become the builder and participant for the development of IIOE for the next generation and benefit more learning groups and local communities.

Jiang Qingyu Chief of the Administrative Affairs Office

IIOE not only provides quality courses for online and blended learning, but also tracks the conditions of learners via quizzes and online Q&A, which is the key to higher completion rate of IIOE training courses. Since the outbreak of COVID-19, IIOE has demonstrated vigorous vitality. In the future, IIOE will focus on multilingual production and co-development, serving more learners from developing countries more effectively.

Tang Xiangzheng Chief of the IT and Enterprise Partnership Office

IIOE provides a platform for partner HEIs to transform from traditional teaching to online teaching. We try to introduce education cooperation for public welfare to call on more organizations and institutions to open their education resources and achieve education equality. Through the joining of enterprises, we can explore the closed loop of talents. We hope that IIOE can promote digital transformation in partner HEIs based on the conditions of their local countries and provide support for the employment of local talents.

Zeng Bingran Chief of the Knowledge Production and Communications Centre

IIOE not only provides college teachers in developing countries with urgently needed education resources and customized pathway for capacity improvement during the pandemic, but also counts as a bold practice for cross-border innovation in global higher education. By jointly developing curricula, strengthening quality assurance, exploring best practices and proposing policy suggestions with partner HEIs and enterprises, IIOE will certainly build a teacher-centered digital transformation support ecosystem for higher education in the Global South.

Ain Shams University
Challenges and Opportunities
in the COVID-19 Era

Staff Members at Ain Shams University

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Mona Abdel-Aal

Executive Director of Education Strategy Administration, Professor of Public Health, Ain Shams University

A in Shams University (ASU) is an Egyptian university that was founded in 1950, as one of the oldest and most prestigious universities in Africa and the Middle East. A Mega university with more than 200 thousand students, 14 thousand academic staff and more than 900 academic programs.

ASU has its place among the top 3% of world's universities by being presented in all reputable international rankings fulfilling the various scopes and methodologies. According to CWTS Leiden ranking, ASU is the 576th internationally, 8th in Africa and second in Egypt. This confirms the international outlook and reputation of ASU. Also, ASU is the first and only governmental university in Egypt to get rated with an overall 4 stars with 5 stars in teaching, employability, social responsibilities, facilities and inclusiveness according to the prestigious QS stars rating system which reflects the strength of the university in different aspects.

Aligned with the United Nations SDGs and Egypt Vision 2030, ASU built its strategy based on the desire to continue excellence and leadership by paying attention to quality education with diverse academic programs that comply with the requirements of the labor market, creating a learning environment that stimulates creativity and innovation, internationalization and strengthening the collaboration with our strategic partners. In addition, ASU is keen to be linked to major industrial institutions and civil society organizations by launching new centers of excellence and innovation, which adopt ideas and research projects that lead to achieving the SDGs with ASU eyes open always to the dynamic needs of the surrounding community.

With the appearance of COVID-19, we all faced the fact that digital transformation of all university processes and services became a mandate that needs a series of deep & coordinated work force as well as culture and technology changes. Facing COVID-19, ASU had to develop digital capabilities required to drive the digital strategy. Students had to be motivated, trained and well equipped to have their courses & programs in the reconfigured online and blended way of learning. All academic staff had to adopt all tools of virtual teaching and remote working. The administrative staff also had to develop online services to avoid crowding & to fit with the pending lockdown.

We invested in hybrid learning as we believe that it is here to last. Some may think that hybrid or blended learning just emerges as a crisis management strategy in response to the current COVID-19 pandemic, however, these are innovative learning approaches that emerge in the late 20th and early 21st century, where educators starts to talk about a paradigm shift from the traditional instructor-centered learning to student-centered learning. However, this shift from face-to-face to the online learning was not that easy, and we faced some challenges, such as infrastructure & internet connections problems, security of the systems, the increased need for IT experts, skilled cyber security employees and efficient support team, the need for intensive capacity building of faculty and students, the cultural resistance to change which could be faced at many levels, and the time and resources for hybrid course design and development.

ASU Education and Students' Affairs Sector adopted strategies to transform these challenges to opportunities by giving much effort that ends up with improving our educational technological infrastructure, developing, deploying and maintaining an advanced eLearning environment (LMS), raising ASU staff eLearning competency to select and use a range of eLearning facilities, techniques and tools, and last but not least, building our students' capacity to allow them to operate effectively within an online learning environment and providing them with 24/7 technical support.

Ain Shams University (ASU)
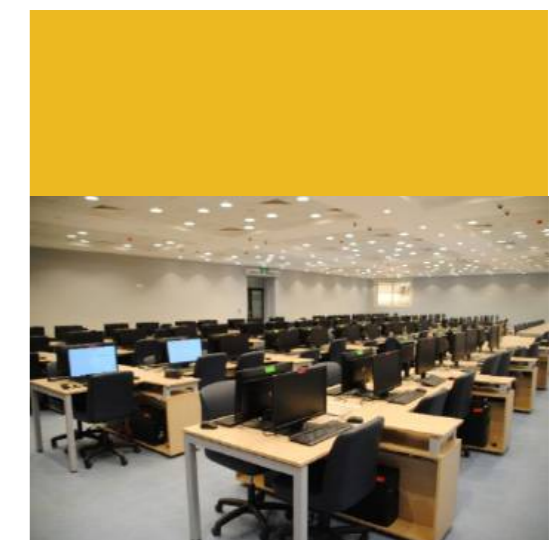
Educational Technological Infrastructure at ASU

The allocated resources & infrastructure to support eLearning at ASU during COVID-19 pandemic include a new Data Center, four eLearning Studios, the Weidong Smart Classroom, and multiple Computer and simulation Labs.

Shooting for Online Courses of ASU

Smart Classroom at ASU

In collaboration with UNESCO-ICHEI, SUSTech and Weidong Cloud Education Group for Cloud-based Education, we started deploying our Smart Classroom in Jan 2020 with training sessions for faculty and technical staff. Smart Classroom utilization started with the "Teaching for Students with Disabilities" Workshop in February 2020 and the "World Design Studio Video" Conference Sessions in March 2020. During the COVID-19 crisis, "Smart Classroom Utilization" Workshop was implemented, and recording of lectures for students started from March 18th and continued. The outcome was 54 video lectures for 18 instructors in 18 different courses that obtained more than 17,000 students' views.

During COVID-19 pandemic, a total switch to online distance education was necessary with fully functioning LMS operated by the eLearning Central Unit, one of the Units of the Education Strategy Administration of ASU, ensuring 24/7 technical support for both faculty and students. Instruction was partly through Interactive Live sessions and partly through recorded video lectures with open communication channels with students. Our Online Learning Statistics during COVID-19 pandemic revealed that more than 6,000 online courses from different academic programs were developed including more than 26,000 video lectures and about 6,000 interactive online sessions with 74% of students regularly interacting with their instructors.

ASU developed a new eLearning portal "ASU2Learn"; a well-developed eLearning system that provides variable educational tools in response to the growing demands of hybrid learning through the effective implementation of modern technologies in eLearning

The "ASU2Learn" Online Learning System by ASU

and distance education. It includes a Moodle-based Learning Management System; a technology toolkit that enable more effective teaching and learning by delivering, tracking & managing education with advanced content authoring and management, recorded lessons, interactive activities, assignments, plagiarism checker, chat, forums and discussion groups, professional technical support system, in addition to an advanced reporting system and dashboards. It also includes innovative teaching and learning tools: virtual classroom, e-portfolio integration for competency-based education systems, virtual microscopy, virtual laboratories and virtual patient platforms.

For teachers, it helps them to create, update & manage interactive e-content, easily integrate online and offline learning experience, use online collaboration tools to create virtual classrooms, track students' performance and get their feedback allowing curriculum modifications and delivering individualized feedback, and manage administrative tasks as track attendance, student grading, distributing materials etc. For students, it allows them to access their course lessons anytime and anywhere, learn collaboratively by creating online study groups, interact with their peers and teachers, and submit their homework, track their grades & provide course feedback.

ASU Virtual Microscopy Platform, integrated within "ASU2Learn", included 1072 scanned microscopic slides, in addition to 4500 slides that are shared with a number of eminent universities in Europe and United States.

E-Assessment was included as one of the modalities for assessing students. Our new smart assessment system does provide blended learning instructors with opportunities to implement a variety of learning assessments using new and innovative tools. It includes creating standardized Item Bank based on

ASU Virtual Microscopy Platform

Example of Online Learning Interface

program ILOs to develop a balanced exam, delivering it to examinees through multiple platforms (PCs, smartphones or printed papers), and using easier & more advanced software for electronic exams correction producing meaningful exam analysis.

ASU Computerized Item Bank allows easy storage and retrieval of hundreds or even thousands of items, facilitates and enhances the construction of both paper-and-pencil and computerized tests. Items can be sorted and filtered to enable easy review by content experts and psychometric staff.

In addition, ASU e-Portfolio System, which is also integrated with "ASU2Learn" includes collection of student work within an educational competency framework that showcase student's learning progression, achievement, and evidence of what students can do. It also supports principles of self and continuous learning.

Faculty capacity building was and still a crucial element for the success of blended, hybrid and online learning. As Bill Gates said, "Technology is just a tool. In terms of getting students working together and motivating them, the teacher is the most important." Education Strategy Administration started putting strategies and standards for applying blended, hybrid and online learning, developing and deploying training programs for staff and students' capacity building, monitoring the workflow and testing the efficiency of hybrid learning approach.

As a co-initiator and the first elected presidency unit of IIOE, ASU was committed to play a major role in enhancing the quality of higher education in Egypt as well as in all co-initiator universities, and help faculties build their capacity to master their online education process and effectively use eLearning tools. We started Launching our IIOE-ASU Facebook page in April 2020 and had more than 750 followers from most Egyptian Universities. Through this Facebook page, we announced for the COVID-Response Training Series as the first IIOE-ASU activity during April/May 2020, the Big Data in Higher Education program during Sept/Oct 2020, and recently, the IIOE Multi-Level Training Series "AI General Level" during April/May 2021. We had more than 450 Egyptian participants from 17 educational institutions, 66% of them were females.

Moreover, Certified Teaching Excellence Programs in Pharmacy and Dentistry Education were held within the framework of collaboration between ASU and the

Egyptian Knowledge Bank.

From this crisis management experience, we learned that hybrid learning, when properly designed, will offer a perfect learning experience to students, and this is a real challenge. Hybrid learning should not be viewed by instructors as an 'add-on' to an existing teaching approach. It is about "re-designing the teaching & learning dynamic." If we spend enough time and effort to redesign and develop our courses including content delivery methods, we will not be compromising.

The first principle in hybrid course design is to focus on the objectives of the course, not on the technologies. And always remember that "Like any course design, the challenge is highly context dependent with a practically infinite number of possible solutions". For best results, Online and face-to-face components of the hybrid course content need to be integrated and strategies to maximize student engagement should be also adopted.

We should also choose the appropriate tools for delivering interactive online content where there are many these days, and for ensuring successful experience of online and face-to-face content delivery in the hybrid context, we should begin our course with "Buying our product well" if it is accepted to use business terms here, this is preferably through one or more face-to-face orientation sessions to teach students how it will work, what is the schedule of online as well as face-to-face sessions, how could they interact with their colleagues and their instructor in a virtual environment, how to successfully navigate the online components of the course & prepare for the face-to-face meetings, what are the needed software for online sessions. We should also provide them with clear instructions on how to use the technologies, this is usually performed using online video tutorials, we should also tell them from where they can get technical support.

Such technical support should be offered to both students and staff and always be available through multiple routes, such as help desk, email, and in-campus support office.

And throughout the course, we should always stay in touch with our students and provide them with a method to ask questions and receive answers in a timely manner especially when they are working in such virtual environment. In addition, encouraging ongoing educational research can help creating suitable eLearning solutions and respond to faculty and students' feedback.

2019 International Consultative Meeting on the International Institute of Online Education

Sri -Lanka's Evolving Education System — an Innovative Response to the COVID-19 Pandemic

Country Focal Point for UNESCO New Dehli Cluster Office, Sri Lanka National Commission for UNESCO,

Ministry of Education, Isurupaya Pelawatte, Sri Lanka

Covid-19 profoundly changed my life just like a storm. The schedule and routine are all gone. At the school we receive compliments as well as criticism from our teachers, but now we only see our faces through the screen. We are unable to eat together, play together and gossip together. In simple terms we are unable to perform activities which enhance our friendship.

Sri-Lankan student (age 18)
#LearningNeverStops
#Learning4Empathy

Introduction

COVID-19 has had a substantial effect in Sri Lanka, as with many other countries across the globe. In Sri Lanka, the first case was reported on 27th January 2020, and at the time of writing this article there have been 138,085 confirmed cases of COVID-19 with 923 deaths. As of 2 May 2021, a total of 1,134,638 vaccine doses have been administered [1].

The Government of Sri Lanka a day before the first confirmed case of COVID-19 was identified in the country formed the National Action Committee for COVID-19 [2]. encompasses four lines of operation: Tri-Forces, police, and intelligence; medical and health care; community engagement; and economic and psychosocial well-being [3].

Sri Lanka's response to the COVID-19 pandemic was considered swift, decisive, and coordinated, using a 'whole-of-society' approach directly under the leadership of H.E. President with technical guidance from the Ministry of Health and Indigenous Medical Services and the World Health Organization [4]. Initially however, it was thought that Sri Lanka had won over the virus substantially, as the figures of the infection were far lower than then those in other countries Sri Lanka was ranked 9th in the Global Response to Infectious Diseases (GRID) [5] along with Hong Kong, UAE, Japan, and Taiwan [6].

Sri Lanka was also the first country in the South Asian region to re-open schools [7] and doors opened for tourists far earlier than other countries in the region. However, the hope of ensuring further normalcy in the country were dashed when the country had to face unprecedented waves of COVID 19 infections.

Sporadic closures of educational institutions

Facing a number of outbreaks of COVID 19, the Government had to keep opening and closing schools, however despite facing difficulties, the Grade 5 and the GCE Advanced Level Examination were held. Special guidelines for schools 'Healthy living through good habits' were issued by the Ministry of Education in accordance to the instructions and directions of the Ministry of Health, aimed at addressing measures for the entire school community [8].

Students attending a workshop on 'Learning for Empathy' organized by the Sri Lanka National Commission for UNESCO

[1] WHO,'SriLankaSituationWHOCoronavirus(COVID19)Dashboard'https://covid19.who.int/region/searo/country/lk,(accessedon16.05.2020).

[2] CeylonChamberofCommerce,StateIntelligenceServiceCombattingCovid19SriLankanApproach.2020.http://www.chamber.lk/images/COVID19/pdf/conceptpapergovt.pdf(accessed16052020)citedinDilanthiAmaratunga,NisharaFernando,RichardHaigh,andNaduniJayasinghe,TheCOVID19outbreakinSriLanka:Asynopticanalysisfocusingontrends,impacts,risksandsciencepolicyinteractionprocesses,ProgressinDisasterScience.2020Dec;8:https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7836425/#bb0170(accessedon16.05.2020).

[3] Ibid.

[4] WHO,Sri–LankaARobustHealthSystemRespondingEffectivelytoCOVID19.Pandemic,COVID19:WHO'sActioninCountries"August2020,(accessed16.05.2020).https://www.who.int/docs/default-source/sri-lanka-documents/5th-edition-august-2020-covid-19-country-case-studies.pdf?sfvrsn=27d968d5_0(accessedon16.05.2020).

[5] TheGlobalResponsetoInfectiousDiseases(GRID)IndexwhichevaluateshowefficientandeffectivetheleadershipofthecountryandthepreparednessofitshealthsystemwereintacklingCOVID-19pandemic.

[6] DailyMirror'SLperformswellinfightingCoronavirus&ranked9inGRIDIndex',16April2020,http://www.dailymirror.lk/breaking_news/SL-performs-well-in-fighting-Coronavirus-ranked-9-in-GRID-Index/108-186696(accessedon16.05.2020).

[7] UNESCO,'Schoolsreopenwithsafetymeasures',August20,2020,https://en.unesco.org/news/schoolsreopensafetymeasuresrilanka(accessedon16.05.2020).

[8] MinistryofEducation,'CompactDisccontainingtheinstructionsforpreventionofcovid19isreleased'https://moe.gov.lk/compact-disc-containing-the-instructions-for-prevention-of-covid-19-is-released/(accessedon16.05.2020).

In response to the increasing spread of COVID 19, all higher educational institutions also closed from 12 March 2020, namely 15 state universities, 40 other state and nonstate tertiary education institutions.

More than 90% of higher education institutions (state and nonstate) were able to implement remote learning (online), far more than in pre-pandemic times. In a survey undertaken, 12% of faculty in state higher education institutions and 27% of faculty in nonstate higher education institutions stated that they had not used online education at all, however by June,2000 almost all state and nonstate higher education institutions had provided education facilities online [9].

