



Co-constructing a global ecosystem for higher education digital transformation

— International Institute of Online Education
Developmental Report

(2019-2022)





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The International Centre for Higher Education Innovation under the auspices of UNESCO (Shenzhen, China) was established on June 8th, 2016, and is the tenth Education Sector UNESCO Category 2 centre in the world. On November 13th, 2015, the 38th General Conference of UNESCO approved the establishment of UNESCO-ICHEI in Shenzhen, China, which is the first Category 2 centre for higher education in China.

Preface



As a global teacher training platform that has only been live for three years, IIOE still has a long way to go to achieve its goal of efficiently realizing digital transformation in empowering development. IIOE is still in the process of continuous practice, exploration, and iteration. In the future, how to scale up IIOE's operations, how to emphasise the quality of IIOE's activities, and how IIOE and UNESCO-ICHEI could extend their current role and become a think tank are important topics for the next stage of IIOE. The current development practice of IIOE proves that "things are done by people, and roads are built by people". I believe that as long as we keep up with the trends of global development, and closely align with partners' needs, operate with a scientific attitude, exert a spirit full of wisdom and uphold perseverance, down-to-earth, step-by-step, IIOE can grow into a flagship and active agent for the digital transformation of higher education in developing countries in the future.

The question of "How to carry out cooperation activities between the centre and its partners on a regular basis?" has sprouted since the centre was established. Since its inception in 2016, many activities have been deployed regarding ICT capacity building by the International Centre for Higher Education Innovation under the auspices of UNESCO (UNESCO-ICHEI). After discussions and consultations with many experts, the idea of building an international online education platform is vividly portrayed.

In December 2019, the International Institute of Online Education (hereinafter "IIOE") was officially established by UNESCO-ICHEI in conjunction with 15 higher education institutions and 9 enterprises worldwide. On the occasion of the third anniversary of the establishment of IIOE, the IIOE Secretariat summed up the practice and experience of the past three years, compiled and released the Co-constructing a global ecosystem for higher education digital transformation —— International Institute of Online Education Developmental Report, which systematically summarized the needs of higher education institutions in IIOE developing countries for the digital transformation, through the "co-consultation, co-construction, and shared-benefits" transnational, cross-sector public-private partnership, built an international public learning platform that provides public online courses and training, and the systematic empowerment of university teachers' digital capabilities, meanwhile the relevant experience is captured.

IIOE is an innovative vision based on ICHEI's years of experience in international higher education cooperation and practices, and promptly responds to the authentic needs of quality international educational services in developing countries. Since the establishment of IIOE, partner universities and related institutions' active participation in the implementation of the IIOE project has driven IIOE's growth drastically, which can be described as the crystallization of collective wisdom. Dozens of institutions participated in providing curriculum resources and organizing training, and over 10,000 teachers from more than 130 countries benefited from the training programmes organized by IIOE. The emergence of IIOE complies with the needs of developing countries, and IIOE played a vital role in the pandemic and has seized the challenge as an opportunity for growth. A series of achievements and experiences summarized in the report show that empowering teachers through digital learning platforms for public benefit, supporting the needs for future talent cultivation of higher education institutions in developing countries, and realizing digital transformation have become a consensus of many partners of IIOE.

The important basis for the continuous development of IIOE is the development principle and cooperation mechanism of "co-consultation, co-construction, and shared benefits". The establishment of IIOE is inseparable from the deep involvement and collaboration among experts and institutions of the developing countries in Asia and Africa, and especially IIOE national centres under the leadership of the IIOE rotating presidency units from 2020-2023 (Ain Shams University in Egypt, University of Engineering and Technology (UET) Lahore in Pakistan, University of Nairobi in Kenya, and Universiti Putra Malaysia in Malaysia).

Institutions and teachers in developing countries have gradually grown from participants in digital transformation training programs to leaders in the digital development of local education. With the support of localization mechanisms such as IIOE National Centres, IIOE is enabling more teachers to obtain rich and diverse digital development resources, which has created a new model of multilateral cooperation in the context of global multiculturalism.

In the three-year history of IIOE, the cross-sector cooperation mechanism in which enterprises participated is also particularly important. The Tencent Charity Foundation's philanthropic donation to the IIOE project has supported us in building a multilingual and accessible online education platform, bringing free training resources and teaching tools to thousands of teachers. The learning network of Huawei ICT Academy has brought valuable insights and remarkable support to IIOE. Enterprises such as Weidong Cloud Education, Guangzhou Createview Science and Education, and Seewo have contributed to 6 phases of a total of 34 smart classroom project installations around the world, building an important carrier for the digital development of higher education institutions in developing countries, and providing a steady stream of impetus for the digital transformation of higher education.



Director, **LI Ming**

International Centre for Higher Education Innovation under the auspices of UNESCO (Shenzhen, China)
Chair Professor of Southern University of Science and Technology

Remarks

TANG Qian

Former Assistant Director-General
for Education of UNESCO, 2020

With the hard work of all the staff, IIOE accomplished impressive achievements with many concrete results. It has the right style of work and made the right decision to choose Africa as one of the regions to focus on. The type of work UNESCO-ICHEI is doing turned the pandemic disaster into an opportunity. IIOE developed an attractive model for the field of international education.

——2020 International Advisory Committee Meeting of UNESCO-ICHEI



CHEN Yidan

Core Founder of Tencent, Founder of the Tencent
Charity Foundation, Founder of Yidan Prize,
Founder of Wuhan College, 2022

IIOE forms a proper understanding of its own role, and has provided partner HEIs with quality resources in the past three years, which is fairly meaningful in such a pandemic.

——2022 Governing Board Meeting of UNESCO-ICHEI



QIN Changwei

Secretary General of the National
Commission of China for UNESCO, 2022

Congratulations on the timely and successful launch of IIOE, which has drawn the attention from the Ministry of Education leadership, who are quite satisfied with it and willing to offer support. It is hoped that IIOE will continue to adhere to the principle of "extensive consultation, joint contribution and shared benefits", and figure out a feasible design of partnership expansion mechanism and course entry assessment mechanism so that IIOE will enjoy smoother development to attract more developing countries and to build itself into a powerful platform for teachers' empowerment and higher education transformation.

——2022 Governing Board Meeting of UNESCO-ICHEI



Prof. Shahbaz Khan

Director of UNESCO Beijing Office, 2022

The Micro-credential Project (a pilot project launched by IIOE Malaysia National Centre) is conducive to the improvement of regional and global education quality as well as the development of remote digital education. The Smart Classroom Project is also of great meaning.

—2022 Governing Board Meeting of UNESCO-ICHEI



Mr. Peter Wells

Chief of Education, UNESCO Harare Office, former
Chief of Higher Education Section, UNESCO

The IIOE continues to provide a perfect platform and mechanism for learners from a variety of backgrounds and starting points to learn, re-skill and up-skill in a unique, innovative and quality-driven way. ICHEI has been valued partner in higher education since its founding, with close collaborations on a number of critical milestones for the organization and the global higher education communities, not least the 3rd World Conference on Higher Education in 2022 as well as priority initiatives in Africa such as the Shenzhen project on quality assurance in higher education. We look forward to continuing the excellent partnership with the ICHEI/ International Institute of Online Education as we roll out UNESCO's Flagship "Campus Africa" Programme (2022-2029).

—Remark for IIOE's Three-Year Development Report



Prof. Mahmoud El-Meteini

President of Ain Shams University (Egypt), IIOE rotating
presidency unit of 2020

As the first rotating presidency unit of the IIOE, we hope that IIOE will play a major role in enhancing the quality of higher education in Egypt, as well as in all co-initiator universities in African and Asia-Pacific countries. I would like to express my sincerest gratitude to UNESCO-ICHEI's unwavering support and cooperation over the years, especially during the COVID-19 pandemic, without which IIOE would never have seen the light. I would also like to thank all IIOE partner universities for their support for Ain Shams University as the IIOE rotating presidency unit in 2020. Ain Shams University is committed to the IIOE Egypt National Centre, which has become a magnet driving the rapid advancement of digital transformation, which is becoming the norm rather than the exception worldwide.

— Quote from 2020 IIOE Annual Partnership Meeting and the
IIOE Egypt National Centre Pilot Project Launch Meeting



Prof. Dr. Syed Mansoor Sarwar

Vice-Chancellor of the University of Engineering and Technology (UET), Lahore, Pakistan. IIOE Rotating Presidency Unit for 2021



The UET Lahore is committed to pursuing higher education digital transformation and IIOE agenda beyond the presidency. We would love to contribute to the IIOE advocacy and call for the engagement of partner HEIs with IIOE. While working together in HEW capacity building and HEI digital transformation more actively and proactively, we could build a more robust IIOE network and make more contributions to shape the future landscape of higher education in global south and beyond.

—Quote from CLOUD Issue 2

Prof. Stephen Kiama

Vice Chancellor of the University of Nairobi, IIOE Rotating Presidency Unit for 2022



IIOE has managed to become an international higher education digital transformation alliance, covering 56 partner universities in 31 countries and 22 partner enterprises, serving more than 10,000 higher education teachers in 135 countries around the world. This is a great achievement within a short period.

—Quote from CLOUD Issue 6

YBhg. Dato' Prof. Mohd Roslan Sulaiman

Vice Chancellor, Universiti Putra Malaysia (UPM), IIOE Rotating Presidency Unit for 2023



It was a great honor for UPM to become the 2023 Rotating Presidency Unit. Looking forward to more constructive research and practice. UPM hopes to conduct closer cooperation with UNESCO-ICHEI, the University of Nairobi and other partner universities and institutions, playing a bigger role in the digital transformation of higher education.

—Quote from 2022 IIOE Annual Partnership Meeting

IIOE Secretariat and Rotating Presidency Unit



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Chapter 1

Introduction

1.1 IIOE: The Flagship Initiative in UNESCO-ICHEI



The Education 2030 Agenda, adopted by the United Nations General Assembly in 2015, sets out the goal and action plan to achieve the UN's Sustainable Development Goal 4 (SDG4) by providing inclusive and equitable quality education and promoting lifelong learning opportunities for all by 2030. Digital transformation, as a crucial strategy for global higher education institutions (HEIs) to achieve the SDG4 and the Education 2030 Agenda, offers the possibility to increase access to quality education, enhance teaching and learning, increase efficiency and effectiveness, and foster innovation and entrepreneurship. The International Centre for Higher Education Innovation under the auspices of UNESCO (UNESCO-ICHEI) ties its work to SDG4 and the Education 2030 Agenda, focusing on the need for digital transformation in higher education in developing countries and highly values the need for enhancing digital competency of HEIs' workforce, has initiated a series of activities in this realm. Since June of 2016, UNESCO-ICHEI has been brewing the idea of building an educational network for HEIs worldwide. Through rounds of consultation with experts from international organisations, the education sector, administration authorities, and years of ideation, the International Institute of Online Education(IIOE) was launched in December 2019. The conceptualisation of IIOE was a joint effort after consulting with experts including(with no particular order):

- Ms. Stefania Giannini, UNESCO Assistant Director-General for Education,
- Mr Peter Wells, former Chief of Higher Education Section of UNESCO,
- Mr. DU Yue, Director of the Division for Cooperation, Intersectoral Follow-Up and Partnership, in the Africa Department UNESCO
- Mr. TANG Qian, Former Assistant Director-General for Education of UNESCO
- Prof. WANG Libing, Senior Programme Specialist in Higher Education, Chief of Section for Educational Innovation and Skills Development, UNESCO Asia-Pacific Regional Bureau for Education (UNESCO Bangkok)

- Mr. QIN Changwei, Secretary General of the National Commission of China for UNESCO
- Prof. Freddy Boey, Deputy President (Innovation & Enterprise) of the National University of Singapore (NUS)
- Prof. ZHAO Jianhua, Professor and Associate Director, Center for Higher Education Research, Southern University of Science and Technology (SUSTech)
- Prof. LU Chun, Chair Professor, Vice President of SUSTech, Deputy Director of UNESCO-ICHEI
- Mr. ZHANG Yu, Chairman, Guangzhou Createview Education Technology Co., Ltd.
- Mr. WANG Min, Industry-Academy Cooperation Senior Consultant of UNESCO-ICHEI; Director of Shenzhen Municipal Committee for the Wellbeing of the Youth
- Mr. FENG Baoshuai, director of the Global Training & Certification Dept. of Huawei Enterprise Business Group

In April 2020, IIOE released its learning platform in collaboration with Jiker Academy (jiker.com). The joint initiation partners of IIOE include: Addis Ababa University (Ethiopia), Ahmadu Bello University (Nigeria), Ain Shams University (Egypt), Makerere University(Uganda), Mongolian University of Science and Technology(Mongolia), Royal University of Phnom Penh (Cambodia), University of Colombo (Sri Lanka), University of Engineering and Technology(Pakistan), University of the Gambia (Gambia), University of Nairobi (Kenya), University of Djibouti (Djibouti), Southern University of Science and Technology (China), Xidian University (China), Shenzhen Polytechnic(China), Shenzhen Institute of Information Technology(China), Huawei Technologies Co., Ltd.(Huawei), Weidong Cloud Education Group Co., Ltd.(WEDON), Guangzhou Createview Science & Education Co., Ltd.(Createview), IFLYTEK Co., Ltd., UBTECH Robotics Co., Ltd., CIO TIMES, Shenzhen Dianmao Technology Co., Ltd., and Jiker Academy. This chapter will discuss how IIOE as a flagship project of UNESCO-ICHEI was conceived and its operational mechanisms.

1.1.1 Conceptualising and Launching IIOE (Why IIOE, Vision and Mission, What is IIOE)

IIOE is an effort guided by Education 2030 Agenda and SDG4, that aims to advance on a priority basis cooperation around the world, narrow the North-South gap, and address development imbalance through providing upskilling ICT competency, technical support, and professional development. To support the digital transformation of HEIs and realise the SDG4, specifically SDG4.3 of ensuring 'equal access for all women and men to affordable and quality technical, vocational and tertiary education', UNESCO-ICHEI, along with its global partner HEIs, enterprises, and international/regional/national organisations, jointly initiated IIOE in December 2019. The design of IIOE strives to promote and build up a collaborative ecosystem for public learning and empowerment of digital competency among developing countries by means of joint-contribution and shared-benefits, harnessing the Global Development Initiative to enhance the access of developing countries to quality higher education. Aligning itself with the SDG 4, the mission of IIOE is to enhance the capacity of HEIs and their teachers for increasing and enhancing their students' access to equitable quality higher education. IIOE aims to fulfil this **mission** by:

1

Upskilling digital competency of the higher education workforce from partner HEIs in Africa and Asia-Pacific, and catalyse their process in the digital transformation;

2

Building partner HEIs' capacity and environment for a digital ecosystem for teaching and learning to realise higher education reform;

3

Providing quality open educational resources(OER) and public digital learning programmes for partner HEIs to meet their demand for quality higher education;

4

Building a culture of exploring and localising emerging technologies like AI, AR/VR, Big Data through IIOE secretariat and its national centre network, improve personalised quality learning for the future-facing higher education talent cultivation in the digital era;

5

Enhancing access to quality higher education with gender equity and socio-economic equity for marginalised communities and developing countries, and;

6

Providing on-demand consultation and evidence-based policy recommendations for the digital transformation of higher education.

IIOE plays **multiple roles** and carries out functions that are beyond an online learning platform. IIOE serves as:

1

An online learning platform and open resource repository hosting quality higher education courses that focus on developing digital competencies of the higher education workforce from partner HEIs to meet the demands of higher education digital transformation;

2

An advisory consortium to guide partner HEIs and teachers to upskill their digital competency, infrastructure, strategic planning, and digital governance through the IIOE National Centre Mechanism, public digital learning platform and partners to realise the digital transformation of higher education;

3

A catalyst and incentive mechanism to support partner HEIs make use of emerging technologies to enhance quality and personalised talent cultivation;

4

A higher education collaborative network consisting of UNESCO-ICHEI, IIOE's National Centres and partner HEIs in developing countries, HEIs in China and developed countries, partners in the private sector, international organisations, and other stakeholders in the higher education sector. This network promotes the joint contribution and shared benefits of professional learning and OER, infrastructure upgrade, strategy-planning consultation for the transforming higher education.

1.1.2 IIOE Organisational Structure and Governing Board

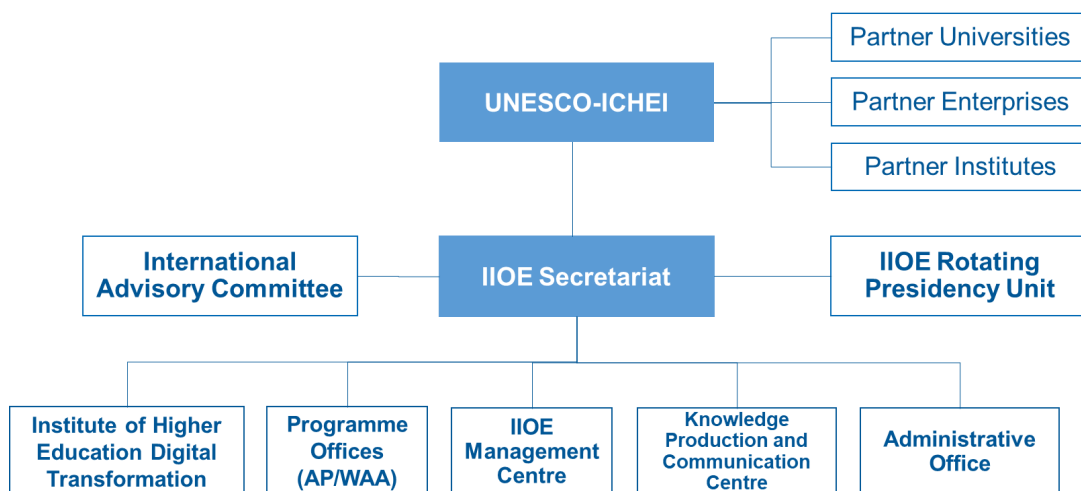
Organisational structure of IIOE

The global collaborative initiative proposed by IIOE aims to optimise the mobilisation of international resources. Stem from selected HEIs and enterprises as the joint initiating parties of IIOE, IIOE now has 8 IIOE National Centres, 82 partner HEIs (49 of which are local partners of local IIOE National Centres), and 22 enterprise-partners around the world.



IIOE Governance/Partnership

IIOE consists of three units: the **Secretariat** as the coordinating unit, the **International Advisory Committee** as the consultation unit and the **Rotating Presidency Unit**. The Director of UNESCO-ICHEI serves as the Secretary-General of the Secretariat. Each partner of IIOE should appoint one personnel from their management team who could coordinate teaching, management and technology, and one personnel in charge of the IIOE implementation to join the Secretariat. The International Advisory Committee provides decision-making consultation for IIOE. Through the annual meeting (international consultative meeting) of IIOE, suggestions and comments on the implementation of IIOE will be collected from all parties, and the discussion of issues and challenges encountered in the implementation of IIOE will be facilitated. The rotating presidency unit of the year will be responsible for hosting the IIOE annual meeting (international consultative meeting), providing opportunities for all parties of IIOE to exchange and communicate on their implementation processes and outcomes of the year, consolidating the promising practices among all IIOE partners, and providing feedback to the Secretariat.



AP: Asia-Pacific
WAA: West-Asia and Africa

Structure and Staff of IIOE

1.1.3 Addressing the Capacity Building Demand of Higher Education for Digital Transformation

IIOE's primary commitment is to assist higher education stakeholders in developing countries to solve the problem of limited connectivity, lacking devices, insufficient access to digital resources and lack of relevant skills in technological resources for teaching and learning. IIOE is also committed to supporting HEIs in developing countries in accelerating the progress of the digital transformation for quality and equitable higher education. To enhance the level of relevant digital and pedagogical skills among university staff, as well as to promote the digital competency of university staff, IIOE also develops solutions for the capacity building of educators in HEIs.

Coincidentally, IIOE launched during the outbreak phase of the COVID-19 pandemic, and served as an emergency plan that supported teachers and HEIs maneuver through the disruption. To address the urgent needs of HEIs in developing countries to carry out online teaching and learning since the pandemic, IIOE organised targeted training sessions on the design and delivery of online learning in multiple languages, and further structuralized the training programmes, online courses, and OERs with the Competency Framework and Digital Competency Course Framework for the HEI Workforce that were supervised by the IIOE Quality Assurance(QA) for quality outcomes, providing university teachers and administrators in Asia and Africa with timely and targeted knowledge sharing. Currently, the primary channel of IIOE's work in realising its mission includes donations of Smart Classrooms(SCR), offering digital capacity-building courses and programmes that are jointly built or disseminated through the IIOE National Centre mechanism for scaled impact. IIOE now provides over 350 online multilingual courses for university teachers covering a range of topics in ICT-teaching capabilities, including Cloud Computing, Big Data, the Internet of Things, Artificial Intelligence, learning design, smart education, and so on. IIOE offers practical support through webinars, self-paced courses and training programmes, in order to improve the digital competency of educators. So far, over 10,000 teachers from 135 countries and regions have taken part in the courses, webinars, and workshops through the IIOE digital platform.

1.1.4 A Joint Initiative of Public and Private Partnership

The conception, establishment, and operation of IIOE interwove with its partners in the public and private sectors. The idea of building a "global educational network of higher education" was conceived at the end of 2016, and was immediately cherished by leading experts from the higher education sector, educational administration agencies, and international organisations that serve in the higher education sector. In the following two years of brewing and refining the idea, IIOE received endorsements and trust from international organisations and HEIs and became a trusted agent that facilitates enterprise knowledge contribution to talent cultivation in public partner HEIs. Furthermore, by establishing cooperation with enterprises, IIOE canvass enterprises to donate SCRs that can be used as training facilities and digital teaching hubs that improve access to quality education for marginalized areas and groups. By leveraging the strengths of each partner, such public-private-partnership(PPP) can help to address persistent challenges in the education sector and provide more enablers for the digital transformation of HEIs, and ultimately achieving the goal of equitable quality education for all.

Hereby, IIOE must acknowledge the supervision and full support from UNESCO-ICHEI's Governing Board, including the Shenzhen Education Bureau, the National Commission of China for UNESCO, Higher Education Section and Priority Africa and External Relations Sector at UNESCO Headquarters, UNESCO field offices in Asia (UNESCO Beijing, UNESCO Almaty, UNESCO Bangkok, UNESCO Jakarta, UNESCO Beirut) and Africa (UNESCO Abuja, UNESCO Dakar, UNESCO Nairobi), UNESCO International Institute for Higher Education in Latin America and the Caribbean, UNESCO Institute for Information Technologies in Education, AUN, SEAMEO Secretariat, Arab League Educational, Cultural and Scientific Organisation (ALECSO), and experts from partner HEIs. Furthermore, IIOE needs to make acknowledgment of the philanthropic donation

made by the Tencent Charity Foundation in the amount of 10 million RMB, and the philanthropic donation made by BYD Company Limited in the amount of 2 million RMB. Additionally, many other partners have made vital contributions in forms, including hardware devices, digital platforms, labour support and course resources. These organisations are: Southern University of Science and Technology, Xidian University, Shenzhen Polytechnic, Shenzhen Institute of Information Technology, Huawei Technologies Co., Ltd.(Huawei), Tencent Cloud, Weidong Cloud Education Group Co., Ltd.(WEDON), Guangzhou Createview Science & Education Co., Ltd. (Createview), Guangzhou Shirui Electronics Co., Ltd. (Seewo), IFLYTEK Co., Ltd., Jiker Academy, UBTECH Robotics Co., Ltd., CIO Times, Shenzhen Dianmao Technology Co., Ltd., Kingsoft Office Software(Kingsoft), Beijing Changjiang Culture Ltd., Phoenix Education, Wisdom House Culture Industry Group, Jiangxi KMAX Industrial Co., Ltd.



1.2 IIOE and its Six Unique Characteristics



Over the course of three years of development, IIOE formulated some unique characteristics that define the rationale and practices of its work. This section will discuss the six unique characteristics of IIOE that depict the core value of IIOE.

Chapter Characteristics	Chapter 2 Empowering Teachers' Digital Teaching and Learning Capacity Building	Chapter 3 Capacity building of Higher Education Workforce: IIOE Past Experiences and Future Reflections	Chapter 4 Empowering Digital Competency of HEIs through Multi- functional Facility	Chapter 5 IIOE Quality Assurance	Chapter 6 IIOE National Centre - IIOE's global initiative for localisation and inclusiveness
Capacity Building of HEIs and Higher Education Ecosystem	●	●	●	●	●
Holistic Approach towards Inclusive and Equitable Quality Higher Education	●		●	●	●
A Design for Scale with Localisation for Inclusion			●		●
Multilingual Engagement and Resources	●	●			●
Joint contribution and shared benefits to meet global development goals	●		●		●
International and Local Partnership	●	●	●	●	●

Mapping of the Characteristics and the Report Chapters

1.2.1 Capacity Building of HEIs and Higher Education Ecosystem

With a global community of higher education institutions (HEIs) worldwide, IIOE is dedicated to empowering the capacity building of HEIs with the leverage of digital technologies. The expansion of access to quality education as a basic human right has been a global consensus, though faced with tremendous challenges such as the large-scale, country-by-country institutional closure caused by the COVID-19 pandemic, unequal balance of educational resources and financial support, and the widening digital gap among different regions. With the mission of building resilience and facilitating innovation for HEIs in developing countries to cope with future-oriented demands on various issues, such as talent cultivation, faculty development, infrastructural upgrading, institutional management, and university-industry-research cooperation, IIOE adheres to the United Nations Sustainable Development Goals and the UNESCO Futures of Education visions of building higher education back better.

IIOE's work is centred around empowering teachers' digital competencies through various teacher education activities such as courses, training programmes, and webinars, gathering higher education professionals worldwide as a collaborative community. At the institutional level, IIOE supports partnering HEIs in different regions to develop local plans and frameworks to integrate a diverse set of digital technologies, collectively re-think pedagogical approaches, conduct capacity-building and related professional development programmes, and establish academic research and international cooperation activities, thus enhancing institutional digital capacity upskilling as a holistic approach. Promising reimagining of a future higher education ecosystem is underway, so that partnering HEIs and private stakeholders can expand educational opportunities, and guide forward dialogues and actions to take the transformation of higher education digital transformation forward. The principle of co-consultation, co-construction, and co-sharing mechanism reinforces collaboration among different agencies and institutions within and beyond the IIOE network, benefitting HEIs and educators worldwide.

1.2.2 Holistic Approach towards Inclusive and Equitable Quality Higher Education

The dynamics of changes and challenges that higher education systems globally are facing is a complex problem that needs to be acknowledged in multiple layers and perspectives. Challenges in the quality of higher education and equitable access to higher education need to be addressed, like education itself, through a holistic approach. IIOE holds this belief and interprets it as the establishment of mechanisms in the combination of infrastructural support, funding, capacity building, policy dialogues and consultation, and QA system of online and blended learning. IIOE initiated SCR Projects to promote the digital learning environment in Asian and African HEIs, and underpins the power of digital teaching and learning in facilitating inclusive professional development programs for HEI personnel (including teachers, technicians, teacher educators, and school leaders). Additionally, IIOE also works with HEIs as a consultancy assisting in the design of curriculums by providing OERs of emerging technologies, and enhancing talent cultivation. This holistic approach assures inclusion and tailoring solutions to the realistic needs of each stakeholder, and accelerates the realisation of UN SDG4: ensuring inclusive and equitable quality education for all.

1.2.3 A Design for Scale with Localisation for Inclusion

Too often, research and studies zoom in on the differences and comparisons in HEI practices around the world, highlighting the uniqueness and variance in local practices. IIOE, alternatively, takes a considerate and practical approach by applying a universal design that is meant to scale up and be adaptable for domestic implementation to steadily address the UN SDG4. IIOE's design for scale bi-folds in its tangible platform and courses as well as its operational mechanism. The IIOE platform hosts courses and content in the 6 official UN languages covering a wide range of topics including innovative digital technology, digital teaching and learning, pedagogy, ICT capacity building that fulfils the basis of digital transformation. Courses and learning materials on the IIOE platform promote engagement in learning and take accessibility into consideration. Additionally, the courses and learning materials comply with Creative Commons licenses, naturally formulated a collection of OERs that can be adopted by partner HEIs depending on their domestic demand and can be translated, further remixed, and localised for wider dissemination and serving a larger scale higher education workforce.

