

# International Institute of Online Education (IIOE)

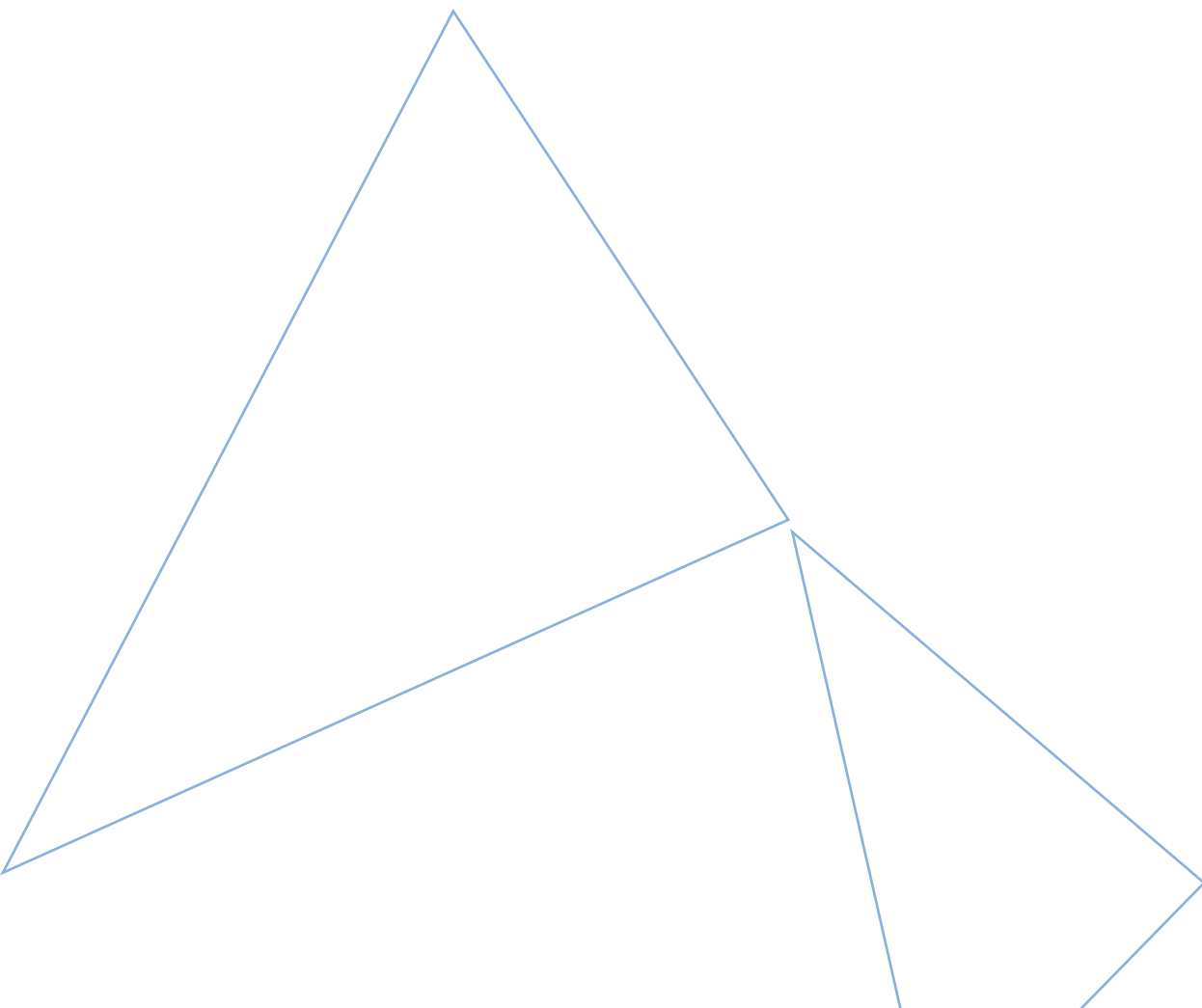
Harnessing the Belt and Road Initiative  
to Enhance the Access of Developing Countries  
to Quality Higher Education





# **International Institute of Online Education (IIOE):**

Harnessing the Belt and Road Initiative to  
Enhance the Access of Developing Countries to  
Quality Higher Education



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## List of Acronyms and Abbreviations