Given Sri Lanka's success rate it would be beneficial to share some of the measures taken[10]:
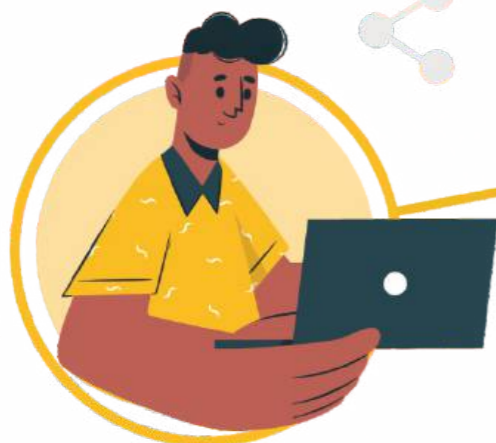
Box 1:
Free access to university web servers in Sri Lanka during COVID-19 -- policy process, benefits and challenges

All internet service providers in Sri Lanka provided free internet access to university servers during the coronavirus disease (COVID-19) pandemic until 17 August 2020. This has been instrumental in promoting online learning for students in Sri Lanka. However, not all countries can start or follow this model. Why was Sri Lanka successful in taking this initiative?

The highest political leadership made a difference. Soon after the pandemic was declared in March by the World Health Organization, the Chairman of University Grants Commission (UGC) approached Sri Lankan President Gotabaya Rajapaksa to provide free internet access for university web servers, because this is the most practical solution to continue the education of collegiate-level students, taking into account the time, scale, and cost. President Rajapaksa immediately discussed with the Telecommunications Regulatory Commission of Sri Lanka (TRCSL) to take actions. As a result, UGC and TRCSL reached an agreement with all internet service providers in Sri Lanka to provide free access for university learning management systems and remote learning facilities through the Lanka Education and Research Network (LEARN) .

This critical intersectoral collaboration was made possible because of the intervention of the highest political leader, but was not an overnight success. LEARN had been in development over 30 years. LEARN is an association registered under the Companies Act of Sri Lanka,and works as a specialized internet service provider for education and research purposes. It provides a high-speed backbone network connecting the Ministry of Education, UGC, and state higher education and research institutions. LEARN functioning as an internet service provider facilitated whitelisting university web servers for access to online tertiary education during COVID-19.

Both students and faculty members immensely benefited through this solution. According to the LEARN report, as of 23 August 2020, 13 million activities (e.g.,accessing reading materials, following lecture slides, attending online quizzes) using learning management systems were launched in a peak week during May. For synchronous teaching and learning using LEARN's video conferencing solution, nearly 540,000 participants in total were recorded per week in July. As LEARN had developed its own network over time, this also saved international data bandwidth.

However, students and faculty members did have some issues along the way. While access and download of all learning materials from the university web servers were free, some faculty members put website links beyond university web servers, such as YouTube and digital news article websites, to facilitate distance learning. Access to these websites,however, is charged, which raised oncerns and confusion among students and faculty members.

With the announcement of gradual university reopening, the LEARN access measure is only valid until 17 August 2020. However, some internet service providers will continue free access until the end of the billing period close to that date. Full university reopening will take some time. Thus,providing affordable, reliable, and high-speed internet access remains as a challenge.

[9]ADB,ADBBRIEFSNO.151,'OnlineLearninginSriLanka'sHigherEducationInstitutionsduringtheCOVID19Pandemic',https://www.adb.org/sites/default/files/publication/635911/online-learning-sri-lanka-during-covid-19.pdf,(accessedon16.05.2020).

[10]Ibid.p.2

Sources: Asian Development Bank; and Lanka Education and Research Network. 2020. Online Teaching and Learning Activities of State Universities Under the UGC. Colombo.
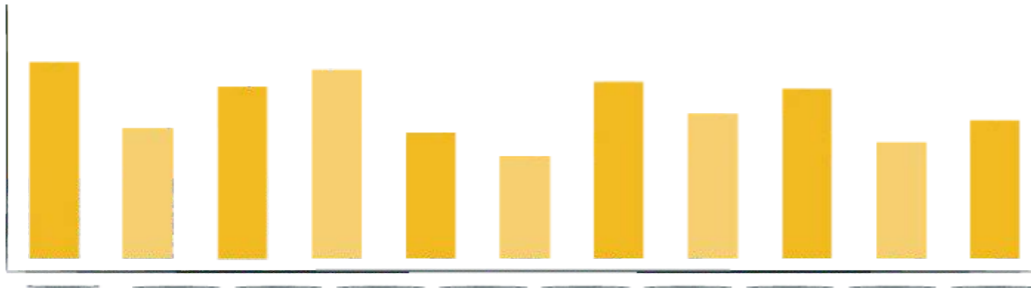
Further data presented through the survey, pointed out that students also actively joined online education, achieving an 88% participation rate for both state and nonstate institutions. Nearly 90% of students were highly or moderately satisfied with online education. Interestingly, differences were not large in online learning adoption by gender, and between state and nonstate institutions [11].

> **'The temporary closure of educational institutions during the coronavirus disease (COVID-19) pandemic has abruptly transformed the global education landscape in favor of distance learning. This radical shift saw a surge in the use of various digital platforms and applications, including digital learning management systems, collaboration platforms for live-video communication, massive open online courses (MOOCs), and tools for creating learning content [12],**

It is noteworthy to also cite here, the support extended through the International Centre for Higher Education Innovation under the auspices of UNESCO (UNESCO-ICHEI) project to support the university education system in Sri Lanka. Introduced in 2017, the project 'Seizing Digital Opportunities in Higher Education: Building Staff Capacity for ICT-driven Innovation' provided the capacity and methodology to introduce blended learning to the syllabi, integrating online learning methods to Sri Lankan Universities, which provided a sturdy foundation for the universities to face the 'new normal' education system at tertiary level [13].

ICHEI staff at a Symposium on Blended Learning organized in collaboration with the University of Colombo School of Computing in 2018.

[11]Ibid.p.5.
[12]UNESCO,'DistanceLearningSolutions',https://en.unesco.org/covid19/educationresponse/solutions/(accessedon19.05.2020).
[13]UniversityofColombo,'SeizingDigitalOpportunitiesinHigherEducation:BuildingstaffcapacityforICTdriveninnovationinCambodiaandSriLanka',https://cmb.ac.lk/seizing-digital-opportunitis-in-higher-education/(accessedon18.05.2020)

Other UNESCO initiatives to support the education system

There were a number of other initiatives that UNESCO launched in attempt to thwart the effects of the pandemic to the educational system. Spearheaded by UNESCO, the Global Education Coalition was established in March 2020 to ensure that learning never stops even during the lockdown period. Here in Sri Lanka the initiative has provided an opportunity to provide free rides to teachers to receive their vaccines in instances where transport would not be available through public and private partnerships, in this instance with UBER [14].

UNESCO, along with the United Nations Children's Fund (UNICEF), the World Food Program (WFP), and the World Bank also jointly issued a "Framework for Reopening Schools" in April, 2020[15], in which guidelines were distributed to a network of government and non-government educational institutions, including the Ministry of Education in Sri Lanka.

Another initiative by UNESCO was the 'Minding the Minds during Covid-19'program collaborating with the Ministry of Education. In consultation with senior mental health professionals in the country, posters were launched in Sinhala and Tamil, with the aim to create awareness on how women, girls, youth, internally displaced groups, and children with disabilities can cope with their anxieties surrounding COVID-19[16].

Conclusion

Despite current escalating numbers, it is hoped with the new vaccination drive throughout the country will thwart the spread of the virus, along with stipulated precautionary measures.

As with the affects to the education system across the globe, the disparities between those who have access to the internet, has only widened the chasm, between those who have, and those who do not who fall through the gaps, delipidating on-going efforts to strive to provide education for all.

Concluding, we can only hope that the effects of the pandemic can be swiftly impeded, however we should also take the opportunity to embrace the positive changes that it has brought with it.

Posters in Sinhala and Tamil launched in August, 2020

[14] UNESCO, 'Schools reopen with safety measures', August 20, 2020, https://en.unesco.org/news/schools-reopen-safety-measures-sri-lanka (accessed on 16.05.2020).
[15] UNESCO, 'Uber and UNESCO partner under Global Education Coalition to support teachers around the world', https://en.unesco.org/news/uber-and-unesco-partner-under-global-education-coalition-support-teachers-around-world, (accessed on 16.05.2020).
[16] UNESCO, 'Minding our minds during COVID 19', 14.08.2020, https://en.unesco.org/news/minding-our-minds-during-covid-19-0(accessed on 16.05.2020).

University of Engineering and Technology Lahore in COVID-19

Muhammad Tahir Naeem,
Senior Research Officer, University of Engineering and Technology, Lahore

Muhammad Zeeshan,
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Waqar Mahmood (Reviewer)
Director of Al-Khawarizmi Institute of Computer Science, University of Engineering and Technology, Lahore (UET Lahore), Pakistan
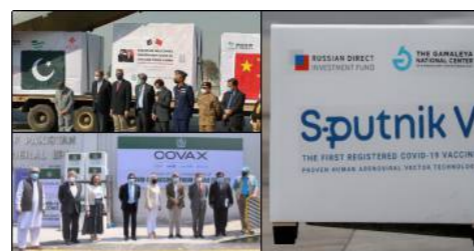
COVID-19 in Pakistan

Pakistan has been in the state of high alert since February 2020. In June 2020, the World Health Organization (WHO) ranked Pakistan among the top ten countries reporting the highest number of new COVID-19 infections. The government implemented lockdown, closure of businesses and mosques, restriction of movements, and working at home to promote social distancing and curb the spread of disease. At the beginning of March, over 300,000 educational institutes including schools, colleges, and universities had been closed so that the students could be protected from the inflammation. Only leading institutes were able to make the digital connection with students to maintain their learning through multiple applications. But the majority of the students all over Pakistan were unable to continue their learning practice through smartphones or the internet.

Statistics of COVID-19 in Pakistan for the year 2020 (Jan 1,2020 – December 31, 2020)

Vaccination in Pakistan

Since late February, a million doses of Sinopharm, half gifted by China (Thanks to China) and half bought by the government, have arrived in the country along with 600,000 doses of single-shot CanSino vaccines. The first shipment of the privately imported Russian COVID-19 vaccine, Gam-COVID-Vac or Sputnik V, comprising 50,000 doses, arrived at the Jinnah International Airport in Karachi. Pakistan has started the local formulation of the Chinese vaccine CanSino, and the first local batch would be available by the end of May 2021. Pakistan has also received the first lot of 1.2 million Astra Zeneca vaccines under the COVAX facility. As of May 5, 2021, a total of 2,8 million vaccine doses have been administered in Pakistan. The country's largest vaccination has been inaugurated in the Karachi Expo Center, with a capacity of 30.000 vaccinations/day.

Different Vaccines received from China, Russia and UK

Pakistan's Education Responses to COVID-19

In response to the COVID-19 pandemic, on March 13, 2020, the Ministry of Federal Education and Professional Training (MOFEPT) advised all educational institutions, including schools, colleges, universities and madrasahs (religious institutions) to "suspend academic activities, and close down until April 5, 2020", and the closure was later extended until May 31, 2020. The closure was considered as an early summer break. Schools have started opening in a phased manner since September 15, 2020.

As countries worldwide sought to shift educational infrastructure from physical classes to online, Pakistan also tried to follow suit by launching the eTaleem portal and Taleemabad app to encourage remote learning via the internet, TV or radio. The government started a TV channel with the name of TeleSchool to help students get educated during the lockdown.

UET Lahore's Response to COVID-19

UET Lahore strictly followed guidelines directed by the Higher Education Commission (HEC) and the Government of Pakistan. The hostels were closed due to which students had to go to their hometowns and they could not use the libraries. The final year projects of students were also delayed. Vocational training at UET offered by National Vocational and Technical Training Commission (NAVTTC) and Punjab Skill Development Fund (PSDF) was also delayed.

In this perspective, one of the prominent issues faced by the UET was conducting regular classes on campus.

UET's Contribution to Stop the Spread of Coronavirus and Treatment of COVID-19 Patients

The Vice Chancellor of University of Engineering and Technology (UET) Lahore, Dr. Syed Mansoor Sarwar, formed four working groups when the Coronavirus pandemic started becoming serious and shortage of personal hygiene items and shortage of ventilators started becoming an issue all over the world. Two working groups from Chemical Engineering and Chemistry departments under the supervision of their deans have produced multiple lines of sanitizers, liquid disinfectant soaps, herbal antiviral disinfectants, and alcohol-based sprays, according to the formulations recommended by World Health Organization (WHO). These groups were given the tasks to start working on the local production of gel hand sanitizer, disinfectant hand wash, face masks, and ventilator on urgent basis to alleviate the ongoing problems related to COVID-19 as well as preparing for future medical emergencies.

Sanitizers made by UET Lahore

Vice Chancellor UET, Prof. Dr. Syed Mansoor Sarwar said that "Instead of dealing with the situation reactively, we decided to manage the change with a well-thought-out plan, to be implemented incrementally starting with the final semester undergraduate classes." The university also decided to adopt a mixed-mode of delivering synchronous and asynchronous lessons. So, teachers had the option to deliver lecture notes, recorded audio or video lectures, etc. via email or digital repositories, or deliver live lectures using software tools such as Microsoft Teams, Google Teams or Hangout, Zoom, etc. Teachers kept addressing student queries using these tools, such as email, WhatsApp, social networks, and other mechanisms. In June 2020, UET started an online training series titled "How to be an effective online teacher" comprising multiple sessions on synchronous and asynchronous techniques, and the training series was open for all.
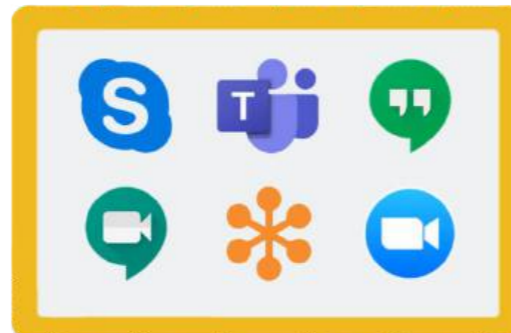
The COVID-19 response training with the title of "Assessment in Distance Learning" was one of the best training sessions in which teachers got perceptive of interactive and engaging use of online tools. Online COVID-19 response trainings played a great role in helping UET faculty and staff learn and understand the effective use of the online interactive tools for online and blended teaching and learning with maximum interaction with students and engaging students during online activities.

The University of Engineering and Technology Lahore (UET) launched the first phase of the Online-cum-Distance Learning (ODL) program in April 2020 for undergraduate students in their last semester so that they could graduate on time. The UET administration issued several notifications on ODL Policy Guidelines, ODL Course Readiness Certificate, ODL Quality Assurance Committee, and ODL Academic Committee. The ODL policies mandate teacher training and student readiness for ODL, ODL readiness of each course through a well-defined process, and the timeline for lectures, labs, Final Year Projects (FYPs), and comprehensive final examination.

Weidong Smart Classroom in UET

Built in collaboration with UNESCO-ICHEI and WEIDONG Cloud Education, Weidong Smart Classroom was a useful resource for recording the lectures to make the ODL repository. During the 2nd wave of COVID-19 in Pakistan the Government of Pakistan decided to continue the vocational and professional trainings on campus. In UET Lahore, NAVTTC and PSDF trainings were conducted in Smart Classroom due to its size to maintain the social distance during the onset classes and monitor the SOPs with the help of Cameras installed in Smart Classroom.

Weidong smart classroom in UET Lahore

IIOE in UET

The International Institute of Online Education (IIOE) COVID-19 response trainings played a vital role in teacher's ICT professional development and their user effectivity with the latest lectures and interactive tools for online and blended learning.

COVID-19 Response Trainings by IIOE

In addition, examination was another big issue for UET Lahore since the start of COVID-19. Enterprise Software Solution Lab (ESSL) developed and incorporated a module in their CAMPUS solution 360. The module of online examination offers the conduction of timed, supervised, and mandatory degree assessments and evaluations in a completely secured, paperless, and online and virtual environment. This allows the evaluators/teachers to plan the online assessments and questions in a perfectly easy-to-manage environment. It allows planning of multiple forms of assessments like quizzes, final and mid-term exams, etc. In addition to that, questions of multiple types, i.e., MCQs, Long & Short, etc., can be planned. To make the whole process fair, transparent, and free of cheating and malpractices, the system is installed with a highly robust real-time surveillance and authentication system. The real-time surveillance includes the secured console rules and facial and credential authentication. The system is seamlessly integrated with the existing campus management system.