A design for scale alone cannot meet the need for Higher Education digital transformation, all forces from partner HEIs need to unite, and localization needs to be emphasized. IIOE acknowledges the collective impact of the partner HEIs and recognises the need to further expand the network. In order to engage and mobilise HEIs on the regional level, and establish national focal points to coordinate and build capacity for local partners, the IIOE Secretariat calls upon long-standing partner HEIs to host IIOE National Centres in their respective countries. IIOE National Centres (IIOE-NC) serve as the national hub for IIOE partner HEIs in the country to coordinate IIOE projects and push for national and regional professional development. Taking the Empowering Teacher in Digital Teaching Competency Project as an example, IIOE-NCs in Mongolia, Malaysia, Egypt, Kenya and Nigeria formulated their own action plans under the support from UNESCO-ICHEI and the IIOE Secretariat, leveraged the knowledge and tools of IIOE for higher education digital transformation in their region and achieved compounded impact. This mechanism not only encourages co-authorship of reports and learning material, but also allows active operational participation of its partner HEIs, empowering and mobilizing partner HEIs' best expertise to meet demand from their own nation, as well as the demand of the IIOE ecosystem.

1.2.4 Multilingual Engagement and Resources

As an essential element in ensuring harmonious communication and embracing diversity among people, multilingualism is of vital importance to IIOE. The IIOE platform promotes educational resources and activities in six official languages of the United Nations, including English, French, Arabic, Chinese, Russian, and Spanish. On a general scale, multilingualism ensures active participation in different countries and regions, and ensures greater convenience and transparency; moreover, such mechanism is recognised as a core value of IIOE to involve global partners to contribute locally-characterised content, bring together different perspectives, and nurtures the insights and richness of IIOE contents considering long-term development.

The initiative to develop multilingual OER with the leverage of the multilingual mechanism serves as a core development strategy of IIOE. With the hit of the COVID-19, OER is recognised as an important part of teaching & learning in transforming education. Following the Creative Commons License of CC BY-NC-SA 3.0 IGO, IIOE and its partner HEIs, and enterprises jointly develop courses, webinars, and training programmes in multiple languages with respect to 'an open community', and formulate a vision to integrate OER better in educational practices in alignment with the SDG4.

1.2.5 Joint contribution and shared benefits to meet global development goals

Multistakeholder-led partnerships, dialogues, and action plans approach problems from different angles, and provide comprehensive solutions for innovative education practices and enhanced learning experiences in the digital age. Higher education must be socio-culturally relevant to support students to develop greater civil awareness, responsibilities, and essential knowledge and skills to excel in future life and work in the digital era. The exchange of insights, experiences, local practices and characteristics is vital to fostering collective wisdom in reshaping the future of higher education and responding to these intense challenges.

IIOE calls for building inclusive partnerships at global, national, regional, and local levels among different stakeholders, to ensure that all HEIs have the means to tackle the challenges, recover from the global pandemic, and level-up preparedness facing the global digitalisation trends. IIOE partnerships are to mobilise high-quality educational resources rather than HEIs acting on their own. By contributing to the collective work, partner institutions can benefit from the shared content used for teaching and research, enhance education infrastructure, expert resources, talent development, and access to wider financial support. Moreover, activities within the partnership network create diverse opportunities for mutual learning, collaboration, and increasing international visibility. Gathering HEIs in Asia, Africa, Latin America and Europe, IIOE Global Network stimulates institutional collaboration to move beyond the individual teaching work of professors, but with the appreciation of diversity in culture, subjects, and expertise to strengthen the network value system forward.

1.2.6 International and Local Partnership

Disproportionate distribution of resources and support cripples the higher education system and the way out of this circumstance relies on joint efforts globally and locally. A single tree cannot make a forest, IIOE takes a partnership approach in addressing the challenge of providing quality and equitable higher education for all. On the supply front, IIOE invites enterprises in ICT to donate funds and devices, offering training programs, and playing an active role in human resource cultivation through industry-driven combinations. Partners in the public sector are international agencies like UNESCO-IITE, UNESCO-IESALC, UNESCO Bangkok, UNESCO Beirut, UNESCO Abuja, UNESCO Dakar, UNESCO Nairobi, the Arab League Educational, Cultural and Scientific Organisation, as well as national agencies such as the ministries of education and higher education issue policy recommendations and contribute to quality research reports that map out a future trajectory for action.

On the demand end, IIOE acknowledges the collective impact of the partner HEIs and recognizes the need of these partners and their local connections. IIOE National Centres hosted by HEIs in their respective countries put a tremendous amount of effort localizing IIOE-built content and retrofitting the content for the true needs of the domestic environment. This type of partnership and mechanism has produced extraordinary outcomes through the three years since the founding of IIOE, and the impact of certain locally designed courses and best practices have transcended from their own country to regional or cross-regional level. The Public-private Partnership, University-Industry partnership, and inter-agency partnership within IIOE's global network enhances the project success rate, offers a better channel for project management and supervision, and most importantly, builds a true consortium of Higher Education Teacher for digital transformation.

IIOE is a convergence of design, operation, and implementation of work from researchers, administrations, international organisations, partner HEIs, and the private sector. The ambition of closing the gap in education and facilitating the digital transformation of higher education are addressed by divergent approaches in the context of IIOE. In the following chapters, specific activities of IIOE will be introduced in more elaborative detail with practical cases and evidence.



Chapter 2

Empowering Teachers' Digital Teaching and Learning Capacity Building

In the 21st century, knowledge, skills, and competencies have been reshaped by the penetrating influence of continuously advancing technology, requiring educational systems to make prompt responses and rethink how to cultivate citizens for the new society. Higher education institutions play a vital role in planning and achieving the development agenda, as fertile ground for new ideas, and teachers act as important agents in this process[1]. International organisations and national administrations of education identify teachers' capacity building as a strategic area of improvement, and are committed to ensuring that teachers and educators are adequately trained and professionally qualified [2]. Although growing awareness and actions emerged in the recent decade, policies have been made in regard to addressing digital competency building, challenges still exist in perspectives including complex social and cultural backgrounds, developmental phases, diverse personnel, and more. How does IIOE respond to these challenges in the complex context? This chapter will discuss IIOE's holistic approach to empowering teachers' digital competency for teaching and learning, including its competency framework, course framework, and approaches to teacher professional development activities.

2.1 Digital Teaching Competency Framework



2.1.1 Glance at existing Teacher Competency Frameworks and Standards

Teachers are key to the digital transformation of higher education, therefore building a recognition of ICT competencies and digital competencies, and teachers' capacity building needs to be guided by intricately designed frameworks. Prior to IIOE launching its Competency Framework for Higher Education Workforce and the Digital Competency Course Framework for capacity building, a systematic review was conducted to ensure scientific construction, worldwide applicability, and flexibility for localisation.

- UNESCO ICT Competency Framework for Teachers (2018)

In 2018, UNESCO updated the ICT Competency Framework for Teachers to the third version in response to the technological and pedagogical developments in the field of ICT and education. The framework serves to guide pre- and in-service teacher training on the use of ICTs, covering all levels of the education system, and guides teacher-training personnel to design and develop localised training and practices for the life-long development[3]. A total of six dimensions were outlined, including policy and vision, syllabus and assessment, pedagogy, ICT, organisation and administration, and teacher training. This framework covers a wide range of perspectives that are transferable to different educational contexts, and has been recognised and localised in many countries and regions worldwide.

- European Framework for the Digital Competence of Educators (2017)

The European Commission recognises a need for broadening and a more sophisticated set of competencies of teachers to encompass the rapid growth and development of the society. The ubiquity of digital devices and the model of how the labour force participates in jobs being a pressing issue was put at the core of talent cultivation. Hence, the European Framework for the Digital Competence of Educators (DigCompEdu) outlines a set of common languages and approaches that direct educators' competency building[4]. Six core dimensions that describe educators' routine in teaching were observed in the framework, including social and professional engagement, digital resources, digital pedagogy, assessment and feedback, training of students, and facilitating students' digital competence. These dimensions capture and describe educator-specific digital competencies, offering a reference for variants to be developed by member states and partners.

- International Society for Technology in Education Standards (2019)

The International Society for Technology in Education (ISTE) establishes its standard for educators in 2019, aiming to provide a comprehensive guide to the transforming educational systems. The standard lists lateral objectives from the perspectives of students, educators, education leaders and coaches for the digitally transforming world, and guides the teaching workforce to coach and motivate students adequately. The ISTE Standards takes a role-specific approach, positing educators to be empowered professionals and learning catalyst in the educational system[5]. Other core dimensions in the ISTE Standards include: Student learning and creativity, learning experiences and assessment, work, citizenship, and professional growth. In addition, the ISTE Standards emphasize computational thinking, providing a roadmap for the effective use of technology in schools.

• Education industry standard——Digital literacy for Teachers, China (2022)

In 2022, the Ministry of Education of People's Republic of China released the education industry standard, Digital Literacy for Teachers, to guide professional development and its evaluation for the digitally transforming educational system. The standard proposes five core areas of digital competency, including Digital Awareness, Digital Technology Knowledge and Skills, Digital Application, Digital Social Responsibility, and Professional Development, complemented by 13 secondary dimensions and 33 sub-dimensions guiding teachers' competency development in accessing, processing, utilizing, managing and evaluating digital information and application[6]. The standard lists observable indicators that clarify competencies that teachers need to possess, and set talent cultivation goals for pre-service teacher education.

It can be observed that despite the fact that numerous frameworks and standards pave a roadmap towards the use of digital technology and competency building in the education system, there is no single specific model that particularly targets higher education digital transformation for its complexity and varied agenda of higher education operation model. Based on the observation, IIOE designed its Competency Framework and Digital Competency Course Framework for Higher Education Workforce Capacity Building to specifically address the need of higher education digital transformation to fulfil the commitment IIOE has made.

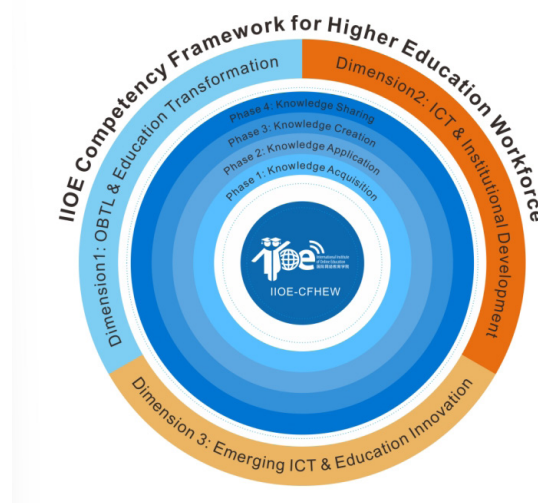
2.1.2 IIOE Competency Framework for the Higher Education Workforce and Digital Competency Course Framework for Capacity Building

IIOE Competency Framework for the Higher Education Workforce

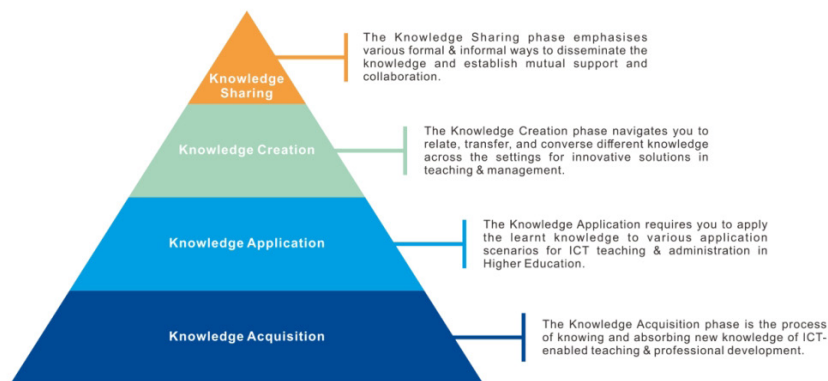
In 2020, IIOE released the IIOE Competency Framework 1.0, which outlines and evaluates higher education teachers' comprehensive ICT teaching and professional skills for Online Learning and Blended Learning(OBTL) practices. In 2021, with inputs from experts, feedback from partner HEIs, as well as the incorporation of the IIOE Quality Assurance Framework, the IIOE Competency Framework for Higher Education Workforce was updated to the 2.0 version, accelerating partner HEIs' digital transformation on a larger scale. The IIOE Competency Framework for the Higher Education Workforce (IIOE-CFHEW) facilitates capacity building of innovative ICT-catalysed teaching and learning, enhances the effective use of online learning and blended learning for education transformation, empowers institutions' governance and development, and prepares higher education institutions for future-oriented talent cultivation.

The IIOE-CFHEW was designed to serve three key functions to respond to the need of higher education digital transformation:

- As a roadmap, the IIOE-CFHEW provides references for all Higher Education Workforce(HEW) regarding the convergence of diverse topics in ICT-enabled teaching and learning, ICT infrastructural support, staff professional development, organizational changes, university-industry collaboration, and talent cultivation in preparation for a digital future of HEIs.
- As a guideline, the IIOE-CFHEW is closely associated with the IIOE Quality Assurance (QA) Framework. The QA Framework offers diagnostic insights into online and blended teaching and learning(OBTL) and the associated toolkit guides institutions, and teachers in benchmarking implementations of online and blended learning at different levels. Two frameworks complement one another, ensuring quality capacity building and outcomes at a high standard.
- As a toolkit, the IIOE-CFHEW engages staff at all levels of working in higher education to apply and enhance targeted ICT competencies flexibly in their respective work fields. The interconnected ICT competencies accord with the IIOE Digital Competency Course Framework, enabling HEI professionals in developing countries to practice digital literacy progressively through active, personalised training programmes.



IIOE Competency Framework for the Higher Education Workforce (IIOE-CFHEW)



Four Phases of the IIOE – CFHEW

IIOE-CFHEW identifies three core dimensions for teaching and professional development, including mastering OBTL practices in initiating digital transformation, transitioning towards ICT-enabled faculty and institution development on organisational level, and understanding emerging ICT in higher education for future-orientated talent cultivation. The three core dimensions address current and long-term dynamics of ICT-enabled teacher professional development from a holistic approach, facilitating institutional leaders, education practitioners and leading stakeholders in creating, accelerating and transforming the future higher education workforce.

IIOE Digital Competency Course Framework

In 2022, IIOE revamped its platform and revised its course framework based on the iterations of research on the digital transformation of higher education teaching and learning. Based on literature review, expert consultation and partners' practice, and under the guidance of the Research Report on Digital Transformation of Higher Education Teaching and Learning^[7], developmental stages of institutional infrastructure, policy and teacher's readiness need to be taken into consideration, and specific guidance on the critical aspects of implementation is in clear need^[8]. Besides, balancing between globalisation and localisation in professional development resources in existing digital competency frameworks and standards has been another significant challenge, although a common language was created in the framework, it gets lost in the process of localisation and redistribution, creating new barriers for knowledge sharing. Hence, IIOE Digital Competency Course Framework highlights three developmental phases of higher education transformation and specifies the competency-building needs for three groups of key stakeholders of HEI, namely HEI Leadership, HEI Instructors, and HEI Learning Support. A range of competencies covering digital awareness, strategic vision, policy-making, technology planning, knowledge capture and sharing, pedagogy, learning experience design, support, and research are observed in the course framework. The design provides flexibility for localisation in different areas and institutions, yet keeps common ground for the co-construction of resources and knowledge sharing. The developmental phase, on the other hand, targets the tangible environment of HEI infrastructure and policy, offering specific observation points for HEIs to navigate their area of growth.

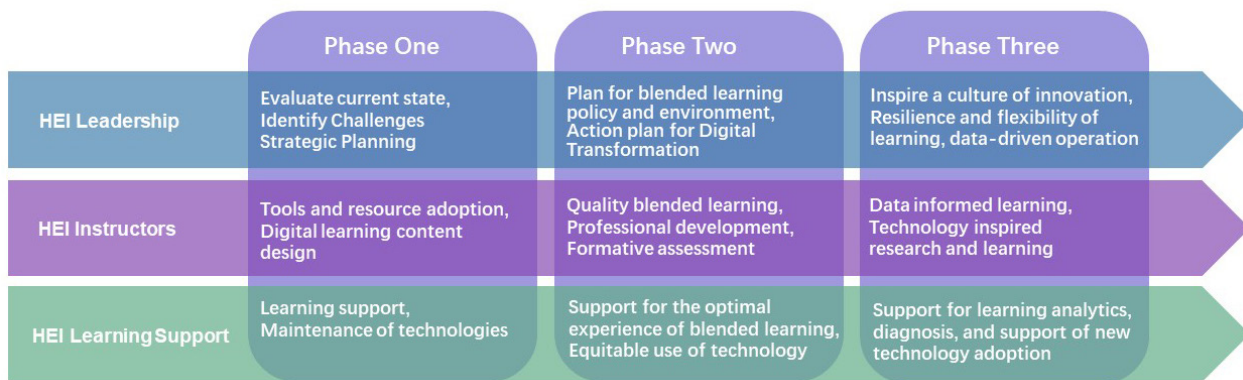
Phase One: This phase targets institutions that have already adopted digital technology for teaching, but quality blended learning or online learning is underachieving due to the constraints in internet connectivity, insufficiency of digital devices, or unstable infrastructure. The focus of digital transformation at this stage is mainly on the application of OER and digital media. Institutions use digital technology or media primarily in face-to-face instruction or asynchronous learning. Working digitally emerges, however synchronous online collaboration is premature. Instructors can utilize digital resources and digital media to support learning objectives. However, designing and implementing quality blended learning remains challenging, and limited interaction can be achieved throughout instruction.

Phase Two: In this phase, institutions are ready to conduct quality distance learning, or blended learning, the network connectivity sufficient for open learning. The focus of digital transformation at this phase can be on the implementation of quality blended learning. Institutions recognise OER from various sources and use them for academic program instruction, and adequate technical platforms are in place fulfilling the need. Institutions have infrastructure that allows flexibility and autonomy for students to choose offline or online learning; interaction and student engagement can be supported through digital technology.

Phase Three: Institutions have relatively mature digital environments such as LMS and digital portals that support data-driven governance and learning experiences for future talent cultivation. Learning analytics, virtual laboratory, research platform, data engine, and advanced instruments are properly built or planned for digitally transforming teaching and learning. Data and emerging technology break boundaries between HEIs, between HEIs and society, and other stakeholders. The focus of digital transformation in this phase emphasizes personalized, equitable, sustainable and life-long learning.

IIOE Digital Competency Framework

The framework was designed for the **three tangible developmental phases** of higher education digital transformation and **targeting three groups of audiences**



IIOE Digital Competency Framework

Such design considers the challenges in existing frameworks and standards and especially responds to challenges of lacking clear indicators of digital transformation phases and tangible measurements of teaching and learning transformation. The framework serves as a cognitive map suggesting implementation and links resources for HEIs and the workforce and serves as a repository for partners to share voices and practices. In finer detail, the sub-indicators for each group of target audiences at different developmental stages were designed to align with existing digital competency frameworks that allow institutions, administrations or areas to adopt or localise seamlessly. The framework guideline also offers a common lingo system promoting co-construction in professional development content of partner organisations of the IIOE National Centres and of the IIOE ecosystem which adhere to the core principle of joint contribution and shared benefits.

2.2 Channels of Competency Building



IIOE was launched in 2020 initially as an emergency education plan to quickly orient educators during the breakout phase of the COVID-19 pandemic, then broadened its reach as the platform had matured with empowering the HEI workforce in emerging ICT technologies including Cloud Computing, Big Data, and digital competency-building of the higher education workforce for digital teaching and learning. Over three years of development under the guiding principles of IIOE CFHEW, Digital Competency Course Framework, and Quality Assurance Framework, various methods of learning are now integrated into the platform catering to different learning needs and styles. The current IIOE platform hosts self-paced courses, training, webinars, and certification programmes, formulated a comprehensive solution kit that can be mixed and matched based on different objectives and demands of partner HEIs.

2.2.1 IIOE Courses

The self-paced course comprises a key element of IIOE. IIOE courses aim to extend opportunities for higher education professionals to conduct self-paced learning according to personal interests and needs regarding their digital reskilling in diverse teaching, learning, and management settings. Based on the IIOE Competency Framework for the Higher Education Workforce, the courses touch upon key aspects and content sectors for IIOE learners worldwide to explore the frontier knowledge, skills, and competence needed in the context of higher education digital transformation at different levels. Teachers, HEI leadership, and HEI learning support practitioners can enrol at their own command and complete the course at their own pace.

The self-paced courses on the IIOE platform are designed with defined objectives, multi-model learning activities, complementing resources and tools, and respond to UNESCO's Recommendation on Open Educational Resources. The courses comply with the Creative Commons Open Licenses (CC-BY) that allow learners to learn, share, modify and adapt with appropriate attribution. In response to the call for developing OER by UNESCO(2019)[9], the IIOE platform leverages its partnership in the private sector and HEIs to co-develop quality learning content. So far, there are over 350 courses on the IIOE platform, and the courses have benefited over 6000 educators across over 100 countries worldwide. More significantly, the Virtual University of Côte d'Ivoire utilised the courses in Big Data, Cybersecurity, the Internet of Things, and Blockchain to empower the teachers and their students. 128 post-graduate students in total undertook the courses in the mentioned domain, upskilling their practical skills in ICT for credit towards their degree completion. Course topics on the IIOE platform fall into the following main areas:

Online and Blended Learning at the front

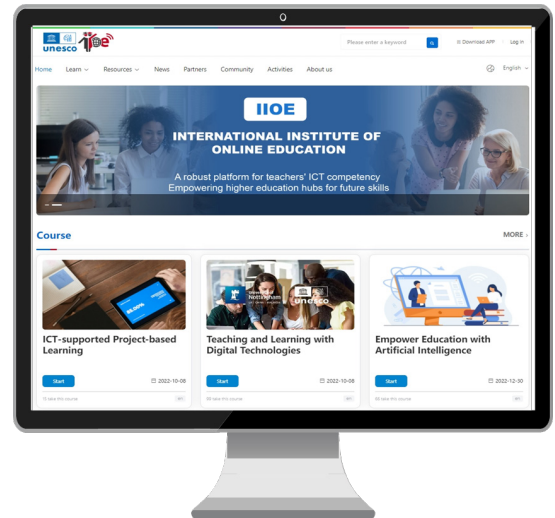
Courses in this category introduce innovative pedagogies, digital technologies, and design approaches to Online Learning and Blended Learning, enabling frontline teachers in higher education to enhance their digital teaching skills for daily practices.

Higher Education Development for a Digital Future

Courses in this category introduce leading concepts of higher education digital transformation, related teacher professional development & organisational development strategies, empowering the higher education workforce including educators, leaders, and support staff at all levels to enhance their digital literacy.

Digital Transformation of STEM Disciplines & Entrepreneurial Universities

Courses in this category focus on the transformation and upgrading of course disciplines that are cross-/ inter-related with emerging technologies such as Artificial Intelligence, Big Data, Cloud, etc., in enabling HE teachers, researchers, curriculum specialists, and support staff in various functions to promote university-industry cooperation, research breakthroughs, innovation & entrepreneurship.



IIOE Online Learning Platform

2.2.2 IIOE Training Programmes

Training Programmes on the IIOE platform refer to structured programs that are scheduled to run over the time span of 2 to 3 weeks and are facilitated by instructors and teaching assistants. Compared with the courses on the IIOE platform, training programmes target comprehensive digital capacities and have a stronger emphasis on instructor-student interaction and support, peer-to-peer collaboration and knowledge sharing. The training programmes are certification-driven, meeting the demand of professional development requirements and are aligned with the competencies required for the digital transformation of higher education.

The training programmes' design are in compliance with the IIOE CFHEW and the Digital Competency Course Framework, and are categorised into three levels of difficulty based on Bloom's Taxonomy forming a learning progression. At the moment, a system accrediting capacities in ICT discipline, Blended Learning, and Administration has been established, linking "small but specific" training programmes designed for decomposed capacity indicators into a professional development structure and giving learners a better sense of expectation. The figure below shows a list of existing training programmes in the three tiers (foundational, intermediate, and advanced). Upon completing all required learning activities and showing artifacts of competency, learners are then issued a certificate of competency celebrating their achievement.



IIOE Training Programme System and Certificate of Competency

IIOE adheres to the principle of “user-friendly, effective learning” and fully considers the different conditions and needs of HEIs around the world. To address the diversified language and cultural needs, IIOE provides training programmes in the six official languages of the United Nations, and encourages joint contribution for localised practices. By the end of 2022, training programmes on 5 topics have been built and delivered. These courses include: “Cloud Essentials for Higher Education Workforce”, “Teaching Video Design and Production”, “Logicalisation & Visualisation of Teaching Presentation”, “AI-General Level”, and “Big Data-General Level”. A total of 7,396 registrations for these courses from over 100 other countries across different continents, including a large proportion from 29 IIOE partner HEIs in 25 countries. Regarding learning completion, the number of learners who eventually completed the training programmes was 64% at the highest. The percentage of learners who earned the certificate of competency from “IIOE Training Series - AI General Level” reached 43% at the highest of all programmes.

Training Title	Language
IIOE Training Series - Cloud Essentials for Higher Education Workforce	English, French
IIOE Training Series - Teaching Video Design and Production	French
IIOE Training Series - Logicalisation & Visualisation of Teaching Presentation	English
IIOE Training Series - AI General Level	English, French
IIOE Training Series - Big Data General Level	English, French, Spanish, Arabic, Russia

Joint Contribution Highlight

Case 1

Partnership Institution—Teaching Video Design and Production

Teaching Video Design and Production is the first French training program co-constructed by IIOE and Cadi Ayyad University (UCA), aiming to improve teachers' skills in making teaching videos and emphasizing the key role of teaching videos in facilitating knowledge dissemination in an increasingly connected world. After completing the training, learners will be able to create educational videos tailored to their teaching needs and share them with their colleagues and students. Over 100 teachers from 10 French-speaking countries in Africa participated in this training and improved their ability to make instructional videos. At the end of the training, teachers formulated an online community of practice supporting one another professionally by sharing ideas and experiences in making short educational videos.

Case 2

Partnership Enterprise—Logicalisation and Visualisation of Teaching Presentation

This training program is jointly developed by IIOE and Kingsoft Office to enhance teachers' capabilities. It introduces the application of presentation design software in various teaching scenes based on the WPS office suite. From design thinking to operation skills, the course reveals principles and practices of logicalisation and visualisation of teaching contents in an all-around way to help teachers fully master the techniques of Teaching Presentation design, production, and delivery.



WPS Office Software Training Program

2.2.3 IIOE Global Webinar

The IIOE Global Webinars are a series of knowledge-sharing sessions focusing on different important agendas of higher education digital transformation. The design of the webinars is in alignment with the UNESCO Futures of Education Initiative, offering a platform for knowledge exchange under the guidance of the UN SDGs, Gender Equality. It promotes dynamic forms of knowledge sharing, experience exchange, and capacity building for higher education professionals in developing countries and worldwide to rethink education and reshape a better future.

The design of IIOE Global Webinars presents professionalism and closely aligns with the different perspectives of SDGs, such as diversity and inclusion, equity, quality education, and partnerships, just to name a few. Through various forms of presentation, such as expert sessions, focus-group, multi-perspective dialogues, interactive Q&A, and practical workshops, a well-rounded coverage in skill-based, knowledge-based, and competency-based sharing is achieved.

Till date, the IIOE Global Webinar covers a wide range of frontier topics in the realm of higher education digital transformation:

- Emerging Technologies and Disruptive Innovation in Higher Education
- Empowering Teachers' Digital Teaching and Learning
- Future-oriented Curriculum Design & Talent Cultivation
- International Higher Education Research and Development
- STEM Education, Inter- and Cross-Disciplinary Innovation
- Sustainable Development Goals and Higher Education
- Higher Education Management & Quality Assurance

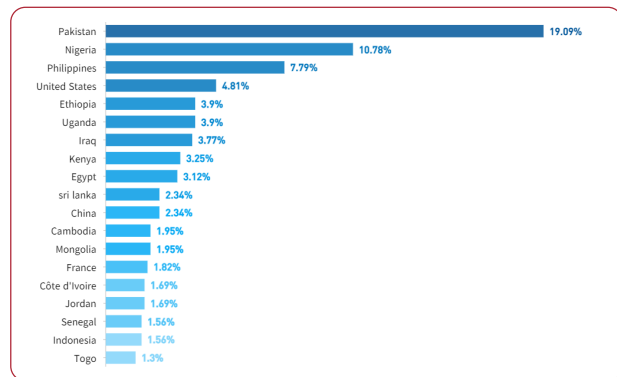


Multiple IIOE Global Webinar Sessions in 2020 - 2022 for University Teachers' Capacity Building

The IIOE Global Webinars use web-conferencing tools to curate knowledge sharing and broadcast to the world. Audiences include university teaching faculties, leaders, administrators, and relevant learning support staff from all around the world and especially from developing countries. With a focus on higher education digital transformation, IIOE Global Webinars invites world-leading researchers, and practitioners in higher education and other related sectors to jointly contribute. Since June 2021, the webinars have received over 12,000 registration counts from over 3,000 active learners distributed in over 70 countries and regions worldwide.