<b>Blended Learning</b>	Blended learning involves both online (asynchronous or/and synchronous) and face-to-face contact time between teachers and learners, and/or among learners in a course.
<b>Education 2030</b>	Education 2030 refers to the global commitment of the Education for All movement to ensure access to quality education for all. It is an essential part of the 2030 Agenda for Sustainable Development.
<b>Equity in Education</b>	Equity in education means that personal or social circumstances such as gender, ethnicity, religion or socioeconomic class, are not obstacles to achieving educational potential (fairness) and that all individuals reach at least a basic minimum level of competencies (inclusion).
<b>Online Learning</b>	Online learning is a flexible instructional delivery system that takes place via the Internet instead of face-to-face contact in traditional classroom setting. Online learning connects teachers and learners who may not be able to enrol in a traditional classroom course, and supports learners who need to work on their own schedule and at their own pace.
<b>Open and Distance Learning (ODL)</b>	Open and distance learning is the educational process in which all or most of the teaching is conducted by someone removed in space and/ or time from the learners, with the effect that all or most of the communication between teachers and learners is through an artificial medium, either electronic or print. It opens opportunity for learners to study regardless of geographic, socio-economic or other constraints.
<b>Partner Enterprises</b>	Enterprises in the field of ICT and educational technology which has provided support to IIOE in terms of courses, technical support, hardware and software.
<b>Partner Higher Education Institutions</b>	UNESCO-ICHEI's long-term partner universities in Africa (7) and Asia-Pacific (4) by the end of 2020.
<b>Quality Assurance (QA)</b>	Quality Assurance can be defined as the set of policies, structures and processes by which the institute monitors, assesses and regulates the quality of its teaching programmes in order to ensure that academic standards are commensurate with those of peer institutions (local and international) and conform to the requirements of relevant standards authorities. QA is also concerned with ensuring consistency between the institute's vision, mission and teaching/learning policies and practices.
<b>UN SDG</b>	The Sustainable Development Goals are the blueprint to achieve a better and more sustainable future for all. They address the global challenges we face, including those related to poverty, inequality, climate change, environmental degradation, peace and justice. The 17 Goals are all interconnected, and in order to leave no one behind, it is important that they can be achieved by 2030.
<b>UN SDG4</b>	One of the United Nation Sustainable Development Goals (i.e. quality education). It aims to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

<b>UNESCO-China Funds-in-Trust (CFIT)</b>	The UNESCO-China Funds-in-Trust (CFIT) Project, which was launched in late 2012, for harnessing Technology for Quality Teacher Training in Africa.
<b>UNESCO-Shenzhen Funds-in-Trust (SFIT)</b>	The UNESCO-Shenzhen Funds-in-Trust is supported by the Shenzhen Municipal Government, China. 0.5 million USD of the funding is for supporting higher education development in Asia, and 1.5 million USD of it is for higher education quality assurance development in Africa.
<b>UNESCO-ICHEI</b>	International Centre for Higher Education Innovation under the auspices of UNESCO. It is the tenth Education Sector UNESCO Category 2 centre in the world and also the first Category 2 centre for higher education in China.
<b>UNESCO ICT Competency Framework for Teachers (ICT CFT)</b>	UNESCO ICT CFT is intended to be adapted to support national and institutional goals by providing an up-to-date framework for policy development and capacity building in this dynamic area. The Version 3 of it is a response to recent technological and pedagogical developments in the field of ICT and Education, and incorporates in its structure inclusive principles of non-discrimination, open and equitable information accessibility and gender equality in the delivery of education supported by technology.
<b>The Belt and Road Initiative</b>	The Belt and Road Initiative refers to the Silk Road Economic Belt and 21st Century Maritime Silk Road, a significant development strategy launched by the Chinese government with the intention of promoting economic co-operation among countries along the proposed Belt and Road routes. The Initiative has been designed to enhance the orderly free flow of economic factors and the efficient allocation of resources. It is also intended to further market integration and create a regional economic co-operation framework of benefit to all.
<b>ACDE</b>	African Council for Distance Education
<b>AI</b>	Artificial Intelligence
<b>AVU</b>	African Virtual University
<b>CAL-ED</b>	Latin American and Caribbean Institute for Quality in Distance Education
<b>CHEA</b>	Council for Higher Education Accreditation (U.S)
<b>CDN</b>	Content Delivery Network
<b>COL</b>	Commonwealth of Learning
<b>EADTU</b>	European Association of Distance Teaching Universities
<b>HEI</b>	Higher Education Institution
<b>HTTPS</b>	Hypertext Transfer Protocol Secure
<b>KPI</b>	Key Performance Indicator
<b>ICT</b>	Information and Communications Technology
<b>IT</b>	Information Technology

<b>IIOE</b>	International Institute of Online Education
<b>MOOCs</b>	Massive Open Online Courses
<b>NADEOSA</b>	National Association of Distance Education Organisations of South Africa
<b>NGO</b>	Non-Governmental Organisation
<b>ODL</b>	Open and Distance Learning
<b>QAA</b>	Quality Assurance Agency for Higher Education (U.K)
<b>SSA</b>	Sub-Sahara Africa
<b>TVET</b>	Technical and Vocational Education and Training
<b>UIS</b>	UNESCO Institute for Statistics
<b>UNESCO</b>	United Nations Educational, Scientific and Cultural Organisation



# 1

## Background

Many developing countries have recognised that higher education is vital to economic transition when they are making effort to move their economies away from a reliance on low-skilled, low-wage, and low value-added industries. However, many developing countries face the challenges of advancing higher education reform and addressing the tensions of its quality and equity<sup>1</sup>. The challenges of higher education institutions (HEIs) in these countries include: HEIs lack the resources and capacity to develop quality courses, particularly courses related to Information and Communications Technology (ICT) competencies, to meet the demands of the digital era; Teachers from HEIs may lack the necessary competencies for quality teaching, and they might lack the capacity to develop and implement quality courses. Therefore, talent cultivation of these HEIs may not meet the changing demands of the countries' development from low value-added industries to higher-valued ones. At the same time, there is also limited access to higher education in these countries for marginalised groups (including women, ethnic minorities, people with special needs) and groups from rural and remote areas<sup>2</sup>.