On February 26, 2021, The Higher Education Commission (HEC) of Pakistan has clarified that all universities will continue to operate as per guidelines issued by the HEC earlier. It is reiterated that all HEIs will continue academic and research operations in accordance with the relevant instructions already provided by the HEC in the Covid-19 guidance notes of HEC Policy Guidance Note
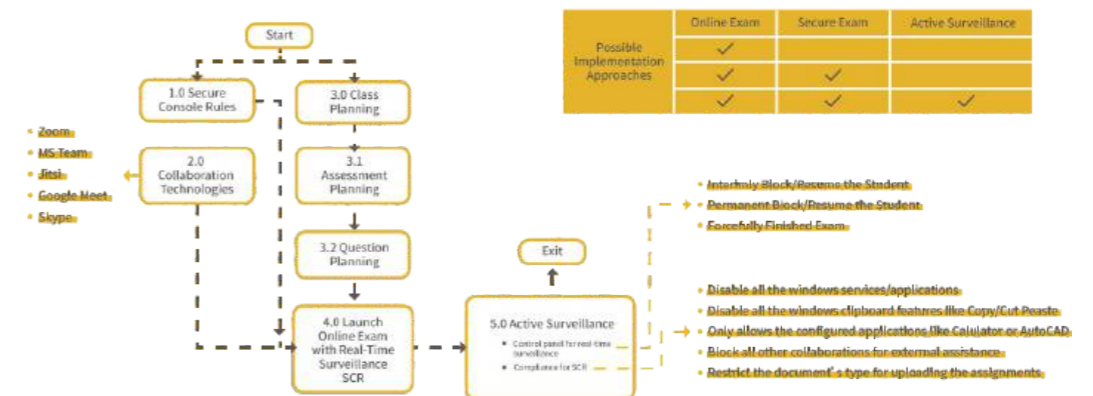
CONCLUSION:

Now is the time to build back better. While there have been some improvements in both access and learning levels in recent years, the pandemic is a substantial setback against hard-won gains. Collectively, we need to step up our support to protect education as an essential service and preserve t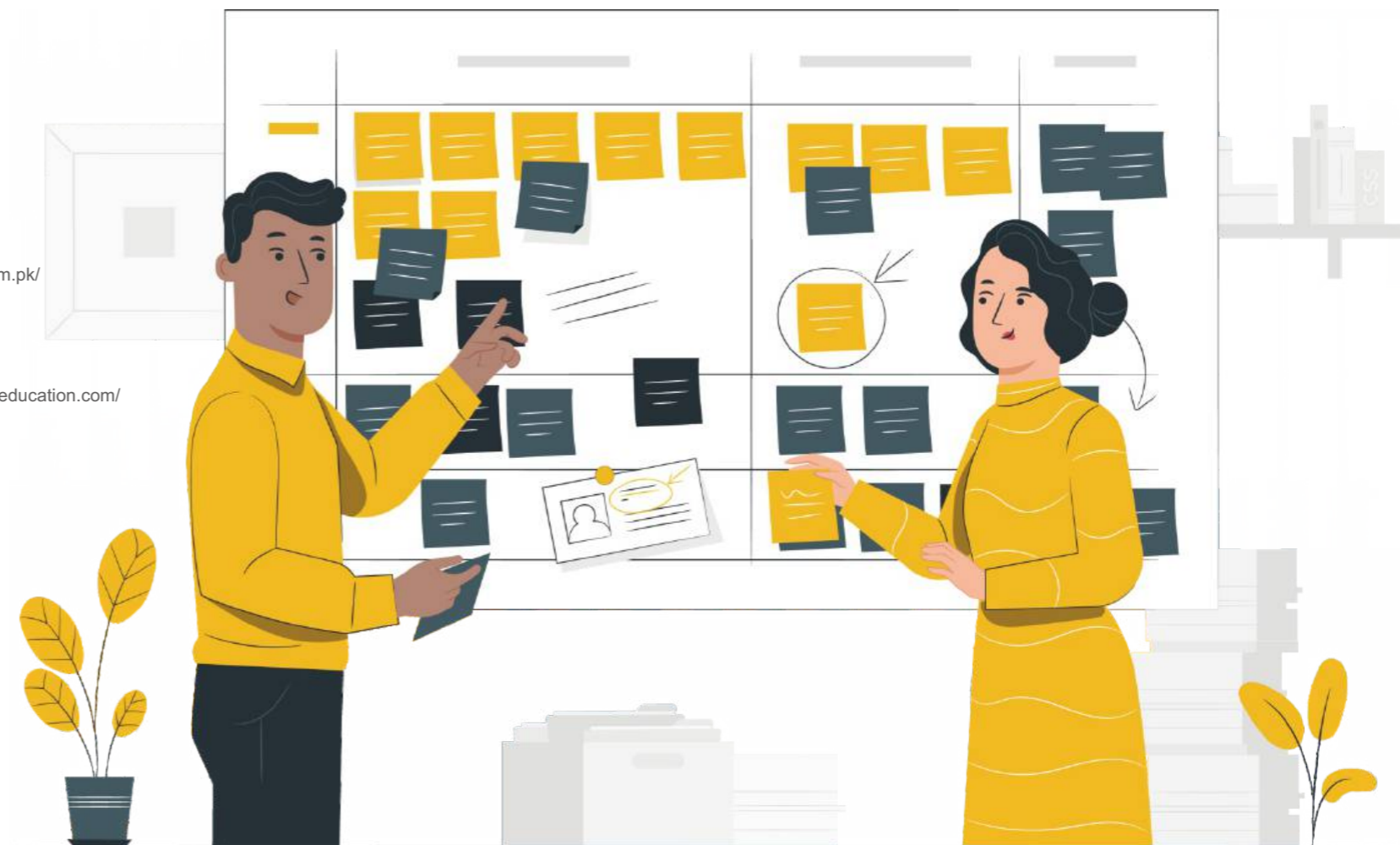he budget for education. COVID-19 affects everyone, but we cannot let the young generation and the most energetic members of our society suffer from a crisis that threatens their present and their future. Following are some conclusion and suggestions:

· Improve access to remote learning by expanding connectivity and device ownership.

· As COVID-19 disturbs people financially there are many parents who cannot send their students to school after COVID because it results in unemployment and all family savings were used during the lockdown.

· Proper mechanism should be defined to enhance teacher's competency with the help of IIOE and other platforms.

· Universities should start producing their MOOCs and share with other universities.

· We should design a reliable and secure system for the assessment of students to take exams if we have to face the pandemic situation.

· MOOCs can be created using Smart Classroom in every university and then universities can access MOOCs centrally through HEC.

· Improve the quality of remote learning by further developing the content, its sequencing, and by making the content more interactive.

· Plan the first few months after Institutions reopen carefully. Strengthen curricula and support teachers to facilitate rapid catch-up with learning losses.

· We must build a passion for self-learning in students.

· We should arrange extra physical classes especially for technical students who suffered from this situation.

· Use student assessments to gauge the scale of the problem, help teachers strengthen teaching to the level of the student and to facilitate planning.

· We should follow the SOPs issued by the government and other health-related departments.

The World Bank examined current out-of-school rates by economic quintile alongside macro projections of economic contraction in 2020 and predicted that more than seven million children may not return to school because of economic disaster. That's why government and other institutions should help find and help such students to continue their studies.

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Leveraging multilingual open education resources for quality higher education in the COVID-19 era -

the case of IIOE and the Virtual University of Côte d'Ivoire

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The insufficiency of open education resources, especially multilingual resources is one of the prevailing issues in the field of education even before the COVID-19 pandemic. Ever since the beginning of the pandemic and the ensuing closure of physical campuses worldwide, especially in developing countries, this issue has become even more urgent. This is even more so in Africa, where online curricula are insufficient to meet the demands of higher education. When physical campuses were closed, many university students' access to curricula and hence education were severely impacted.

Even though commercial education platforms and MOOCs providers possess abundant education resources, two persistent obstacles exist that hamper developing countries' access to online education resources. First, most of the online courses on major commercial education platforms are produced in English, which do not suit the needs of the many non-anglophone countries. The language barrier and the lack of online education resources in local languages risk excluding larger number of learners in the transition towards online and blended teaching and learning.

Second, many online courses on commercial platforms require users to pay certain amounts in order to have full access to learning content and certification. Such "paywall" puts the learning community in developing countries, often economically disadvantaged, in a dire situation when education activities largely or completely shifted to the virtual world. The inequalities created by the language barrier and the "paywall" are important issues that need to be addressed if quality higher education was to be achieved for all.

To tackle these two major obstacles, the International Institute of Online Education (IIOE) has put the provision of quality, multilingual open education resources at the centre since its inception. Since its launch in 2020, in collaboration with international education platforms, MOOCs providers, EdTech companies and technology enterprises, IIOE pooled over 300 quality online courses in Chinese, English and French, all made freely available to its global

users. The courses cover a wide range of subjects, such as frontier ICT technologies, TVET, teacher professional development, online pedagogy, etc.

In order to fill the gap in online courses in French, UNESCO-ICHEI conducted a comprehensive survey of MOOCs providers around the globe and negotiated with 8 MOOCs providers from the global north.

The survey showed that English language content still dominates the global online education landscape, while non-English content adapted to the realities of developing countries remains largely inadequate. Moreover, available multilingual content comes with a high price.

After deliberation, UNESCO-ICHEI procured online courses in French from commercial platforms, which are then made freely accessible to IIOE's partner universities in Francophone Africa, in order to support teaching and learning, as well as teacher professional development in these universities.

As a leading university in the field of online education and digital transformation in West Africa, the Virtual University of Cote d'Ivoire (UVCI) has been an active member of IIOE. In collaboration with UNESCO-ICHEI, UVCI utilised IIOE online courses on machine learning to support the training of 128 students enrolled in UVCI's Master of Big Data, Cybersecurity, Internet of Things and Blockchain. These IIOE online courses fit into the academic programme of UVCI and are recognised as part of the students' learning paths, helping them to develop competencies with the most up-to-date pedagogical content. As the courses are freely accessible to students enrolled on the platform as long as they possess the appropriate devices and internet connection, this matches squarely with UVCI's online pedagogical model, allowing students to learn anytime, anywhere, even in times of crisis.

UVCI,
an avant-garde and agile university during the Covid-19 period

The coronavirus pandemic declared in Côte d'Ivoire on March 11, 2020, motivated the Ivorian authorities to declare a set of measures, including the closure of all educational establishments (preschool, school, secondary and higher education) for a long period (90 days). As a result, nearly six million learners across all thirty-one (31) regions of the country were deprived of their usual social learning environment: school classrooms. In such a context, the most immediate Ivorian response was the pedagogical continuity provided by the Virtual University of Côte d'Ivoire (UVCI), via its digital working environment, while it continued to offer distance learning for its students and positioned itself as a technical assistance organisation for all institutions wishing to demonstrate resilience to the pandemic.

This was followed by the implementation of three pedagogical platforms to address the pedagogical continuity for students preparing graduation examinations in the primary school or middle school, with

· prepepabac.uvci.edu.ci
· prepabepc.uvci.edu.ci
· prepacepe.uvci.edu.ci

Banner of the online platform prepabac.uvci.edu.ci

Then, beyond strengthening its internal human resources (teachers, tutors and platform managers), under the leadership of its Director General, Prof. KONE Tiemoman, the expertise of the UVCI in the pandemic situation was quickly applied to both public and private institutions, which are:

•Institute of Sciences and Communication Techniques (ISTC Polytechnique)

•Alassane Ouattara National Centre of Medical Oncology and Radiotherapy (CNRAO)

•provision of teleworking tools for West African Science Service Centre on Climate Change and Adapted Land Use (WASCAL)

•implementation of an open and distance learning system of Groupe CEFIAT

•implementation of an open and distance learning system for the Groupe 21MPE (International Institute of Mines, Petroleum and Energy)

•creation of white labels for the National School of Statistics and Applied Economics (ENSEA)

•creation of white labels for the Institut National Polytechnique Félix Houphouët-Boigny (INPHB) in Yamoussoukro;

•and many more.

Capacity building of IT technicians

One year after the outbreak of the pandemic, one of the most significant actions for the UVCI is its international networking with the International Institute of Online Education (IIOE), especially for:

· online and blended ICT skills training for teachers

·sharing educational resources online;

·co-organizing events on the digital transformation of higher education.

From this international cooperation, the UVCI/UNESCO-ICHEI project was born in 2020, from which more than a hundred students and teachers continue to benefit from training related to the new digital professions (Big Data and AI). In this regard, the sharing of educational content has led to the co-signing of a certificate in machine learning, for the benefit of the first batch of students in Master of Big Data, Cybersecurity, Internet of Things and Blockchain. Beyond that, the experience of co-construction of educational content in artificial intelligence intensified the bilateral relationship between the two institutions for the digital transformation in higher education, initiated on April 27, 2021.

UNIVERSITE VIRTUELLE DE CÔTE D'IVOIRE

What's more ,
for a university whose leitmotif lies in the slogan:

"UVCI, my university with me, anywhere and anytime!"

The expertise and commitment of UVCI towards quality online and blended higher education as shown in the case study is a prime example of IIOE as a platform to support efforts of ensuring educational continuity in the global south, and to promote and leverage the mutual sharing and co-development of quality online curricula that suit local contexts. By mobilising multi-stakeholder partnerships involving the university communities, international organisations and the private sector, the promotion of multilingual open education resources has great potential in contributing to achieving quality higher education for all.

Cloud + AI + Big Data – Tencent Education for University Digital Transformation

On April 20, 2021, at the Second MEET Education Technology Innovation Summit ("the Summit"), Tencent Education and UNESCO-ICHEI/IIOE signed a strategic cooperation agreement. At the Summit, UNESCO-ICHEI/IIOE also joined hands with the Tencent Foundation to release the Recommentions on Accelerating the Digital Transformation of Global Higher Education during the COVID-19 Pandemic, in a bid to encourage and guide global colleges and universities to achieve digital transformation. Over the past year, under the impact and catalysis of the COVID-19, the education industry underwent drastic changes: offline education paused for half a year, demands for remote education underwent an explosive surge, and tasks such as university management and combatting COVID-19 posed brand new challenges. Against this new backdrop, Tencent Education, as the "digital assistant" for industrial smart upgrading, launched a wide range of diversified products, tools and solutions for students, educators, management staff and founders of higher education institutions (HEIs).

The Second MEET Education Technology Innovation Summit

Resume Study and Complete Graduation on Cloud

COVID-19 prevented teachers and students from returning to schools and regular teaching activities, and presented major challenges for graduation tasks. With the help of Enterprise Wechat and Tencent Meeting, Wuhan University (WHU) offered a viable solution to such issues. After the onset of COVID-19, Wuhan University reacted quickly. By integrating WeCom, QQ, Tencent Meeting and other platforms, Wuhan University achieved "online tutorship for students to write their graduation thesis", organized live-broadcast training on academic honesty and plagiarism check of graduation theses to ensure "timeliness and quality of thesis defense". In the end, Wuhan University successfully completed the graduation thesis (design) defense for over 7,000 graduates of in 2020 via Tencent Meeting in the "cloud". On the morning of June 8, 2021, nearly 3,000 students of Wuhan University returned to the campus. In order to ensure the safety of educators and students returning to school, Wuhan University worked with Tencent Education to launch the WHU Health Code to cover all faculty, students and visitors. Teachers and students may log in the WeChat "Wuda Daily Safety Report" applet to conduct health check-ins and declare their personal health status. The administrative department from the back-end may view the health status of over 80,000 teachers and students, thereby forming an effective chain for health supervision. Meanwhile, the Wuda Daily Report for Safety applet is connected with the "Wuhan against COVID-19" applet in a seamless manner, and all teachers and students may directly apply for a Hubei Health Code to facilitate their entry and exit of the campus. During the cherry blossom blooming period of 2020, the WHU campus was under strict lockdown and remained closed to the public. In order to care for the public sentiment during the pandemic, Tencent Education actively participated in the live broadcast of WHU cherry blossom viewing, and conducted a themed activity called "I come to Wuhan to see you in the spring", which received over 12 million views. Several teachers and students acted as commentators in the live broadcast to introduce the campus conditions, the history, and stories of the fight against the pandemic. WHU's policy to "lock down the campus but not the scenery" during the key period for pandemic control received wide praise from the online community.

First Group of Thesis Defense for the Class of 2020 in Communication Studies at Wuhan University

Mobile Offices Facilitate a Safe Return to Campus

Since June 8, 2020, colleges throughout Hubei Province have allowed graduating students currently living within Hubei and those performing scientific research tasks to return to campus in batches on a voluntary basis. On June 15, the South-Central University for Nationalities (SCUN), located in Wuhan welcomed its first batch of students to return to campus. With the aid of Tencent Education, SCUN created a platform for the smart and comprehensive management of the health and safety of teachers and students on campus, which is capable of fast perception, interconnection, and smart decision-making. The platform was also integrated with products and functions such as campus pass codes, a facial recognition and temperature measurement system, unified ID verification platform upgrade and Internet of things (IoT) middle-end, thus fully covering all scenarios before, during and after the return of teachers and students, and strengthening a firm safety line. Before returning to campus, teachers, students and workers were required to log in on the platform and fill in relevant information in order to automatically generate the "SCUN Code" which was connected with the "Hubei Health Code". The status of the code was then linked with the measured temperature of the platform in real time. During their return to campus, the platform provided the daily trends of returned teachers and students, so as to facilitate the university's arrangement of bus schedules. When entering the campus gate, students would have their temperatures taken automatically, and the data would be quickly synchronized to the platform to facilitate registration and other tasks. After returning to campus, teachers and students could enter campus venues by their codes, and their temperatures were monitored automatically during entry and exit. They could also use the code for shopping, borrowing books, and so on. Administrators could see the status of students on campus from the back-end. The platform simplified the approval process for the attendance checking of teachers, students, and faculties, achieving a true "mobile office".