IIOE Global Webinars Serve Higher Education Professionals of Multiple Backgrounds across Units and Departments



Countries/ Regions of Learners with Active Participation in the IIOE Global Webinars

2.2.4 Promising Practices and Challenges in Empowering Teachers' digital competency

Empowering teachers' digital teaching and learning capacity building is a grand commitment and will require a blueprint to align goals, channels for resources and support, and practical experiences that can be modeled after. IIOE Competency Framework and Digital Competency Course Framework illustrate a cognitive map for empowering teachers' digital competency, the multimodal courses, OERs and programmes pave the way connecting each destination, and experiences are shared through the facilitation of the open public ecosystem of IIOE. In 2021, UNESCO-ICHEI collaborated with the Institute of Education of Tsinghua University and over 50 experts from China and worldwide to jointly develop a series of publications themed on the digital transformation of higher education teaching and learning. The series includes the ***Research Report on Digital Transformation of Higher Education Teaching and Learning, Handbook of Educational Reform through Blended Learning, Handbook of Teacher Professional Development in TVET, and the Handbook of Teacher Professional Development in Higher Education***, which generated new knowledge and implementation blueprints for IIOE. The holistic approach that IIOE took to building educators' capacity in the context of higher education digital transformation can be transformed into tangible practices at scale for partner HEIs. More detailed cases of the "IIOE Pilot Project on Empowering Teachers' Digital Teaching and Learning" will be presented in Chapter 6.

Moving forward with empowering higher education workforces' digital competency, IIOE has summarized encountered challenges and consulted experts through advisory board meetings and a series of panel discussions covering Africa, the Arab Region, Central and South-Eastern Europe, South Asia and Southeast Asia. Areas for ideation include:

a.Enhance recognition mechanisms of professional development

Although certificates of competency are issued upon learners meeting the requirements of the courses and training programs, having the certificates accredited by local authorities and attaching more value to professional growth is needed. The certifications' recognition of professional development under the umbrella of IIOE needs to be taken a step further, and transnational/ inter-region recognition needs to be encouraged. A deeper and more strategic collaboration relying on IIOE's National Centre network with local higher educational administrations is in clear need, for establishing wide recognized competency-aligned professional development of the higher education workforce.

b.Stronger mechanism for radiating broader institutions

IIOE facilitates localisation of courses and programmes for digital capacity building, but doing so at scale with effective reach to a wider range of institutions will require more structured processes and standardisation. IIOE may think about ways to reduce the repetition in digital resource production and better dissemination models so more institutions are aware and can effectively contribute to the ecosystem.

c. Address user-generated and audience-based needs in competency building

Current resources, courses and programmes on the IIOE platform offer a robust body of knowledge and skills to the workforce of higher education in the context of digital transformation. However, as the understanding and the demand for the digital transformation of higher education shifts, the workforce will require new knowledge, skills and competency. It is an open question left for IIOE and its partners to consider and address with the importance of a learner-centred approach in designing and implementing the training programmes.

d. Moving beyond empirical evidence to evidence-based success stories and evidence-driven policy recommendations

IIOE's work in building HEI workforce's digital capacity has created huge resources of qualitative evidence of what works and what doesn't. It is time to move practices of teachers' digital capacity building towards evidence-based recommendations and success stories rooted in a better matrix of measurements of impact and consolidate evidence-driven policy recommendations.

e. Evaluation and links to the QA

Building from previous recommendations, IIOE needs to consider integrating assessments and standards towards measuring knowledge acquisition and the learning effect of professional development. Since IIOE built the Quality Assurance Frameworks and relevant toolkit, establishing a stronger link to the impact of professional learning should be considered.

Summary: This chapter discussed IIOE's overarching principle of design and its various channels for empowering HEI workforces' digital competence. IIOE aims to build a comprehensive framework guiding HEI workforce competency building and leverage its partners and relevant stakeholders of higher education digital transformation filling in concrete programmes and courses that can be used flexibly based on the demand of HEIs worldwide. These activities are expressions of the holistic approach towards competency building, and an outcome of joint development of international collaboration in the public and private sectors. In the next chapter, elaborative outcomes will be introduced that further strengthen IIOE's design.

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Chapter 3

Capacity Building of Higher Education Workforce: IIOE Promising Experiences



Based on the IIOE-CFHEW and IIOE's various modalities of empowering HEI workforce's digital competencies, IIOE's teacher professional development has taken root in its partner HEIs, countries and regions thanks to an extensive international network. This chapter provides real-life case studies and testimonies from IIOE's partners in Africa, Asia-Pacific, and the Arab States, showcasing the impact of IIOE's professional development in action. From providing emergency support to HEIs during the COVID-19 pandemic, to offering various professional development opportunities catering to changing needs, as well as providing a platform for the transnational transfer of knowledge and skills through co-construction and sharing of multilingual educational resources, IIOE has proven its relevance, adaptability, and scalability across time and space.

3.1 IIOE's multiple teacher professional development programmes benefited a large number of HEI teachers worldwide, especially teachers from IIOE's partner HEIs in Africa, Asia-Pacific, Arab States



3.1.1 Implementation of IIOE professional development programmes in Africa and Arab States

Since the launch of the IIOE platform in April 2020, IIOE's various online training series, OER, conferences, and course competitions have involved higher education professionals from 40 out of 54 countries in Africa and 14 out of 19 countries in West Asia. Overall, IIOE activities have attracted the active participation of education professionals in 54 countries in West Asia and Africa, creating a broad impact in the region.



Dr. Abdoulaye Salifou

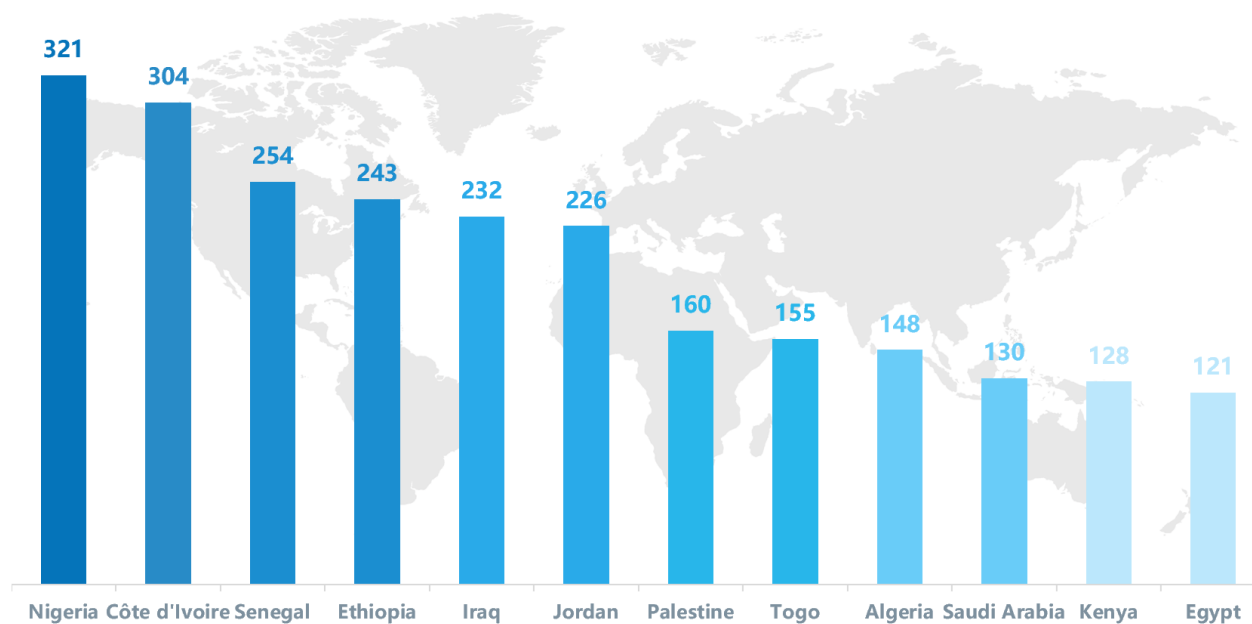
Chief of Education, UNESCO Liaison Office to the African Union and United Nations Economic Commission for Africa

IIOE's ability to react quickly and efficiently to reduce the harmful impact of the COVID-19 pandemic through launching virtual trainings about online teaching and learning, as well as IIOE's provision of "Big Data, Cloud Computing, Artificial Intelligence, and Blockchain" training series, have contributed a lot to increasing access to quality resources by both students and academics of HEIs in Africa.

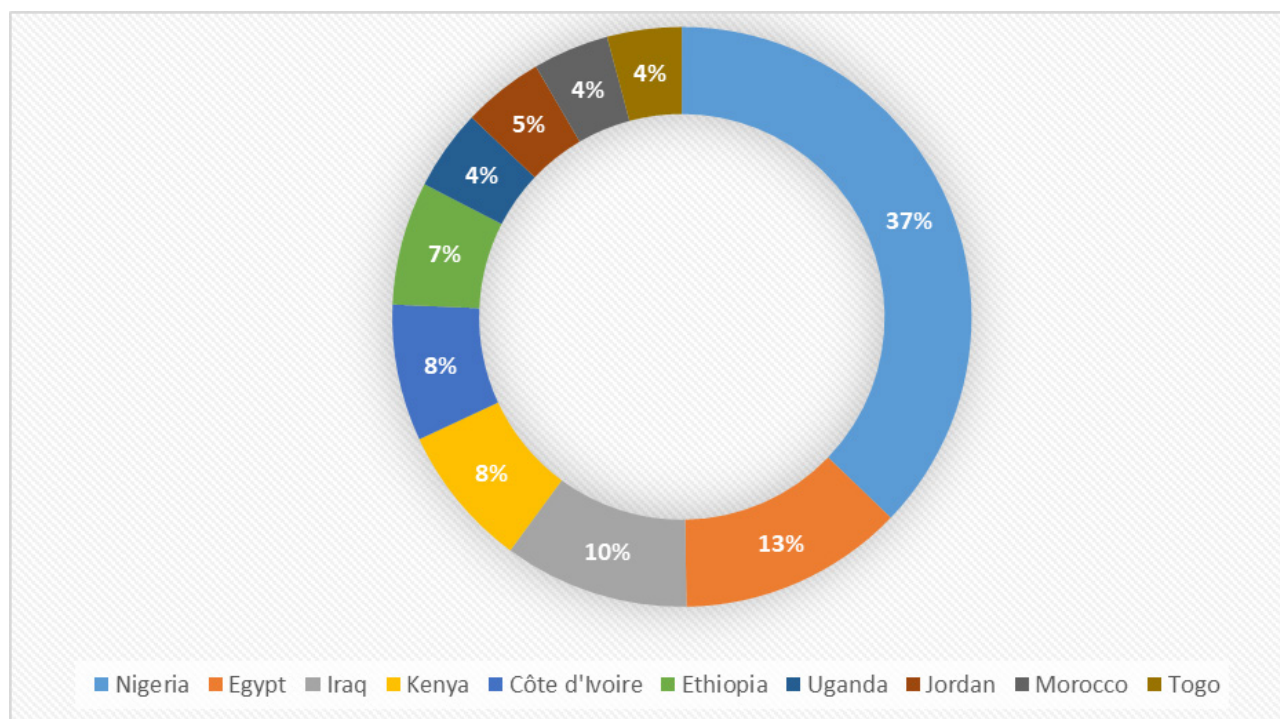
IIOE's new strategy for professional development is welcome in the higher education landscape in Africa. The new strategy catering to the needs of leaders is necessary and important, as leadership is the driving force to initiate strategies and to bring everyone on board for online and blended teaching and learning.

In Africa and the Arab region, IIOE has gradually formed an extensive network of partner HEIs covering various sub-regions. As of October 2022, UNESCO-ICHEI established IIOE partnerships with 17 HEIs from 16 countries in West Asia and Africa. There is also an intensive and extensive engagement at the national level in some countries. In 2022, in collaboration with Ain Shams University in Egypt, Ahmadu Bello University in Nigeria, and the University of Nairobi in Kenya as well as their respective governmental higher education departments, IIOE National Centres were established in Egypt, Nigeria, and Kenya to serve as IIOE national hub supporting HEIs in the country to build the capacity of higher education teachers, leaders, and support staff. These partner HEIs and IIOE National Centres have been effective in mobilising sustained participation in IIOE activities in their respective institutions and countries.

Using the Big Data, Artificial Intelligence, Cloud Computing training series, and WPS "Logicalisation and Visualisation of Training Presentations" training as an example, which were launched successively from 2020 to 2022, on average more than 100 participants joined the training in Nigeria, Côte d'Ivoire, Senegal, Ethiopia, Iraq, Jordan, Palestine, Togo, Algeria, Saudi Arabia, Kenya, and Egypt (see the Fig below). For IIOE Global Webinars, data from January 2020 to December 2022 shows that in Nigeria, Egypt, Iraq, Kenya, Côte d'Ivoire, Ethiopia, Uganda, Jordan, Morocco, and Togo, a considerable number of participants (between 4%~37%) participated in related sessions. Except for Saudi Arabia and Jordan, all other countries with active participation have established IIOE partner HEIs in local regions.



Countries in West Asia and Africa with More than 100 Participants in the IIOE Online Training Series (2020 - 2022)



Percentage of Participants in African and Arab Countries for the IIOE Global Webinars (2020 - 2022; with the Total Number of Registrants around 9500)

3.1.2 Implementation of IIOE professional development programmes in Asia-Pacific

In the Asia-Pacific region, IIOE has developed an HEI network covering 15 countries in Southeast Asia, South Asia, Northeast Asia and Central Asia. In Indonesia, Malaysia, Mongolia, and Pakistan, IIOE National Centres were jointly established by UNESCO-ICHEI and leading HEIs with endorsement from national authorities in charge of higher education in respective countries. These partnership networks played crucial roles in ensuring the local implementation of IIOE professional development programmes in Asia-Pacific countries.



Dr. Thushani A. Weerasinghe

IIOE Coordinator at University of Colombo, Sri Lanka

IIOE conducted several training sessions that were found timely and very useful during the COVID pandemic for all academics to transfer their teaching-learning practices from the physical classroom to online. These training sessions not only shared information related to new technologies but also provided the participants with the required skills to improve their online teaching-learning practices.



Ganagathulasi Janardhanan

Professor and Head in charge, Department of Curriculum Development, Planning and Coordination, National Institute of Technical Teachers Training & Research, Ministry of Education, India (third prize laureate of the IIOE Online Course Competition 2022)

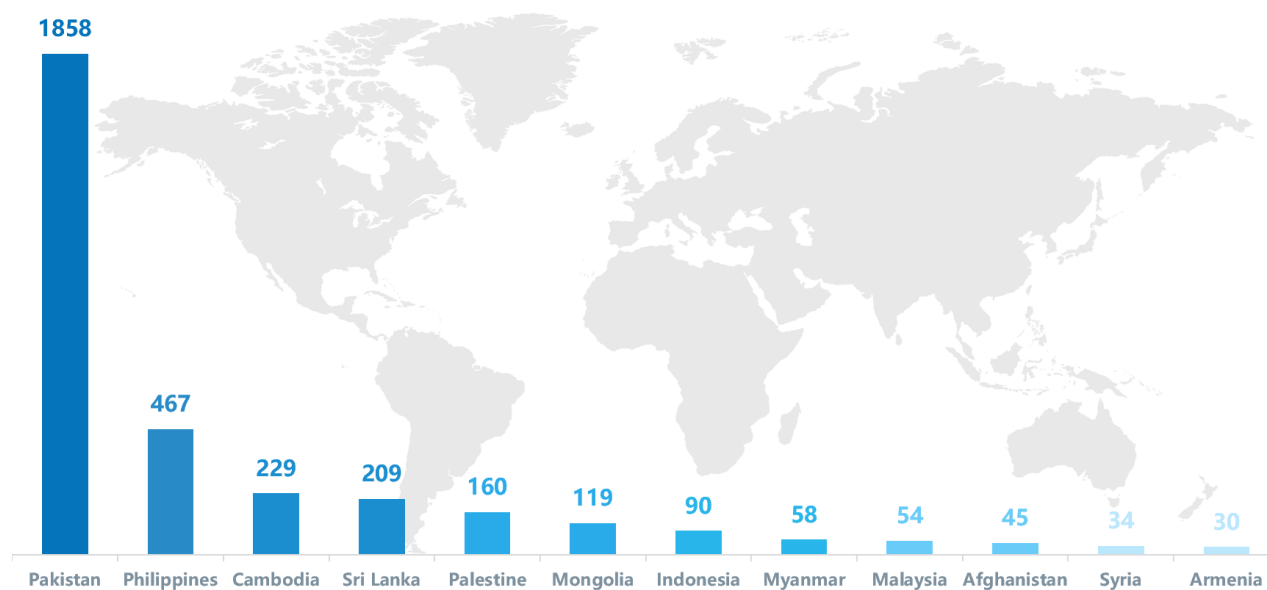
The (IIOE) webinars and specialised courses on contemporary topics provided more scope to me in enriching my technical competency. The courses provided a new perspective in redefining the programme I offered at NITTTR Chennai. It broadens my horizon in understanding the cultures and corners of the world beyond boundaries. The competency framework in ICT and digital literacy honed my skills and offered me a chance to disseminate to my fellow teachers.



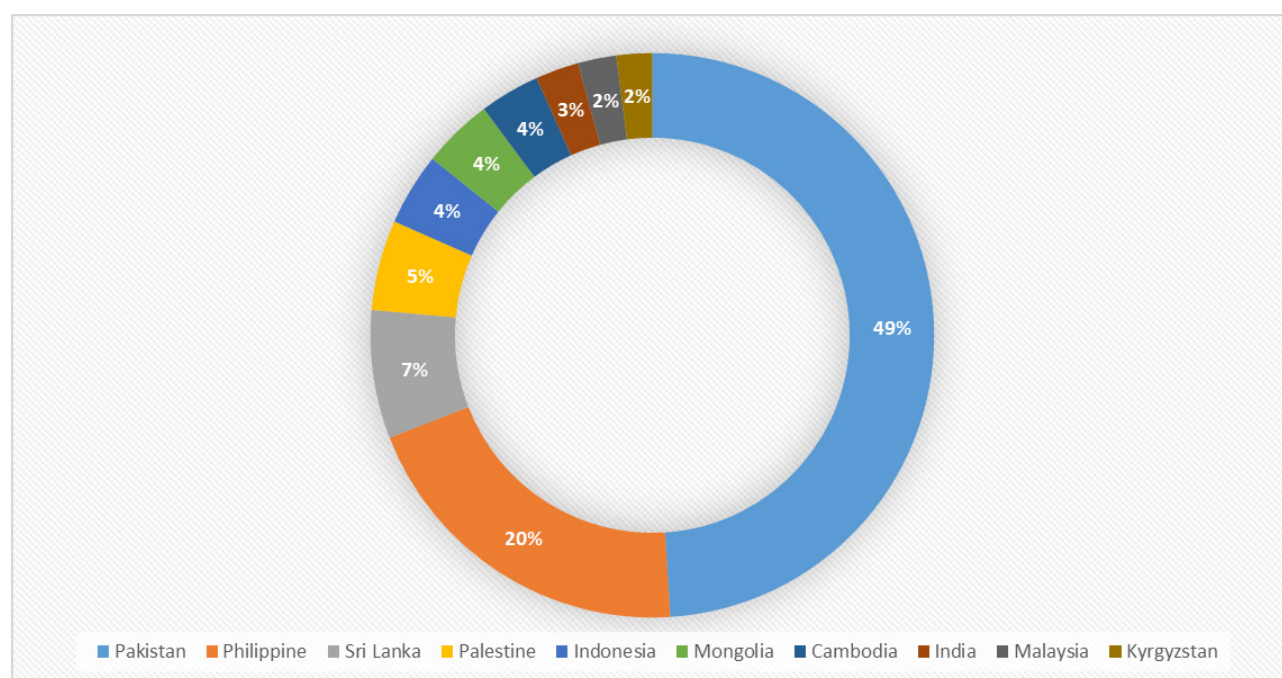
Dr. Nurul Afiqah

Coordinator of IIOE Malaysia National Centre, Universiti Putra Malaysia (UPM)

UPM was able to learn and benefit from the systematic work planning and execution by UNESCO-ICHEI. In an effort to build and empower educators across the globe, UNESCO-ICHEI team dedicated themselves to a great amount of work that ultimately became a systematic and informative reference to HEIs and other stakeholders around the world. Sharing mutual goals and interests as knowledge-based organisations and as platforms to share and disseminate knowledge, UPM is very honored for the opportunity given by UNESCO-ICHEI to contribute and create an impact on society and the community worldwide.



Countries in the Asia Pacific with more than 30 Participants in the IIOE Online Training Series (2020 - 2022)



Percentage of Participants in Asia Pacific Countries for the IIOE Global Webinars (2020 - 2022; with the Total Number of Registrants around 9500)

3.2 IIOE's provision of teacher professional development courses and programmes effectively met faculty's varying demands at different times



In response to the urgent need for educational continuity at IIOE partner HEIs, IIOE organised 10 online lectures engaging global experts on the topics of emergency online teaching and learning from April to June 2020, when the global COVID-19 pandemic caused massive disruptions in education. The lecture series received widespread participation from teachers worldwide, with 2,108 teachers from 307 HEIs in 46 countries participating in the series. This effectively supported teachers in various countries to use online teaching tools for emergency teaching during the pandemic and contributed to ensuring educational continuity.

In the era of digital transformation, new technologies such as Big Data, Artificial Intelligence, the Internet of Things, and Cloud Computing are playing an increasingly influential role in the field of higher education. IIOE responded to this trend by initiating a training series on the application of Big Data, Artificial Intelligence, and the Internet of Things in higher education to raise teachers' awareness and competencies of applying new technologies to improve the quality of teaching and learning in the digital era. Since its launch in October 2020 till September 2022, a total number of 7,257 teachers from 169 countries have participated in the training series. 3,210 teachers from 175 countries participated in the Big Data - General Level training while 2,823 teachers from 136 countries participated in the Artificial Intelligence - General Level training.

In 2021, as the global higher education community gradually emerged from emergency teaching during the pandemic, IIOE partner HEIs and teachers expressed the need to continuously explore innovative teaching and management models in the digital era, and to exchange on topics such as digital teaching and management. IIOE webinar was then introduced as a flexible and diverse form of online experience-sharing activity. From October 2021 to October 2022, a total of 4,067 participants from 111 countries attended IIOE's webinars. Its topics covered macro trends and planning for digital transformation, application of digital teaching tools, and digital pedagogy, among others, responding to the needs of diverse groups for digital teaching and learning.

As the world enters the post-pandemic era, higher education is under transformation. Hence, IIOE's curricula framework and capacity building modalities also need to be reinvented to suit the changing higher education landscape. Currently, the teacher professional development programmes offered by IIOE are mainly large-scale and cover general knowledge. In order to adapt to the needs of different countries' development phases and different groups of higher education professionals, there is a need to further customise and systematise IIOE's content and to strengthen collaboration between IIOE partners and IIOE. On the other hand, more diversified forms of professional development activities for higher education professionals are needed. In particular, IIOE's target group needs to go beyond teachers to include leaders, administrators, and technical support staff, while the format and content of professional development activities could be adapted to suit the needs of different groups.

3.3 IIOE's principle of "co-construction and shared benefits" promotes knowledge and experience exchange across HEIs and countries, and contributes to the improvement of higher education quality.



IIOE has emphasized the principle of "co-construction and shared benefits" since its establishment in 2019. Its design, preparation, launch and establishment were the outcome of close collaboration among global partner HEIs, partner enterprises, experts and international organisations.

Since its launch, IIOE has advocated for the sharing of educational resources and best practices in digital teaching and learning, building an ecosystem for the sharing of quality curricula and the promotion of digital teaching and learning. Over the past three years, IIOE has gradually established a mechanism of co-construction and shared benefits, providing a platform to facilitate knowledge exchange among IIOE partner HEIs and to improve the quality of higher education.

Transnational knowledge sharing to enhance the quality of digital teaching and learning (Morocco & Francophone Africa)

From 2021 to 2022, UNESCO-ICHEI and the Cadi Ayyad University (Université Cadi Ayyad, UCA) in Morocco jointly developed IIOE's first online training programme on teachers' digital teaching competencies dedicated to Francophone Africa. The programme consists of six modules aiming to capacitate teachers through increasing their technological, disciplinary and pedagogical expertise, based on UCA's rich experience of digital learning and its "University Pedagogy" professional development programme. Essential characteristics of this professional development initiative were group work and collaboration and learner-centred design.

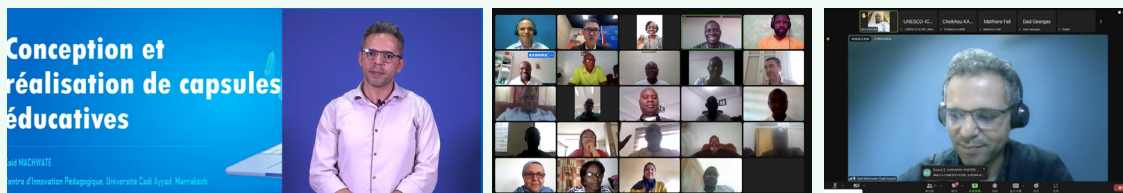
The first co-developed module "Design and Production of Educational Videos" was designed, produced, and implemented by UCA, while UNESCO-ICHEI provided financial and technical support for the project, organised the participation of IIOE partner HEIs in the training, and monitored and evaluated the project.

From September to October 2022, 100 teachers from 11 Francophone African countries enrolled in the module and participated in the training via the IIOE platform. Among them, IIOE partner HEIs Gaston Berger University (Senegal) and the Virtual University of Senegal selected their teachers to participate in the training, while the Virtual University of Côte d'Ivoire coordinated the participation of teachers from six public HEIs across the country. Finally, 33 participants completed the training programme and received the "Certificate of Fundamental Competence in Blended Teaching" jointly awarded by UNESCO-ICHEI and UCA.

Analysis of data generated from learners' self-evaluation showed significant improvement in both awareness and capacity of designing, producing and using educational videos for teaching and learning. Surveys also showed learners' satisfaction of both the content and training format, which allowed them to develop new skills and contribute to the development of quality online resources. Key takeaways from this experience include the following.

- 1.The importance of learner-centred approach in designing and implementing the training programme;
- 2.Need to provide more learner support through offline sessions and encourage peer exchange;
- 3.Need to produce more oer for teacher training and make it accessible to more countries;
- 4.Need to scale up training through the tot model to benefit more teachers.

This programme represents a true embodiment of the IIOE spirit of "co-construction and shared benefits", which promoted cross-country and cross-institutional cooperation among IIOE partner HEIs. UCA shared its quality online educational resources and practical experience with other IIOE partner HEIs in Francophone Africa, thus strengthening the online teaching capacity of teachers in Francophone African HEIs, contributing to the quality of digital teaching in Francophone Africa. As a model of South-South cooperation within the IIOE network, the programme provides valuable experience for IIOE to put the principle of "co-construction and shared benefits" into action in more regions and even at the global level in the future.



Online Sessions of the UNESCO-ICHEI - UCA Joint Training Programme for Francophone Africa

Sharing Local Experience of the application of Artificial Intelligence and Cloud Computing in Higher Education

Since 2020, IIOE has been developing a training series on the application of cutting-edge technologies in higher education, such as cloud computing, big data, the internet of things and artificial intelligence. Since the development of the "Artificial Intelligence (General Level)" training programme in 2021, IIOE has called for video cases of the application of cutting-edge technologies in higher education from its global network of partner HEIs. UNESCO-ICHEI proposed guidelines and technical standards for case production, and provided professional and financial support to partner HEIs to share their best practices.

From 2021 to 2022, the Virtual University of Côte d'Ivoire (Côte d'Ivoire), Gaston Berger University (Senegal), and Ahmed Bello University (Nigeria) from the West African region, and the University of Engineering and Technology, Lahore (Pakistan), Tashkent University of Information Technologies (Uzbekistan) and Universitas Negeri Surabaya (Indonesia) from the Asia-Pacific region have produced and shared promising case studies of cutting-edge technologies applied to higher education teaching and research.

The Virtual University of Côte d'Ivoire provided a video case of AI applications in healthcare for the IIOE AI (general level) training, sharing the experiences of local researchers using AI technologies to assist medical diagnosis; University of Engineering and Technology (UET), Lahore, shared a video case on UET's innovative and exemplary applications of AI in higher education.