In 2013, there were 7.2 million learners enrolled in higher education in Sub-Sahara Africa (SSA), compared with fewer than 400,000 learners in 1970<sup>3</sup>. However, growth in enrolment is still insufficient to meet rising demand for higher education, and the pressure on SSA countries to improve access to quality higher education is increasing.

The quality of education ultimately depends on teachers. Teachers are key to achieving United Nation Sustainable Development Goal (UN SDG) 4, yet many of them do not receive sufficient and relevant professional development on teaching and learning in higher education, let alone ICT competencies. Young teachers should be empowered to shape education and teaching in order to deliver quality learning and guarantee the right to education for all<sup>4</sup>.

According to the data from UNESCO Institute for Statistics (UIS), SSA countries have the highest rates of exclusion, with over one-fifth of the children are at primary school age. Girls are more likely to be excluded from schools first. In this age group, 24% of the girls never get the chance to study in schools compared to about 18% of the boys<sup>5</sup>. Besides, other data resources demonstrate that exclusion and gender disparities are likely to increase at the tertiary level in many regions and countries. The overall female participation in higher education has increased

1 Ra, S., Chin, B., & Lim, C. P. (2016). A holistic approach towards Information and Communication Technology (ICT) for addressing education challenges in Asia and the Pacific. *Educational Media International*, 53(2), 69-84.

2 Lim, C.P. (2018). Digital learning for development of Asian schools (pp.365-368). In K.J., Kennedy, & J.C.K., Lee (Eds.), *Routledge International Handbook of Schools and Schooling in Asia*. Singapore: Routledge.

3 Darvas, P., Gao, S., Shen, Y., & Bawany, B. (2017). *Sharing Higher Education's Promise beyond the Few in Sub-Saharan Africa*. The World Bank

4 World Teacher's Day 2019: Fact Sheet, UNESCO. <https://unesdoc.unesco.org/ark:/48223/pf0000370921>

5 <http://uis.unesco.org/en/news/international-womens-day-explore-latest-uis-data-eatlas-gender-inequality-education>

globally and currently surpasses male participation in almost all developed countries and in half of developing countries. However, women are underrepresented in the more advanced degree programmes, especially in science-related fields, resulting in fewer women than men in research. Women account for 30% of all researchers—an increase compared to the previous decades but still far from parity<sup>6</sup>. Female teachers are underrepresented in higher levels of education. At the tertiary level, only 19% of teachers are women from low-income countries and about 46% or less from the other income groups<sup>7</sup>.

ICT may address some of these challenges by providing HEIs with opportunities to enhance the quality and the efficiency of higher education, and to improve the access to higher education. ICT in education has a multiplier effect throughout the education system, by enhancing learning and providing learners with new sets of competencies; reaching learners with poor or no access (especially those in rural and remote areas); facilitating and improving teacher training; and minimising costs associated with the delivery of traditional instruction<sup>8</sup>.

Artificial Intelligence (AI) provides opportunities to support teachers in their educational and pedagogical responsibilities, and has potential to support learning and learning assessment. HEIs should review and adjust curricula to promote the in-depth integration of AI and transformation of learning methodologies. AI adoption may lead to the systematic and long-term transformation of the labour market. Higher education should develop mechanisms and tools to anticipate and identify current and future competencies related to AI development so as to keep their curricula updated and closely related to the changing economies, labour markets and societies<sup>9</sup>.

The Chinese government has been actively promoting the Belt and Road Initiative that upholds the Silk Road Spirit - “peace and cooperation, openness and inclusiveness, mutual learning and mutual benefit”<sup>10</sup>. The Belt and Road Initiative aims to promote and build up collaborative development mechanism among countries by means of talent cultivation and exchange. Higher education sector has been one of the key foci of the Belt and Road Initiative. Under the guidance of the Belt and Road Initiative, the International Centre for Higher Education Innovation under the auspices of UNESCO (UNESCO-ICHEI) has been actively exploring, sharing and implementing innovative higher education practices and ideas in developing countries.

After more than a year of meticulous planning, UNESCO-ICHEI proposed the International Institute of Online Education (IIOE) initiative. The centre has conducted several rounds of consultation meetings with feedback from partner HEIs and education experts from around the globe. The IIOE initiative has also gained 10 million RMB as special seed fund from the Tencent Charity Foundation. UNESCO-ICHEI would like to share the experiences of higher education in China and the resources for talent cultivation with more developing countries and to support them in their higher education reforms and talent cultivation in the digital era.