Procedures for Taking the School Bus at Wuhan University

In addition, the SCUN safety comprehensive management platform also built up the smart campus IOT middle-end on the basis of current informatization, so as to connect with the university's security, monitoring and campus card systems, thereby comprehensively improving the informatization level of its service and management. Online pushes of timely and accurate information were key to combatting COVID-19. During pandemic prevention and control, the Informatization Office of Changshu Institute of Technology (CIT) formulated an e-brochure regarding how to use the video conference system on WeCom. More than 1,600 faculty and 20,000 students completed relevant deployment work in an orderly manner via Tencent Meeting. According to back-end statistics, during the period of 25 days of usage, a total of 1,305 meetings were initiated via Tencent Meeting, with a total duration of 37,138 minutes. This efficient and flexible video conference system played an active part during the pandemic prevention and control. Collecting the daily health information of all teachers and students and compiling statistics was an important task for colleges and universities during the pandemic. Utilizing the health reporting system of WeCom, Changshu Institute of Technology (CIT) assisted its schools with fast reporting and statistics collection regarding the health information of teachers and students by class. Meanwhile, as required by the Ministry of Education for uninterrupted teaching and learning, CIT formulated an online teaching plan and practiced online teaching using the live broadcast platform of WeCom. Utilizing WeCom and QQ to organize different class groups and lesson groups, the Informatization Office worked with the Office of Academic Affairs to formulate relevant manuals and management standards. Furthermore, CIT applied on the cloud platform of Tencent Education to integrate the campus private cloud with the public cloud to establish a fast-responding, safe and reliable digital campus. The hybrid cloud mode will be a definite trend for the applications of colleges in the future, and CIT provides a reference example for the construction of informatization in this regard.

Focused on Aiding Industrial Transformation

In the post-pandemic era, Tencent Education has optimized and upgraded its smart college solution by integrating its system of "one cloud platform, two supporting pillars, three connections, four major middle-ends and five major scenarios", so as to closely link cloud, security, middle-end with users, and provide services to their industrial partners via the open platform, so that they jointly develop products and solutions providing college clients with high-quality services. Taking the core scenario of teaching as an example, Tencent Education utilized the "cloud + AI + big data" mode to help each learner "grow". After the hybrid mode of online and offline teaching had been normalized, Tencent Education conducted the low-cost scale construction and popularization of the formerly expensive Smart Classroom, and also accelerated its process in building an ecosystem of lifelong learning for all those relying on digital technologies, which is more flexible, more resourceful and more convenient.

In the future, Tencent Education will continue developing its capacities, and will work with many partners of the industry to help colleges with further informatization and value upgrading. Taking the cooperation with the International Centre for Higher Education Innovation under the auspices of UNESCO (UNESCO-ICHEI) as an example, both parties will utilize their professional and technical advantages in higher education innovation, and conduct in-depth cooperation in aspects such as provision of cloud services, co-development of multilingual lesson resources, and online and offline training and technical solution support, so as to better promote the digital transformation of higher education.

Meeting Frequency

200

100

0

01-28 01-30 02-01 02-03 02-05 02-07 02-09 02-11 02-13 02-15 02-17 02-19 02-21 02-23

1.Host service: back-end operation 2.Split screen: content instruction
3.PC login: effect monitoring   4.Mobile phone login: effect monitoring

Light up South Africa with Knowledge and Technology by the "Air Class" of "Learn ON"

" The pandemic lockdown closed schools and directly affected the continuity and quality of education. UNESCO called on international organizations, civil society and enterprise partners to set up the Global Education Coalition to achieve 'uninterrupted teaching and learning' through remote education. At present, nearly 100 partners, including Huawei, have participated in this program." This is part of a speech by Dr. Hubert Gijzen, the Regional Director and Representative of the UNESCO Regional Office for Southern Africa, at the online launching event of Huawei ICT Academy, held by Huawei and the South African Public Colleges Organization (SAPCO) on June 19, 2020. On that day, 23 vocational schools throughout the Republic of South Africa officially became Huawei ICT Academies, and were included in Huawei's Learn ON action plan together with other Huawei ICT Academies throughout the world, enjoying the resources provided by Huawei, such as incentive funds for college cooperation, free MOOC resources and an online MOOC platform, while realizing "uninterrupted teaching and learning" via remote online education.

In fact, in the early stages of the pandemic, in response to the call from UNESCO, Huawei launched the Learn ON action plan to provide incentive funds for college cooperation with a value of USD $5 million, so that cooperative colleges could undertake online courses, online training, online experiments and other activities. They opened up the access to over 300 MOOCs free of charge for students, and established over 100 online training courses to provide training for more than 1,500 teachers. In the Learn ON action plan, the performance of Sub-Saharan Africa (Southern Africa) particularly stands out.

Closed Schools and Unemployed Graduates During the Pandemic

Southern Africa includes countries such as the Republic of South Africa, Ghana, Nigeria, Tanzania, Mauritius, Angola, Uganda, Lesotho and Kenya. On the one hand, the digital transformation of such countries requires a greater number of ICT talents; on the other hand, the entire employment rate in this region is quite low, particularly under the impact of the pandemic. For example, according to statistics from the Kenya National Bureau of Statistics in Quarter 2 2020, at least 300,000 Kenyans lost their jobs during the pandemic. This resulted in the talent supply and demand of Southern Africa having certain gaps in terms of quantity and quality. Since March 2020, in several countries in Southern Africa, under the impact of COVID-19, many universities were closed. Under such circumstances, it became particularly important to help students with their studies, ensure their continued learning, promote employment, and ensure the continued cultivation and smooth employment of local ICT talents.

# Numerous Measures to Ensure Learning and Employment

Utilizing Huawei's online talent platform of WeLink online meeting and E*-learning online exam platform, Huawei established a cloud-based class and exam room, to help Huawei ICT Academies in several countries in Southern Africa with online teaching, and held online talent-enterprise exchange activity to promote employment.

For theory-focused classes, teachers may teach online via WeLink video conference, and students may ask questions at any time. For practical classes, teachers may share their screen via WeLink to teach students configuration, after which students can share their screen to practice, enabling students to learn practical lessons remotely. In addition, students may also study MOOCs after class.

To ensure the improvement of students' theoretical and practical abilities, examination is a must. Huawei launched online certification services to examine their progress at any time. Students may take online exams via e-learning where examiners will supervise them via WeLink video conference, to ensure the fairness and justice of the exam.

Talent output has also been an import part for the ecological building of local talents, especially in the face of rising unemployment during the pandemic. The Huawei Southern Africa Region joined hands with partners to hold three online talent-enterprise exchange events to provide hundreds of jobs to graduates of Huawei ICT Academy, and help solve their employment issues.

During the online Huawei ICT Job Fair of Kenya held on July 8, 2020, Huawei worked with the Communications Authority of Kenya, as well as numerous colleges and cooperative channel partners to provide 34 ICT-related jobs for students, attracting the participation of over 100 excellent graduates of Huawei ICT Academy. The event elicited a positive local response and attracted over 10 local media outlets in Kenya.
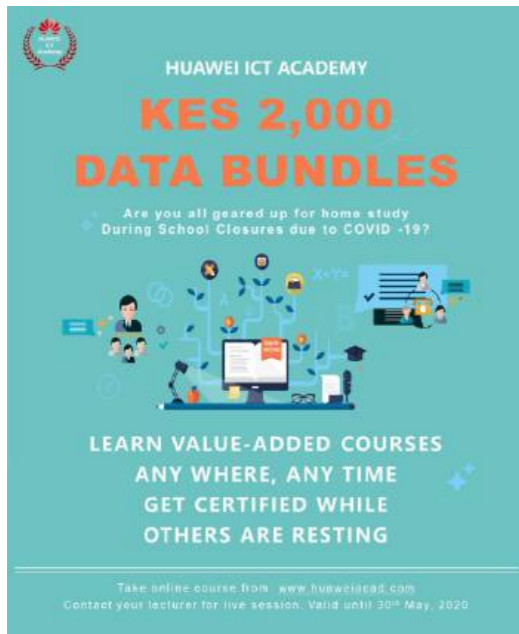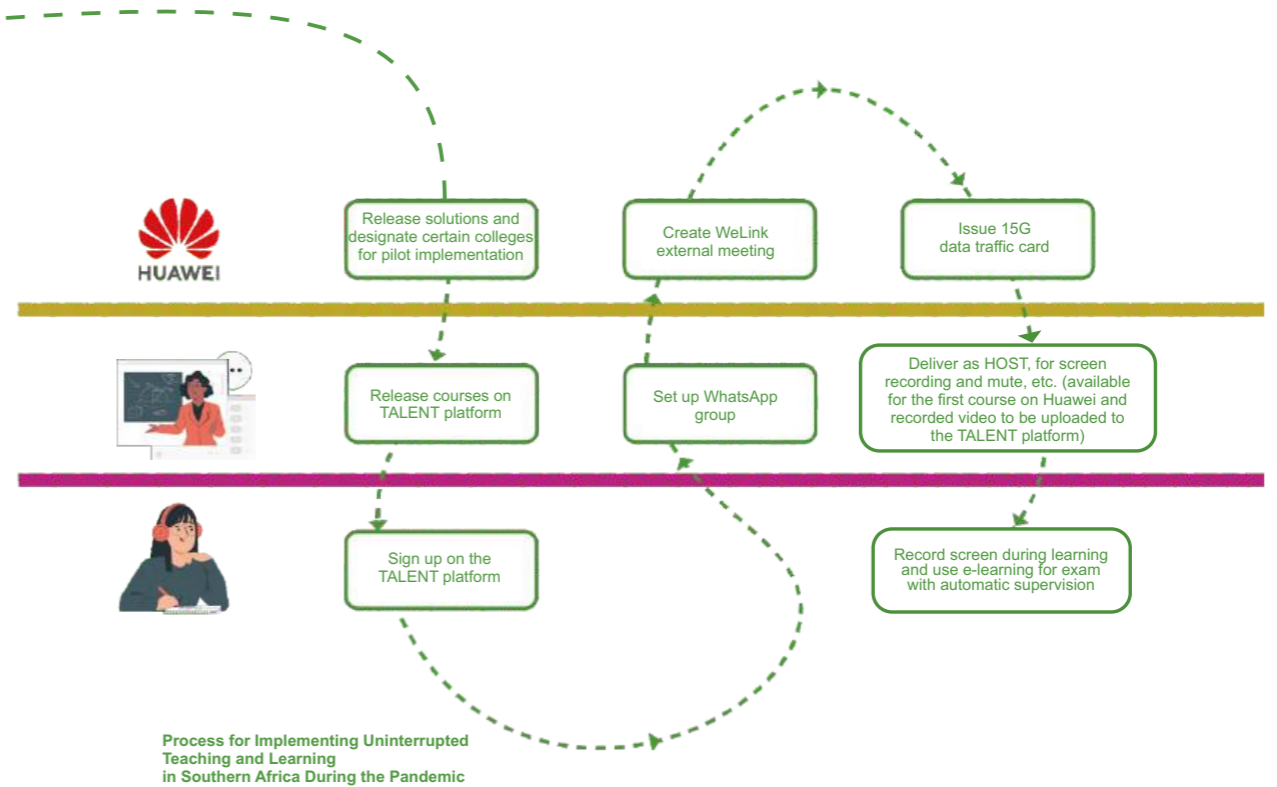
Huawei's Free MOOCs Help with Uninterrupted Teaching and Learning

Huawei Holds an Online ICT Job Fair in Kenya

To ensure the uninterrupted teaching and learning for all college students in Southern Africa, Huawei also actively cultivated "online influential teachers" who were promoted by its social media, in order to benefit more people from equitable education opportunities.

Process for Implementing Uninterrupted Teaching and Learning in Southern Africa During the Pandemic

Learn ON Will Continue Until the Pandemic Is Over

By the end of 2020, Huawei's Learn ON action plan had been implemented in over 150 colleges in 10 countries of Southern Africa. It has cultivated 375 local teachers for ICT Academy via Train the trainers (TTT) training; and the number of online students in Southern Africa exceeded 11,000, with over 5,000 students receiving the certification of Huawei. The UNESCO Regional Office for Eastern Africa highly recognized the implementation plans and achievements of Huawei's uninterrupted teaching and learning program in Southern Africa, and supported the popularization of such plans to other countries in Africa and even other parts of the world.

At present, the pandemic is still not over, and Huawei's Learn ON action plan is still ongoing across the globe. In the future, Huawei will continue joining hands with global talent partners to build a learning community through innovative ICT technology during the pandemic. Huawei will continually provide equal and quality opportunities in education for people from different regions and ethnicities, and support uninterrupted teaching and learning, thereby helping illuminate the world with knowledge and technology.

What Role Does Cloud Education Play During the COVID-19 Pandemic?

WEDON
EDUCATION
伟东云教育

In early 2020, COVID-19, an unexpected pandemic, swept across the world. Many high-tech enterprises in China took active measures to join this battle against COVID-19 by virtue of their own technical strength. As a global online education platform service provider, Weidong Cloud Education provides solutions for digital transformation in education and a self-developed online learning platform to schools and educational institutions in China and around the world. The goal of Weidong Cloud Education is to ensure that "instructors can teach, and students can learn online", thereby aiding schools and institutions worldwide to mitigate the educational disruptions caused by COVID-19 effectively. During the pandemic, Weidong Cloud Education provided free technical services and high-quality teaching resources for "Classrooms in the Cloud" to more than 8,000 education departments, schools and education training institutions nationwide, with a total investment of more than RMB 10 million.

On March 26, UNESCO launched the Global Education Coalition, of which the initial members include Weidong Cloud Education and powerful international actors such as Microsoft, Google, Amazon, Facebook and Zoom. By providing an online education platform for countries affected by COVID-19, Weidong Cloud Education assisted students from all over the world to "continue learning during class suspension". Weidong Cloud Education participated in more than 20 online seminars organized by UNESCO Headquarters, Chinese National Commission for UNESCO, UNESCO Institute for Information Technologies in Education and UNESCO Regional Office for Eastern Africa. Weidong Cloud education successively discussed its anti-pandemic initiatives with education ministers and experts from countries including Kenya, Ethiopia, Djibouti, Rwanda and Comoros. The WeLMS online learning management system, independently developed by Weidong Cloud Education, is also an important tool for schools in these member countries to realize distance education, which fully demonstrates the responsibility of Chinese enterprises in the international community.

On April 2, the International Institute of Online Education (IIOE), launched by the International Centre for Higher Education Innovation under the auspices of UNESCO (UNESCO-ICHEI), was officially released. As one of the co-sponsors, Weidong Cloud Education provides ICT training courses in English and French to partner higher education institutions (HEIs) of UNESCO-ICHEI in Asia and Africa, with the assistance of excellent instructors and course resources of its own European Demos Training Group and Brest Business School. WeLMS, an international learning management platform independently developed by Weidong Cloud Education, is also regarded as one of the learning tools for the IIOE, and it is used to support the partner HEIs in distance learning as well as production and management of digital course resources. At the same time, through cooperation with UNESCO-ICHEI, Weidong Cloud Education has created "Weidong Smart Classrooms" in HEIs in countries such as Pakistan, Cambodia, Sri Lanka, Egypt, Ethiopia and Djibouti, to provide local HEIs with intelligent teaching tools and distance learning platforms, thus effectively reducing the impact of class suspensions caused by COVID-19.

HOW CLOUD IS SET TO REVOLUTIONIZE HIGHER EDUCATION

Founded in 2012, Weidong Cloud Education is a global Internet education platform service provider of high-quality educational resources and services to governments, enterprises, colleges and institutions worldwide. It builds an open online education cloud platform to create a global education pattern of "One Body and Two Wings", striving to construct an ecology of lifelong education that serves the interests of the world. At present, Weidong Cloud Education focuses on vocational education and actively empowers the development of vocational education in the new era. Its business has covered 25 provinces and 169 cities, districts and counties across China, and has been laid out in 25 countries and regions around the world, serving numerous Fortune Global 500 companies.

Weidong Smart Classroom Project

The Weidong Smart Classroom project, organized in cooperation with UNESCO-ICHEI, has created a digital teaching environment, integrating intelligent teaching facilities and interactive software tools for instructors and students at local HEIs. The project provides intelligent teaching facilities such as large interactive screens, All-in-One PCs, cloud terminals video recording device to design class interaction and learning management platforms. It also provides training of digital skills for teachers, along with subsequent operation and maintenance support. The project value is approximately RMB 6 million, providing important technical support and guaranteeing local digital education development. The Smart Classroom Project at the University of Djibouti has created a digital teaching environment integrating intelligent teaching facilities and interactive software tools for teachers and students in local HEIs. In addition, the Smart Classroom at Ain Shams University in Egypt served 17,000 students during the pandemic, and recorded online courses covering 18 different subjects. The Weidong Smart Classroom, opened at School No. 67 in Bishkek, Kyrgyzstan, provides students with necessary course materials by introducing electronic teaching facilities and technologies, and effectively tracks students' attendance and academic progress, thereby alleviating the local shortage of paper-based teaching resources.