For the 2022 IIOE Cloud Computing (General level) training, Gaston Berger University (Senegal) shared a video case study on the use of cloud computing technology to process and analyse agronomy research and teaching at the university; Ahmadu Bello University (Nigeria) shared a video case study on the use of cloud computing technology to develop chatbots for teaching and learning at the Department of Computer Engineering; Tashkent University of Information Technologies shared a video case on Corporate Digital Library developed by the university using cloud computing technology; Universitas Negeri Surabaya's case focusing on opportunities and challenges of cloud computing in Indonesia.

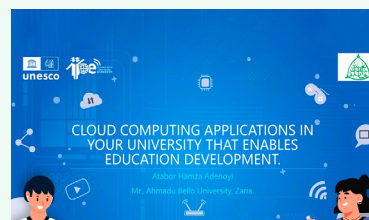
The cases provided by partner HEIs vividly demonstrated promising practices in applying cutting-edge technologies to solve local development problems, thus laying the foundation for building quality localised programmes and serving as a reference for other partner HEIs in the region.



Video case of artificial intelligence-assisted medical diagnosis at the Virtual University of Côte d'Ivoire (Côte d'Ivoire)



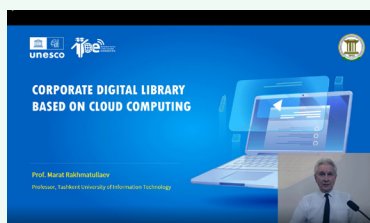
Video case of using cloud computing technology to process and analyse agronomy research and teaching at Gaston Berger University (Senegal)



Video case of educational chatbots using cloud computing technology at Ahmadu Bello University (Nigeria)



Video case on UET Lahore (Pakistan)'s innovative and exemplary applications of AI in higher education



Video case on Corporate Digital Library developed by TUIT (Uzbekistan) using cloud computing technology



Video case by UNESA (Indonesia) on opportunities and challenges of cloud computing in Indonesia

Sri Lanka and Mongolia: Co-development of IIOE courses

Since 2020, IIOE has actively recruited from its network of partner HEIs to co-develop IIOE courses. Among all, the University of Colombo (UoC) in Sri Lanka and the Mongolian University of Science and Technology (MUST) in Mongolia responded to this call and co-developed two courses respectively.

As a founding member of IIOE, UoC piloted this initiative with a course on how to design and develop video-based learning content for blended or online courses. It sought to serve other HEIs within the network with similar situations and offered practical reference. The course consisted of 7 modules, starting with the role of HEIs in blended learning as well as curriculum design, content design, video production, editing, and evaluation. Upon completing the content, UNESCO-ICHEI would collaborate with UoC in organizing a series of live-streaming Q&A sessions whereas IIOE Management Centre will provide technical support.

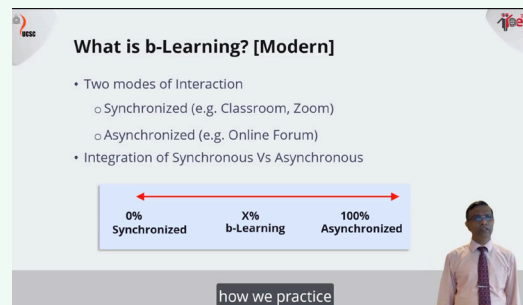
MUST, a founding member of IIOE and the host university of the IIOE National Center in Mongolia, developed an online course for IIOE, aiming to share MUST's practical experience in lightboard course production, help teachers in the IIOE global partnership network learn to build their own lightboards and use them in video course production, and at the same time attract more IIOE partner HEIs to participate in the co-development of IIOE courses. The training programme includes two components: recorded videos for self-paced learning and live sessions for interactive Q&A. Among them, the video content is about 8 hours in total, including the following modules: construction of lightboard, instructional design principles on using lightboard, development stages of lightboard technique; application scenarios of lightboard in different disciplines; lightboard course development; editing of lightboard courses and more.

Co-based Learning Content Development for e-Learning and b-Learning

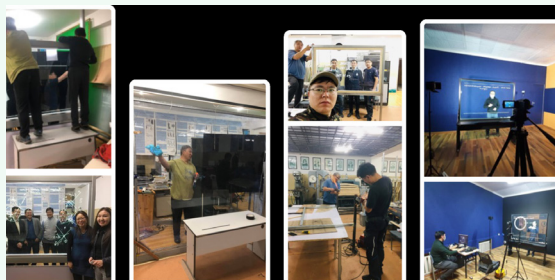
Introduction to e-Learning and Blended Learning



Courseware of UoC's Co-development Course



Video Content produced by UoC



Lightboard studios at MUST



Video course development using lightboard technology

3.4 IIOE's multilingualism promotes inclusive participation of HEIs, teachers and learners from different backgrounds.



Multilingualism has been one of IIOE's priorities since its establishment. When the IIOE platform was first launched in April 2020, the platform was already available in Chinese, English and French, and provided courses and professional development programmes in these three languages. As of May 2022, the IIOE platform is available in six official languages of the United Nations (Chinese, English, French, Spanish, Arabic and Russian), and hosts over 200 online courses in French, 15 online courses in Arabic.

The provision of quality educational resources in multiple languages is essential for the inclusion of diverse educators and learners to achieve equitable and quality higher education. IIOE partners have raised the need for multilingual content and platforms and highlighted the necessity of promoting the inclusive participation of HEI teachers from diverse backgrounds.



Dr. Anasse Bouhlal

Higher Education Program Specialist, UNESCO Regional Bureau for Education in the Arab States (Beirut, Lebanon):

IIOE's training programmes in English and French have garnered enthusiastic participation from HEI teachers and stakeholders in the Arab region. We hope that IIOE can provide online courses, training, and resources in Arabic for Arabic-speaking HEI teachers in the Arab region to better respond to their needs.

To better support HEI teachers of multilingual backgrounds, IIOE has conducted various activities in different languages. For example, IIOE conducted 3 French training sessions and developed 1 French webinar, with a total of 1,345 teachers participating. IIOE also conducted 1 Arabic training session and 1 Arabic webinar, with a total of 627 teachers participating. IIOE has also co-hosted 2021 IIOE Online Courses Competition among Francophone countries as well as the Arabic Micro-course Competition to strengthen and encourage the construction of French and Arabic courses. 31 HEI teachers from 14 countries have submitted their courses to the IIOE Online Course Competition (French edition). In terms of the IIOE Arabic Online Micro Course Competition, 63 HEI teachers from more than 10 countries in the Arab region have participated in the competition as of November 2022.

The construction of IIOE courses and programmes in 6 UN official languages needs to be further strengthened. To this end, IIOE will collaborate with IIOE National Centres, regional international organisations and IIOE partner enterprises to mobilize and construct more high-quality Arabic and French educational resources suitable for local needs in response to the needs of HEIs in the Arab region and Francophone countries, to better support the development of HEIs teachers in West Asia and Africa. IIOE will also collaborate with UNESCO system partners such as IITE and IESALC to produce more quality educational resources in Russian and Spanish.

Leveraging Multilingual Open Educational Resources for Quality Higher Education (Côte d'Ivoire)

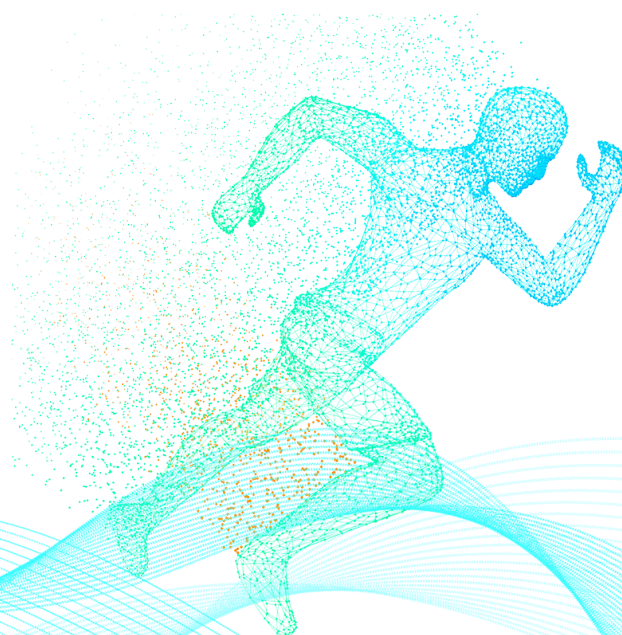
As a leading university in the field of online education and digital transformation in West Africa, the Virtual University of Côte d'Ivoire (UVCI) is an active member of the International Institute of Online Education (IIOE) projects. UVCI has partnered with UNESCO-ICHEI to integrate the IIOE platform's French online course resources into UVCI's master's degree programmes in the areas of big data, web security, IoT, and blockchain as part of credit courses and professional learning pathways to promote professional upgrading and provide internationally leading course content. In 2021, 128 master's students from the Virtual University of Côte d'Ivoire successfully completed the IIOE French courses, which were integrated into the university curriculum.

Promoting quality higher education in Central Asia: Partnership between UNESCO-IITE and UNESCO-ICHEI

In 2021, UNESCO-IITE and UNESCO-ICHEI signed an agreement to implement the "Higher Education Digital Transformation in Central Asia" project. The project activities aim to improve the quality of higher education in Russian-speaking countries in Central Asia by leveraging digital technologies and educational resources.

This two-year project will develop and publish 2 courses in the Russian language in the field of higher education digital transformation themed on "learning analytics" and "media and information literacy". It also plans to conduct research on capacities built through the courses and develop an analytical report. The course materials are being developed by teachers from ITMO University, a leading university in ICT in Russia. High-caliber professionals, university teachers, lawyers and journalists from Kazakhstan, Kyrgyzstan, and Uzbekistan will share their experience in this course via e-books, videos, podcasts and game-based learning. These courses will be made available on the IIOE platform and support the capacity building of higher education professionals in Russian-speaking countries.

The diverse cases presented in this chapter showcased how the collective action of the IIOE network put into practice the spirit of "joint contribution and shared benefits". While the IIOE platform provides a cyber environment for capacity building and lays the foundation for an ecosystem for higher education digital transformation, the multilingual resources ensured the inclusive participation of educators from different backgrounds. Furthermore, the co-construction mechanism facilitated the sharing of quality professional development programmes and the transfer of know-how among IIOE partners, while also fostering inter-university partnerships in contribution to the common goal of quality, equitable, and inclusive higher education for all.





Chapter 4

Empowering Digital Competency of HEIs through Multi-functional Facility

The infrastructure-ready facility, which includes hardware and software as well as technical training modules, as one of the basic capacity-building components for HEIs, is also a crucial pillar of the tech-leveraged higher education ecosystem in advancing the acceleration of the digital transformation shift for HEIs. In addition to the digital competency-building resources and tools made available by the IIOE project on the digital platform, the facility upgrade of HEIs and the higher education ecosystem through the Smart Classroom project also translates into improving the capacity of HEIs – from the leadership level to teachers and support staff – to effectively use technology in teaching and learning. Thus, the capacity-building of HEIs through the implementation of the Smart Classroom project and IIOE platform, helps to enhance pedagogy by providing access to advanced technology and supporting more interactive and engaging teaching methods, leading to improved student learning outcomes. It will foster innovation by encouraging innovation in teaching and learning, providing opportunities for HEIs to experiment with new pedagogical approaches and explore new educational technologies. Besides, it facilitates remote learning and collaboration, creating a more inclusive and diverse learning environment between students and faculty. Additionally, it strengthens the higher education ecosystem by providing access to technology to build a more robust and technologically advanced higher education ecosystem, which can support the development of students, faculty, and institutions. With the high spirit of joint-contributions and shared-benefits, the collective approach for the implementation and operations by all stakeholders of the Smart Classroom project facilitates an interactive, engaging and technologically-advanced learning environment to support remote, blended, HyFlex learning and collaboration from the core of it.

4.1 Smart Classroom Project: Providing the Necessary Conditions for Inclusive and Equitable Quality Higher Education in Blended and HyFlex Learning Environment



From individuals of all socio-economic statuses to entities of all types, technology has affected all segments of society, including the education sector. In the modern era of ever-evolving higher education delivery and acquisition, technologies' integration into existing settings perhaps plays the most significant role in reshaping the entire educational landscape. Increased levels of technology usage in the shape of hardware devices and software applications as well as online platforms/portals and offered training programmes, regardless of in-person, blended and online classes, have been a new norm for the past couple of years. Therefore, HEIs are always in need of the most updated and relevant hardware and software infrastructure support to brace for the ICT-filled future of higher education.

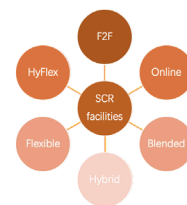
To realize the digital transformation of higher education in developing countries in Asian and African regions, HEIs do require establishing hardware infrastructure that can support online, blended and hybrid teaching in addition to an institutional push for integrating technologies into education, a policy shift towards going digital plus a team of university teachers and support staff with ICT competencies, professionalism and career development resources. COVID-19 has forced the global education workforce to immediately

adapt to the online teaching environment and equip themselves with advanced and complete intelligent recording and broadcasting equipment, practical and intuitive Learning Management System (LMS), and in-demand and rational training sessions for university teachers and technicians.

Given such a context, the concept of SCR revolves around an ambition to provide equitable infrastructure support and capacity-building assistance in the forms of essential yet robust hardware, necessary software applications and mandatory capacity-building training modules for HEIs in developing countries. Specifically, it means establishing a technology-powered interactive space to facilitate HEIs in developing quality educational resources, enhancing the repository of digital content, utilizing the offered LMS for classroom activities, and automating the cross-campus online and blended teaching and learning modalities for all. For students synchronously and asynchronously, attending either in-person or remotely, SCR facility also enables access to the same learning resources and interactive experiences as a Hyflex learning model to provide flexibility to learners.

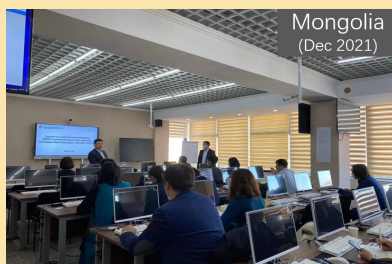
SCR could be:

- ✓ Traditional classroom
- ✓ Lecture recording
- ✓ Classroom activities recording
- ✓ Live streaming classroom recording
- ✓ Computer lab
- ✓ Conference/meeting room
- ✓ Exam proctoring
- ✓ Test centre (Professional certifications)
- ✓ Facility for external bodies (government, institute, etc.)



SCR Functions

This chapter studies the specifics of a shining example of this much-needed infrastructure support - the Smart Classroom Project by UNESCO-ICHEI, which is rendered to selected partner HEIs in Asian and African regions. For the study, focal points of UNESCO-ICHEI's partner HEIs from selected countries were invited to share their experience of SCR Project in terms of usability cases and data. Based on the feedback from the HEIs, this chapter can be useful in setting the guidelines for the modernisation of HEIs' facilities in the future to cope with the rapid changes in the higher education horizon.

Pakistan
(July 2019)Djibouti
(Feb 2020)Egypt
(Jan 2020)Cambodia
(Feb 2020)Mongolia
(Dec 2021)Sri Lanka
(Feb 2022)Kenya
(April 2022)Ethiopia
(April 2022)Gambia
(July 2022)Nigeria
(Aug 2022)Uganda
(Sep 2022)Indonesia
(Sep 2021)

Empowering HEIs through Infrastructure Support: 12 Fully-operational
SCR Facilities in 12 UNESCO Member Countries in Asia and Africa

4.1.1 SCR Project Introduction

The Smart Classroom Project is one of the flagship projects of UNESCO-ICHEI. It aims to enhance the infrastructural facilities of UNESCO-ICHEI's partner HEIs in Asian and African countries, strengthen their capacity of designing and implementing online and blended teaching and learning (OBTL), and accelerate the digital transformation of their higher education systems. The Smart Classroom consists of both hardware and software components, such as interactive touch panels, student terminals (laptops, all-in-ones or cloud desktops), servers, uninterruptible power supply (UPS) unit, recording and broadcasting system, wireless visualizer, wireless microphones, and network switches and related accessories. Besides, SCR is also powered by the inbuilt Management System that provides support for learning analytics, which creates SCR facility as a user-friendly, smart, and interactive learning environment.

Through PPP with leading Chinese educational technology enterprises, UNESCO-ICHEI has been able to donate and establish smart classrooms at partner HEIs. The Smart Classroom is a digital learning environment that integrates emerging ICT domains, such as Big Data, Cloud Computing, the Internet of Things (IoT), Computer Vision and AI to support digital teaching and learning, localised curriculum design, cross-campus resource-sharing, learning analytics, administration and management, among other requirements for realising the digital transformation of HEIs. Each Smart Classroom facility can accommodate 50 students for lectures, seminars, training, forums, and workshops, among other functions.



Design Scheme of SCR

- Create a shared digital learning environment for teachers and students to realise ICT-driven innovative teaching and management.

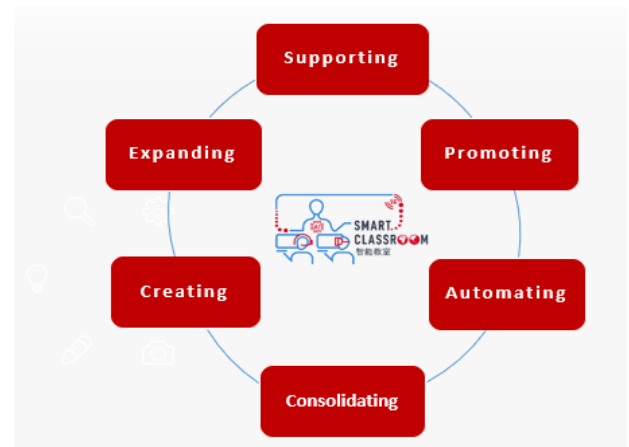
For online and face-to-face learning models, SCR project facilitates teacher-student interactions and collaborations through the interactive touch panel, display terminals, audio systems, and the LMS. The SCR LMS also supports learning analytics for teachers to monitor and evaluate students' learning outcomes and generate data analysis reports to inform differentiated instructions for each student.

- Narrow the gaps in educational resources for HEIs in developing countries to propel the transition to online education.

The LMS and learning analytics system of SCR enhances HEIs' capacity to design and implement OBTL. Teachers can record, edit and upload their video lectures at the SCR, enabling more teachers to develop and customize online courses with localised curriculum, and thus expanding access to quality education resources and opportunities for lifelong learning.

- Connect the global HEI networks to facilitate knowledge production and resource sharing.

The SCR Project provides hardware support for partner HEIs in Asia and Africa, to enable HEIs to develop, customize and localize the courses and training modules, and enhance the classroom learning experience and foster collaboration between beneficiaries of SCR Project around the globe to stay abreast with latest trends and practices in higher education delivery. At the same time, IIOE as a global HEI network and platform, facilitates collaborative research and educational resource sharing. Higher education professionals can also share their successful experience of curriculum design, research and development, and digital management with international HEIs, opening up a new path to higher education digital transformation for developing countries.



Six Functions of SCR

To summarize the specifics of SCR Project functions, SCR Project intends to:

Expand the repository of educational resources and supplementary materials by developing updated digital content for MOOCs and university LMS to be accessed on- and off-campus

Create recording & broadcasting systems for academic programmes across campuses and for remote learning (lectures, training sessions, courses, etc.)

Consolidate the core essence of the traditional classroom, computer labs, exam room, lecture and classroom recordings and live streaming, conference room, etc. into one multipurpose facility

Automate classroom teaching and learning activities with built-in hardware, bundled software applications and installed LMS (to carry out assignments, quizzes, tasks, exams, etc.)

Promote student-teacher interactions, blended learning, HyFlex mode and online education

Support the shared-benefits and joint-contribution spirit at institutional, national and cross-regional levels

Since its inception, UNESCO-ICHEI envisions the world having an educational eco-system and network for ICT-driven Quality Education. Thus, to realize the vision, UNESCO-ICHEI, in collaboration with partner HEIs, supported by the Southern University of Science and Technology (SUSTech, <https://sustech.edu.cn/>), successfully deployed SCR Projects in 12 UNESCO member states, which are Pakistan, Egypt, Djibouti, Cambodia, Kenya, Ethiopia, Sri Lanka, Mongolia, The Gambia, Nigeria, Uganda, and Indonesia with generous support coming from top-notch Chinese educational technology enterprises as donors named WEDON (<https://www.wdecloud.com/>) and Createview (<https://www.createview.com.cn/>).



Milestones of the Development of SCR

(UET: University of Engineering and Technology, Lahore; ASU: Ain Shams University; RUPP: Royal University of Phnom Penh; UoD: University of Djibouti; MUST: Mongolian University of Science and Technology; UoC: University of Colombo; AAU: Addis Ababa University; UoN: University of Nairobi; UTG: University Of The Gambia; ABU: Ahmadu Bello University; MAK: Makerere University; ITB: Institut Teknologi Bandung.)

The role of each partner has been crucial for the successful implementation of the project in all project countries. The usage after the post-deployment is the responsibility of the partner university to maximize the utilization to SCR project's potential. However, UNESCO-ICHEI and IIOE keep providing support and guidance to ensure the smooth operation of the SCR facility. Therefore, the partnership between UNESCO-ICHEI, partner HEIs and educational technology enterprises keeps strengthening to empower university teachers and infrastructure for a longer-term productive collaboration on digital transformation and sustainable development.

4.1.2 SCR as Promising Practice That Effective Results for Partner HEIs

University of Engineering and Technology (UET) Lahore in Pakistan, with a total number of 13,313 students, is the first partner HEI of UNESCO-ICHEI which got successful deployment of SCR project in July 2019 and in UET Lahore's words, "Overall experience is excellent with respect to teaching and learning environment and devices." Before the SCR launch, UET lacked the infrastructure for online class activities and a broadcasting facility. SCR solved the challenge of UET Lahore with the availability of infrastructure for recording and broadcasting classroom activities. Since its launch, SCR at UET Lahore has been utilised for 2,686 hours to teach various curriculum subjects and conduct different kinds of educational events (workshops, conferences, seminars, meetings, etc.) and activities (regular and special classes), serving 1,549 students. The SCR facility at UET Lahore assisted 23 teachers to record 98 hours of 55 different videos with a size of 135-GB, supported by an interactive smartboard, cloud desktop terminals, server and server system, and video recording and broadcasting system, to name a few devices. SCR project at UET Lahore is highly acknowledged by Prof. Dr. Syed Mansoor Sarwar, the Vice-Chancellor of UET Lahore, endorsed it by saying, "I am pleased to observe the progress made by UNESCO-ICHEI in the digital transformation domain and its support for UET Lahore in implementing WEDON Smart Classroom. I thank and congratulate the UNESCO-ICHEI

Smart Classroom Project team for the successful implementation and continued support in the effective use of the Smart Classroom at UET Lahore and other partner HEIs. I always enjoy my visits to the WEDON facility to attend various programmes there. The Higher Education Commission in Pakistan has also funded the establishment of two additional smart classrooms at UET Lahore, one each in the Chemical Engineering departments at the Main and New campuses. I will request ICHEI and WEDON to guide us in making optimized and effective use of these smart classrooms for initiating digital transformation at the institutional and national levels."



A training session is being conducted in the Smart Classroom facility at the University of Engineering and Technology (UET) Lahore, Pakistan

SCR Project at Ahmadu Bello University (ABU), in Zaria of Nigeria - one of the largest HEIs in sub-Saharan Africa, with a 104,475 student population, was successfully deployed in August 2022. Before the launch, ABU faced a few challenges e.g. non-availability of standard and control recording studios for digital and online content development, lack of robust infrastructure for digital content conversion and development, lack of facilities for blended classroom settings and inadequate capacity building with respect to blended learning. Since its launch, SCR at ABU has been utilized continuously for staff capacity-building training sessions, workshops, meetings, and viva voce. So far, SCR has served more than 700 teachers, students and staff members of ABU, with 584 hours of its usage fully put into interactive smartboards, computers, high-speed scanner, digital displays and UPS. The challenges that were answered by the SCR facility at ABU are: a control room for content development, a blended learning environment, a cost-free recording system, high-speed scanner for digital content conversion and provision of a medium for capacity building. In recognition of SCR's contribution to ABU, Prof. Dr. Kabir Bala - the Vice-Chancellor of ABU, did mention that "I wish to sincerely extend our profound gratitude to UNESCO-ICHEI for this project, as the SCR has boosted our IT infrastructure, especially in the digital transformation of teaching and learning at the University. The SCR has been utilized in staff capacity-building training on digital skills for effective teaching and learning. This training was organized for teachers at the University to enhance their digital teaching skills as the students will resume full academic activities by January 2023."



SCR orientation and technical training modules were attended by leaders, teachers and technical staff at Ahmadu Bello University (ABU), Zaria, Nigeria





4.1.3 Fostering Industry-Academia Partnership for the Technology-leveraged Futures of Higher Education

From industries' demand for quality graduates to research-focused academia's knowledge creation as well as infrastructure upgrade, and from students' talent cultivation to teachers' professional development, UNESCO-ICHEI strives to support higher education stakeholders through its substantial projects. Smart Classroom and IIOE projects' implementation as collaborative and effective outcomes, in their efforts to achieve SDG 4 by bringing experts in both domains together for constructive contributions in all possible ways and capacities. An educated, peaceful and just world is what UNESCO-ICHEI envisions, and thus it is dedicated to assisting UNESCO member states in higher education domain via innovative and in-demand approaches to establish an ICT-driven quality-filled eco-system for all.

The donors, beneficiaries, facilitators and supporters of SCR project are equally important for the successful implementation and post-deployment smooth operations of SCR facilities. Below are a few testimonials from some representatives of partner enterprises and HEIs to share their thoughts about SCR project:

Mr. Wang Zhiqian, Vice President of WEDON: "WEDON Smart Classroom is a flagship project of WEDON and ICHEI, which aims to promote the digital transformation of education in Asia and Africa, and build a digital teaching environment that integrates intelligent teaching equipment and interactive software for teachers and students. Our project has safely landed in top HEIs in many Asian and African countries, providing important technical support and guarantees for the development of local education digitalization. Especially during this pandemic, WEDON Smart Classrooms have played an important role."

Mr. Zhang Yu, Chairman of Createview: "We hope that the advanced teaching equipment of Createview can help teachers better serve education and teaching, contribute to the innovative development of higher education digitalisation and promote educational equity. Especially in the critical period of the COVID-19 epidemic, the smart classroom can be put into use smoothly, and it has played a key role in online distance education, reducing the impact of the epidemic on education and teaching."

Mr. Deng Yigang, President of Seewo: "We hope that, based on the

smart classrooms project, we can offer more efficient and interactive teaching experience in the classrooms in HEIs, improve the digital teaching ability of teachers in HEIs and colleges, and jointly promote the development of digital transformation of higher education."

Prof. Dr. Waqar Mahmood, UET Lahore, Pakistan: "The WEDON Smart Classroom at UET Lahore is the first of its kind in Pakistan. The Higher Education Commission (HEC) of Pakistan along with Chinese enterprises visited WSCR and incorporated the trend of digital transformation by integrating Smart Classrooms into Pakistan's HEIs. I want to express my gratitude to UNESCO-ICHEI for their assistance in this matter. Except for a few limitations, it operates smoothly. We have made every effort to keep the facility operable and up to date for the necessary tasks. With the help and collaboration of WEDON we should be able to integrate several devices, some suggested in this survey, to maximize its utilization. In order to enhance the OBTL experiences, we would like to integrate emerging technologies in the next phase."

Prof. Muhammed Bashir Mu'azu, ABU, Nigeria: "The SCR has so far been used as a platform for digital transformation of teaching and learning in the University and other partners HEIs. This is achieved through staff capacity building trainings and workshops. Seminars, presentations, etc. for students and other staff will be conducted once the school resumes fully. All thanks to UNESCO-ICHEI for providing this platform and various training that empowered us with digital skills towards enhancing teaching learning in the University."

Dr. N M Karannagoda, Assistant Librarian (Sys & IT), University of Colombo, Sri Lanka: "The Smart Classroom is very important to our university. Lecturers highly preferred the recording facility provided by the Smart Classroom. They can take the video recording of the lecture as soon as they finish their session. Also, the computer system is very useful when conducting practical exams for undergraduates. Further, by using the Smart Classroom computer system, lecturers can teach in a very user-friendly way and lecturers can teach some highly valued software to too many students by using a single software. Therefore, we were highly satisfied with the Smart classroom which was provided to us. Thank you."