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6 The World’s Women 2015, <https://unstats.un.org/unsd/gender/chapter3/chapter3.html>

7 World Teacher’s Day 2019: Fact Sheet, UNESCO. <https://unesdoc.unesco.org/ark:/48223/pf0000370921>

8 Information and Communication Technology (ICT) in Education in Sub-Saharan-Africa, UNESCO-UIS, 2015. <http://uis.unesco.org/sites/default/files/documents/information-and-communication-technology-ict-in-education-in-sub-saharan-africa-2015-en.pdf>

9 BEIJING CONSENSUS on artificial intelligence and education, <https://unesdoc.unesco.org/ark:/48223/pf0000368303>

10 Vision and Actions on Jointly Building Silk Road Economic Belt and 21st-Century Maritime Silk Road. <https://www.beltandroad.gov.hk/visionandactions.html>

## 2

# Introduction of International Institute of Online Education (IIOE)

## 2.1 Mission and Aims of IIOE

Aligning itself with the UN SDG 4 - *Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all*, the mission of IIOE is to enhance the capacity of UNESCO-ICHEI's partner HEIs and their teachers for increasing and enhancing their students' access to quality higher education. IIOE aims to fulfil this mission by:

- (1) developing the **ICT in education capacity** of teachers from partner HEIs in Africa and Asia-Pacific, and supporting them to conduct quality teaching with ICT;
- (2) building **partner HEIs' capacity and environment for an online and blended learning ecosystem** to realise higher education reform;
- (3) providing quality online courses for partner HEIs to meet their **demand for quality higher education resources**;
- (4) using **AI** for partner HEIs to improve **personalised talent cultivation** based on the **talent demand of socio-economic development in the digital era**;
- (5) establishing a bridge between **higher education graduates and competencies demand of labour market** so as to enable higher education to meet the demands of the countries' economic development; and
- (6) enhancing access to quality higher education for **female teachers and learners** and marginalised communities in developing countries.

## 2.2 Main Target Beneficiaries

The main beneficiaries of IIOE are **UNESCO-ICHEI's partner HEIs** and their teachers in developing countries. From the IIOE online learning platform, teachers could access course resources that could enhance their capacity to develop and implement their own courses in their HEIs. They are then more likely to provide learners with quality learning experiences that prepare them for future employment in value-added industries. **Gender equality** is an integral part of the IIOE initiative to encourage and support more female teachers and learners to access and engage in quality higher education.

At the initial stage, IIOE will work collaboratively with course providers such as HEIs and partner enterprises in China, and the 11 partner HEIs of UNESCO-ICHEI. These partner HEIs are Addis Ababa University (Ethiopia), Ahmadu Bello University (Nigeria), Ain Shams University (Egypt), Mongolian University of Science and Technology (Mongolia), Royal University of Phnom Penh (Cambodia), University of Colombo (Sri Lanka), University of Djibouti (Djibouti), University of Engineering and Technology, Lahore (Pakistan), Makerere University (Uganda), University of Nairobi (Kenya), University of the Gambia (Gambia).

HEIs in the African countries from **UNESCO-China Funds-in-Trust** and **UNESCO-Shenzhen Funds-in-Trust** will also join the IIOE initiative. These countries include Cote d'Ivoire, Malawi, Mali, Namibia, Niger, Senegal, Togo and Zambia. IIOE is also open to other HEIs in developing countries that have the necessary conditions to benefit from the IIOE Initiative.