Weidong Smart Classroom - Djibouti

**Weidong Smart Classroom - Kyrgyzstan**

Weidong Smart Classroom -- Egypt

Weidong Cloud Education's positive contributions have been highly recognized by all sectors of society. On April 10, Vladimir Norov, Secretary-General of the Shanghai Cooperation Organization (SCO), warmly received Mr. Wang Duanrui, President of Weidong Cloud Education Group. The delegation at the SCO Secretariat presented Mr. Wang Duanrui and his team with a letter of thanks. Mr. Norov affirmed and highly appreciated the contribution made by Weidong Cloud Education in supporting the global "Suspending Classes Without Stopping Learning" initiative. He believes that this is a faithful practice of China's initiative of a "Community of Shared Future for Mankind" and hopes that Weidong Cloud Education will continue to promote its professional online platform technologies and intelligent education solutions to a greater number of SCO member states.

Modern Instructional Technology and Vocational Training Project (MS-EFTP) of the Ministry of National Education and Higher Education

Republic of Guinea-Bissau

Weidong Cloud Education Group serves the Ministry of National Education and Higher Education of the Republic of Guinea-Bissau to further modernizing local educational technology and vocational training. The project focuses on vocational training institutions and has established several national vocational education and training centres that can accommodate up to 10,000 trainees. In addition, the project also provides internal ICT infrastructure, such as information and technology services, Internet, campus monitoring systems, smart classrooms and virtual reality technology.
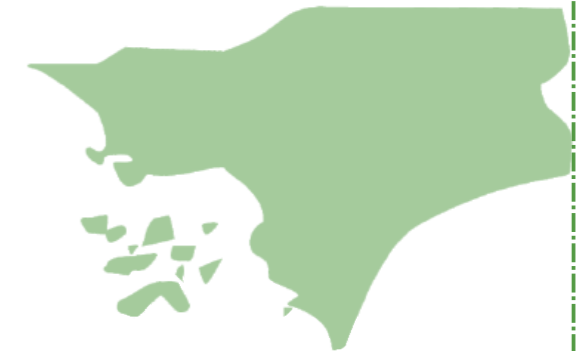
As a strategic partner of UNESCO and SCO, Weidong Cloud Education has actively implemented the Belt and Road Initiative and the Digital Silk Road construction. Due to the fact that digital transformation in education is a long-term and arduous task, Weidong Cloud Education will continue to provide its global partners with the overall solution of "infrastructure + digital hardware + platform + content + training," and tailor its services to customer pain points in the coming post-COVID era. Aided by highly skilled instructors and course resources of its own European Demos Training Group and Brest Business School and combined with China's innovative technologies such as artificial intelligence, analog simulation training and construction of information-based cloud platforms, Weidong Cloud Education will empower the development of vocational education and digital transformation in education in countries involved in the Belt and Road Initiative.

The project will also establish a nationwide unified training and learning platform and form a unified vocational education and training content repository and national community to further promote the sharing and distribution of such areas. These efforts will also better equip trainees with skills necessary for the labor market.

Signing Agreement with Republic of Guinea-Bissau

Kingsoft Office's Collaboration Strategy: Post-COVID Innovation in Education

Kingsoft Office

Kingsoft Office is one of China's leading providers of office software products and services. At present, there are more than 100 million WPS Office users throughout the world. In 2020, Kingsoft Office provided stable and high-quality products and services to users in 220 countries and regions, while fully leveraging its technical advantages, and devoting itself to the global fight against COVID-19. On September 27, 2020, Kingsoft Docs, a subsidiary of Kingsoft Office, was named the official exclusive supplier of office software for the 31st Universiade.

According to statistics disclosed by Kingsoft Office at the end of 2020, Kingsoft Office had provided more than 4 million cloud office accounts for free to government agencies, hospitals, schools and SMEs, thereby supporting the telework of more than 600 million people throughout China's fight against COVID-19. At the same time, millions of micro, small and medium-sized enterprises began to resume work and production as early as February and March 2020, with the help of Kingsoft Docs and through online collaboration, which is of great aid to China's overall efforts to resume production while combatting COVID-19.

Jianghan District, Wuhan, Hubei Province, China, February 10, 2020. It's just been more than two weeks since the Wuhan lockdown began. Mr. Liu, a young English teacher who works at an experimental primary school in this district, successfully offered remote online courses to more than 40 students from his living room. He used mobile application that supports online real-time multi-user sharing of a document, a PPT file which he prepared in advance, and audio-video synchronization. Mr. Liu's bold practice and innovative teaching convinced the District Primary and Secondary Education Department that they could take the lead in resuming classes online with the help of novel models and technical solutions to realize "Suspended Classes, Ongoing Learning". Compared with other online teaching modes which use video conferencing, the model based on WPS & Kingsoft Docs is structured around a shared document and has many advantages. It supports all types of devices, has low bandwidth requirements, offers extensive support for students to focus on the topic, and has low operating costs for teachers and students. In less than one week, 4,200 teachers and 60,000 students from 54 primary and secondary schools throughout Jianghan District, Wuhan, Hubei Province participated in online teaching based on document sharing, until schools in Wuhan gradually began to reopen. This is one of the cases in which Kingsoft Office, a Chinese S&T company, helps people from all walks of life cope with the COVID-19 pandemic, and resume work and production through "online offices". On December 1, 2020, Kingsoft Office announced that "collaboration" became its new product strategy.

COVID-19 Gives Birth to Telework, and Online Education is Highly Favored

Online Collaboration is also widely used in education. In addition to facilitating online instructions based on document sharing during a lesson, Kingsoft Docs virtually supports the entire teaching process, including lesson preparation, online teaching, student questioning and interaction, and assigning, collecting and grading homework. Furthermore, along with China's gradual reopening of schools, with strict requirements for epidemic prevention in place, the non-contact information collection solutions represented by Kingsoft Spreadsheets were preferred by many schools. Features include online collection of students' body temperatures, travel statistics, and information regarding personnel on and off campus. As a result, Kingsoft's innovative practices during the pandemic have quickly attracted the attention of China's leading educational institutions. In September 2020, Kingsoft Office signed a formal "smart campus" office cooperation framework with Tsinghua University, who is set to deploy Kingsoft Office's smart office products and services across the campus, thus creating a new smart campus office ecosystem.

In 2021, Kingsoft Office and Tsinghua University are further exploring the concept of a smart campus. On April 24, Kingsoft Office signed a strategic cooperation agreement with the Rain Classroom developed by Tsinghua University to further explore "higher education teaching and office solutions", and they will work together to promote China's ICT in education to a new stage. Xiao Bin, Vice President of Kingsoft Office, said, "The cooperation (with Tsinghua University) at this stage focuses on the features of online document collaboration and editing of Kingsoft Docs, a product of Kingsoft Office, to empower the teaching activities of the Rain Classroom and improve the quality of learning within limited instructional time."
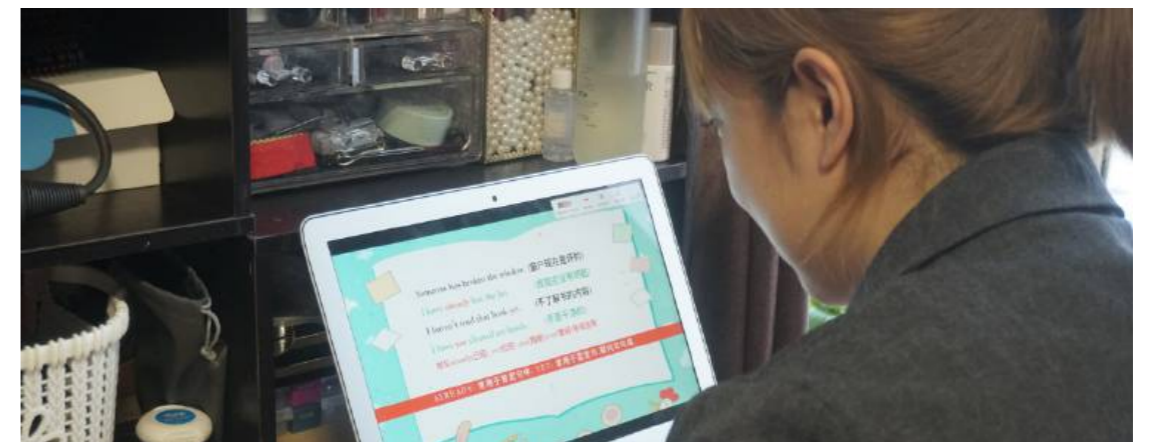
China's Educational Innovation Helps Belt and Road Partners Cope with COVID-19

As myriad innovations in online office work, combined with the education industry, are being applied in numerous fields, S&T companies such as Kingsoft Office have been globally promulgating this effect. At present, telework, characterized by "online collaboration", has become an important option for the countries of the "Digital Silk Road" to cope with COVID-19 and resume work and production. On April 20, 2021, at the Boao Forum for Asia Annual Conference 2021, with the theme of "Join Hands to Strengthen Global Governance and Advance the Belt and Road Cooperation", Zhang Qingyuan, CEO of Kingsoft Office, said, "During the stage of regular pandemic prevention and control, Kingsoft Office has customized linguistically localized software, and localized templates for countries of the Digital Silk Road. Kingsoft Office also provided free form templates required during various pandemics to act as office support for people in countries affected by the crisis." It is the result of China's Belt and Road Initiative that Kingsoft Office's educational innovation for China's fight against COVID-19 has been extended to many countries throughout Southeast Asia.

In June 2020, Kingsoft Office and the International Centre for Higher Education Innovation under the auspices of UNESCO (UNESCO-ICHEI) signed a Strategic Cooperation Agreement in Shenzhen to connect WPS Office-related online courses to UNESCO-ICHEI's global education resource platform, thereby assisting the development of higher education in developing countries throughout Asia-Pacific and Africa.

In the future, Kingsoft Office will further focus on the five product strategies of "multi-screen, cloud, content, AI and collaboration" and actively bring the resulting innovative office experience to Belt and Road partners. In Southeast Asia's education market, China's extensive and efficient efforts such as implementing "online classes" and "smart campus" in fighting against COVID-19 may be promoted and landed in this region. At present, with the advent of the post-COVID era where the existing mainstream products are not adapted sufficiently to education scenarios, Kingsoft Office will strengthen the export of solutions and localized product layout for the education industry in Southeast Asian countries. Kingsoft Office aims at addressing the need of the education industry and customers with Kingsoft Docs and WPS+ Cloud Office, and to become a supplier of innovative office products and services characterized by localized operations based on China's innovation features.

Thailand

During the critical stage of fighting against COVID-19, Kingsoft Office provided thousands of Kingsoft Docs suites to the Thailand Ministry of Defense. This action has greatly supported Thailand's information processing work during the outbreak and provided technical support for its response to the sudden need for large-scale information collection and sharing.

Indonesia

In early February 2021, Kingsoft Office, together with Huawei Indonesia, teamed up with the Ministry of Education and Culture of Indonesia and Directorate General of Higher Education to accelerate the digital transformation of national education. Kingsoft Office and Huawei Indonesia donated WPS Office suites to the Ministry of Education and 500 affiliated universities. It is worth mentioning that at present, many teachers at Mulamawan University have adopted WPS as the main tool for distance education. In May 2021, organized by Huawei Cloud, Kingsoft Office provided online training for numerous instructors at Mulamawan University, focusing on carrying out distance education with WPS. Due to the great penetration through the routine office work of teachers and colleges in Indonesia, WPS has successfully assisted the university's instructors to realize distance education during the COVID-19 pandemic.

Innovative Wisdom of SUSTech on Higher Education in the Post-COVID Era

Opportunities and challenges during the pandemic

In early 2020, the wide outbreak of COVID-19 severely impeded the development of global higher education. Like other universities in China and around the world, SUSTech was faced with many new challenges in student learning, teaching and school management. The key issues included how to effectively utilize information-based education resources and network platforms to undertake online teaching, improve teachers' ability in digital teaching and mitigate the space limitations of school management. However, new opportunities often arise from such challenges. Under the impact of COVID,

SUSTech actively utilized the strong vitality of the "Internet + education" model and the development advantages of Shenzhen to gradually explore new methods for cooperation between international colleges and universities based on online education platforms. These practices provided a series of valuable practical experiences for international education aid and the digital transformation of higher education.

SUSTech 2020 Spring Semester: The First Lesson

SUSTech is an innovative public university with a high entry point and high expectations, established by Shenzhen against the broad background of the national reform and development of higher education. Since its establishment, SUSTech has been devoted to playing a pioneering and demonstrative role in higher education reform. Over the past decade, SUSTech has achieved astounding results in discipline building, scientific research and public services, especially in setting up MOOC courses, which has provided an effective reference for the digital transformation of higher education both within China and internationally. During the pandemic, SUSTech collaborated with the International Centre for Higher Education Innovation under the auspices of UNESCO (UNESCO-ICHEI) and other organizations to continue exploring new methods for effective international cooperation, and to solve the issue of education during the pandemic with digitalized education for colleges and universities in numerous countries.

Xue Qikun,
Academician and President of Southern University of Science and Technology (SUSTech)

Practical experiences of SUSTech

SUSTech MOOC: Financial Market and Financial Institution

Enlightened by the online teaching model during the pandemic and relying on its campus MOOC Center, SUSTech actively explored international cooperation based on MOOC, and achieved breakthroughs in creating and promoting online courses. The SUSTech MOOC Center began preparations in December 2017 and was officially completed and put into operation in May 2018. Since the outbreak of the pandemic, SUSTech has provided students with online learning support with pandemic themed courses recorded by the MOOC Center and webinars. In recent years, SUSTech has joined hands with UNESCO-ICHEI in many projects, including the UNESCO-Shenzhen Funds-in-Trust Project, the foreign-aid training program of MOFCOM, and the Smart Classroom Project. Through cooperation in these projects, SUSTech and UNESCO-ICHEI have constantly expanded the international cooperation network, signed cooperative agreements with several countries in Asia and Africa, and created a new "SUSTech + UNESCO-ICHEI + N (partner HEIs)" model. Throughout the pandemic, SUSTech has worked with UNESCO-ICHEI, domestic and foreign partner HEIs and enterprises to jointly launch the International Institute of Online Education (IIOE). IIOE aims to provide MOOCs for the capacity building of teachers and new technology courses to support partner HEIs in developing countries in the Asia-Pacific and African regions to achieve quality online education.

Courses of International Institute of Online Education (IIOE)

SUSTech Teacher Teaching Classes at MOOC Center

Thoughts and exploration in the post-COVID era

In the post-COVID era, the general trends of global education will still be based on economic globalization, Information Technology, international education, democratization of education and lifelong learning. The Education 2030 Framework for Action issued by UNESCO presents the general goal of global education in 2030 as "towards inclusive and equitable quality education and lifelong learning for all," the proposition of which provides new thoughts for the education reform and innovation in different countries. Against the backdrop of normalizing COVID-19, SUSTech will continue working with international organizations to promote international cooperation between HEIs based on existing projects and by setting up platforms such as international conferences and webinars. Additionally, SUSTech highly values the students' rights to education under the "Internet + education" model in the post-COVID era and will set up a system to support the students' self-learning. SUSTech will continue assisting the innovation of education service supply and the reform of teaching methods, and integrating education resources to provide effective support for ICT in education to realize the co-development of quality education resources and achieve higher education innovation through diverse perspectives on learning, teaching and management. The South-South Cooperation in education is also the development direction of SUSTech in the post-COVID era. We will gather forces from multiple sources to improve the infrastructure in developing countries, share successful experiences of blended learning, improve teachers' ability in digital teaching, and contribute the SUSTech wisdom to achieving UNESCO's 2030 goals and the sustainable development of global education.

Guidance for Online Teaching during the COVID-19 Pandemic

Global MOOC Conference Forum Ⅲ Held at SUSTech

The Use and Misuse of ICT in the Delivery of Higher Education Programmes

"ICT-enabled innovations in education practices are revolutionary. But just like all other technologies leveraged in our lives, ICT brings not only opportunities, but also challenges."

The benefits of harnessing ICT for teaching and learning in higher education are obvious:

• First, it can help higher education programmes to reach out to more learners, many of whom are non-traditional learners and those from underdeveloped or remote areas who would have otherwise been left behind due to the capacity limitation of campus or classroom-based learning environment.

• Secondly, the use of ICT has empowered learners with the same level, if not higher levels, of access to information and knowledge that used to be monopolized by teachers for a long period of time.

• Thirdly, with the use of ICT, higher education learning programmes can be more diversified, flexible, adaptive, and relevant to the needs of communities and individuals. Last but not least, the use of ICT can make learning systems more resilient to overcome future disruptions to learning.