4.2 IIOE Platform: An Open-access Online Platform Supporting Teacher's Professional Development



In addition to cooperating with enterprises and HEI partners to enhance the digital competencies of their infrastructure through the implementation of SCRs in partner institutions, IIOE also provides an open online learning platform based on cloud services to help HEIs build a sustainable environment for online blended learning. It is also a multi-dimensional link-open co-construction and sharing platform among partners. IIOE encourages partner HEIs to actively use smart classroom facilities to carry out digital curriculum development and training, and at the same time upload these high-quality digital course resources to the IIOE platform to share within IIOE ecosystem and the extended IIOE network, which essentially reflects the equitable service that IIOE has been advocating. Moreover, the IIOE learning platform is designed for flexible access. Teachers and students of partner HEIs can visit the IIOE learning platform through PC or mobile devices in the SCRs or using their own devices, and complete their studies at their own pace with various learning activities. Through the combination of this software and hardware service, online and offline blended learning, the SCRs and the IIOE online learning platform can effectively support partner HEIs to carry out online hybrid

teaching and the practice and research related to the digital transformation of higher education.

The initial establishment of the IIOE online learning platform was fiscally sponsored by Tencent Charity Foundation. UNESCO-ICHEI covered the cost of server deployment as well as the management and maintenance of the IIOE platform provided, in collaboration with the learning platform service provider Jiker Academy (jiker.com). In view of possible network limitations of developing countries, the IIOE platform was deployed on a cloud server and equipped with basic servers along with content delivery network (CDN) service, in order to ensure partner HEIs on all continents have optimal access to the resources. Through CDN, platform accesses, document downloads and live streaming, etc. can be accelerated. Different CDN nodes will be set up according to the geographical locations of partner HEIs for ensuring access speed to the IIOE platform. The IIOE platform 1.0 was officially launched in April 2020, and to date, IIOE has

provided a variety of online learning services to more than 10,000 university teachers from 135 countries around the world, and offered courses and training resources in the six official languages of the United Nations (Chinese, English, French, Arabic, Russian and Spanish).

Unlike traditional online learning platforms, IIOE plays multiple roles and carries out functions that are beyond an online learning platform. First, IIOE serves as an online learning platform and OER repository hosting quality higher education courses that focus on developing ICT-related competencies of teachers from partner HEIs to meet the demands of online teaching and learning. The courses and training programmes are free of charge to all users on the platform. Second, IIOE is an advisory body to guide partner HEIs and teachers to enhance their capacity and quality of online and blended learning through the IIOE Quality Assurance Framework, IIOE Digital Competency Course Framework and mechanisms to realise higher education reforms of partner HEIs in the digital era. Third, the IIOE platform is also a repository of web-based tools and relevant tutorials that are curated for various use cases for management, teaching, and evaluation. Fourth, the platform could also facilitate online course sharing and information exchange among members who join the IIOE initiative to ensure accurate and efficient message delivery across the board.

Partner HEIs are encouraged to share their online courses on the platform, which draws on the principle of "joint contribution and shared benefits" and builds bridges between academic exchanges and international collaboration among HEIs. The courses shared on the platform should satisfy two conditions: a) The courses should be approved by the partner HEIs and meet the related criteria of online courses; and b) the courses are free of charge to share with other partner HEIs on the platform.

All courses offered by the course resource provider will be stored on cloud servers, and can be accessed by IIOE users after registration and logging in the IIOE platform. Teachers of partner HEIs can benefit from the course resources in three ways: learning, utilising and developing online courses.

Learning online courses

Teachers of partner HEIs can log in to the IIOE platform to learn what they are interested in for their professional development of knowledge and competencies in their own fields.

Utilising online courses

Teachers of partner HEIs are encouraged to integrate online courses into their teaching, if applicable, through a blended teaching and learning way. However, the information of original course developers/providers (including name and affiliation) should be kept. Partner HEIs are allowed to translate the content of online courses on the platform for localised teaching and learning without any secondary editing to the course content.

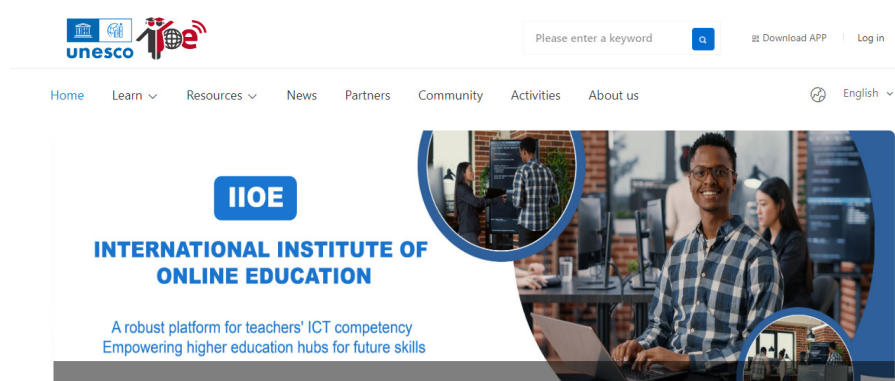
Developing online courses

Partner HEIs and their teachers are encouraged to develop their own online courses with the tool(s) of course development provided by the IIOE platform. To share the newly developed course on the IIOE platform, teachers need to get approval from their institutions and IIOE.

The IIOE online learning platform is equipped with the function of using qualitative and quantitative learning data for analysis for HEIs, including but not limited to quantitative and qualitative data such as the duration of the courses, online interaction, the number of courses utilised, uploaded, or developed, etc. With the support of the IIOE platform, partner HEIs can also upload the data of offline teaching and learning activities, and conduct evaluation and research of online and blended learning that can be used for evidence-based practices and policies. IIOE pays a lot of attention to data security, and hence, personal privacy and data security will be strictly protected with technical guidelines. Relevant clauses about the copyright of online courses and personal privacy are also an integral part of IIOE operations to ensure the rights of developers and contributors.

With the continuous development and application of new technologies, and the increasing demands of IIOE partner HEIs and teachers in terms of functional features, user experience and learning management, the IIOE platform is facing systematic iteration and upgrading in order to provide better services and experiences for all partners. In July 2022, UNESCO-ICHEI, together with Zhixue Cloud Technology Co., Ltd. (<http://www.zhixueyun.com/>), completed the iterative upgrade of the IIOE learning platform. After nearly half a year of trial operation and refinement, the brand new IIOE platform 2.0 (<https://www.iioe.org/>) has been officially launched for public visits on January 1, 2023.

The new platform made updates and improvements in four main aspects: product design, user experience, technology capacity, and operational functions. Firstly, the product design of the new platform is mature and on par with leading service providers in the industry. The new LMS is compatible with many standard services such as Single Sign On (SSO), SCORM, standard API and etc, which enables IIOE to connect and interact with other learning management systems,



IIOE Platform 2.0

especially those of IIOE partner HEIs. Secondly, the new platform features a fresh new UI and improved user journey designs, making site navigation more friendly for users across different countries and regions. Thirdly, the new platform improved its structural design for IIOE's specific user groups based on different internet capacities and technology affordance, making the platform more stable and secure for all IIOE users around the world. And in terms of operational features, the new platform provides a set of functions that allow teachers and partner university administrators to easily access the IIOE LMS and share their learning resources with the IIOE network, gradually formulating a learning community on the platform. New data managing engines and visualisation tools would also help instructors to conduct learning effect analysis and issue teacher capacity certification upon meeting the requirements. Further updates will incorporate new technologies including AI and big data analysis, to strengthen the intelligent capabilities of the platform.

Facing the future, UNESCO-ICHEI will continue to adhere to the principle of "joint contribution and shared benefits", and join hands with our partner HEIs and partner enterprises to stay committed to building IIOE into a global digital competency certification learning platform for university teachers, and promoting the digital transformation of partner HEIs through the development of digital capabilities of university teachers.

4.3 SCR and IIOE: Empowering HEIs for Digital Futures of Higher Education



Delivery and receiving of educational content and instructions have been evolving for decades. So do the technical infrastructure and learning platform to facilitate the entire academic system and empower HEIs. To foster lifelong learning opportunities, the world is witnessing rapid development in the application of technologies in education e.g. integration of AI, big data, virtual reality (VR), cloud computing, the IoT as well as robust hardware, to strengthen blended and hybrid learning whereby online education is going to be more prevalent. The levers of the digital transformation of higher education are not only about "techniques" such as concepts and methods, but also "fields" such as environments, offline spaces and online platforms. The re-design of the teaching and learning space is an upgrade of pedagogical thinking. The smart classroom and the learning platform driven by digital transformation are to integrate digital technologies to rebuild a flexible and unlimited online and offline hybrid learning space with the support of the Internet.

Since technology has always been an integral tool in the academic environment for the last few decades, UNESCO-ICHEI believes that ICT-leveraged quality, equitable and inclusive higher education for all is the way for talent cultivation in order to bring socio-economic prosperity to UNESCO member states as well as a peaceful and educated world. To shoulder UNESCO's mission and to advance the efforts in achieving Sustainable Development Goal 4 "Quality education for all", UNESCO-ICHEI will continue collaborating with more enterprises and HEIs at a global scale to equip more HEIs with SCR Projects, and the relevant professional development programme for educators with the IIOE platform in the years to come.

UNESCO-ICHEI has signed a strategic cooperation agreement with Seewo (<https://www.seewo.com/>) and got 10 more SCR which will be deployed in Asian and African countries. Therefore, with a holistic approach, SCR Project will gradually expand in Nepal, Malaysia, Morocco, Kyrgyzstan, Uzbekistan, Thailand, the Philippines, and more UNESCO member states in Central Asia, ASEAN region, the Arab States as well as in Latin America and Caribbean regions in the future. On top of this, the SCR project team will keep consolidating the constructive and suitable modalities into the existing framework to carry out SCR Project, which will incorporate and mix the advanced technologies and components in education such as AI, VR, AR, the IoT and Big Data for futuristic HEIs and smart campuses. This will also include a vibrant and up-to-date portal for the world to experience real-time data visualization, which will be generated in accordance with SCR facility usage in all countries and cross-regional knowledge sharing by bridging SCR focal persons to exchange views and practices, strengthening the spirit of joint contribution and shared benefits, and paving the way for IIOE training and courses. UNESCO-ICHEI will also continue to work with learning platform service providers to enrich the functions and features of the IIOE platform, apply advanced ICT to the platform, and provide educators with a world-leading digital training certification platform.

UNESCO-ICHEI acknowledges that this is an ambitious aspiration, and there will be unanticipated challenges along the way to SCR and IIOE learning platform implementation. However, the dedication towards achieving the mission of IIOE will conquer difficulties and uncover solutions with collective efforts, a high spirit of collaboration, and a strong interest in flourishing IIOE partnerships.

While the SCR project and IIOE learning platform offer the technology, infrastructure and training resources necessary to empower partner HEI's modern teaching and learning modalities, including providing teachers and students with access to up-to-date technology for the digital futures of higher education, a need for building a common understanding for communication and quality emerges. QA – as one of the very critical aspects of the higher education system – helps to ensure that the educational services provided by the university meet established standards and expectations for an equitable and inclusive higher education experience. For that reason, IIOE has collaborated with international experts and developed IIOE Quality Assurance which will be elaborated further in the next chapter.

Chapter 5

IIOE Quality Assurance

While digital facilities lay the necessary foundations for empowering digital competencies of the higher education workforce and institutions, quality assurance (QA) is a sufficient condition to ensure effective education inputs, processes, and outputs, to uphold academic standards and enabling recognition of digital learning. This chapter elaborates on the context, content, operationalisation and impact of IIOE's QA Framework and toolkit for OBLT. Combining the presentation of theoretical frameworks with cases of local application, it seeks to highlight the imperative of developing a comprehensive, relevant, applicable IIOE QA framework of OBLT to empower quality higher education, as well as the impact that QA could have once implemented according to local contexts.

5.1 Developing IIOE Quality Assurance: rationale, process and content



5.1.1 Quality Assurance (QA) of digital teaching and learning: a developmental agent to drive and support quality higher education.

The global COVID-19 pandemic has accelerated the digital transformation of higher education teaching and learning, prompting HEIs worldwide to apply digital technologies in teaching and learning, and adopting online and blended learning to ensure educational continuity. Even as the higher education community is moving into the post-pandemic era, digital teaching and learning will continue to serve as a "key lever" for transforming education (United Nations, 2022). As good structures for the QA statements of higher education are crucial for enabling trust in qualifications and protection of academic standards and integrity, the development and implementation of QA mechanisms for digital teaching and learning has become an imperative for ensuring quality, inclusive and equitable higher education.

Echoing the Global Convention on the Recognition of Qualifications Concerning Higher Education ("Global Convention") and UNESCO's efforts to strengthen QA in higher education, UNESCO-ICHEI has placed QA at the heart of its mission since its establishment.

In the same thread, the Shenzhen Municipal Government contributed 2 million US dollars and jointly established the "UNESCO-Shenzhen Funds-In-Trust" (UNESCO-SFIT) with UNESCO in 2015. With support from UNESCO-SFIT, the "Strengthening Quality Assurance in Higher Education in Africa" project was launched in March 2017, aiming to support the implementation of the Revised Convention on the Recognition of Qualifications, Diplomas and Certificates concerning Higher Education in Africa ("Addis Convention") through the development of QA systems and strengthening of national higher education systems, with a view to promoting quality higher education, cross-border recognition of qualifications and academic mobility in Africa. With active participation and contribution from UNESCO-ICHEI, the project was concluded in June 2022 with fruitful results.

- Supported Côte d'Ivoire, Mali, Niger and Togo to establish national QA agencies and operationalise QA mechanisms.
- Strengthened institutional capacity building of established QA agencies in Egypt, Malawi, Namibia, Senegal, Gambia, and Zambia.
- Consolidated QA networks in Africa and developed Mutual Recognition Tools of Quality Assurance in Africa.

However, the project did not adequately respond to the urgent need for QA of digital teaching and learning in higher education. As HEIs in the global south are often faced with limited capacity to implement digital teaching and learning, addressing these challenges requires a holistic approach that coordinates the efforts of all higher education stakeholders. Therefore, an up-to-date, comprehensive and operationable QA framework and toolkit are needed to build an ecosystem that drives and supports digital teaching and learning.

5.1.2 From IIOE QA 1.0 to 2.0: joint consultation and development

In response to these challenges, UNESCO-ICHEI initiated the development of IIOE Quality Assurance Framework and Toolkit for Online and Blended Teaching and Learning 1.0 (IIOE QA 1.0) in 2018 based on an extensive review and systematic analysis of existing QA frameworks. In December 2019, UNESCO-ICHEI officially introduced IIOE QA 1.0 during the launch of IIOE, which received endorsement from all 11 founding partner HEIs in Asia and Africa. In April 2020, the IIOE QA 1.0 online self-assessment tool was officially launched on the IIOE online learning platform to support IIOE partner HEIs to carry out self-assessment, identify strengths and areas for improvement, and provide customised suggestions for improvement based on the assessment results.

1.0 IIOE Quality Assurance Framework 1.0

6 Components	20 Sub-Components	60 Statements
• Institutional policies and mission	4	11
• Teaching and learning Infrastructure and Resources	3	9
• Development and Implementation of Online and Blended Programmes/ courses	6	17
• Learner assessment and evaluation	3	8
• Learner learning support and progression	2	4
• Professional development and support for teachers and staff	2	11

IIOE QA 1.0 Framework and Institutional Online Self-assessment Tool

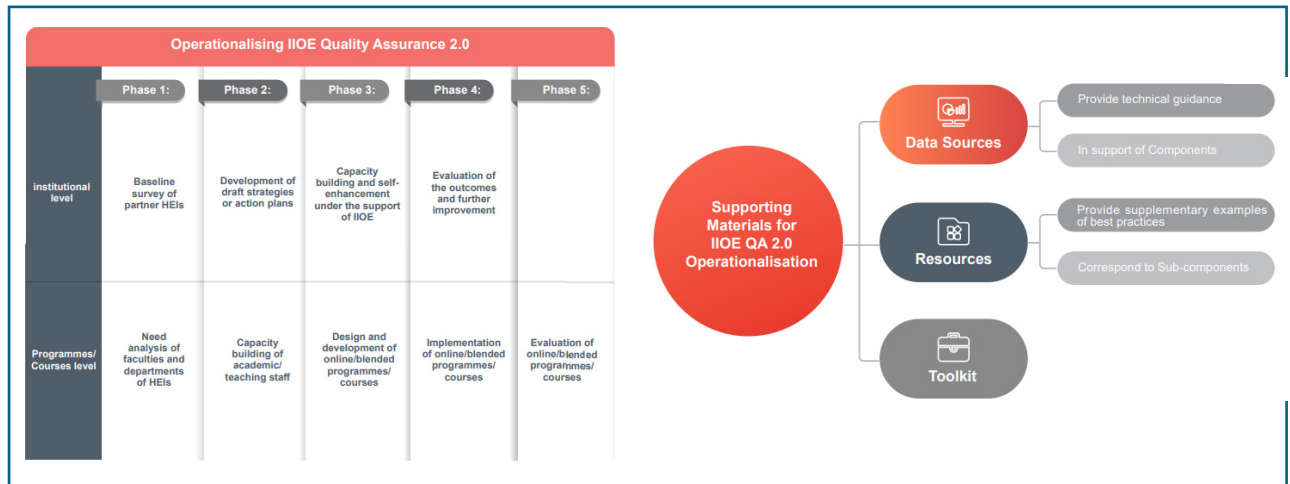
As the COVID-19 pandemic drastically changed the global higher education landscape, IIOE partner HEIs highlighted the need for a more operationable QA framework and toolkit applicable to local contexts. Against this background, IIOE QA 2.0 was developed based on the experiences of IIOE partner HEIs and drawing upon the latest international and regional QA frameworks, while taking into account the unprecedented uptake of OBTL brought about by the COVID-19 pandemic, and adapting it to different regional contexts.

IIOE QA 2.0 maintained the original structure of IIOE QA 1.0, while it added 2 components ("Collaboration and Partnerships" and "Monitoring and Evaluation") and associated sub-components, and expanded on existing components, sub-components and statements.



IIOE QA 2.0 Components and Sub-components

In addition, IIOE QA 2.0 gave special attention to its operationalisation, incorporating operationalisation guidance, data sources, resources and toolkit for HEIs as a benchmark for localised implementation.



Guidelines and Supporting Materials for IIOE QA 2.0 Operationalisation

In 2021, UNESCO-ICHEI gathered inputs from IIOE partner HEIs in Africa and QA experts from the Asia-Pacific and Africa on the relevance, comprehensiveness, practicality and adaptability of the draft IIOE QA 2.0. Many partner HEIs and experts fully affirmed the relevance, comprehensiveness, practicality and adaptability of IIOE QA 2.0. It was validated in October 2021 by IIOE partner HEIs in Africa on the occasion of the IIOE QA 2.0 consultation meeting.



IIOE QA 2.0 Document



IIOE QA 2.0 Consultation Meeting, October 2021

5.1.3 Content of IIOE QA 2.0 framework and toolkit

The IIOE QA 2.0 framework includes 8 components, 20 sub-components and 73 statements. Compared to IIOE QA 1.0, IIOE QA 2.0 has slightly modified the categories of components and changed some of the statements. For example, the component "learning support" was changed to "student support" because students not only need learning support, but also technical and administrative support.

2.0 IIOE Quality Assurance Framework 2.0		
8 Components	20 Sub-Components	73 Statements
• Institutional policies and mission	3	9
• Institutional Structure and Culture	3	4
• Digital Infrastructure and Resources	2	10
• Online and Blended Program/ Course Development and Implementation	3	20
• Student Support	2	10
• Staff Professional Development and Support	3	9
• Collaboration and Partnership	2	2

IIOE QA 2.0 Framework

Another example of increased clarity is in "Component 8: Monitoring and Evaluation" and its sub-components. Compared to the previous version, there are more details on enacting the monitoring and evaluation mechanisms, such as specifying the need for a centralised committee and highlighting the different levels of committees.

Furthermore, the resources were revised, with abstracts of each resource added in addition to the links, while more resources from diverse countries, especially developing countries were added. The new self-assessment tools are based on the framework, supporting HEIs to reflect upon their readiness for OBTL from a QA perspective, to identify gaps for OBTL and engage in strategic planning to address those gaps.

5.2 Operationalising IIOE QA: from design to practice



5.2.1 IIOE QA 2.0's relevance, adaptability and applicability to HEIs

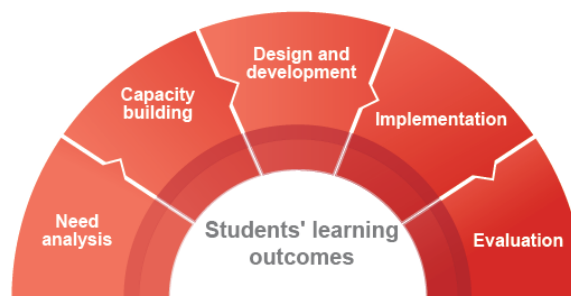
IIOE QA 2.0 is widely considered to be highly relevant to HEIs in the global south, considering its comprehensiveness and solid research foundation. The operationalisation guide and toolkit based on international best practices, including resources from the global south ensure IIOE QA 2.0's applicability to HEIs in the global south, as their perspectives and knowledge are recognised, which increases the ownership and empowerment of IIOE partner HEIs.

A typical implementation of IIOE QA 2.0 at an HEI could include the following main steps.

1. Review existing mission statements and carry out an audit of existing capacities/Identify strengths and weaknesses using the online self-assessment tool or the self-assessment report template
2. Develop strategies, policies and plans to address areas for improvement and build upon strengths.
3. Design and implement capacity building programmes for staff, including collaboration with other HEIs and partners
4. Monitor and evaluate the process of QA and quality enhancement, share good practices

On the programmes/courses level, IIOE QA 2.0 provides a suite of guidelines and templates for planning, implementing, reviewing and evaluating online and blended programmes/courses, with the core aim of enabling students to achieve learning outcomes. Key steps to implementing IIOE QA 2.0 at programmes/courses level include the following.

1. Needs analysis of faculties and departments of HEIs
2. Capacity building of academic/teaching staff
3. Design and development of online/blended programmes/courses
4. Implementation of online/blended programmes/courses
5. Evaluation of online/blended programmes/courses



Flowchart of Implementing IIOE QA 2.0 at the Programmes/Courses Level

5.2.2 Opportunities and challenges of operationalising IIOE QA: perspectives from IIOE partner HEIs and experts

Ain Shams University (Egypt)

Ain Shams University (ASU) is a pioneer of higher education digital teaching and learning in Egypt. The current digital learning QA system at ASU is based on the Egyptian accreditation standards developed by the National Authority for Quality Assurance and Accreditation of Education "NAQAAE" and international ranking standards, as well as ASU's approved and published standards and minimum requirements for online and blended courses. (Elzahry, 2022)

Despite existing internal QA mechanisms, there is a need for a comprehensive and practical QA framework that covers the inputs, processes and outputs of higher education. IIOE QA 2.0 serves as an important benchmark for improving ASU's QA system. After reviewing the IIOE QA 2.0 framework and toolkit, the ASU team decided to adapt it to the local context, particularly by translating existing standards into operational checklists. In addition, IIOE QA 2.0 will also be compared to existing QA tools and translated into Arabic. (Elzahry, 2022)

Nevertheless, some challenges exist in terms of implementing IIOE QA 2.0 at ASU, such as aligning with national standards of NAQAAE, and the need to enhance university staff's competencies of quality management and adapting traditional face-to-face curricula and programmes into online and blended mode. To surmount these challenges, it is crucial to ensure engagement from senior leadership such as the university presidents and vice presidents, deans and vice deans, and programme coordinators. In addition, continuous professional development at all levels can facilitate the adoption of change and enhance the capacity to effectively implement QA of online and blended courses and programmes.

Cadi Ayyad University (Morocco)

Cadi Ayyad University (Université Cadi Ayyad - UCA) is one of the leading HEIs in Morocco in terms of digital transformation. UCA has integrated the use of LMS, MOOC, SPOC, E-labs in teaching and learning and teacher professional development since 2012. It is building upon existing achievements and progressing towards a "Smart University" that takes holistic advantage of ICT in pedagogy, collaborative research as well as administration and financial management for greater efficiency and better governance.

Currently, QA of digital teaching and learning at UCA uses the same framework and tools as face-to-face education. Therefore, IIOE QA 2.0 could serve as a very good tool to improve and complete the current QA system at UCA. A self-assessment of the blended education system at UCA using the IIOE QA 2.0 framework indicated areas of improvement, demonstrating that the application of IIOE QA 2.0 could enable the present blended education system at UCA to shift from semi-planned to planned and controllable management, so as to optimize QA management, smoothing the path to excellence. (Sidmou, 2022)

However, to make such changes a reality, all stakeholders of the university should be aware of and accept the goals and functions of IIOE QA 2.0. In addition, cultural factors could inhibit the transition toward adopting new QA frameworks and practices. To address these challenges, it is important to develop an integrated, decentralised QA system for both face-to-face and online and blended teaching and learning to connect all relevant stakeholders of the university and to ensure genuine acceptance of new QA functions, goals and tools. Staff professional development is also important for shaping a flexible institutional culture that is open to change.

National Authority for Quality Assurance of Higher Education and Scientific Research (ANAQ-SUP), Senegal



Prof. Lamine Gueye

Secretary General, ANAQ-Sup, Senegal

Up till now, Senegal does not possess a reference framework for blended teaching and learning. In this regard, certain internationally accredited quality assurance frameworks such as IIOE QA 2.0 may benefit HEIs in Senegal by serving as the regulatory basis. Adopting IIOE QA 2.0 can render the following benefits for Senegalese higher education, which could also apply in other regions in Africa.

First, this framework can complement the remote teaching reference framework proposed by ANAQ-SUP, and become a guideline for HEIs to manage and implement OBTL courses.

Second, HEIs can benefit from the online training sessions related to this framework, improving the capacity of the participants such as teachers, researchers, administrative staff, technology specialists and service personnel.

Third, this framework can become the online self-assessment tool for HEIs, to identify the areas for improvement.

Fourth, this framework can expand access to higher education.

Fifth, in a crisis or emergency such as the COVID-19 pandemic, this framework can play an active role to ensure the continuity of educational activities.

Sixth, this framework can provide HEIs with a teaching assurance toolkit, including the determinants of quality assurance (such as framework, standards etc.).

Seventh, this framework builds up a platform for helping each other and sharing outstanding international practices.

Eighth, this framework involves regular tracking and evaluation of relevant systems, and is therefore helpful in making necessary adjustments.



Dr. Antoinette van der Merwe

Senior Director of Learning and Teaching
Enhancement at Stellenbosch University, South Africa

IIOE QA 2.0 is incredibly relevant to higher education institutions in the Global South, especially in its holistic and comprehensive approach and operationalisation. The toolkit itself also contributes to the relevance of IIOE QA 2.0 since it contains resources that one can click through to get best practices and examples and data sources, both primary and secondary, that are suggested for some of the components.

Stellenbosch University is willing to engage in a self-evaluation at our university, using the 8 components. We can use the online version to identify our strengths and weaknesses, develop strategies and plans to address areas of weakness and grow areas of strength accordingly. We can also explore partnering with other institutions to deliver capacity development, share good practices and evaluate the success of interventions.



Prof. Tian Belawati

Rector of Indonesia Open University, Indonesia

The IIOE Quality Assurance 2.0 is quite comprehensive as it takes missing parts of IIOE QA 1.0 into consideration. Two of the newly added components, Collaboration and Partnership, Monitoring and Evaluation, are particularly important.

Descriptions of Components, Sub-components and Statements are necessary and precise, and the lists of resources and references for each Sub-component are helpful to supplement understanding of the Components. Two notable strengths of online learning are seamless networking and access to ample resources that prevent "reinventing the wheel" and thus promote resource sharing.



Dr. Grace Oakley, Associate Professor

Deputy Dean of the Graduate School of Education,
University of Western Australia

Overall, the (IIOE) QA 2.0 document is comprehensive and easy to understand. In addition, I really like the fact that the toolbox includes research and resources generated in the global South, as it is becoming increasingly apparent that knowledge and perspectives from the global North may not necessarily translate or be relevant to all countries. Furthermore, there is increased ownership and empowerment for countries in the global South when their own particular perspectives and knowledge are valued and represented.

The IIOE QA 2.0 framework and toolkit could be implemented in many settings, as is the intention. An example of implementation might start with the institution reviewing its mission statement and an audit of its current capacity. In conjunction with this, institutions should ensure they have a clear picture of the needs and demands of the target students and other stakeholders. It is important not to make assumptions about the capacities, wants and needs of the stakeholders and students. I would also like to reiterate that contextual factors can vary greatly; some countries have a lower level of technology in terms of affordances and availability, for example, so the design and implementation of courses needs to be feasible within the particular context. There may also be political issues to consider, such as gender equity issues. For example, it is known that in some contexts females have lower access to technological tools.