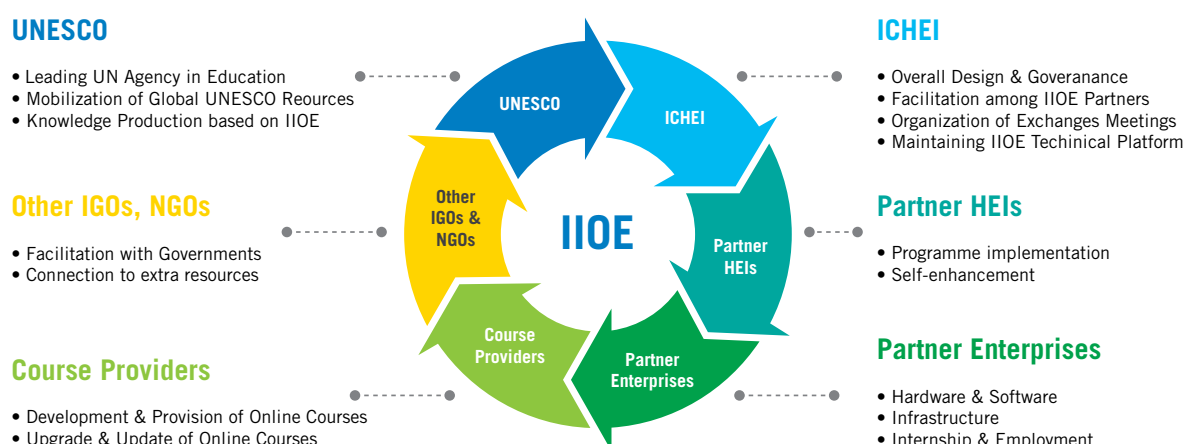
## 2.3 Roles and Functions of IIOE

Unlike traditional online learning platforms, 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 ICT-related competencies of teachers from partner HEIs to meet the demands of online teaching and learning;
- (2) 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 and mechanisms to realise higher education reforms of partner HEIs in the digital era;
- (3) A **catalyst and incentive mechanism** to help partner HEIs make use of AI to realise the **talent cultivation of their learners through personalised learning** in the digital era.
- (4) A **higher education collaborative network** consisting of UNESCO-ICHEI, UNESCO-ICHEI's partner HEIs in the developing countries in Africa and Asia, HEIs in China, partner enterprises, and other stakeholders in the higher education sector. This network promotes the joint contribution and shared benefits of higher education resources, infrastructure and hardware upgrades of partner HEIs, and quality assurance and enhancement of higher education.

## 2.4 IIOE Governance and Management

IIOE is a global collaborative initiative to build **the capacity of HEIs' teachers** in developing countries to enhance the access of their learners to quality higher education. The initiative involves partners around the globe (see **Figure 1**). In order to optimise the mobilisation of international resources, IIOE adopts a multi-party collaboration mechanism that includes UNESCO-ICHEI, UNESCO-ICHEI's partner HEIs in the developing countries in Africa and Asia, HEIs in China, partner enterprises, and international/regional/national organisations. All these partners play a significant role in this initiative to ensure the accountability and sustainability of IIOE.



**Figure 1: IIOE Governance/Partnership**

UNESCO-ICHEI is responsible for the overall governance of IIOE that includes the holistic design of IIOE, coordination among partners, evaluation of IIOE, upgrade and improvement of IIOE. The partnerships of IIOE are based on mutual agreements between UNESCO-ICHEI and its global partners and will be realised by signing relevant agreements. UNESCO-ICHEI expects all partners that have signed the agreement to uphold the principles of mutual benefits, and respect the sociocultural diversity and intellectual property rights of different organisations and countries.

## 2.5 Organisation Structure and Mechanism of IIOE

### 1) Secretariat

The Secretariat is the coordinating unit for IIOE and is based in UNESCO-ICHEI. 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.

Responsibilities of the Secretariat include coordinating: (i) the relationship and liaison of all members of IIOE, (ii) the daily operations of IIOE, and (iii) the policies and programmes of IIOE.

### 2) International Advisory Committee

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 International Advisory Committee includes the delegates appointed by each party of IIOE from their management teams. The International Advisory Committee is elected on the basis of rotation. The chair will be from the presidency unit that will be rotated once a year. Within countries and regions, partner HEIs will take turns to serve as the rotating presidency unit. If a HEI does not have the capacity to take up the rotating presidency unit, the next HEI will take its place.

### 3) Rotating Presidency Unit

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.

### 4) Joint Initiating Parties

During December 7 and 8, 2019, the International Consultative Meeting on IIOE was held by UNESCO-ICHEI in Shenzhen, China. After preliminary communication, UNESCO-ICHEI, its partner HEIs in Africa and Asia-Pacific, and selected HEIs and partner enterprises in China jointly launched IIOE. These universities and enterprises are the joint initiating parties of IIOE.

### 5) Entry and Exit Mechanism

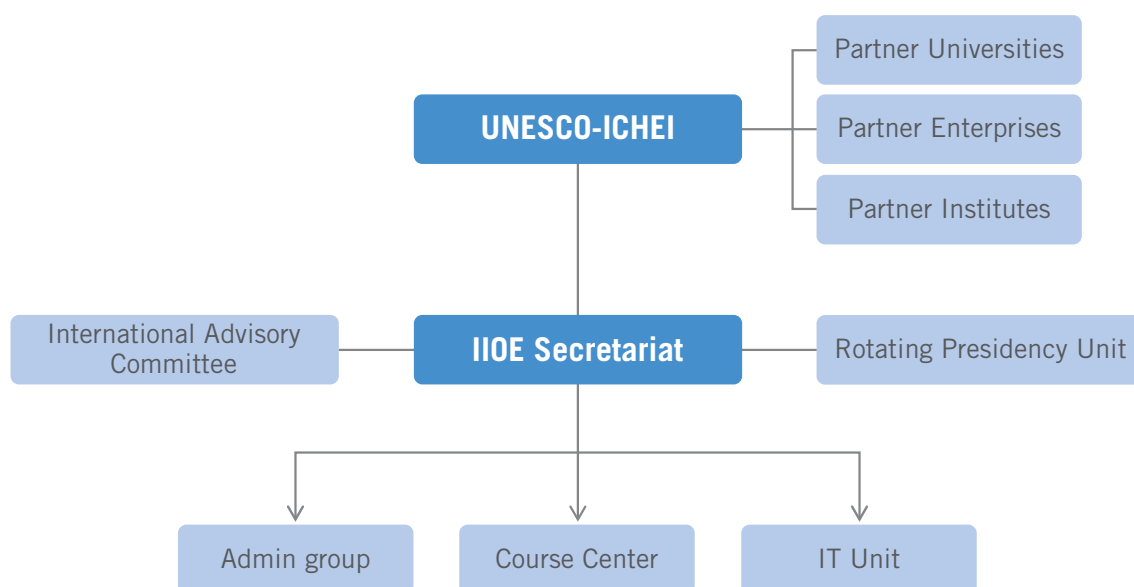
In the process of the IIOE development and implementation, if any HEI intends to **join** IIOE, the following procedures shall be executed:

The HEI submits an application to the Secretariat → the Secretariat examines the application materials → the Secretariat decides whether the HEI meets the IIOE quality assurance standards → the Secretariat signs an agreement with the HEI → the HEI joins IIOE.

In the process of the IIOE development and implementation, if any HEI intends to **withdraw** from IIOE, the following procedures shall be executed:

The HEI submits an application to the Secretariat → the Secretariat examines the application materials → the HEI withdraws from IIOE.

The organisational structure of IIOE is presented in **Figure 2**.



**Figure 2: Organisational Structure of IIOE**

## 2.6 Expected Outcomes of IIOE

IIOE focuses on improving **ICT capacities of partner HEIs and their teachers** in developing countries. Unlike traditional open and distance learning (ODL), massive open online courses (MOOCs) and other online learning modes that focus on the provision of online courses, IIOE will support partner HEIs to establish a conducive ecosystem and multi-party collaboration mechanism for the implementation of quality online and blended teaching & learning in partner HEIs. Such an ecosystem and collaboration mechanism will support teacher professional development, institutional capacity building for management and governance, and infrastructure and hardware investment and maintenance.

IIOE recognises the cultural diversity of different countries and HEIs, and hence, the implementation format of IIOE may differ among partner HEIs based on the local context.

The expected outcomes of IIOE are:

- 1) online learning platform;
- 2) quality online courses;
- 3) an advisory body for the quality enhancement of higher education; and
- 4) network for resource sharing, mutual exchanges and cross-cultural communications.



### 2.6.1 Online Learning Platform

IIOE has its own online learning platform. Apart from providing quality online courses, IIOE online learning platform is also a repository of web-based tools, a platform for information sharing and a laboratory for data analysis.

The IIOE platform features a set of assessment tools developed by an expert team. Besides, IIOE will also select a number of quality web-based tools utilised and developed by other HEIs. The tools are categorised according to UNESCO policy-making tools, IIOE assessment tools, and course productivity tools. In addition, the platform will also provide online tutorials and/or instructions on how to use these web-based tools as needed.

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. All members have their own accounts and management system on the IIOE platform for sharing information, accessing web-based tool and evaluating teachers' capacity on teaching and learning, etc.

IIOE online learning platform is equipped with the function of data collection and analysis. It will provide partner HEIs with data analysis of their teaching and learning, and could support them to upload the data of offline teaching and learning activities. The platform then supports partner HEIs to conduct the evaluation and research of online and blended learning that will ensure evidence-based practices and policies.

IIOE pays much attention to data security, hence, relevant clauses about copyright of online courses and personal privacy are an integral part of IIOE operations. Multiple versions of the IIOE platform (e.g. PC-based webpage version, mobile Android version, iOS version, HTML 5 version, etc.) will be developed in phases.