Indeed, ICT-enabled innovations have never stopped

hitting the headlines with revolutionary and transformative solutions. As every coin has two sides, the use of ICT also has pros and cons. The introduction of Massive Online Open Courses (MOOCs) makes it possible for quality programmes and courses to be shared at scale, especially when they are based on and contribute to new open educational resources (OERs). However, we cannot ignore the potential risks of restricting the knowledge creation capacity of local and indigenous people, the dominance of star professors, negative impacts on the democratization of learning processes, and over-convergence of learning and teaching materials, etc. Leaners' exposure to online knowledge and information can enhance their self and independent learning, but can also be counterproductive to systematic learning. The diversity and flexibility of learning should be accompanied by overarching learning frameworks, such as National Qualifications Frameworks, to avoid risks of learning fragmentation.

W hether you like it or not, the increasing use of information and communication technology (ICT) has been apparent in the delivery of higher education programmes in recent decades. With the unprecedented disruption of learning caused by the COVID-19 pandemic across the globe, ICT-enabled solutions to continue learning were fueled by a new and powerful impetus to take action. As a result, online and blended learning has become a new normal during and even after the pandemic.

Dr. Libing Wang,
Chief, Section for Educational Innovation and Skills Development (EISD), UNESCO Asia-Pacific Regional Bureau for Education, Bangkok, Thailand

Information and Communication Technology

The ICT infrastructure, including internet penetration rates and connection speeds and the availability of online communication platforms and online portals with accessible learning support materials, are critical to the resilience level of higher education systems. On top of these physical infrastructures, academic infrastructures, such as National Qualifications Frameworks, subject/occupation/professional-specific quality standards, programme development and course planning templates, are equally important, as they can make sure that ICT-empowered learning programmes and solutions are part of a broader learning framework that promotes diversity and flexibility under common umbrellas.

Higher education teaching personnel, who used to be well-trained with subject-specific competencies, need to be reskilled and upskilled to increase their competencies in ICT, quality assurance, and pedagogy. The pedagogical use of ICT and the capacity to align online and blended learning programme development and course planning with upstream academic infrastructures/quality assurance frameworks are indicative of the new requirements for college teachers and professors. To institutionalize and incentivize the faculty to update their mindsets and capacity, a well-established and functioning continuing professional development system for teaching personnel should be in place with support from an institution-wide teaching and learning centre staffed by specialists in learning sciences, pedagogy and assessment, quality assurance, and ICT working together in an integrated manner.

Safe, Effective and Responsible Use of ICT

The integration of ICT into programme development and course planning by faculty members should be promoted with the aim to foresee the ICT needs of the specific learning programmes and courses and plan ICT-integrated solutions accordingly. In this connection, higher education institutions need to turn ICT integration requirements into their internal workflows, templates, and approval processes, and not leave them to the personal interests of individual staff. To evaluate the capacity and preparedness of faculty members for ICT integration, we can use ICT-sensitive, responsive, and transformative as the three escalating levels of awareness, actions, and transformation. Here, sensitivity is the result of awareness while responsiveness is coming from the capacity to take action. Eventually, ICT-driven transformation is the outcome of internalization and integration.

While the ICT toolbox keeps expanding, frontier technologies like artificial intelligence and big data can efficiently help diagnose the effectiveness of teaching and learning. When all the interactions in the learning processes can be tracked, recorded, and quantified via big data technologies, with data feeding into different models of learning analytics to automatically generate evaluation reports, less human work is needed. But to give it a human touch, subjective evaluation can supplement a machine-dominant and seemingly objective evaluation. Needless to say, the identification of evaluation indicators is itself subjective. What we need is evidence-based evaluation that can nurture objectivity in subjective personnel

"The use of ICT to promote quality education and life-long learning should be a means by itself, rather than an end."

The ethical use of ICT has become increasingly important, as it is pertinent to the protection of personal privacy of learners, as well as the promotion of diverse ownership and transparency of data collection and management processes. Big data should be kept under the domain of public good with collective ownership of those who contribute to its collection under various platforms and mechanisms, rather than be controlled solely by individual companies and entities. In this regard, intensified government regulation, common data infrastructure, as well as public and private partnerships can be the way forward for future solutions.

As a means, rather than an end by itself, the use if ICT can make sense if opportunities can be maximized and risks minimized in contributing to the achievement of Sustainable Development Goal 4 (SDG 4) to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. From ICT-assisted, to -enabled, -enhanced, -empowered, and -integrated, we are moving towards a more holistic and balanced approach to the use of ICT in the delivery of higher education programmes.

The quality of teaching and learning ultimately depends on the quality of the learner's interactions with their teachers, fellow learners, teaching and learning materials, learning environments, local communities, etc., whether they are conducted in person or virtually. As the new generation of teachers and learners are increasingly technology-savvy and digital-native, online and blended learning can be more easily mainstreamed in the delivery of higher education programmes. One day we may miss the traditional ways of learning, just as we treasure hand-made crafts versus those made possible by machines.

Introduction to MOOC

Sustainable Development Goal 4

Higher Education in West Africa
facing COVID-19 crisis
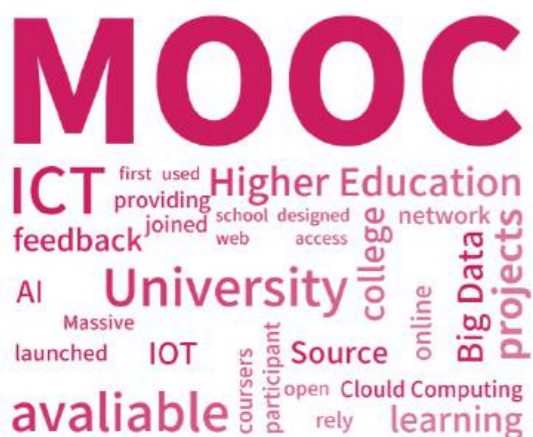
For over a year now, the world has been dealing with a series of multifaceted crises caused by the coronavirus (COVID-19). This pandemic that started as a health crisis has had ramifications in many areas. The socio-economic impacts are becoming increasingly apparent as the crisis is lasting. To date, compared to other continents, Africa remains a continent relatively less affected by COVID-19 for reasons that are still unclear.

Indeed, as of April 23, 2021, Africa has a total of 4,478,733 COVID-19 cases, with 119,354 deaths and an impressive 4,019,022 COVID-19 cured cases[2]. At the worst point of the crisis, in May 2020, Africa had 2,344 deaths, 66,319 confirmed cases, and 23,143 cured cases, making it the most resilient continent to COVID-19 compared to others[3].

Like all other sectors of activity, COVID-19 has not spared African education systems, which have been hit hard by its devastating consequences. This is because the crisis has entered the gaps already opened by the fragility of these systems. Indeed, when African countries were faced with the thorny issue of ensuring school continuity following the closure of educational institutions, most countries were without technological infrastructure and adequate knowledge on protection and response strategies. In addition to this is the precariousness of the infrastructure, electricity supply and internet connectivity, making online courses more difficult to implement.

Between April and May 2020, the most critical period of this health crisis, the United Nations Educational, Scientific and Cultural Organization (UNESCO) sounded the alarm that more than 1.5 billion students and young people around the world were or have been affected by the closure of schools and universities due to the epidemic. One year after the beginning of COVID-19, nearly half of the world's students are still affected by partial or total school closures and more than 100 million children will not meet the minimum reading skills threshold due to the crisis[4].

Dr. Dimitri Sanga,
Regional Director of UNESCO-Dakar and Regional Director a.i. of UNESCO-Abuja

Higher education in West Africa and COVID-19: the situation remains worrying

Under these conditions, African higher education is at a crossroad. In addition to the multiple challenges to address, such as funding, climate change, Artificial Intelligence, education, massive youth unemployment, hunger, and peace and security in Africa, etc, we should add COVID-19 crisis. Faced with the widespread closure of schools and their gradual reopening thereafter, the education sector, including higher education has taken a forced turn to online training and distance education, but not without difficulties. Indeed, African States and their academic institutions that were not prepared for this crisis are facing a multidimensional crisis: health, educational, economic and social. This crisis risks jeopardizing progress towards achieving the SDG4 and its targets.

UNESCO, Abuja

[1] https://africacdc/covid-19/
[2] https://fr.africanews.com/2020/05/12/coronavirus-en-afrique-la-tanzanie-se-tourne-vers-le-covid-organics/
[3] https://fr.unesco.org/covid19/educationreponse

African higher education responses to COVID-19: the cases of Côte d'Ivoire, Nigeria and Senegal

Like all universities in the West African region, the Gaston Berger University (UGB) of Senegal has been affected by the Covid-19 health crisis. Indeed, the pandemic has had repercussions on its functioning, leading to the closure of several Training and Research Units (UFR) for several months. In addition, as part of its policy of service to the community, the UGB has initiated in May 2020 the production of large quantities of hydro-alcoholic gel. Thus, nearly 1,200 liters of gel were produced by students and faculty volunteers. Part of the production was made available to the medical region of Saint-Louis in order to contribute effectively to the fight against the pandemic[5].

Production of hydro-alcoholic gels at the UGB (Source image : UGB website)

UGB students learning remotely

In May 2020, the UGB moved towards teaching through distance learning and making teaching tools and contents available to students. Thus, virtual classes via the collaborative tool "MS Teams" have been created. All the directors of the Training and Research Units and their staff have exchanged with their students via a webinar on the importance of distance learning in this context of Covid-19[6].

The Virtual University of Côte d'Ivoire (UVCI), which has proven expertise in designing and setting up of online courses, has developed helpful and supportive a program to strengthen the capacities of some universities and schools, that were not prepared to put their courses online to ensure the continuity of learning and teaching and organize examinations. This action of UVCI is to put on the advantage of the leaders of this virtual university who understood very early, that in such circumstances, inclusion and solidarity are the levers to be activated to prevent the education systems from suffering from this health crisis[7].

Source: UVCI Conference on the response of the Virtual University of Côte d'Ivoire to COVID-19

On other side, the Open University of Nigeria (NOUN) co-organized with UNESCO Abuja Regional Office, the National University Commission (NUC), the Federal Government of Nigeria, and the Economic Community of West African States (ECOWAS), in June 2019, a regional workshop on online courses, MOOCs, and virtual university devices, ahead of this pandemic. Today, NOUN is a leading example of online learning during this COVID-19 crisis[8]. Not only because the online courses went well, but like the Virtual University of Côte d'Ivoire, NOUN initiated various actions to help schools and other universities in Nigeria to deploy online courses after building the capacity of some of them that requested supports[09]. The Virtual University of Senegal (UVS) and the Senegalese Radio and Television (RTS1), with the support of the Ministry of Education, launched in April 2020 the creation of a television channel dedicated to education, "Learning at Home" to ensure the continuity of courses to students in areas where there is no Internet connection[10].

Source: NOUN website

[06] http://www.lecames.org/covid-19-luniversite-gaston-berger-de-saint-louis-poursuit-ses-enseignements-en-ligne/
[07] Presentation by Dr. Clément LOBO of the Virtual University of Côte d'Ivoire during a webinar on UVCI solutions to   the COVID-19 crisis, April 2020.
[08] www.nounmooc.org
[09] https://mylearningspace.nouedu2.net
[10] https://www.uvs.sn/wp-content/uploads/2020/09/2_sept_2020_RAPPORT-DE-PERFORMANCE_UVS_2019.pdf

[4]https://www.ugb.sn/actualites/1120-covid-19-l-ugb-produit-du-gel-hydroalcoolique-pour-les-populations-de-saint-louis.html
[5] http://www.lecames.org/covid-19-luniversite-gaston-berger-de-saint-louis-poursuit-ses-enseignements-en-ligne/

Priority to multilateral cooperation and international solidarity in response to this crisis

"As part of the creation of the Global Coalition for Education created by UNESCO in March 2020, the Director of the International Center for Higher Education Innovation (ICHEI), Mr. LI Ming and the Regional Director of the 'UNESCO, for the Multisectoral offices of Abuja and Dakar, Mr. Dimitri Sanga, signed on May 05, 2021 a partnership agreement to support the promotion of higher education in the ECOWAS region, which has 15 Member States of the UNESCO. According this partnership agreement, the two parties will cooperate to improve the digital infrastructure of universities in West Africa, promote and co-build capacity building programs in Artificial Intelligence (AI), Big Data, IoT , Cloud Computing with a focus on building the capacity of teachers and researchers in higher education, conducting joint research and designing policies for the digital transformation of higher education, and supporting quality assurance for online and blended training. They also agreed to work with the Ministries of Higher Education and Scientific Research to implement large-scale training programs for teachers and researchers."

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Other specific actions have been put in place by UNESCO in West Africa to support the continuity of teaching and learning in some countries. For example, UNESCO Regional Office in Abuja has put in place an emergency project to build the capacity of teachers and experts in E-Learning and Mobile Learning for four universities in Sierra Leone (Njala University, University of Sierra Leone (USL), Ernest Bai Koroma University of Science and Technology (EBKUST) and University of Makeni (UNIMAK) in 2020. The teacher-researchers and ICT experts benefiting from this UNESCO technical assistance are expected to share good practices in digital education with their counterparts at the four universities involved in this initiative in Sierra Leone. The UNESCO Regional Office in Dakar, for its part, has supported the Ministry of National Education of Senegal so that its teachers can deliver their courses online. To do this, the Virtual University of Senegal (UVS), as an expert in distance learning, was asked to offer its services for capacity building of 200 trainers, who in turn each committed to train 100 others.

The first graduates of UVS

Seize COVID-19 as an opportunity to entrench the E-Learning culture in Africa and rethink African higher education

To address the digital divide and the major challenges that reduce access to quality higher education, the time has come to reflect on inclusive and innovative ways to consolidate this sub-sector in Africa. It is a question of equipping students with knowledge and digital skills, in order to improve their chances of becoming actors in the development of our societies. To achieve this, it will be necessary to develop technological and knowledge infrastructure, but also renewable energies to compensate for the lack or erratic supply of electricity.

In this vein, in 2020 and 2021, in the midst of the global COVID-19 crisis, UNESCO-ICHEI launched online training programs on e-learning, Big Data and Artificial Intelligence (AI) in higher education in order to respond to the urgent needs of higher education institutions in Africa and the developing countries to switch from offline mode to online mode. UNESCO offices in Abuja and Dakar widely disseminated information on the online training of the International Institute of Online Education (IIOE) Big Data and Artificial Intelligence (AI) to ministries and higher education institutions in the region. This activity mobilized hundreds of teachers, lectures and students

who participated in the various online training courses. These interventions have also helped to sensitize the higher education community in West Africa regarding the application of advanced Information and Communication Technologies (ICT) in higher education and scientific research as well as improving the quality of education in the region.

"Despite the major challenges that COVID-19 related to higher education, this pandemic should be seized as a unique opportunity to reinvent higher education and lay the foundation for the future of African higher education."

In this regard, two major events that UNESCO will organize with its partners in the upcoming months appear as right moments for African and global higher education to examine their contributions to the current and future challenges that Africa and the world must address. The first event is the Regional Conference on the Future of Higher Education in Africa, to be held in 2022, and the 3rd UNESCO World Conference on Higher Education, to be held in Barcelona in 2022. The time has therefore come for higher education institutions in Africa to rethink what the future of education would look like and take practical steps to adopt a blended learning approach in education to improve inclusion, access and equity.

In Africa, COVID-19 demonstrated the most significant and positive impact that digital transformation can have on access and quality of higher education and the education system as a whole. Overall, higher education in West Africa has demonstrated resilience during this health crisis by ensuring the continuity of teaching and research activities. Applied to higher education, Artificial Intelligence (AI) and Big Data have great potential to create more personalized curricula, as well as to democratize education worldwide and reinvent effective and relevant scientific teaching, learning and research methods.

Prof. Dr. LI Ming, Director of UNESCO-ICHEI

Dr. Dimitri Sanga, Regional of UNESCO Abuja Office and Director of Dakar Office

Digital Divide
in the 21st Century

Relationship between ICT Development Index and GDP per Capita (current USD)

Size of the Bubble: Number of Internet User in a Country

GDP per Capita (current USD)

30000

3000

300

UAE

Malaysia

Djibouti

Nigeria

Sri Lanka

Egypt

Uganda

Laos

Cote d'Ivoire

Mongolia

Kenya

Pakistan

Philippines

Bangladesh

Indonesia

Cambodia

Senegal

Ethiopia

Gambia

Nepal

Myanmar

Malawi

Togo

0   1   2   3   4   5   6   7   8

ICT Development Index

- Middle East and North Africa
- East Asia and Pacifc
- South Asia
- Sub-Saharan Africa

Source: The World Bank

Underdeveloped countries need more financial support to strengthen their readiness for higher education digitalization.

Economic capacity is a key predictor of a country's ICT development. Higher level of GDP per Capita implies better ICT development.