5.3 Impact of IIOE QA: driving quality digital teaching and learning at IIOE partner HEIs

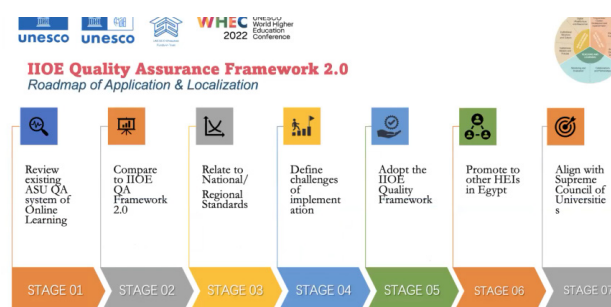


Several IIOE partner HEIs have repeatedly highlighted the importance of adopting and implementing QA mechanisms for online and blended teaching and learning. IIOE QA 2.0 has served as a catalyst and benchmark for concrete actions, generating the drive towards quality teaching and learning at IIOE partner HEIs. The following practices in Egypt and Nigeria showcase IIOE QA 2.0's impact in terms of promoting OBTL and fostering a culture in pursuit of excellence and quality in education.

5.3.1 ASU (Egypt) - localising IIOE QA 2.0 and scaling up its implementation nationwide

After reviewing the existing QA system of online learning at ASU, the current system was compared to the IIOE QA 2.0 framework. It was found that IIOE QA 2.0 can be easily integrated with existing institutional strategic planning processes, while the IIOE QA 2.0 toolkit is applicable to most online learning strategies at ASU. It is also important to align the IIOE QA 2.0 framework with national standards of NAQAAE and regional standards such as the "Practical Guide to Quality Assurance of Online Learning" of the Association of Arab Universities (AARU).

After these processes, the localised IIOE QA 2.0 framework will be adopted by the QA Centre and University Council of ASU, while orientation sessions for staff will be organised. The IIOE Egypt National Centre hosted by ASU will then promote the localised framework among its partner HEI network through orientation sessions, focus groups, review sessions, finally reaching a consensus among partner HEIs. The network currently includes 20 HEIs across Egypt and will further expand. The ultimate vision is to propose the final localised framework to the Supreme Council of Universities of Egypt for approval and disseminate it to all Egyptian HEIs.



Roadmap of Localising IIOE QA 2.0 in Egypt Proposed by ASU

5.3.2 ABU (Nigeria) - leveraging IIOE QA 2.0 to implement the ABU Teaching and Learning Policy

Arising from the realities and aftermath of the COVID-19 pandemic, rethinking the mode of teaching and learning has become a strategic priority for ABU. As a result, the University developed the Teaching and Learning Policy (TLP) which was approved by the University Senate in January 2022, with the vision to transform teaching and learning from the traditional face-to-face to OBTL mode. To realise such vision, the TLP envisions ToT sessions enhancing teachers' digital literacy and capacity, the development of incentivisation policies to encourage the adoption of OBTL programmes across the university community.

To implement the TLP on the institutional level, a robust QA framework tailored to the specificities of OBTL and its associated tools, institutional structure and staff capacity need to be in place. In response, the ABU Directorate of Academic Planning and Management started developing a QA framework for OBTL, using the IIOE QA 2.0 as a benchmark.

The development and application of IIOE QA represents a key component of IIOE's ecosystem. As a guideline, toolkit and roadmap, IIOE QA provides a holistic approach towards building inclusive, equitable quality higher education at the institutional level in the digital age, while also laying a common ground for IIOE partner HEIs in terms of developing online and blended courses and programmes. In comparison, the Asia-Pacific area is relatively more familiar and mature with the Quality Assurance for quality online education, as they have contributed in forms of consultation throughout the implementation and localisation of the IIOE QA. Looking forward, Asia-Pacific area follows the trend of promoting competency-based micro-credential, and seeks opportunities to update and incorporate the QA Framework. [5]. In addition, the process of joint development, consultation and validation by UNESCO-ICHEI, IIOE partner HEIs and global experts is yet another living example of IIOE's spirit of "joint contribution and shared benefits", and its dynamic international partnership network. In the same spirit, the next chapter elaborates upon the "IIOE National Centre", IIOE's global initiative to scale up IIOE's activities through localisation and inclusive participation of more HEIs and higher education workforce.

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Chapter 6

IIOE National Centre - IIOE's global initiative for localisation and inclusiveness

IIOE has proven to be a valuable and effective driver to support its global partner HEIs in their transition from traditional face-to-face teaching and learning mode to the online and blended mode, and to facilitate their digital transformation. As many HEIs have placed emphasis on the digital transformation of higher education in recent years and positioned digital transformation as a key driver to develop a resilient, inclusive and quality higher education system, IIOE has witnessed increasing demand from HEIs across the world for partnership and cooperation since 2020.

In 2022, landmark global events of education such as the UN Transforming Education Summit and the UNESCO World Higher Education Conference recognised the key role of technologies in transforming teaching, learning, research and collaboration, and called for prompt action on digital learning in response to the current education crisis and to prepare for future crises.

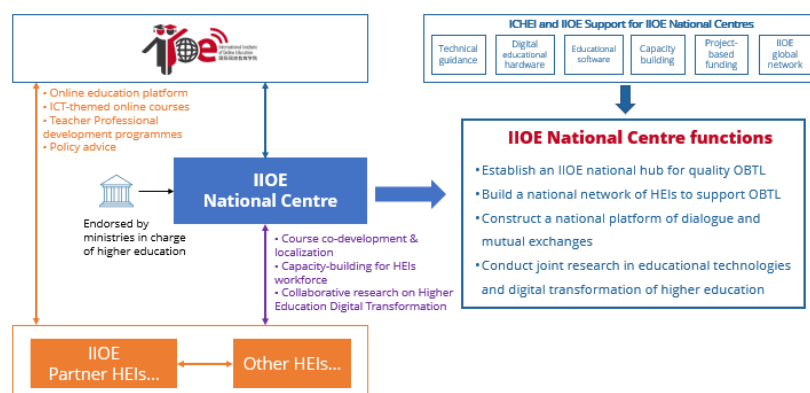
In light of the rapidly increasing demand for cooperation and global calls for transforming education, IIOE's traditional bilateral cooperation model characterised by partnership between UNESCO-ICHEI and 1 leading HEI in each partner country could no longer meet the needs of potential partners and IIOE's further development. Therefore, a design for scale enabling localisation for greater inclusion of more HEIs and higher education workforce, especially the marginalised led to the "IIOE National Centre" initiative.

6.1 Proposition of IIOE National Centre Initiative - Localising the IIOE Mission for Inclusion and Equity

Against such background, UNESCO-ICHEI consulted with several IIOE founding partner HEIs and collaboratively developed the "IIOE National Centre" initiative. Ain Shams University (Egypt), the first rotating presidency unit of IIOE for 2020, officially proposed establishing the IIOE Egypt National Centre at this meeting.

IIOE National Centres are jointly established by UNESCO-ICHEI and IIOE partner HEIs, while IIOE partner HEIs take the main responsibility for their operation. The hosting HEI of the IIOE National Centre should be a leading public HEI that is committed to facilitating digital transformation in the country, and equipped with the necessary digital infrastructure. The establishment of IIOE National Centres should be endorsed by governmental agencies, typically the ministry in charge of higher education in the country, for IIOE National Centre to play its national coordinating role. The IIOE National Centre performs the following functions to promote the digital transformation of higher education in the country.

- Establish the IIOE national hub to facilitate the process of digital teaching and learning, and enhance the quality and inclusiveness of higher education through digital transformation.
- Build a national network of HEIs and construct a national platform of dialogue and mutual exchanges for higher education teachers, leaders and relevant stakeholders.
- Coordinate the co-construction and mutual sharing of digital courses and programmes among IIOE partner HEIs nationally and internationally.
- Conduct joint research of OBTL and digital transformation in collaboration with UNESCO-ICHEI and apply research outcomes into practices locally.



The functioning mechanism of IIOE National Centre



Prof. Mahmoud El-Meteini

President of Ain Shams University, Egypt

I would like to express my gratitude for UNESCO-ICHEI's unwavering support and cooperation over the years, especially during the COVID-19 pandemic. Ain Shams University is committed to serving HEIs nationwide through the IIOE National Centre, striving for quality higher education in the post-COVID-19 era.

Since its official launch, IIOE Nigeria National Centre has formed a local network covering 8 HEIs in 5 northern federal states and the capital Abuja. Meanwhile, it organized 10 local training sessions and lectures on topics including the use of online educational tools, online course development and frontier technological development such as machine learning, and the metaverse.



Dr. Christopher Jibreel Maiyaki

Deputy Executive Secretary of the National Universities Commission (Nigeria)

The establishment of IIOE Nigeria National Centre is a major milestone in Nigerian higher education development. It has huge potential in closing the gap between demand and supply in higher education in Nigeria, broadening access and promoting equity in higher education, which is in alignment with Nigeria's development vision.



Local training sessions organised by IIOE Nigeria National Centre

Established in October 2021, IIOE Pakistan National Centre is hosted by the University of Engineering and Technology (UET) Lahore, Pakistan with endorsement from the Higher Education Commission of Punjab State, Pakistan. As the IIOE Rotating Presidency Unit of 2021, UET Lahore played a leading role in setting up the operational mechanism of the IIOE Pakistan National Centre and a local network including 10 Pakistani HEIs.



IIOE Pakistan National Centre and its local network

In Malaysia, the IIOE Malaysia National Centre hosted by Universiti Putra Malaysia (UPM) was endorsed by the Malaysian Ministry of Higher Education. It seeks to become an independent institution to serve national and international needs in terms of university teachers' capacity building.



Ms. Nural Afiqah

Coordinator of IIOE Malaysia National Centre

IIOE National Centre, Malaysia is a great platform to move forward with realizing the agenda of enhancing HEI educators' professional development, especially with regard to improving digital skills and competencies. In line with HEIs' digitalization agenda cascaded from the Ministry of Higher Education (MOHE), Malaysia, the great collaboration and support from UNESCO-ICHEI will be able to translate this collective vision and mission. As a proud and strategic partner of UNESCO-ICHEI, UPM through the IIOE National Centre, Malaysia is looking forward to implementing long-term professional development and empowerment for educators in UPM, other Malaysian HEIs, and across the globe.

6.3 Empowerment to meet local needs: IIOE National Centre Pilot Projects

On the verge of a digital future of higher education, "Transforming Education" as a critical global agenda calls for prompt action on digital transformation, which calls for research and evidence-based practices and policies. In order to support the IIOE global partner HEIs in their journey of digital transformation, UNESCO-ICHEI launched the Research Report on Digital Transformation of Higher Education Teaching and Learning and 3 handbooks at UNESCO's 3rd World Higher Education Conference (WHEC2022). This research series was jointly led by UNESCO-ICHEI and Tsinghua University Institute of Education, which provides a theoretical framework and practical insights into the digital transformation of higher education.

The operationalisation of IIOE National Centre, including its operation mechanism, and networks, among others, provided a foundation for IIOE to support the digital transformation of higher education teaching and learning in partner countries through national hubs. Within this context and with theoretical guidance of the research series, UNESCO-ICHEI and IIOE National Centre jointly launched the IIOE Pilot Project for Empowering Teachers' Digital Teaching and Learning in Malaysia, Mongolia, Egypt, Kenya, and Nigeria. The pilot project aimed at empowering teachers to conduct innovative practices of digital teaching, focusing on the enhancement of HEI teachers' digital teaching competencies and the formulation of relevant standards, while promoting the advancement of policies and mechanisms related to the digital transformation of higher education.

The design and implementation of these pilot projects are guided by 4 principles.

- **Customisation**

The project was designed based on an in-depth analysis of the demands of partner HEIs in digital teaching and learning to ensure that the project activities are tailored to localised needs of IIOE National Centres of different countries.

- **National Ownership**

IIOE National Centre is responsible for project design, implementation, monitoring and evaluation. IIOE National Centres localise the pilot project proposals, organise partner HEIs in the country to participate in the project, ensure the production of project deliverables and outcome reports, as well as establish the operation mechanism to promote higher education digital transformation in their respective countries.

- **Research-based**

The project was supported by solid research outcomes on the digital transformation of higher education teaching and learning, including the Research Report on Digital Transformation of Higher Education Teaching and Learning and the 3 Handbooks on blended learning, digital competencies of high education and TVET teachers.



• Outcome-oriented

The project puts special emphasis on outcomes to ensure the project's quality and effectiveness within a limited timeframe. Monitoring and evaluation frameworks were developed for each project to measure its outcome.

The projects were based on local needs in terms of digital transformation and digital teaching and learning at project countries and partner HEIs. Through working with domain experts from the IIOE network worldwide, UNESCO-ICHEI and IIOE National Centres jointly designed the projects. The projects were focused on master teacher training, involving high-level policy dialogue and recommendations in some project countries, and took the "Training of Trainer" (TOT) approach by identifying and upskilling "master teachers" in blended learning to disseminate and localise knowledge and best practices to a broader teaching body. The Pilot Projects training utilized a blended approach incorporating online and offline activities in a synchronous and asynchronous manner, and were complemented with courses and webinars under the support of the IIOE platform for additional learning resources. Upon full implementation of the projects, promising practices at various levels and professional development resources will be collected and developed to enrich the transforming need for digital teaching competency building. It has also galvanised research and policy advocacy on blended learning, and has created a positive impact on collaborative efforts to promote capacity building of HEIs and the higher education ecosystem.

IIOE National Centres	Pilot Project Theme	Main Project Activities	Pilot Project Outcomes
Egypt (Ain Shams University)	Empowering Higher Education Institutions for Digital Teaching and Learning in Egypt	- Digital Teaching Training Series and competency certification for master teachers nationwide - National policy dialogue on digital teaching and learning for higher education management staff - National digital leadership symposium (university presidents and leaders of governmental agencies in charge of higher education)	63 teachers from 14 HEIs completed the training. - Produced 10 high-quality micro-courses (ICT for Education for Students). - Successfully held policy dialogue on digital teaching and learning with Supreme Council of Universities, National Agency for Quality Assurance and Accreditation, Egyptian HEIs and released policy dialogue report. - Organised the national digital leadership symposium with the Ministry of Higher Education and Scientific Research, Supreme Council of Universities, National Agency for Quality Assurance and Accreditation and released policy recommendations. Enhanced digital leadership of Egyptian HEIs and policy environment for digital teaching and learning in Egypt.
Kenya (University of Nairobi)	Transforming Online Pedagogy for Effective Curriculum Delivery in Higher Education Institutions in Kenya	- Digital Transformative Pedagogy Training - Organised "Effective Open and Distance Learning" webinar and shared the latest trends and research of digital teaching and learning	87 teachers from 5 partner HEIs participated in the training. - Developed 4 quality online courses. - Developed 2 digital teaching and learning assessment rubrics and an upscaling plan for the training.
Malaysia (Universiti Putra Malaysia)	Digital Educator Micro-credential (Artificial Intelligence, Post-pandemic Pedagogical Innovation for HyFlex Learning)	- Develop courses on the themes of "AI-empowering" personalised learning in higher education", "Innovative teaching and learning practices in Hyflex learning post COVID-19" and "Micro-credentials" - Embed micro-credential into educators' professional development at the institutional level - Increase flexible access to quality content and to promote recognized certifications for educators across HEIs in Malaysia - Support relevant policy development and evidence-based research	262 Teachers received Micro-credentials for digital teaching and learning. 6 Expert teachers were identified to capture institution-based best practices. - Enhanced teacher training capacity at UPM, and developed 3 micro-credential courses in cooperation with local and regional experts.

IIOE National Centres	Pilot Project Theme	Main Project Activities	Pilot Project Outcomes
Mongolia (Mongolian University of Science and Technology)	Blended Learning Capacity Building for STEM Teachers	• Support Mongolian HEIs to develop and adopt benchmarks and guidelines to encourage blended learning; • Conduct systematic teacher training on blended learning and developing exemplary courses in STEM, serving as training resources for national Teacher Professional Development programmes • Facilitate a community for teachers engaged in blended learning • Develop a blended learning assessment tool and formulating guidelines for blended learning course development	• 5 theme-based modules and a Blended Learning Course Development Guide were localised in Mongolian for domestic teacher professional development. • An Evaluation Tool for Blended Learning was built to measure qualitative improvements in teachers' blended learning competency. • 332 teachers from 6 HEIs completed the training.
Nigeria (Ahmadu Bello University)	Empowering Institutional Policy Implementation for Digital Teaching and Learning in Nigeria	• ToT sessions on online course design and development for teachers from ABU and partner HEIs of the IIOE network in Nigeria • Policy workshop to develop an implementation plan for the ABU Teaching and Learning Policy • Teachers' digital literacy enhancement programme to build teachers' capacity to use digital tools for teaching and learning	• 55 teachers from 7 HEIs completed the training on online course development, and have made plans to redesign their own courses. • 205 teachers trained in digital literacy, including the use of digital tools and digital pedagogy for teaching. • 4 quality online courses developed, covering engineering, medical sciences, and history. • Online course assessment rubric developed. • Ahmadu Bello University Teaching and Learning Policy Implementation Plan developed and adopted.

IIOE Pilot Projects for Empowering Teachers' Digital Teaching and Learning



Digital Teaching Training Series for Master Teachers organised by IIOE Egypt National Centre



Policy Dialogue among Egyptian Higher Education Management Staff



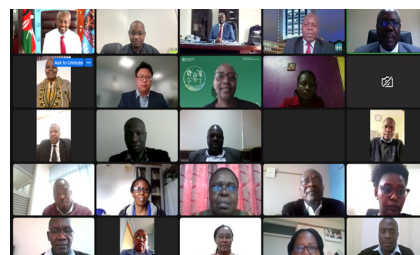
Policy Dialogue among Egyptian Higher Education Management Staff



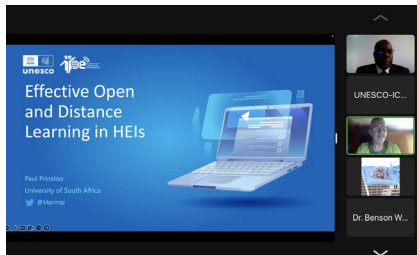
Online Course Design and Development Training at ABU Smart Classroom in Nigeria



ABU Vice Chancellor, Senior Management and Academics participated in ABU Teaching and Learning Policy Workshop



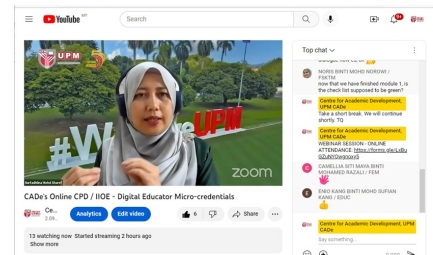
Digital Transformative Pedagogy Training Organised by IIOE Kenya National Center



"Effective Open and Distance Learning" Webinar organised by IIOE Kenya National Centre



IIOE Pilot Project in Malaysia: On-site Training at Universiti Putra Malaysia



IIOE Pilot Project in Malaysia: Digital Educator Micro-Credentials Online Training



Master Teacher Training for IIOE Pilot Project in Mongolia led by Prof. Charles Graham from Brigham Young University



65 master teachers from six state-owned universities in Mongolia participated in the pilot project in Mongolia

6.4 Future of IIOE National Centres

Based on existing achievements, UNESCO-ICHEI consulted with IIOE National Centres and identified the following main directions for the future development of IIOE National Centres.

1. Scale up IIOE National Centres' networks and professional development programmes.

Enhancing the scale of IIOE National Centres' networks is key so that IIOE's professional development programmes and resources can reach out to more HEIs and higher education professionals, especially those that are less well-resourced and marginalised. Engaging more HEIs and higher education professionals in IIOE's programmes, projects and activities could then contribute to enhancing the inclusiveness and equity of higher education in IIOE's partner countries.

3. Develop joint certification mechanisms of IIOE professional development programmes in alignment with national and institutional frameworks and standards.

To encourage sustainable participation and recognise higher education professionals' participation in IIOE professional development programmes, appropriate certification mechanisms tailored to national and institutional regulations are needed. IIOE National Centres are well positioned to develop joint mechanisms with UNESCO-ICHEI to properly document, evaluate, validate and certify competencies of higher education professionals participating in IIOE activities, so as to incentivise continuous professional development of higher education professionals.

2. Localise IIOE professional development programmes in terms of content and language.

To reach a wider audience and generate greater impact, it is also essential to localise IIOE's professional development programmes. IIOE National Centres have a unique role in localisation, in terms of adapting IIOE's resources, content, programmes according to local contexts, and transforming the content into various local languages so that IIOE could benefit more higher education professionals in an inclusive and equitable manner.

4. Establish functioning modalities of IIOE National Centres with national characteristics.

Based on existing practices of developing national HEI networks and the pilot projects, IIOE National Centres will further improve their functioning modalities in terms of developing and managing local networks, longer-term work planning, monitoring and evaluation, and sustainable financing, among others. The gradual establishment of functioning modalities will set solid foundations for IIOE National Centres' sustainable development.

The IIOE National Centre initiative is still at its infancy, while it is up to IIOE partner HEIs and partner countries to collectively chart the way forward. However, the establishment of the first cohort of IIOE National Centres and the launch of the pilot projects have demonstrated the promising potential of scaling up professional development, localising educational resources, and enhancing inclusiveness through local networks. These valuable lessons provide insights into IIOE's future as a global ecosystem for higher education digital transformation, yet capable of adapting to various local contexts with inclusion and localisation at its heart. The local ownership of IIOE National Centres exemplified by national government endorsements, sustained investments and localised networks is a powerful force to ensure the sustainability and scalability of IIOE across time and space.

Chapter 7

IIOE's Experiences and Challenges

The previous chapters sketched out how IIOE was established, its operationalisation, key activities, and achievements. This chapter aims to summarise the good practices of IIOE activities and programmes beyond the structured activities, with special focus on the outcomes from IIOE's characteristics, "Capacity Building" "Holistic Approach" "A Design for Scale with Localisation for Inclusion" "Multilingual Engagement and Resources" "Joint contribution and shared benefits" "International and local partnership". Based on good practice, challenges and prospects are further discussed, mapping out the proximal zone of development of IIOE.



7.1 Evaluation, Certification, and Application of IIOE Teacher Professional Development

According to the 2022 EDUCAUSE Horizon Report, the demand for and the longer-term importance of faculty development for hybrid teaching has become more evident as institutions invest more time and resources into those learning modalities. Investing the time and resources to ensure faculty are trained and equipped to engage in hybrid and remote learning environments effectively is viewed as one of the easiest and highest-reward decisions an institution can make, and it may produce the biggest returns in improved student experiences and learning.

Though most HEIs have recognised the importance of continuous professional development for OBTL, it is also important to evaluate the outcome and impact of professional development, and integrate them into their disciplines. Though extensive research shows high-quality professional development can enhance the learning and well-being of students, research also shows that, on too many occasions, professional development is not very effective.

While IIOE works with IIOE-NCs and its partner HEIs to ensure that its professional development programmes and courses are relevant, contextualised, ongoing, collaborative, and designed with adult learning theory in mind, it is also important that IIOE's partner HEIs should take ownership of the professional development to ensure that teachers who received training have the resources needed to implement what they have learned in their teaching and learning practice. To achieve this transformation in practice, IIOE should work together with HEIs to construct an ecosystem facilitating digital transformation actions and processes of HEIs, including formulation of supportive institutional structures and policies by HEIs to motivate teachers and to strengthen the teaching and learning environment.

The recognition of competencies gained by teachers is a critical issue that influences the practice of teachers in professional development and its application in teaching and learning. IIOE, in collaboration with IIOE-NCs and its partner HEIs, should ensure that the development, implementation, as well as certification of the IIOE professional development programmes, take into consideration the national or institutional competency and qualification frameworks, ensuring alignment with existing policies and standards. This will also be a necessary step to ensure a common language among national and international stakeholders and provide bases for quality assurance, career pathways, and cross-border recognition.



Dr. Peter Wells

Chief of Education, UNESCO Multisectoral Regional Office for Southern Africa

The issue of the legitimacy of professional development offered under the umbrella of the IIOE is crucial. It is one thing for teachers to receive recognition for having participated in professional development, and it is quite a different thing to receive accreditation from local authorities. It is important to recognise that individuals, schools and organisations invest their time and resources, but, at the end of the day, does it make any difference to the professional development career of participants? The need for formal recognition links to the Addis Convention for the region and the Global Convention on the recognition of qualifications that support the notion of teacher exchange, mobility, knowledge and competency exchange. If teachers who received training from the IIOE in one context, e.g., Nigeria, do not get recognition for the training in another context, e.g., Cote d'Ivoire, it would mean a wasted resource.

Dr. Peter Wells at IIOE Africa Regional Consultation (1 December 2022)



7.2 Facilitating Gender Equality in Professional Development

One of IIOE's objectives since its establishment is to "improve access to quality higher education for female teachers, learners, and marginalised groups in developing countries". The objective aligns with one of UNESCO's global priorities "gender equality" and the United Nations Sustainable Development Goal 4 "Quality Education", which envisages the elimination of gender disparities in education.

Since its establishment, IIOE has served a total of 3,123 female higher education professionals from around the world. For example, the IIOE "Big Data, Artificial Intelligence, Cloud Computing" training series, and the WPS teaching competency training conducted from 2020 to 2022 have served 597 female teachers from West Asia and Africa. However, female participants only accounted for 23.79% of the total number of participants, and the participation rate of female teachers was low in most countries. Egypt was the only country in West Asia and Africa IIOE region with a majority of female participants - 61.98% of participants were female.

To achieve the goal of encouraging and supporting more female teachers and learners to access quality higher education opportunities, IIOE needs to systematically promote female participation in IIOE activities. In line with this, UNESCO-ICHEI integrated gender equality indicators into its projects' monitoring and evaluation mechanism. For example, IIOE National Centres' Pilot Projects on Promoting Higher Education Digital Teaching and Learning (covering Egypt, Kenya, Nigeria, Mongolia, and Malaysia), which was launched in September 2022, integrated the number and percentage of female participants in professional development activities under the project framework as one of the indicators for monitoring and evaluation. This provided incentives for IIOE National Centres to encourage more female participation in the design and implementation of the projects.

Preliminary results recorded elevated female participation in some pilot project countries, while gender disparities remain significant in others. For instance, 62% of university teachers who participated in the IIOE Egypt National Centre's "Master Teacher Training Series" were female. In addition, the Egyptian project team's leaders and core members were predominantly female. In Mongolia, the percentage of female teachers who attended the master teacher trainings reached 80%. In Kenya and Nigeria, the percentage of female participants in the pilot projects' teacher trainings were 42% and 33% respectively. Beyond the quantitative aspect, it must be noted that some female teachers also played important roles in designing, implementing and managing the pilot projects.

Such differences in terms of female participation in IIOE's professional development exhibit varying landscapes of female participation in higher education across countries. In the future, there should be contextualised approaches to promoting female participation in the whole cycle of IIOE professional development activities, from design, implementation to evaluation and certification. This could enhance IIOE's effectiveness in achieving its gender equality goal, while ensuring its relevance to global development priorities to better achieve quality, equitable, and inclusive higher education.



7.3 The Effective Dissemination of Best Practices Facilitating the Digital Transformation of Higher Education

UNESCO-ICHEI and IIOE have been supporting partner HEIs across regions to realize their regional and institutional ICT in education policies, HEI workforce competency building, and set out action plans for ICT adoption in teaching and learning. IIOE took an approach focusing on the authentic need of partners, leading to a high adoption rate and successful implementation of projects.

At the institutional and national level, IIOE served to support the UNESCO project (UNESCO-Shenzhen Fund-in-Trust project). This project was identified as highly relevant to the national-level priorities of the participating HEIs, hence IIOE was able to extend the impact and helped form a series of national and institutional-level practical cases. With the support of partners in the private sector, 12 smart classrooms were built in IIOE national centers as an access hub for equitable and quality blended and HyFlex learning, 5 in Asia and 7 in Africa. The best practices and knowledge in these initiatives at the institutional level were captured in the format of reports and knowledge products and were disseminated worldwide through UNESCO-ICHEI's own digital publication (CLOUD), through social media, international conferences, and some recommendations were included in the UNESDOC. As an ecosystem, IIOE adheres to the principle of "joint contribution, shared benefit", encouraging partners to share their practices which contribute to the effective scaffolding for other institutions or areas in their process of digital transformation. In UNESCO-ICHEI's Research Report on Digital Transformation of Higher Education Teaching and Learning, policy recommendations and best practices from IIOE partners offer diverse perspectives for policy-making, industry partnership, and operational advice.

However, A recent study by Hagel(2020) highlighted the effectiveness of such an ecosystem for digital transformation might minimise fear and motivate inspiration, but have the downside of being specific to the institutional context. That is to say, transnational or inter-regional knowledge sharing may be challenging for adoption. There is a tendency for the best practices to be context-heavy — based on local policy and



environment, but insufficient in reflection and meta-thinking that guides institutions' decision-making.