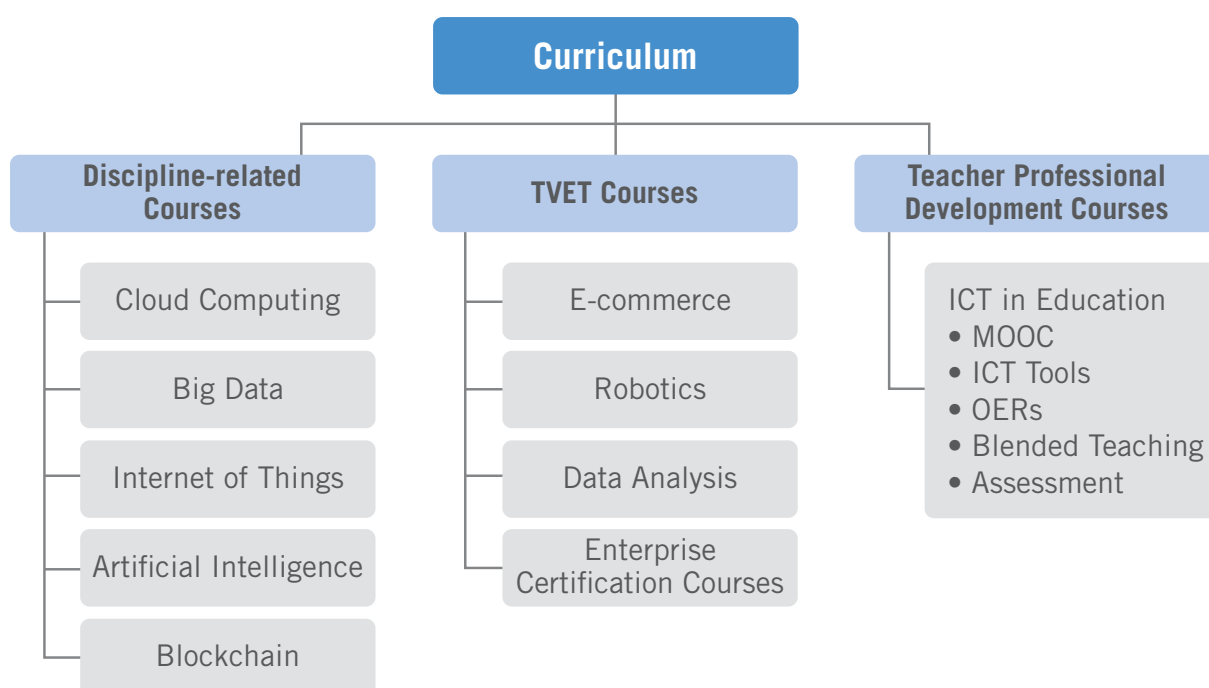
### 2.6.2 Quality Online Courses

IIOE will coordinate the efforts of HEIs and ICT enterprises to offer diverse course resources. These courses aim to:

- (1) enhance ICT competencies of teachers from partner HEIs, improve their capacity of conducting modernised online teaching;
- (2) meet the demand of its partner HEIs for quality course resources. IIOE online courses could support partner HEIs to upgrade their existing courses as part of their quality enhancement efforts to improve the quality and accessibility of existing courses, and at the same time support them to develop new courses that they would not otherwise have the capacity to.

The IIOE courses are designed based on the actual demands of HEIs in developing countries. The courses focus on ICT related areas and are categorised into three types: discipline-related, technical and vocational education and training (TVET)-related and teacher professional development courses, as indicated in **Figure 3**. These courses focus on developing teachers' ICT competencies for teaching and learning.





**Figure 3: The Curriculum for the Implementation of IIOE**

The courses and resources are managed by IIOE through the quality-assured mechanism of joint contributed and shared course resources. IIOE will continually expand the network of collaborative partners and attract more developers/providers of quality courses to expand the repository of courses that will better meet the demand of partner HEIs. IIOE has designed phases and ways listed in **Appendix 1** for course integration, sharing, development and protection to shape an ecosystem of joint contribution and shared benefits among partner HEIs and to ensure the sustainability and applicability of course resources.

The courses on IIOE online learning platform are developed/provided by top HEIs and leading enterprises that specialise in ICT competency development. The quality of these courses has to be assured by the developers/providers and the format has to be compatible as required by the IIOE online learning platform. IIOE respects the intellectual property rights. IIOE will keep original course materials and show the name(s) and affiliation(s) of course developers/providers. At the same time, IIOE also will protect the intellectual property rights of the courses on the platform through technical methods. The course developers/providers, including HEIs, enterprises, teachers and other contributors, should ensure the courses provided have no copyright dispute and problems. The partner HEIs can only learn and utilise the courses on the platform. Any secondary editing and commercial use of the courses are prohibited.

The courses on the platform are free of charge when sharing on the IIOE platform. Certification courses provided by enterprises are also free of charge to learners on the platform. Some partner HEIs' needs may go beyond the IIOE Secretariat's capacity, while other partners on the platform might be able to help. In this case, the IIOE Secretariat can help connecting both parties for further communication and negotiation. However, the IIOE Secretariat will neither engage in nor intervene these communication and negotiation.

### 2.6.3 An Advisory Body for Quality Enhancement of Higher Education

A set of the quality assurance (QA) framework and the implementation mechanisms are pivotal to assure the quality of IIOE programmes/courses and their implementation in partner HEIs.

The IIOE QA framework aims to provide a comprehensive guide and support for partner HEIs to create the necessary and sufficient conditions for the implementation of the IIOE courses. The framework may also be used to assess the readiness of partner HEIs to implement these online courses. It could be used as a self-assessment tool for partner HEIs to build their institutional capacity for quality online teaching and learning. The IIOE QA framework supports the partner HEIs' needs for quality assurance and enhancement to comply with the national regulatory agencies, accrediting commissions, and institutional QA mechanisms that have already been in place at some partner HEIs. The national/institutional buy-in and the adoption of the IIOE QA framework and mechanism are critical to the success of the IIOE initiative. The IIOE QA framework serves as an advisory framework alongside the national and/or institutional QA frameworks of partner HEIs for the implementation of IIOE online courses.