Sub-Saharan countries are clustered to the bottom left corner of the chart, with lower GDP per Capita and ICT Development Index

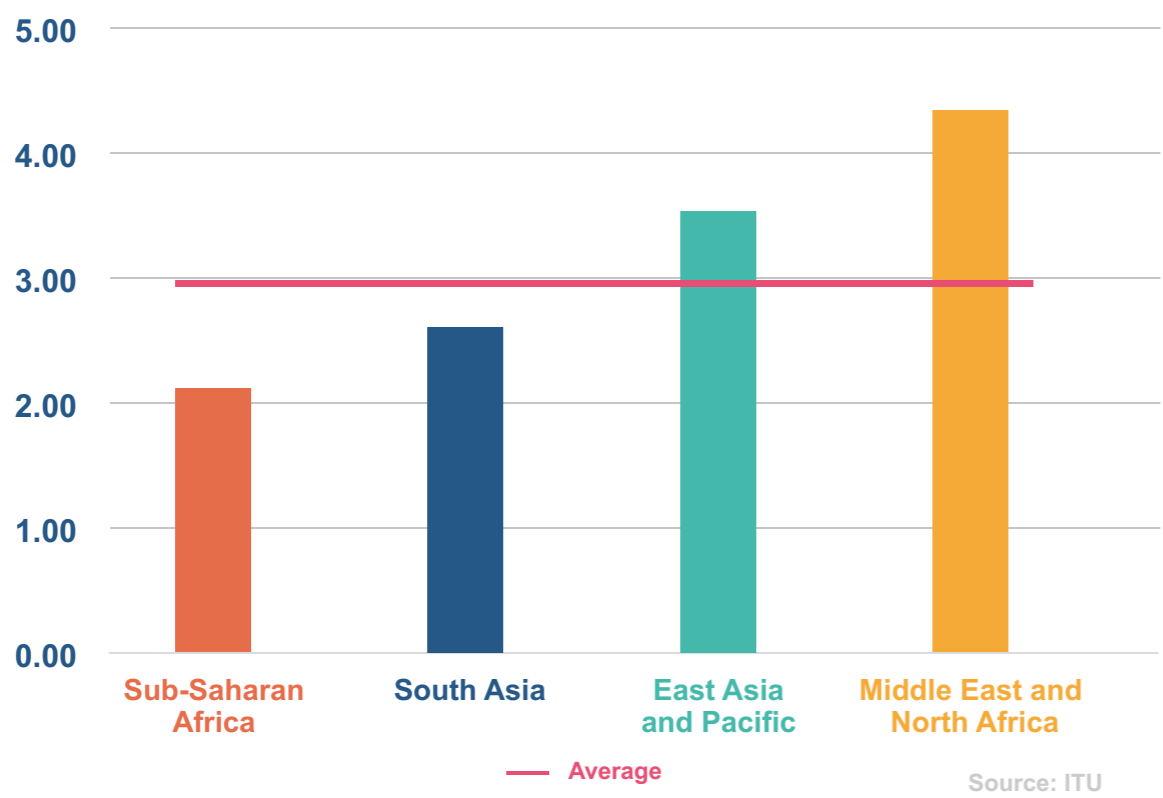Countries with less internet users tend to have a lower level of ICT development.

ICT Development Index by Region

Bar chart showing ICT Development Index values:
- Sub-Saharan Africa: ~2.10
- South Asia: ~2.60
- East Asia and Pacific: ~3.55
- Middle East and North Africa: ~4.35

Y-axis: 0.00, 1.00, 2.00, 3.00, 4.00, 5.00

— Average (~3.00)

Source: ITU

ICT Development Index

- ICT Infrastructure & Access
- ICT Intensity & Use
- ICT Capacity & Skills

What is ICT Development Index (IDI) and Why Does It Matter?

- The IDI aims at measuring the level of ICT development in a country based on three factors: ICT access, ICT use and ICT skills.

- The IDI can be used to analyse a country's progress in ICT development over time, as well as comparing the digital divide across nations.

- The level of ICT development in a country reflects its capacity in using ICT related tools to enhance the development of other fields, including the digital transformation of higher education.

Source: ITU

"Recognizing that ICTs can be development enablers is central to the IDI's conceptual framework" - ITU

Unbalanced development of ICT talents, infrastructure, and usage may impede the process of digital transformation in higher education institutions.

## Percentage of ICT Graduates by Region

8.00%
7.00%
6.00%
5.00%
4.00%
3.00%
2.00%
1.00%
0.00%

South Asia

Middle East and
North Africa

Sub-Saharan
Africa

East Asia
and Pacific

— Word Average

Source: UNESCO; ITU
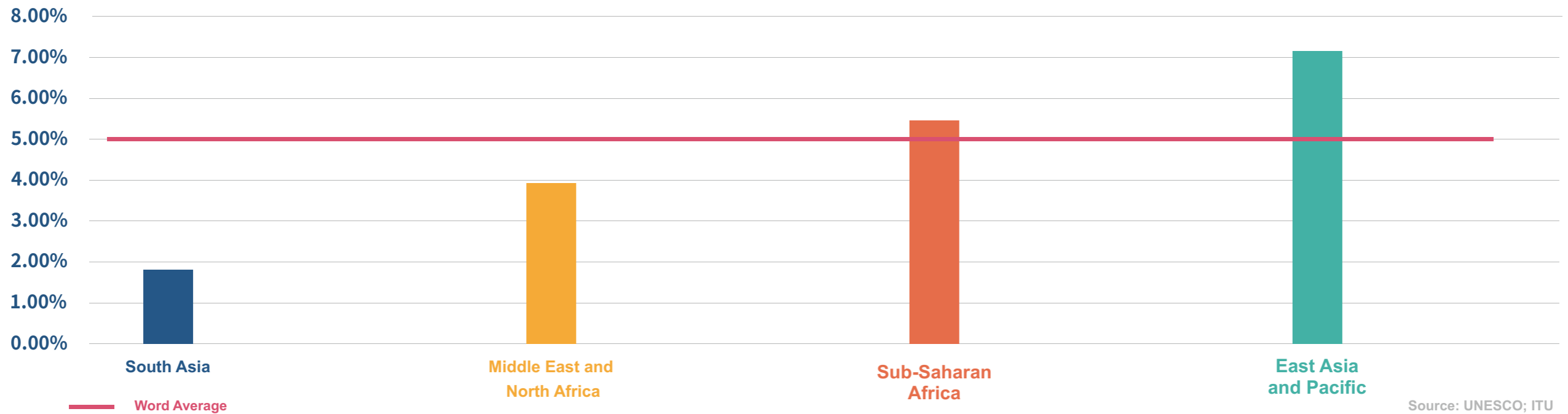
The percentage of ICT graduates in a country reflects the country's capacity and dedication to cultivating ICT talents.

The Institutional Self-Assessment Tool for Blended Learning developed by UNESCO-ICHEI and UNESCO Bangkok highlights "Professional Development" as a key dimension to implementing quality blended learning.

Countries with high percentages of ICT talents do not necessarily have the best ICT Development Index.

Talent cultivation and development in ICT need to happen simultaneously to better facilitate the digital transformation of higher education
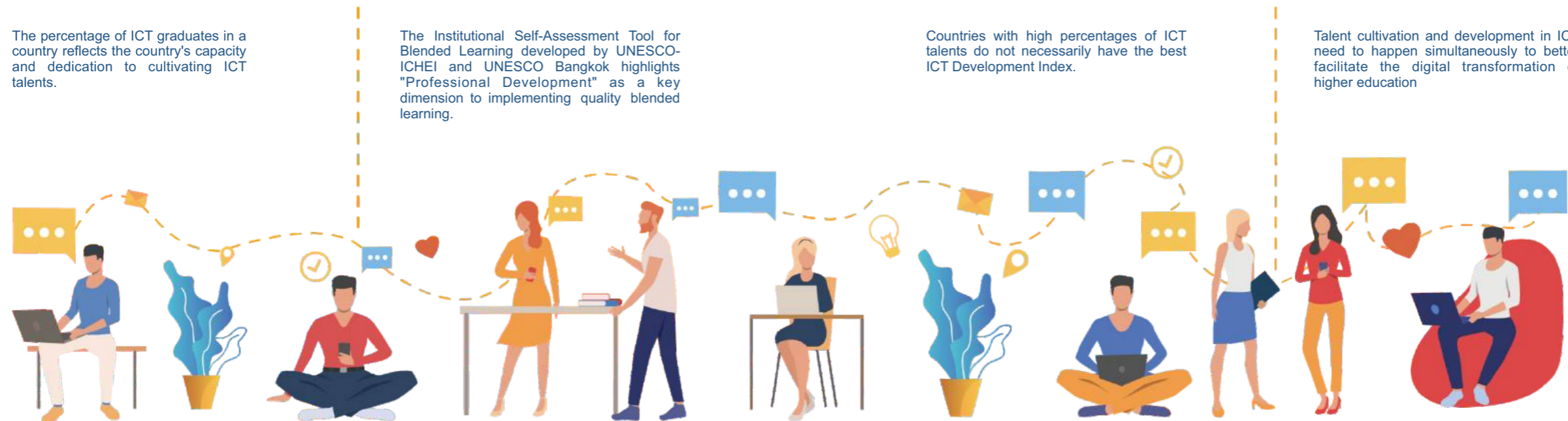
# Access to Broadband Subscription by Region

Sub-Saharan Africa

Middle East and North Africa

South Asia

East Asia and Pacific

- Students in South Asia are **3** times more likely to have access to high-speed public internet than those in Sub-Saharan Africa.

- More than a quarter of the population in East Asia and Pacific have fixed broadband subscription, which is **44** times higher than that in Sub-Saharan Africa.

Percentage of Fixed Broadband Subscription by Income

Bar chart with y-axis from 0.00% to 7.00%:
- Upper Middle Income: ~6.40%
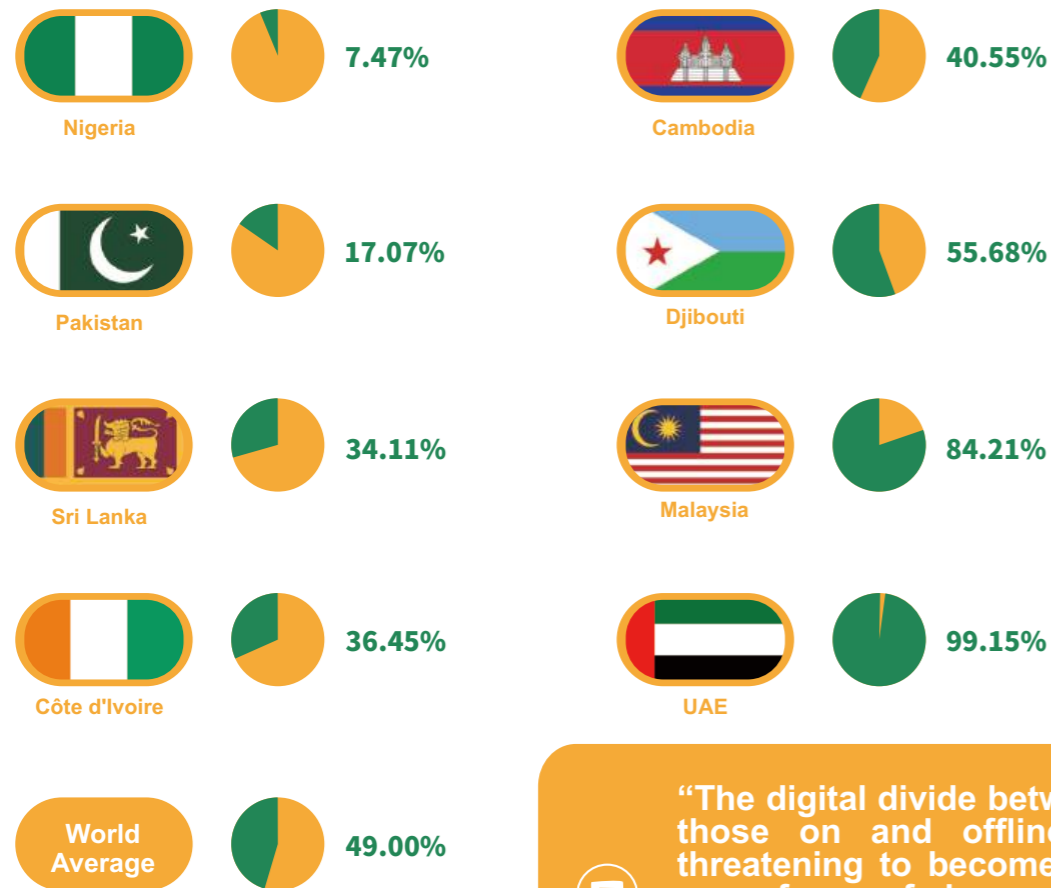- Lower Middle Income: ~2.95%
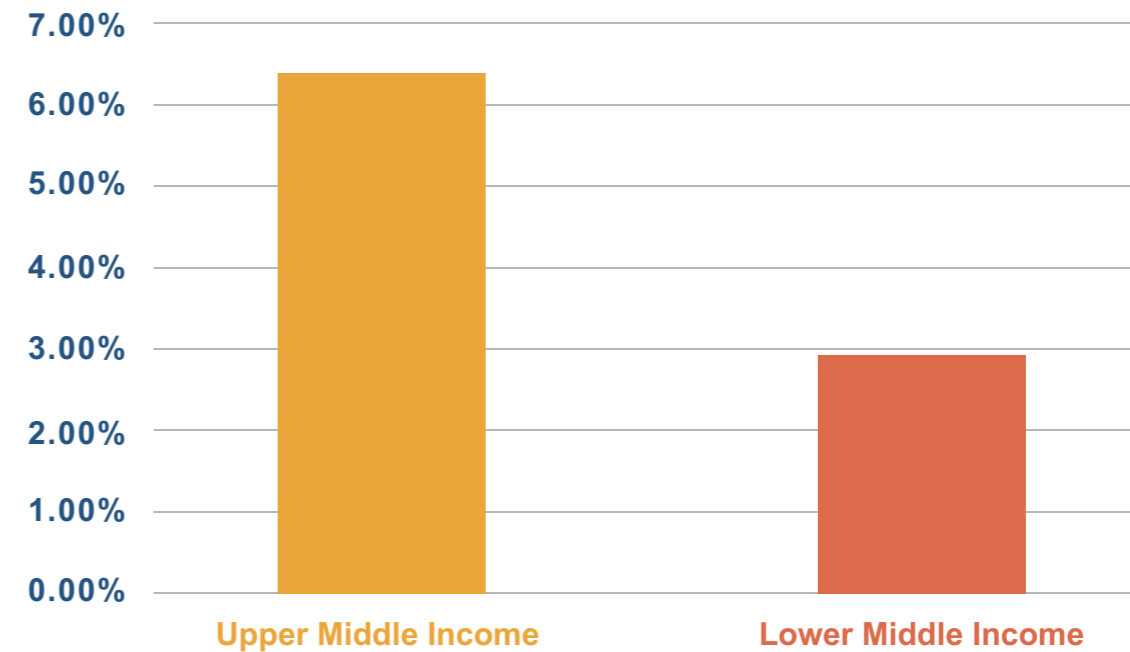
- Students in upper-middle income countries are more than twice as likely to have access to high-speed public internet services than those in lower middle income countries.

"Broadband internet is today seen as critical to the transition to knowledge-intensive economies across the world"
—The World Bank

Source: ITU

Percentage of Internet Users by Country

Nigeria		7.47%
Pakistan		17.07%
Sri Lanka		34.11%
Côte d'Ivoire		36.45%
World Average		49.00%

Cambodia		40.55%
Djibouti		55.68%
Malaysia		84.21%
UAE		99.15%

"The digital divide between those on and offline is threatening to become the new face of inequality, reinforcing social and economic disadvantages."
-UNESCO

- Countries with high number of internet users tend to invest extensively on ICT infrastructure. For example, in 2017, Etisalat spent Dh3 billion to expand internet usage in UAE.

- Low internet penetration could be the result of insufficient infrastructure, including poor electrical power supply, limited number of base stations and low affordability of internet related services.
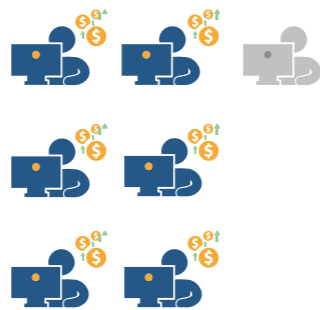
Students in high income countries are 6 times more likely to have access to the internet than those in low income countries.

Fixed Broadband Subscription vs. Internet User

- Fixed broadband subscriptions refers to fixed subscriptions to high-speed access to the public Internet through residence or organizations, which excludes subscriptions via mobile-cellular networks.

- Internet users measurement includes short-term data for individuals who use internet (from any location) in the last 3 months, and it also includes internet accessed through any formes, such as a computer, mobile phone, personal digital assistant, games machine, digital TV etc.