At the individual level, participants of IIOE programmes and learners on the IIOE platform face fear of new technology and digital transformation, lack of confidence and community support to introduce new technologies in their teaching and development. Currently, the experience sharing at a personal level is still missing in the knowledge sharing opportunities. Although the IIOE Courseware Competition provides a good reward system that stimulates teachers' motivation to pursue excellence in their digital teaching, the IIOE ecosystem has yet to build a community of practice facilitating peer-to-peer coaching and communication. It is important to break down silos between institutions and allow individual reflections to circulate so the HEI workforce can ease their fear of change, ultimately curating a culture of digital transformation.

Similar recommendations were also raised in the consultation sessions with the South Asian Region and the Central and South-Eastern European Region. It leaves enough space for IIOE to take actions and plan forward giving guidance that helps institutional or national level knowledge capture and dissemination within the network, facilitating individual-level learners' deeper reflection on digital competencies, and curating a community of practice for teachers, teaching support groups, and the leadership groups. The reflections or best practices can possibly link the IIOE Competency Framework and the Digital Competency Course Framework for Higher Education Workforce, creating a common language for adoption. IIOE will need to leverage the current corridor for sharing understanding and practices, and identify the appropriate dissemination model that ensures effective knowledge transferring and sharing cross-nation or at the international level.



A Series of Knowledge Products Launched by UNESCO-ICHEI
in the Field of Digital Transformation of Higher Education

7.4 Building a Public Platform for the Digital Competency Building of the Higher Education Workforce

As an action plan track, establishing public digital learning platforms and empowering teachers were placed at a significant level for the Transforming Education Summit [2]. The definition of a public platform indicates its openness in access and ownership, enabling the accessibility of digital competency building. The current IIOE platform and approaches fulfill this position, by already providing resources, courses, training programmes and pilot projects to over 10,000 teachers and the HEI workforce. Through interviews, teachers have expressed a favorable attitude towards the IIOE platform's features, including the design that covers different bandwidths, the flexibility of learning, the emphasis on new technologies that expand teachers' exposure, and more. More specifically, the ongoing IIOE initiatives deliver quality learning content that addresses the needs of open learning, teachers' competency building that ensures digital learning is possible, and hardware support ensuring connectivity, yet needs to continue investing effort into advancing the aspiration for quality education for all and lifelong learning. Through a survey study on users' expectations of IIOE future functions, some of the outstanding needs are shown in the word cloud below.



Main Needs and Expectations from Users
for the Future Functions of IIOE

Going forward, the IIOE platform needs to continue refining its design for public access, covering real educator-based needs, for instance, authoring tools for e-learning modules, upgraded interactive tools that boost engagement in blended learning, offering a test field for educators to experiment with new learning technologies and so forth. The test field should operate on an equitable premise, allowing educators to explore, learn, practice, and communicate under minimal fear of new technology and no discrimination, constructing a true community of practice for the higher education workforce.

7.5 Introduce and Promote Emerging Educational Technology to Mend the Digital Gap



According to the recently released study, Future opportunities for education technology in England, the pandemic has undoubtedly caused setbacks for health, education and the wider economy, it has created unforeseen opportunities with regard to digital technology[3]. IIOE Smart Classroom Projects had identified this opportunity window since the beginning of the pandemic and was able to leverage the blooming ICT industry in Shenzhen, China, integrating a digital teaching environment for IIOE national centres. The smart classroom donated to the local HEIs addressed the issue of lacking devices and unstable connectivity, enabled institutions and educators to see and experience the potential of digital teaching and learning. The charitable donations offered a public space for digital competency building and digital teaching, mending the digital gap from an infrastructural perspective.

As technology continues to evolve, keeping up with technology and making sustainable use of the SCRs will require uninterrupted investment preventing aggravated digital gaps. Currently, the SCRs are used for activities like MOOC production, distance teaching and learning, ICT training, and helped educators and leaders to see the benefits of quality blended learning and digital teaching, changing the perception of "the current is perfect" from its root. Beyond the current physical environment for digital teaching and learning, IIOE SCRs can take a step further to become the innovation center for the digital transformation of teaching and learning, by continuing to introduce emerging technologies such as artificial intelligence, AR/VR technologies, blockchain and social robots. The digital gap is a huge problem to solve all at once. However, with the modeling effect of IIOE SCRs and a tangible space for trial and error, digital gaps can be mended with the public space, and perception problems can be noticed for change.

7.6 Public-private-partnership in Education and Moving Forward



Public-private partnership (PPP) is a term commonly used in the built industry that slowly gains attention in the educational sector with a broader emphasis now. IIOE interprets PPP in the educational sector (ePPP) as a mechanism that enables public institutions and administrations to open channels to the private sectors for their agenda in digital transformation. For example, incorporating the industry's competency-building resources into the roadmap for professional development, or receiving donations of equipment from enterprises to enhance HEIs' hardware condition. IIOE utilises this approach since its conception - the IIOE operating mechanism and the design of the IIOE platform took inspiration from MOOC platforms such as XuetangX, Coursera and edX, for effective OER and training resource development and circulation. Building the platform relied on Jiker's professional experience and human resources in technical training. The successful delivery and installation of SCR projects are inseparable from PPP since educational technology enterprises' generous contribution and the willingness of IIOE partner HEIs to embrace technology with open arms. In Chapter 4 of the report, extensive evidence shows that the implementation of SCRs through PPP benefited IIOE partner HEIs at minimal cost by granting access to key hardware for successful online and blended instruction, and created a new channel for IIOE partner HEIs to have radiant effect to other institutions in their area or country by sharing learning resources or becoming the professional development hub with the physical space.

By involving the private sector in the design, financing, construction, and/or operation of HEIs' digital transformation, for example, PPPs can bring innovation, efficiency, and new resources to HEIs potentially reducing the costs of delivering educational services. Additionally, PPPs can also help to improve the quality of education by leveraging the expertise and best practices of private sector organizations, as well as by engaging communities and stakeholders in the design and delivery of educational programs and services. Moving forward, IIOE needs to think about the sustainability of such cooperation and make continuous investments to partner HEIs through its partnership with the enterprises. Furthermore, how such a partnership benefits the private sector without biasing the intention of the public good is worth closer monitoring and design. In the meantime, IIOE needs to leverage its resources to design and monitor PPP at a larger scale ensuring quality and optimal outcomes.

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Chapter 8

Way Forward of IIOE

Higher education is the incubator of future talents and the cornerstone of the global development agenda. HEIs prepare future professionals, conduct foresight research, and tackle challenges for the future of society. The urgency for rethinking the future of talent is more significant than ever. The aggravated economic crisis in the last few years further pulled the mainstream population and marginalised population in polarised direction, resulting in an increasing gap in access to quality higher education. Disruptive technologies such as generative AI became the new threat to the seemingly back-to-normal higher education. Hence, a series of conferences and summits on a worldwide scale was held in the past few years in an attempt to assemble all forces together to envision the future of education, namely the UNESCO World Higher Education Conference, 2022, and the United Nations Transforming Education Summit. Key action tracks of addressing the issues of "skills for employment and entrepreneurship" "initial and continuous professional development – pedagogies" "Educational leadership, innovation" and "Digital learning and transformation" ^[1] were highlighted calling for a persisting commitment to empowering future students by training up teachers and digitally transforming educational systems for inclusive and equitable quality education.

The McKinsey Global Institute's research predicted that over 800 million jobs will be made redundant by AI by 2030, and automation by AI will threaten lower-value-added jobs, setting a higher bar for the future generation entering the workforce. ^{[2][3]} The need for reskilling and upskilling industries, new graduates, the workforce, and HEIs requires prompt action. The OECD Learning Compass 2030 ^[5] further reinforces the need for preparedness for Industry 4.0, and the European Union released its The Digital Education Action Plan (2021-2027) ^[4] to address the dedication of fostering the development of digital education systems and enhancing digital skills, and envisions for Industry 5.0 ^[6] in light of digital transformation. The Association of Southeast Asian Nations (ASEAN) updated its plan to reflect the ongoing initiative of digitally transforming its education system in light of the shared vision of "higher education as one of the catalysts in accelerating ASEAN's economic, political, and sociocultural development agenda" ^[7]. In the Arab States, continuous adoption of online learning and exploration of disruptive technology including AI and relevant digital capacity building through higher education topped the agenda in the region-wide discussion ^{[8][9]}. Simultaneously, the African Union Digital Education Strategy and Implementation Plan ^[10] restated the importance of accelerating the adoption of digital technology in education and empowering citizens for the digital economy, while Latin America identified digital transformation to be very important and a key capability gap that needs extensive work on ^[11].

On the national and regional level, developing countries that historically are in a less competitive position for high-value-added jobs, and identify the growth of the digital economy as a strategic channel to boost economic growth and enhance national competitiveness. The Vietnamese government, Uzbek government and the Philippines officials have separately launched their developmental plan for the digital economy in industrial production, textile, tourism and e-commerce participation ensuring the rapid growth and prosperity ^{[12][13]} ^[14], while Kenya, Egypt, and Nigeria seek to improve livelihood and increase their participation in e-commerce, and develop more high-value-creating opportunities through intelligence in IT and digital innovation ^{[15][16][17]}. The need for digital transformation is sound, and the urgency of higher education adopting digital transformation, serving to meet the demand of future talent, and trying every effort to uphold sustainable development is beyond question. Digital transformation in higher education has significant indicators of deep and coordinated culture, workforce, and technology shifts that enable new educational and operating models and transform an institution's operations, strategic directions, and value proposition ^[18]. Hence, HEIs need to work together and closer than ever to collectively address these challenges, mend the digital divide, ensure the integration of technologies and education, and seize the opportunities, under the framework of public good and with support from all stakeholders, more importantly, to put teachers at the central position of this chain of change. This chapter, by reflecting IIOE's mission and finding refinement with the future of higher education and the process of digital transformation, makes an attempt to envision the way forward for the IIOE ecosystem.

8.1 Scale up IIOE Operations

According to the UNESCO Report *Reimagining Our Futures Together: A New Social Contract for Education* published in 2021, digital technologies are quickly changing how knowledge is created, accessed, disseminated, validated, and used in diverse settings. The conception is to make information more accessible and open promising educational avenues. Nevertheless, the risks exist in various aspects: whether learners can identify resources and access needed learning in the digital space; whether the new educational powers provided by technology are appropriately applied; or whether the digital divide between different regions and different social groups can be narrowed. IIOE has been on the right track in introducing digital technologies and building HEI workforce digital competencies, however, the coverage was at a limited scale. **IIOE should continue serving as an active contributor to Global Higher Education Transformation and facilitate increased access to competency building and OER accessibility.** Through the past three years, IIOE has collected fruitful outcomes, built valuable connections with partner HEIs and established leadership in driving digital teaching and learning in the higher education workforce. Leveraging the previous experience of success and lessons learned, IIOE is committed to further mobilising the initiatives and impact of national centres, catalyzing knowledge sharing and transfer globally, and promoting local designs making sure that all voices are heard. This commitment will be realised through the following areas of work:

Expand the IIOE National Centre coverage and impact of IIOE: IIOE will continue to build partnerships with HEIs in the global south, including identifying more IIOE National Centre and amplifying its radiant effect by inviting more HEIs participation. Through good practices sharing and facilitating the circulation of knowledge from one nation to another, bridging the knowledge gap and facilitating knowledge transfer in higher education digital transformation.

Growing participation from the global north: IIOE will build meaningful connections with HEIs from all over the world, including

partnerships with advanced research institutions and HEIs to ensure IIOE remains in a frontier position in knowledge and pursues excellence in its practice.

Localised Teacher Training Programmes and Regional Empowerment: The success of the Empowering Teacher's Digital Teaching and Learning Pilot project has demonstrated its effectiveness, conducting similar and new programmes at a larger scale is to be considered. Localisation needs to be prioritised as it enables better access to professional development, which is the prerequisite for inclusion and equitable access to quality higher education and professional development for marginalised communities.

Expanded Repository of OER and Competency-Building Courses for the Ecosystem: In addition to the existing OER, professional development programmes, and competency-building courses, IIOE ought to leverage the "joint-contribution, shared-benefit" principle and build a more sufficient repository, serving higher education workforce from marginalised community, multilingual background, and diverse socioeconomic background, enhancing equity access to quality education and professional development.

8.2 Emphasis on the Quality of IIOE Activities

According to the recent surveys conducted by EDUCAUSE and by HolonIQ worldwide^{[19][20]}, in the past few years, digital transformation has become a global consensus in higher education. Growing recognition of "people as the key factor of digital transformation" and gaining attention to the process of digital transformation rather than upgrading technology alone has become the new trend. The shift in paradigm for digital transformation requires a more robust service guiding and supporting workforce capacity building and policy planning at a higher standard and quality, and requires better study and research support in the design. In a knowledge-based society, the accumulation and growth of knowledge follow a cycle of "concrete learning experience, reflective observation, abstract conceptualisation, and active experimentation" according to Kolb's learning cycle theory^[21], calling for a stronger emphasis on a well-designed process. As the ultimate goal of IIOE in alignment with SDG4 is to facilitate "ensuring inclusive and equitable quality education for all" through the channel of digital transformation, in the context of a maturing understanding and readiness for digital transformation, the quality of service seeks to be enhanced in the following areas:

Facilitating Research-informed Practices and Evidence-based Recommendations: Research is the backbone to ensure quality, and evidence-based recommendations are essential in learning and development for professionals. IIOE's key target audiences are professionals that are experts in their discipline, designing impactful and quality training programmes and resources are key to facilitating the transfer of mind and behavior.

Continuous updates of IIOE's Existing Resources: knowledge is iterative, and so are professional development, IIOE's resources and services. Ensuring continuous updates on the quality assurance guidelines, competency frameworks, the design of SCR projects must not stop, and it is a joint work of IIOE and its liaised partners.

Inclusive platform supporting higher education transformation: encouraging knowledge contribution, co-authorship between IIOE and partner HEIs, IIOE-NCs, and multi-region initiatives. In addition, IIOE will continue to put effort into being inclusive in function, multilingual, and have fair representations of all types of community.

8.3 Extend the Current Role of IIOE

The whole world is working towards reaching the goal of Education 2030 and SDG4. Monitoring the activities worldwide, many initiatives have been put into action. In 2022, UNESCO and UNICEF jointly announced the launch of Gateways to Public Digital Learning. The new global Initiative aims to "map, describe and analyze existing public platforms and content; help countries create and strengthen national platforms; identify and share best practices; and establish international norms and standards to guide the development of platforms in ways that advance national and international goals for education"^[22] This action positively responds to the call to action from the Transforming Education of the UN, and address a critical issue of access and navigation to the overabundance of information in a systematic way, and creates a common understanding that helps marginalised community to weigh-in on the important agenda of quality education. Furthermore, the previously addressed rising bar of future employment and gaps urges all countries and areas to take action, which puts IIOE in a position to take on more roles, and extends the service on what's already done. In order to solve these challenges, IIOE will take a more strategic approach, and operate with intelligence in alliance with partners and act in a think-tank role in the future.

8.3.1 Infrastructural Platform for Public Digital Learning

IIOE will be a Public Digital Learning hub for partner higher education institutions and organisations, strengthening cooperation and exchange in digital higher education at the UNESCO level in compliance with the international standard. IIOE will work together with the public and private sectors seamlessly and cost-effectively to accelerate digital transformation when delivered through agile, collaborative partnerships. IIOE provides a shared space for partner HEIs and organizations, establishes links for sharing and distributed intelligence among partners under ethical guidelines. The IIOE Public Digital Learning hub will present the following features:

- **Public funding-** appeals for funds for enhancing connectivity and digital equipment for partner HEIs and organizations
- **A cross-sectorial space** – a community that shares its expertise, best practices and solutions for digital teaching and learning across different higher education processes; promotes discourse, co-creation and action among national centers and partner HEIs
- **Knowledge-sharing and mapping** – encourage exchange and cooperation, information-sharing and mapping the acceleration of digital teaching and learning practices and solutions – accelerate the uptake of digital innovation in education
- **Acting as a 'think-and-do-tank'** - set up a network of international advisory services to support the agile development of policy and practice for digital higher education and engaging stakeholders in user-driven innovation through the IIOE network
- **Acting as an agent of education transformation-** nudge the implementation of the action plans and the development of digital education in IIOE network, including through results from IIOE-supported projects, providing ethical guidelines on the use of educational data

8.3.2 IIOE and UNESCO-ICHEI as a Think-tank

In a world of rapid technology development and shifts in shared value, a brain for planning is the necessary condition for intelligence-supported action. The metacognition of digital transformation of higher education supports the educational sector, policymakers, and administrative bureau to act consciously. A think tank is a research organization that conducts and publishes studies on specific issues related to public policy, government, or society, in this case, it should generate insights and recommendations on how to address complex social, economic, and political challenges for higher education digital transformation. Going beyond the current role of IIOE, the following tracks of action can be taken for IIOE and UNESCO-ICHEI to evolve into a think-tank addressing key issues at an international level:

- **Forming a consortium of intelligence:** IIOE and UNESCO-ICHEI need to be more open and receptive to knowledge and intelligence from all relevant sectors expanding on the current partnership ecosystem. Rooted on a co-thinking entity with highly specialised knowledge and expertise, IIOE and UNESCO-ICHEI could then conduct better policy recommendations, and strategic plans and initiate important projects for the better public good.
- **Building multidisciplinary expertise:** The problems faced are complex and require multidisciplinary and interdisciplinary expertise. IIOE and UNESCO-ICHEI need to extend the area of expertise for the challenges in higher education digital transformation and the future of education.
- **Placing stronger emphasis on research and study:** To create a research culture, organize research through multidisciplinary groups, and establish research and action related to national issues that can support intelligence and recommendation generation.
- **Generating key insights on focused issues and strategic areas:** Based on rigorous research and extensive study, IIOE and UNESCO-ICHEI should be able to generate key insights on important issues in higher education digital transformation and the future of education and strategic areas including but not limited to wide credential-recognition, micro-credential for lifelong learning, digital governance, data security, regional rise and governance of disruptive technologies.

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Appendix

1. List of IIOE Secretariat Members

Institution Name	Role	Name of the Representative
UNESCO-ICHEI	Secretary-General	Prof. Li Ming, Director of UNESCO-ICHEI
Ahmadu Bello University	Deputy Secretary-General	Prof. Muhammed Bashir Mu'azu, Head of Computer Engineering Department
Ain Shams University	Deputy Secretary-General	Prof. Mona Abdel-Aal Elzahry, Director of Education Strategy Administration, Professor of Public Health
Indonesia Cyber Education Institute	Deputy Secretary-General	Prof. Paulina Pannen, Chairman, Indonesia Cyber Education Institute at Universitas Terbuka
University of Engineering and Technology, Lahore	Deputy Secretary-General	Dr. Waqar Mahmood, Director of KICS
University of Nairobi	Deputy Secretary-General	Prof. Justus Inyega, Faculty of Education
Universiti Putra Malaysia	Deputy Secretary-General	Prof. Dr. Ismi Arif Ismail, Deputy Vice-Chancellor (Academic & International)
Mongolian University of Science and Technology	Deputy Secretary-General	Dr. Tserenchimed Purevsuren, Senior Specialist at the Open Education Center
Mulungushi University	Deputy Secretary-General	Mr. Chera Deressa, Acting Deputy Vice Chancellor
UNESCO-ICHEI	Deputy Secretary-General	Prof. Han Wei, Executive director of UNESCO-ICHEI
UNESCO-ICHEI	Deputy Secretary-General	Mr. Lyu Feng, Assistant director, Chief of IIOE Management Centre, UNESCO-ICHEI
UNESCO-ICHEI	Deputy Secretary-General	Ms. Li Fan, Assistant director, Chief of Asia Pacific Programme Office, UNESCO-ICHEI
UNESCO-ICHEI	Deputy Secretary-General	Ms. Bi Xiaohan, Assistant director, Chief of West Asia and Africa Programme Office, UNESCO-ICHEI
Royal University of Phnom Penh	Coordinator	Mr. Khiev Sopheatra, Deputy Director of IT Centre
University of the Comoros	Coordinator	Dr. Ahmed Abdullatif, lecturer and researcher in computer sciences
Virtual University of Côte d' Ivoire	Coordinator	Prof. Fernand Kouame, Director of Academic and Pedagogical Affairs, Coordinator of the Unit of Research and Digital Expertise
University of Djibouti	Coordinator	Ms. Habone Mohamed Said, MAEE Head Engineer
Addis Ababa University	Coordinator	Dr. Mulat Asnake, Director, Continuing and Distance Education Office;
The University of Gambia	Coordinator	Dr. Habibatu Drammeh, Director, Student Affairs and Alumni
Bandung Institute of Technology	Coordinator	Dr. Tutun Juhana, S.T, M.T., Dean, School of Electrical Engineering and Informatics
Al-Farabi Kazakh National University	Coordinator	Mr. Peter Nesterenkov, Head of Academic and Digital Innovations office
Kyrgyz National University named after J. Balasagyn	Coordinator	Mr. Ulugbek Eresheev, Leading specialist of Kyrgyz-Chinese Faculty

Institution Name	Role	Name of the Representative
Mzuzu University	Coordinator	Dr. Paxton Zozie, Deputy Director, Centre for Open, Distance and e-Learning
Cadi Ayyad University	Coordinator	Mr. Brahim ELAQIH, Head of International Cooperation and Partnership
Tribhuvan University	Coordinator	Dr. Ganaga Gautam, Director of Open and Distance Education Center (ODEC)
University of the Philippines-Diliman	Coordinator	Prof. Jerome Buenviaje, Dean, School of Education
Gaston Berger University	Coordinator	Prof. Michel-Bakar DIOP, Director, Open and Distance Learning Centre
University of Colombo	Coordinator	Dr. Thushani Weerasinghe, Deputy Director, "Cyber Campus" Center for Open and Distance Learning, IIOE Coordinator
University of Lomé	Coordinator	Prof. QUASHIE Akossiwaa Marie Luce épouse MENSAH ATTOH, Secretary General
Mbarara University of Science and Technology	Coordinator	Mr. Amos Baryashaba, Head of Computing Services Department
Tashkent University of Information Technologies named after Muhammad al-Khwarizmi	Coordinator	Prof. Marat Rakhmatullaev, Professor at Tashkent University of Information Technologies, Team-leader of HEREs (Uzbekistan Higher Education Reform Experts), Uzbekistan
Wisdom House Cultural Industry Group Co., Ltd	Coordinator	Ms. Kong Qian, General Business Director
Jiker Co., Ltd.	Coordinator	Ms. Han Han, CEO of Jiker
Huawei Technologies Co., Ltd.	Coordinator	Mr. Zhang Jing, Global Partner Operation Director
Guangzhou Createview Education Technology Co., Ltd.	Coordinator	Mr. Jeff Li, General Manager



2. Smart Classroom Project Stories

SCR Project implementation at the Mongolian University of Science and Technology (MUST) in Ulaanbaatar, Mongolia, is also a good example of its relevance and effectiveness, assisting MUST to conduct online, blended as well as hybrid training. Prof. Namnan Tumurpurev, President of MUST, expressed his appreciation for the great support of UNESCO-ICHEI, Createview, and SUSTech, and said that "I would continue to support the project and expect the project to produce more results under the support from IIOE, contributing to the sustainable development of higher education in Mongolia."



Smart Classroom in Mongolian University of Science and Technology (MUST) in Ulaanbaatar, Mongolia

Institut Teknologi Bandung (ITB), Bandung, Indonesia, currently has 26,316 students, and successfully installed its SCR in October 2022. Since its launch, SCR facility at ITB has been used for 95 hours to serve more than 300 onsite students and 278 online students, with a total of 6 GB of recorded videos of learning content. Additionally, 11 academic courses were broadcast by ITB for learners to build the knowledge and enhance skills through SCR project. Prof. Reini Wirahadikusumah, PhD, the Rector of ITB, said "The facility will be used to support education 4.0, moving towards digital transformation. A few other classrooms in ITB have also transformed into hybrids. Through smart classroom-supported hybrid learning, the knowledge transfer will improve significantly as there is real feedback facilitating interactions, and also accelerating the educational transformation into a digitalised path."

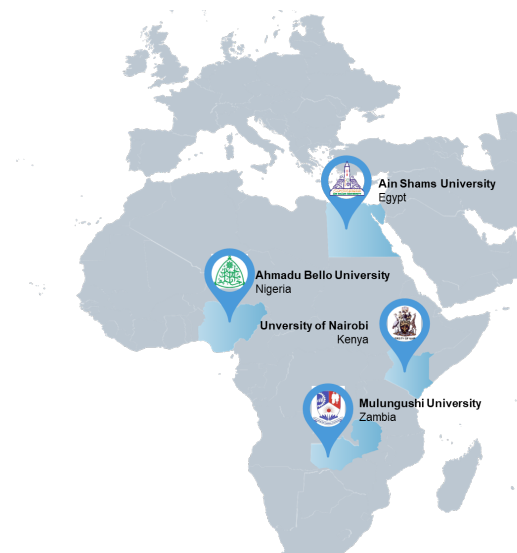


Smart Classroom at Institut Teknologi Bandung (ITB), Bandung, Indonesia

3. IIOE National Centres

IIOE National Centres in Africa and Arab States

Ain Shams University (Egypt), the first rotating presidency unit of IIOE for 2020, officially proposed to establish the IIOE National Centre in Egypt at the IIOE semi-annual meeting of Africa and West Asia in July 2021. The initiative was then quickly welcomed by many other IIOE partner HEIs. IIOE partner HEIs in Nigeria, Zambia, and Kenya have successively expressed their willingness to establish IIOE National Centres in their respective countries. From April to May 2022, IIOE National Centres in Nigeria, Kenya, and Egypt were officially launched by UNESCO-ICHEI in collaboration with Ahmadu Bello University (Nigeria), University of Nairobi (Kenya), Ain Shams University (Egypt). Endorsed and supported by the respective ministries in charge of higher education, IIOE National Centres in Egypt, Nigeria and Kenya presented their annual work plan at the launch ceremony and started their national operation since then.



IIOE National Centres in Africa and Arab States

IIOE Egypt National Centre

The IIOE Egypt National Centre was officially launched on 11 May 2022. UNESCO Cairo Office, Egyptian Ministry of Higher Education and Scientific Research, Supreme Council of Universities, and representatives from over 20 Egyptian universities participated in the launch ceremony. Professor Mona Abdel-Aal Elzahry, director of the IIOE Egypt National Centre, presented the annual work plan, including establishing the IIOE national HEI network to facilitate digital transformation of HEIs, building a platform for national dialogue among teachers, leaders and technical staff, co-constructing localised TPD content and programmes to meet the needs of Egyptian HEIs, as well as carrying out joint research in the field of educational technology with UNESCO-ICHEI.

IIOE Nigeria National Centre

The IIOE Nigeria National Centre hosted by ABU was officially launched on 20 April 2022. Representatives from the National Universities Commission (NUC) of Nigeria, the Nigerian Federal Ministry of Education, and UNESCO regional office in Abuja attended the meeting. Professor Muhammed Bashir Mu'azu, head of the Computer Engineering Department of ABU and director of IIOE Nigeria National Centre presented the annual work plan. IIOE Nigeria National Centre plans to engage more Nigerian HEIs in IIOE training programmes, and to leverage IIOE's course resources to support teaching and learning at local HEIs in line with Nigeria's local needs. It will also cooperate with UNESCO-ICHEI to jointly develop courses and leverage university-industry cooperation to upgrade curricula.

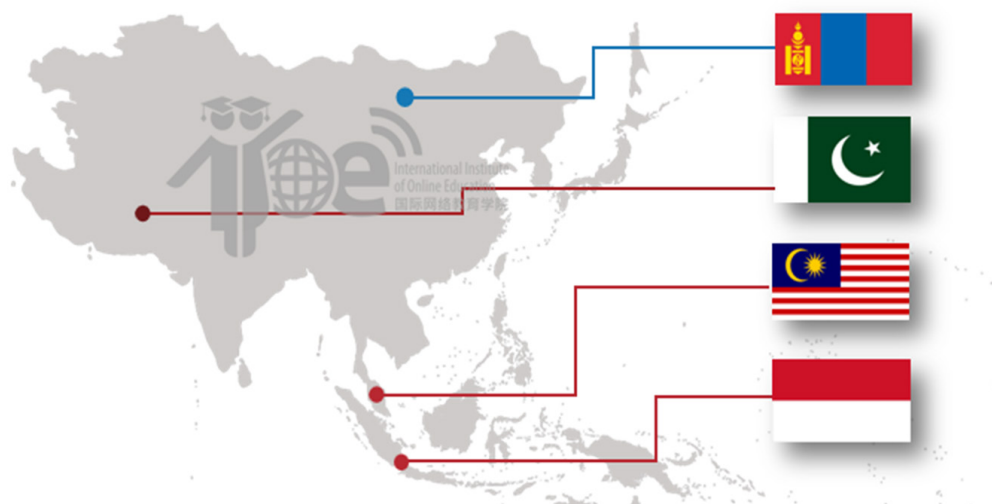
In August 2022, the SCR at Ahmadu Bello University was officially completed, which will equip teachers within the IIOE Nigeria National Centre network with advanced hardware and software facilities, boost technology-driven teaching and learning activities, and support digital transformation in Nigeria combined with capacity-building programmes.