The World Average on Fixed Broadband Subscriptions and Internet Users

|	% of Fixed Broadband Subscriptions	% of Individuals Using the Internet
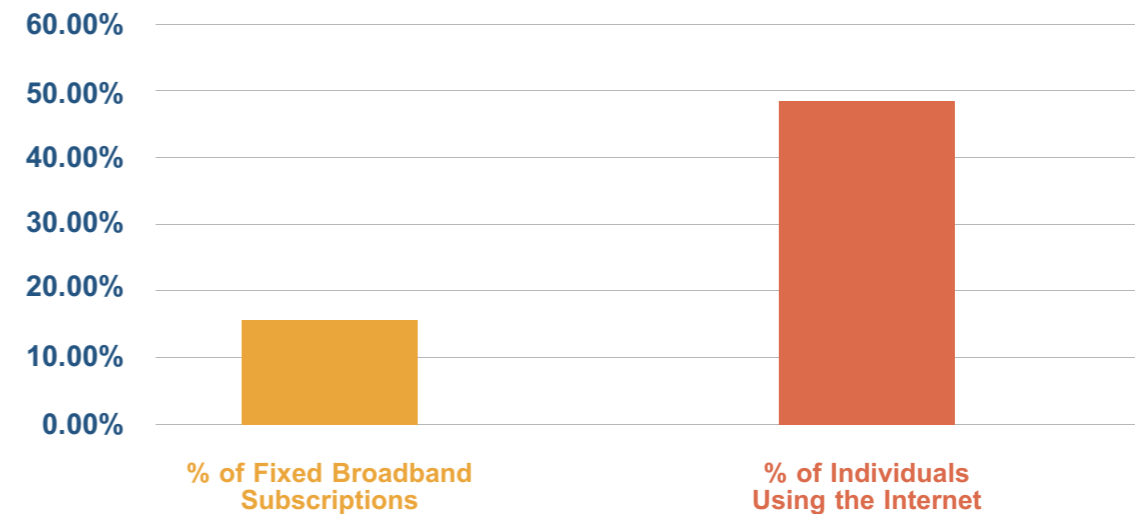
- The high percentage of internet users demonstrates some degree of access to ICT, which might provide information and opportunities for learning.
  However, FBS is a more accurate indicator that measures a country's readiness to implement online learning at scale.

COVID-19
and the Impact on Education

94% of the world's students are impacted by closures of schools and other learning spaces.
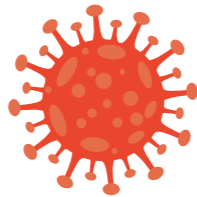
40% of the poorest countries failed to support learners at risk during the COVID-19 crisis.

200 million tertiary education students were impacted by closures of campuses globally.

Less than **25%** of low-income countries established remote learning platforms to support students during the pandemic.

826 million students cannot continue learning during the pandemic due to lack of computers.

During the pandemic, girls:

with higher education diploma are more likely to lose jobs;

are more likely to drop out compared with male learners;

face more challenges of child marriage and gender-based violence due to school closure.

43% of students around the world don't have stable internet access that support remote learning.

Source: United Nations; World Bank

Source: UNESCO; World Economic Forum

The COVID-19 pandemic has exacerbated the exisiting digital divide with uneven distribution of school closures worldwide.

In March 2020, there were 167 country-wide school closure, significantly disrupting or ending the studies of over 220 million post-secondary students.

NO data

Partially open

Closed due to COVID-19

Fully open

Academic break

Source: ITU

Build Back Better:
Digital Transformation of Higher Education in thePost-COVID19 Era

We must seize this opportunity to

"Opportunities offered by digital learning during the pandemic goes beyond a stopgap solution during a crisis. If offers new answers to what, how and where people learn and teach." -- OECD
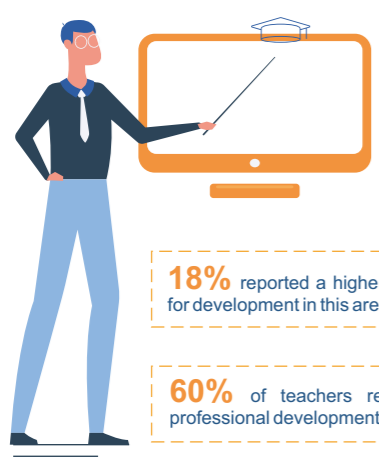
18% reported a higher need for development in this area.

60% of teachers received professional development in ICT.

enhance teachers' ICT skills:

In Lao PDR, UNESCO's Capacity Development for Education (CapED) Programme supports teachers by strengthening their ICT skills in distance teaching, develop national competency standards and build training curricula.
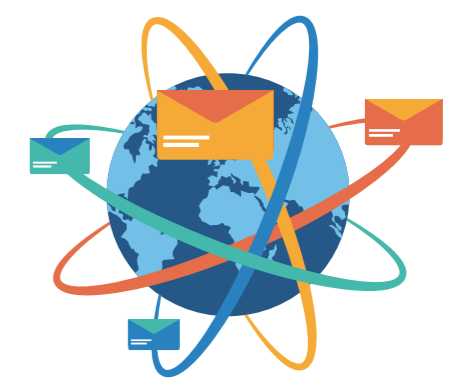
help HEI to build ICT resilience for future crisis

In the COVID-19 plan of Association of African Universities,countries call for massive investments to support the development of campus networks and research and teaching infrastructure.
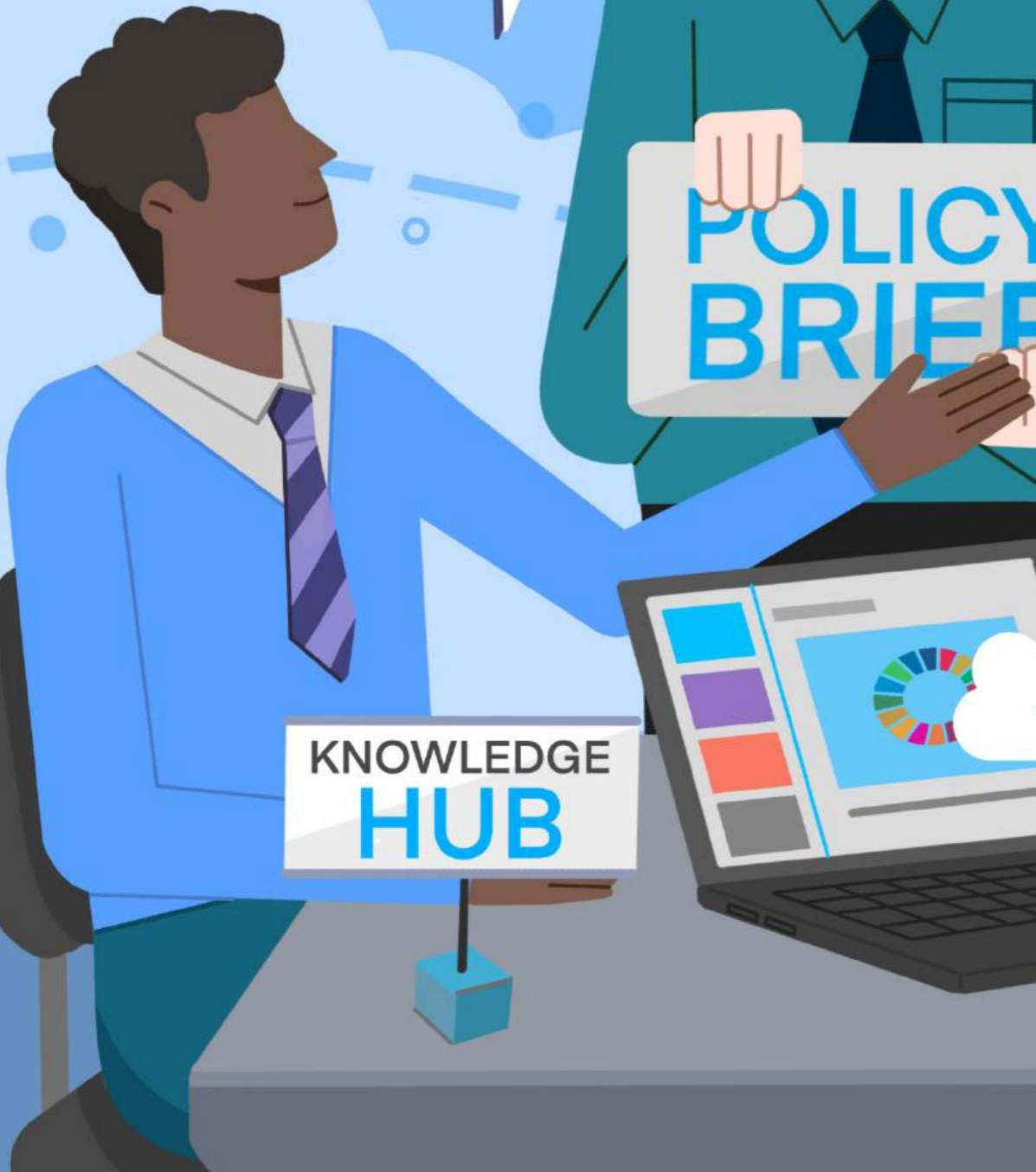
strengthen resource sharing through public-private partnership

Partnered with Tencent, UNESCO-ICHEI has launched the International Institute of Online Education with 15 universities and 9 ICT enterprises, providing open course resources and ICT skills trainings to meet the urgent need of remote teaching during the pandemic.

close the digital divide and enhance equity:

Virtual University of Senegal (UVS) presented the COVID-19 plan to ensure continuity of the courses, with E-Education project contributing to the massification of Higher Education to the reduction of inequalities of access in Senegal.
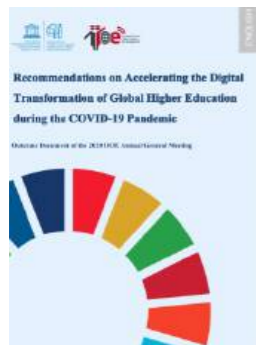
Recommendations on Accelerating the Digital Transformation of Global Higher Education During the COVID-19 Pandemic

Outcome Document of the 2020 IIOE Annual General Meeting The COVID-19 pandemic has created the largest disruption of education in human history, uncovering the urgent need to strengthen the capacity of online teaching in higher education institutions (HEIs). In partnership with global HEIs and enterprises, UNESCO- ICHEI officially launched its flagship project, the International Institute of Online Education (IIOE) in April 2020. IIOE aims to improve access to quality content for teachers' professional development, promote the exchange of knowledge, and strengthen university-industry collaboration on a global scale. During the 2020 IIOE Annual General Meeting on December 9th, IIOE and its partner HEIs and enterprises jointly put forward the recommendations on accelerating the digital transformation of global higher education in response to the COVID-19 pandemic in the hope of supporting global HEIs' efforts in realising SDG4 and Education 2030 Agenda during and after the pandemic.

The recommendations are as follows:
I. Online Education for Equitable and Quality Higher Education
II. Capacity Building of Higher Education Professionals for HEI Digital Transformation
III. Multi-Stakeholder Partnerships for Philanthropic Resource-Sharing
IV. Evidence-based Policies for Online Education Quality Assurance

Building Ecosystems for Online and Blended Learning: Advancing Equity and Excellence in Higher Education in the Asia-Pacific

As COVID-19 upends lives and livelihoods worldwide, the rapid growth of online learning is challenging the relevance of traditional higher education systems. Although efforts to promote and enhance the use of ICT in higher education in the Asia-Pacific have rapidly increased, progress is from sufficient. With support from the UNESCO-Shenzhen Funds-in-Trust (UNESCO-SFIT), the policy brief titled Building ecosystems for online and blended learning: Advancing equity and excellence in higher education in the Asia-Pacific (policy brief) is officially released in February. The policy brief was completed in collaboration with UNESCO-ICHEI, UNESCO Bangkok, the Education University of Hong Kong, Curtin University, Royal University of Phnom Penh, Universiti Putra Malaysia, and the University of Colombo, as well as educational experts and scholars in the Asia-Pacific region. This policy brief focuses on online and blended learning, which is expected to help countries deepen their understanding of achieving equity in higher education.

2020 Global MOOC Conference: The True Year of MOOCs, A New Perspective for Higher Education and Resource Sharing

Massive Open Online Courses (MOOCs) are resources that motivate self-directed online learning. The platforms provide continuous online educational resources globally by releasing free video-based learning resources, assignments and discussion forums that can be accessed by the public. During the pandemic, online education made it possible for universities to continue providing courses even when campuses were shut down. It transformed education around the world and created opportunities for the rapid development of MOOCs. From December 9th to 11th, 2020, the first global conference on MOOCs, the Global MOOC Conference, was held at Tsinghua University. With the theme "Learning Revolution and Higher Education Transformation", the conference aims to build consensus, facilitate innovation, share experience, and showcase new technologies to promote MOOCs and online education development. UNESCO-ICHEI (Shenzhen, China) and Southern University of Science and Technology (SUSTech) jointly organized sub-forum three under the theme of "Resource Sharing for MOOCs and Global Higher Education Cooperation". The sub-forum included discussions on the approaches, methods, case studies and practical experience related to MOOC's application worldwide, especially in developing countries in Asia and Africa. The Review of Global MOOC Conference analyses case studies from different countries based on the UNESCO Blended Learning Self-Assessment Tool for Quality Higher Education to present the commonalities of challenges and lessons learned from MOOCs practices.

International Forum on Artificial Intelligence and the Futures of Education 2020: Developing Competencies for the AI Era

The International Forum on AI and the Futures of Education: Developing Competencies for the AI Era was held in Beijing and online in December 2020. It was co-organized by UNESCO, the Ministry of Education of the People's Republic of China, and the National Commission of the People's Republic of China for UNESCO. Building on the Beijing Consensus, the forum shared policies and practices regarding the role of AI in education, with a specific focus on defining the competencies required in the AI era and strategies to prepare all people to live and work with AI effectively. Forum participants included government ministers and other high-level ministry officials from the Member States, together with representatives of international organizations, NGOs and academic institutions. Topics discussed during the forum are as follows:
I. Internationally recognized ethical principles to regulate AI for the common good
II. Developing AI literacy for all
III. Preparing competencies for the AI era
IV. Implications of the use of AL tools in schools

Ensuring Effective Distance Learning During COVID-19 Disruption – Guidance for Teachers

School closures were mandated as part of public health efforts to contain the spread of COVID-19 from February to May 2020 in most countries. Education systems around the world are facing an unprecedented challenge. Governmental agencies are working with international organizations, private sector partners and civil society to deliver education remotely through a mix of technologies

In order to ensure continuity of curriculum-based study and learning for all. However, the effectiveness of distance learning strategies is conditioned by various types of preparedness. After curricular courses and delivery technologies are in place, teachers are in the frontline to design and facilitate learning activities, monitor and evaluate students' home-based distance learning processes, adjust their learning management accordingly, and assess students' achievement of learning outcomes. This Guidance aims to help teachers understand key issues related to home-based distance learning during COVID-19 school closures and design and facilitate effective learning activities.

AI Guide for Policymakers
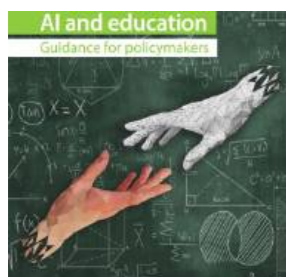
Artificial Intelligence (AI) has the potential to address some of the biggest challenges in education today, innovate teaching and learning practices, and ultimately accelerate the progress towards SDG 4. However, these rapid technological developments inevitably bring multiple risks and challenges, which have so far outpaced policy debates and regulatory frameworks. This publication provides a detailed analysis of the emerging trends and implications of AI for teaching and learning. It introduces the challenges of harnessing AI to achieve SDG 4 and offers concrete and actionable recommendations for policy-makers to plan policies and programmes for local contexts.

Let's Talk AI in Education

The COVID-19 pandemic has posed unprecedented challenges for Higher Education Institutions (HEIs) worldwide to consider digital approaches in ensuring education continuity and sustainability. Various innovations and applications based on Information and

Communications Technology (ICT) have proven valuable in facilitating such transformation for HEIs during the pandemic. Artificial Intelligence (AI) is also gaining prominence in education reform while concerns are simultaneously raised over its far-reaching implications and ethical issues.

On April 2, 2021, IIOE launched the first special AI Webinar Series of 'Let's Talk AI in Education'. The virtual event focused on promoting knowledge-sharing, interdisciplinary conversations and critical discussions of the ethical concerns of AI. Three experts from different industries were invited to discuss AI and explore its implications for higher education.

Higher Education with AI: Global perspectives & Local challenges

AI is enabling tremendous improvements in Higher Education by providing immersive and individualised learning experiences. Simultaneously, Higher Education is at its crossroads, integrating AI technologies and pedagogies to transform the conventional norms in preparation for future challenges and opportunities in an increasingly digitised world.

On April 23, 2021, IIOE launched the second special AI Webinar Series of 'Higher Education with AI: Global perspectives & Local challenges'. Leading scholars and experts were invited to engage the audience in discussing higher education innovation and exploring the possibilities for future education.

IIOE Launched the 'Multilevel Training Series - AI General Level'

On April 26, 2021, IIOE (International Institute of Online Education, UNESCO-ICHEI) launched the 'IIOE Multilevel Training Series – AI General Level'. This training session is a part of the ICT- related training series that aims at enhancing the ICT competencies for teachers, cultivate ICT management capacities in higher education, and promote the digital transformation of HEIs. The training covered topics on the theories and ethics of AI and was delivered by **Professor. Bin Chen** from Peking University, and **Dr. Wen Zheng** from Waseda University.