IIOE Kenya National Centre

The IIOE Kenya National Centre was officially launched on 25 April 2022. The Kenyan Ministry of Information Communication and Technology & Innovation, UNESCO Regional Office for Eastern Africa (Nairobi), Vice Chancellors and Deputy Vice Chancellors from over 20 HEIs in Kenya attended the launch ceremony. Professor Justus Inyega, director of IIOE Kenya National Centre, presented the annual work plan at the ceremony. IIOE Kenya National Centre focuses on promoting local participation in IIOE training and webinars, while also attaching great importance to experience sharing of digital transformation in HEIs. IIOE Kenya National Centre also plans to establish the national network of HEIs step by step, and consolidate university-enterprise cooperation in terms of software, hardware and training.

Since its official launch, 4 Kenyan universities have joined the IIOE Kenya National Centre network. The Smart Classroom at the University of Nairobi was also officially inaugurated during the IIOE Kenya National Centre launch ceremony. As a digital learning environment equipped with cutting-edge ICT hardware and software, the Smart Classroom enables digital teaching and learning practices, and will support the IIOE Kenya National Centre to promote sharing of educational resources and capacity building among IIOE Kenyan partner HEIs.

IIOE National Centres in the Asia-Pacific



IIOE National Centres in the Asia-Pacific

IIOE Pakistan National Centre

Since its establishment, the IIOE Pakistan National Centre and UNESCO-ICHEI organised several local activities, contributing to building teachers' capacity for digital teaching and learning, as well as facilitating local participation in and contribution to IIOE. For instance, it co-organised with UNESCO-ICHEI the "IIOE Global Webinar - Female Leadership in STEM" in October 2022, supporting UNESCO's gender equality priority. In November 2022, it co-planned and held the IIOE South Asia Regional Consultation Meeting with UNESCO-ICHEI and led the drafting of the "IIOE South Asia Regional Development Report".



"IIOE Global Webinar - Female Leadership in STEM" Poster

IIOE Mongolia National Centre

In Mongolia, the IIOE Mongolia National Centre was jointly launched by UNESCO-ICHEI and its longstanding partner HEI, the Mongolian University of Science and Technology (MUST) in January 2022 with the endorsement of the Ministry of Education and Science of Mongolia. As an HEI leading the digital transformation of higher education in Mongolia, MUST developed a national network of 6 state-owned HEIs in Mongolia.

It also co-developed with UNESCO-ICHEI an online course entitled "Creating effective learning materials for STEM courses using Lightboard" based on established practices of the Open Education Centre at MUST, which will be hosted on the IIOE platform and shared with IIOE partners worldwide.



The IIOE National Centre Network in Mongolia



Teaching activities based on lightboard technology conducted by IIOE Mongolia National Centre

IIOE Malaysia National Centre

Jointly established by UNESCO-ICHEI and its long-term partner HEI Universiti Putra Malaysia (UPM) in January 2022, the IIOE Malaysia National Centre. Endorsed by the Malaysian Ministry of Higher Education, it seeks to establish a localised and integral structure of IIOE, and build a physical environment supported by the Smart Classroom.

In 2022, its goal is to establish a localised overall IIOE framework and build the physical environment supported by Smart Classroom. In 2023, it focuses on developing a comprehensive micro-credential training and implementation plan, and offering policy advice to the Ministry of Higher Education. In 2024, it aims to continuously enhance the localised IIOE framework through monitoring and evaluation, including its sustainability and impact across the country. In 2025, IIOE will serve as a national capacity-building institution for university teachers and extend its impact to other countries.



Signing of MOU between UNESCO-ICHEI and UPM

Latest Developments of the IIOE Pilot Projects on Empowering Teachers' Digital Teaching and Learning

In 2021, UNESCO-ICHEI collaborated with the Institute of Education, Tsinghua University Institute of Education and over 50 experts from China and worldwide to jointly develop a series of publications themed on the digital transformation of higher education teaching and learning. The series includes the **Research Report on Digital Transformation of Higher Education Teaching and Learning**, **Handbook of Educational Reform through Blended Learning**, **Handbook of Teacher Professional Development in TVET**, and the **Handbook of Teacher Professional Development in Higher Education**, which generated new knowledge and implementation blueprints for IIOE.

Using the research series as a theoretical framework, under the guidance of Prof. Tiedao Zhang, UNESCO-ICHEI's guest researcher and former vice rector of Beijing Open University, as well as Prof. Lim Cher Ping, IIOE chief expert and chair professor at the faculty of education and human development, Education University of Hong Kong, IIOE's holistic approach to building educators' capacity transformed into practices of partner HEIs at scale.

Egypt - Empowering Higher Education Institutions for Digital Teaching and Learning in Egypt

In Egypt, digital transformation has become a priority of national development. **"Digital Egypt" Strategy** lays out 3 pillars: Digital Transformation, Digital Skills and Jobs, and Digital Innovation. Among these, "Digital Skills and Jobs" envisions the enhancement of "digital literacy and capacity of all members of society" (Ministry of Communication and Information Technologies, 2022). In addition, the Egyptian Ministry of Higher Education and Scientific Research's (MOHESR) **National Strategy for Science, Technology and Innovation (2015-2030)** encourages the establishment of "Smart Universities" and promotes distance learning and digital education. (MOHESR, 2015)



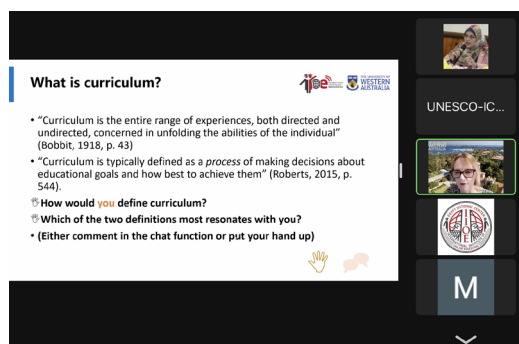
To fulfil IIOE Egypt National Centre's role as a national hub driving the digital transformation of Egyptian HEIs, UNESCO-ICHEI and IIOE Egypt National Centre (hosted by Ain Shams University) jointly launched the national project entitled **"Empowering Higher Education Institutions for Digital Teaching and Learning in Egypt"** in July 2022. The project's overall objective is to enhance teachers' digital teaching competencies in Egyptian HEIs, and to create a conducive institutional environment for digital teaching and learning. The main activities below engaged the active participation of 23 HEIs of the IIOE Egypt National Centre network.

- **Master teacher training in digital pedagogy** including 2 rounds of workshops on digital course design, and delivery.
- **Policy Dialogue among higher education management staff** on digital teaching and learning
- **Digital Leadership Symposium** engaging university presidents and top management from Egyptian HEIs and national authorities in charge of higher education.

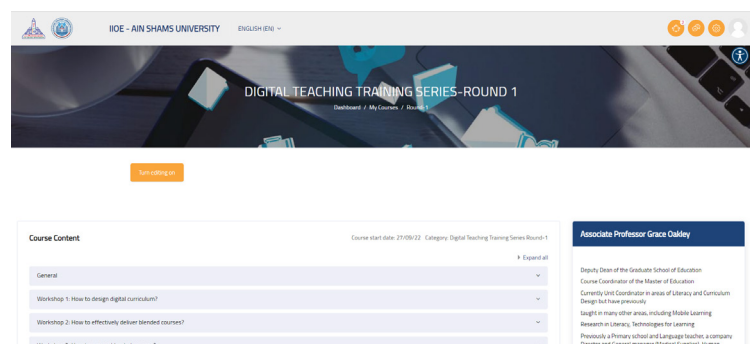


Pilot project team members of the IIOE Egypt National Centre

From September 2022 to January 2023, the project trained **63 master teachers** from **14 Egyptian HEIs** on digital pedagogy, over **60%** of which were female teachers. The participants came from diverse disciplinary backgrounds, spanning across computer and engineering, life sciences, health sciences, and humanities, forming a dynamic nationwide community of practice in the field of digital teaching and learning.



Master teacher training organised by IIOE Egypt National Centre



Webpage of the digital teaching training series organised by the IIOE Egypt National Centre

At the level of policy and management, a **national dialogue among higher education management staff** was also conducted on 12 January 2023. The dialogue engaged representatives of the Ministry of Higher Education and Scientific Research, the Supreme Council of Universities, the National Agency for Quality Assurance and Accreditation, and HEI staff in in-depth discussions about the digital transformation of higher education teaching and learning. Participants developed a report based on current trends of digital transformation of higher education teaching and learning and quality assurance, as well as challenges facing Egyptian higher education. The report proposed recommendations for enacting digital teaching and learning policies at national and institutional levels, while listing the localisation of IIOE QA 2.0 as a key next step.



The **Digital Leadership Symposium** aims to provide a platform and mechanism of dialogue among Egyptian authorities in charge of higher education and leaders of Egyptian HEIs to deliberate upon policy-making for digital teaching and learning. Scheduled for March 2023, national authorities and HEIs participating in the symposium will produce Policy Recommendations on Leadership for Digital Transformation of Higher Education in Egypt.

▶ National Policy Dialogue jointly hosted by IIOE Egypt National Centre and Galala University

Nigeria - Empowering Institutional Policy Implementation for Digital Teaching and Learning in Nigeria

In line with the vision of Nigeria's **National Development Plan 2021 - 2025** to promote digital education and in response to the shift towards online and blended learning accelerated by the COVID-19 pandemic, ABU developed and adopted the **Teaching and Learning Policy (TLP)** in January 2022. The TLP envisions the transformation of teaching and learning into online and blended mode, training the trainers (ToT) sessions to enhance teachers' digital literacy and ICT capacity, and development of incentivized policies to encourage the adoption

of OBTL programmes across the university community. However, its implementation remains a challenge due to prolonged industrial action in Nigerian public universities, lack of an implementation plan with measurable milestones and proper outcome evaluation instruments, lack of adequate or requisite competencies in teachers to design, develop and deliver content in blended mode and lack of adequate funds to acquire requisite infrastructure and digital devices to support both teaching and learning.

Within this context, UNESCO-ICHEI and IIOE Nigeria National Centre hosted by ABU jointly launched the pilot project **"Empowering Institutional Policy Implementation for Digital Teaching and Learning in Nigeria"** in September 2022. It aims to support the implementation of institutional policies for digital teaching and learning in Nigerian HEIs, and empower IIOE Nigeria National Centre as a national hub driving the digital transformation of higher education teaching and learning. The project consists of the following main activities.

- **ToT sessions** on online course design and development for teachers from ABU and partner HEIs of the IIOE network in Nigeria
- **Policy workshop** to develop an implementation plan for the ABU Teaching and Learning Policy
- **Teachers' digital literacy enhancement programme** to build teachers' capacity to use digital tools for teaching and learning



Female trainees of the ToT sessions took a group photo with training expert Prof. Paul Prinsloo (UNISA)



Trainees of the ToT sessions interacting with each other



Trainees of the ToT sessions interacting with training expert Prof. Paul Prinsloo (UNISA)



ABU Deputy Vice Chancellor Ahmed Doko Ibrahim delivered a speech at the policy workshop



Key members who participated in the policy workshop of ABU TLP

Implemented from September till December 2022, the project has trained over **55 teacher trainers** from **7 Nigerian HEIs** across engineering, computing, bio-medical, humanities and social science disciplines. The ABU team and Prof. Paul Prinsloo (UNISA) jointly developed a set of competency evaluation and certification mechanism for the training programme. Based on the deliverables and performance of trainees, UNESCO-ICHEI and IIOE Nigeria National Centre jointly issued three levels of certification for teachers (attendance, mastery, and excellence)

205 teachers from ABU participated in the digital literacy workshops. A number of trained teachers also developed **4 online courses** in engineering, medical and life sciences and humanities/social sciences, which will be put into practice in 2023. IIOE Nigeria National Centre has already planned to train an additional of 300 teachers and to support teacher capacity building at local partner HEIs in 2023.

Following the policy workshop, ABU Vice Chancellor appointed a task team to develop an **implementation plan of the ABU TLP**. The plan was submitted to the University Senate and was subsequently approved, which provides a 5-year roadmap for the TLP's implementation and initiated mindset change among the university community in favour of digital teaching and learning.

Kenya - Transforming Online Pedagogy for Effective Curriculum Delivery in Higher Education Institutions in Kenya

In the National Education Sector Strategic Plan (NESSP) 2018-2022, developed by the Kenyan Ministry of Education, it aims to strengthen and expand e-learning programmes in all HEIs, and also sets a target to have 30% of degree programmes available in e-learning mode, as well as encourages to strengthen Science, Technology, Engineering, and Mathematics (STEM) in Education and Training. The Strategic Plan of the University of Nairobi (2018-2023) supports refocusing Online and Distance Learning (ODEL) as a facilitative platform to enable academic units to offer programmes. However, many higher education

lecturers in Kenya lack the competencies to implement online pedagogy for effective online curriculum delivery.

In order to enhance the digital teaching competencies of teachers in Kenyan HEIs, UNESCO-ICHEI and IIOE Kenya National Centre hosted by the University of Nairobi jointly launched the Pilot Project **"Transforming Online Pedagogy for Effective Curriculum Delivery in Higher Education Institutions in Kenya"** on 30 September 2022. It aims to upskill lecturers on transformative curriculum delivery, and to improve online and blended teaching and learning practices in higher education institutions in Kenya. The project consists of the following main activities.

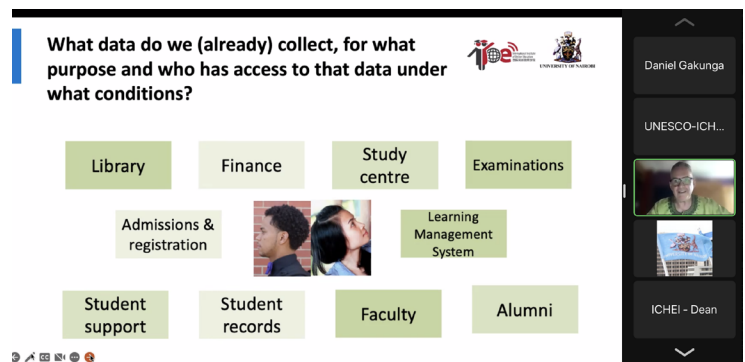
- **Digital Transformative Pedagogy Training**, including 3 modules of online course design, online facilitation and innovative assessment, to enhance the digital competencies of higher education teachers in Kenya.

- **Effective Open and Distance Learning Webinar** to raise digital awareness and share the latest research and trends of digital teaching and learning.

Implemented from November till December 2022, **87 lecturers** from **six STEM-oriented faculties** at the **University of Nairobi**, including engineering, science and technology, health sciences, etc., as well as **4 partner HEIs** of the IIOE Kenya National Centre, including Egerton University, Umma University, Pwani University and Maasai Mara University, have engaged in Digital Transformative Pedagogy (DTP) Training and the webinar.



DTP Training



Effective Open and Distance Learning Webinar



Virginia Gichuru

[Digital Transformative Pedagogy (DT) Training Participant from Pwani University]

Virginia Gichuru, Digital Transformative Pedagogy (DT) Training Participant from Pwani University

I found the training an eye-opener on how to transform my teaching and make it relevant for the 21st century using digital tools.

I learnt how to do course design, how to effectively facilitate teaching and learning and finally, how to carry out the innovative assessments. I am looking forward to implementing many of the learnt ideas in the new semester where I will be teaching two units in Blended mode. This training could not have come at a better time. I would also like to complete the advanced part of the course in order to be more competent. The course was very interactive through the Zoom online sessions with our facilitators. I enjoyed the asynchronous sessions which were varied and engaging. My desire is to transform my courses to fit what we learnt during this DTP Training.

I look forward to more training and also to being able to transfer skills to my colleagues.



Jared Ongaro

[DTP Facilitator, University of Nairobi]

Students can learn whether we teach them or we don't, what we seek is effectiveness. Technology alone won't be enough to improve teaching and learning to where it needs to be for 21st century skills.

Where it is being used successfully, teachers collectively share a vision of promoting deeper learning in all their students, and have collaboratively redesigned the role of the teacher to that of facilitator who uses technology as a tool in their educational aims. As facilitators, we teachers become learning strategists who constantly plan ways to enable students to master complex content knowledge and develop their critical thinking, problem solving, communication, and collaboration skills.

This is exactly what makes DTP so unique in shaping a community of best practice.

The lecturers were trained in the practical application of a variety of toolsets, digital resources and strategies for course planning, and design as well as creative facilitation and innovative assessment, with the guidance and support of 18 facilitators. 62 participants successfully completed the training series, 42% of which were female. As a result, 6 best practice case studies of digital teaching and learning will be produced, as well as 4 quality online courses, 2 online course assessment rubrics, and an upscaling plan of the ToT.

Malaysia - Digital Educator Micro-credential

In 2013, the Malaysian Ministry of Higher Education (MOHE) released an important policy, the "Malaysian Higher Education Blueprint 2015-2025". The blueprint lists 10 shifts for the transformation of higher education in the country, aiming to cultivate digital talents that meet the needs of Industrial Revolution 4.0, and facilitate the development of the digital industry in Malaysia so as to support the country to advance into the ranks of high-income countries. Among them, shifts 9 and 10 emphasize the use of digital technology in promoting the diversity of teaching modes. In 2018, MOHE further formulated the "Malaysia Future Ready Curriculum Framework", which highlighted that all HEIs should ensure that at least 70% of courses adopt a hybrid teaching mode by 2020. In the first half of 2022, MOHE launched the MYDigital Educators to recruit and train master teachers with advanced innovative skills in blended learning in public universities across the country, as well as to develop 1,000 quality blended learning courses.

As a member of IIOE and the host institute of IIOE National Centre in Malaysia, Universiti Putra Malaysia and UNESCO-ICHEI co-launched the Digital Educator Micro-credential pilot project. The overall objective is to explore the adoption of micro-credentials in university teachers' professional development as a way to support institutional capacity building and to promote the digital transformation of higher education in Malaysia. Specifically, it has the following key tasks:

- **Identify (I):** to identify educators' key digital competencies in the Malaysia context;
- **Develop (D):** to develop training content based on digital competencies and skills required;
- **Embed (E):** to embed micro-credential into educators' professional development at the institutional level;
- **Access (A):** to increase flexible access to quality content and to promote recognized certifications for educators across HEIs in Malaysia; and
- **Support (S):** to support relevant policy development and evidence-based research.



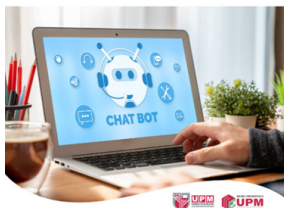
Pilot Project in Malaysia

With the support of international experts from the USA, Australia and Malaysia commissioned by UNESCO-ICHEI, 3 modules of training materials were developed and made available online. The 3 modules are:

1.Chatbot for Learning with Dialogflow ES

2.Artificial Intelligence for Society in 100 Minutes

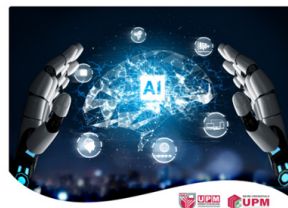
3.Facts about HYFLEX Learning You Need to Know – HYFLEX Beginner



Chatbot for Learning with Dialogflow ES

Nurfadhilina Mohd Sharef (and 1 more)

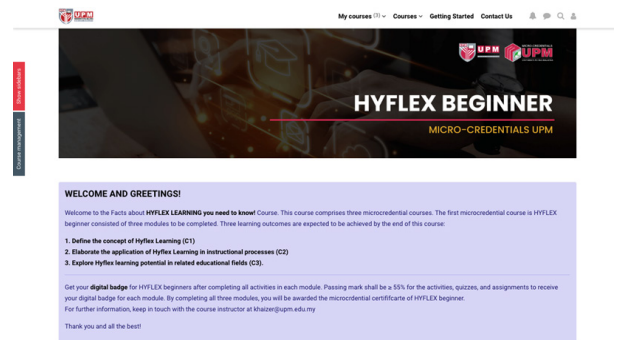
36 Oct 2022



Artificial Intelligence for Society in 100 Minutes

Dr Amalina Abdullah (and 3 more)

159 Dec 2022



As of January 2023, IIOE Malaysia National Centre has implemented several continuous professional development training programmes within the framework of the pilot project, benefiting 262 educators, covering the following themes.

a. Micro-credentials Course Development Training

b. Artificial Intelligence and Data Literacy for Educators

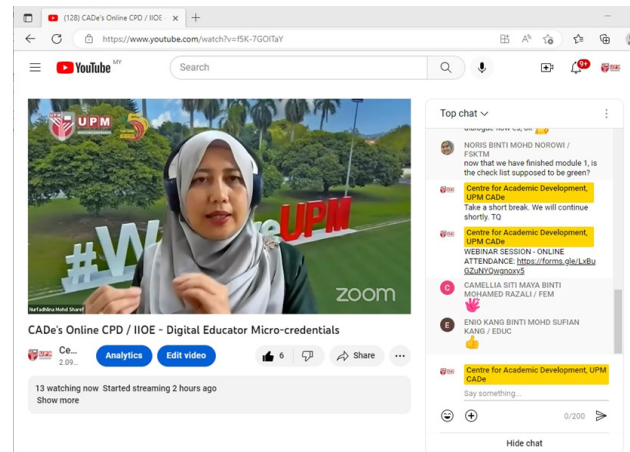
c. Chatbot for Learning with Dialogflow ES

d. Artificial Intelligence for Society in 100 Minutes

e. Facts about HYFLEX Learning You Need to Know – HYFLEX Beginner



Onsite training for digital educators at UPM



Online training of the IIOE Digital Educator Micro-credential pilot project

As a follow up, educators who completed the courses will be selected to engage in the pilot project towards the end. Professional development for digital educators will continue with support of the "Smart Classroom" to be jointly established by UNESCO-ICHEI, UPM, Seewo and Southern University of Science and Technology (Shenzhen, China).

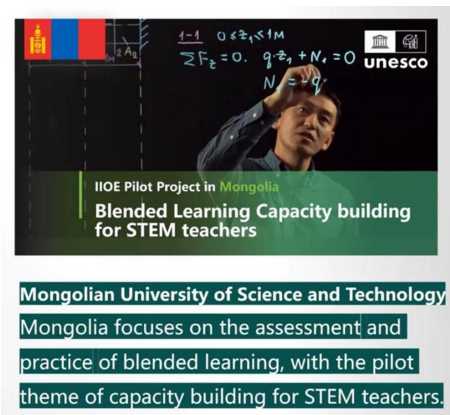
Mongolia - Blended Learning Capacity Building for STEM Teachers

In May 2020, the State Great Khural of Mongolia approved its long-term development policy "Vision 2050", which embeds digitalization in all its chapters and attaches great importance in enhancing an open and flexible lifelong education system. In alignment with "Vision-2050", the Mongolian government developed the "Education Sector Medium Term Development Plan (2021-2030)", emphasizing the need to disseminate flexible, blended learning pathways using open education and digital learning technology.

In higher education, the lack of qualified STEM teachers is one of the key constraints hindering the development of STEM education in Mongolia. To address this, and to facilitate the digital transformation of the higher education system in the country, UNESCO-ICHEI and Mongolian University of Science and Technology (MUST), a founding member of the International Institute of Online Education (IIOE) and the host university of the IIOE National Center in Mongolia, jointly launched a pilot project "Blended Learning Capacity Building for STEM teachers" in Mongolia, focusing on capacity building for university teachers in STEM.

The overall objective of the pilot project is to empower Mongolian university teachers with competency and skills in blended learning and support implementation of related policies, so as to facilitate the digital transformation of Mongolian higher education. The specific objectives of the project are as follows:

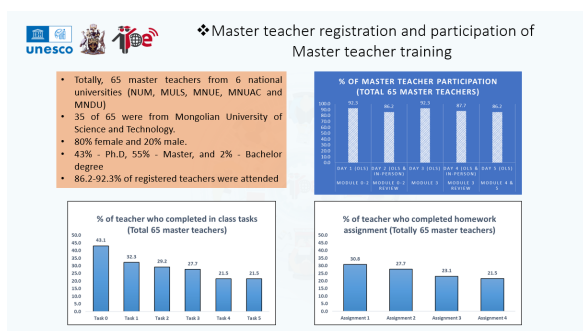
- Supporting Mongolian HEIs to develop and adopt benchmarks and guidelines to encourage blended learning;
- Conducting systematic teacher training on blended learning and developing exemplary courses in STEM, serving as training resources for national Teacher Professional Development programmes;
- Facilitating a community for teachers engaged in blended learning;
- Developing a blended learning assessment tool and formulating guidelines for blended learning course development.



Pilot Project in Mongolia

By February 2023, the project successfully developed 5 training modules on blended learning, trained 322 teachers from 6 state-owned universities in Mongolia, including 65 master teachers (80% were females). In addition, a "Blended Teaching Readiness" test was carried out to evaluate the impact of the pilot project, assess the effectiveness of the master teacher training and monitor behavioural changes of master teachers. Preliminary results showed that blended learning readiness at MUST has improved as a result of the pilot project, while readiness is still moderate and more improvements are needed in terms of data practice, personalisation and online interaction areas. To put blended learning into practice, 2 exemplary blended courses have been developed for MUST.

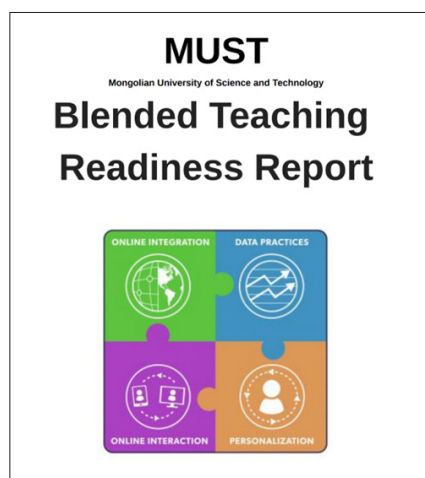
Building upon existing achievements, more cascading trainings will be conducted at MUST and other state-owned universities. An additional 5 to 8 blended courses will be developed. In addition, blended learning assessment tools and blended learning course development guidelines will also be produced to support blended learning practices.



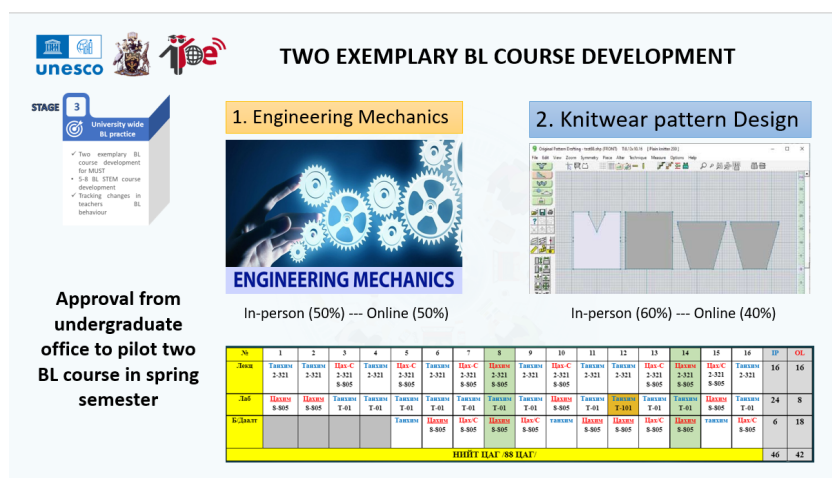
Master teacher training at state-owned universities in Mongolia



Cascading trainings by state-owned universities in Mongolia



Blended Teaching Readiness Report



Two exemplary courses developed

4. Acknowledgements

The *Co-constructing a global ecosystem for higher education digital transformation — International Institute of Online Education Developmental Report (2019-2022)* would not be what it is without the contributions from all members of UNESCO-ICHEI, partners of IIOE, and close collaborators. In developing this report, we have received extensive support from our advising experts, focal points of IIOE national centres and partners, IIOE partner university representatives, and friends in the private sector. Hereby, we are listing all contributors to this report, acknowledging their various forms of support. **(in no particular order)**

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