### 2.6.4 Network for Resource Sharing, Mutual Exchanges and Cross-Cultural Communications

As the secretariat of a consortium of key higher education partners (including leading HEIs, partner HEIs, partner enterprises, etc.), IIOE will build a network for resource sharing, mutual exchanges and cross-cultural communications. IIOE coordinates and facilitates international/national/regional partners to support partner HEIs for the IIOE implementation. IIOE also creates opportunities such as international meetings and forums where international partners and experts could share knowledge and expertise, and partner HEIs could engage in sharing promising practices, lessons learnt and resources. Through the partnerships within this network, the delivery of quality courses at scale by partner HEIs is enhanced.

## 2.7 Five-Year Work Plan of IIOE Implementation, Short-Term and Medium/Long-Term Targets

IIOE's short-term target is to build the capacity of UNESCO-ICHEI's partner HEIs in Africa and Asia-Pacific for inclusive and quality higher education by enhancing partner HEIs' infrastructure, hardware and digital resources, and developing teachers' professional competencies for teaching and learning.

IIOE's medium/long-term target is to expand its beneficiary members from more HEIs across more regions of the globe, and to provide more comprehensive online courses that include course packages for different types of degrees.

Five-year (2020-2024) work plan of the IIOE implementation is presented in **Figure 4**:

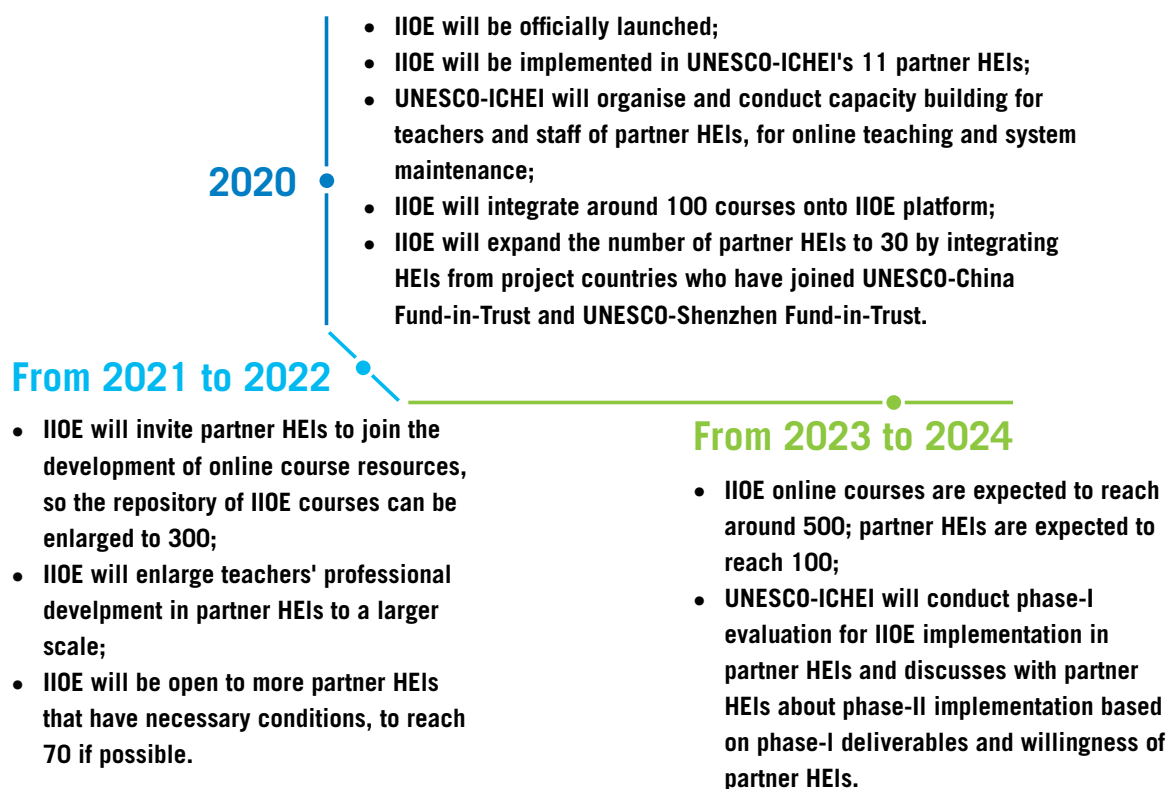


Figure 4: Five-year Work Plan of IIOE Implementation

# 3

## Responsibilities of Partner HEIs

Partner HEIs are pivotal to the success of the IIOE initiative. They will be responsible for localising the implementation of IIOE online courses. This section explains the responsibilities of partner HEIs in developing countries below.

- 1) Being equipped with basic infrastructures (software and hardware) for the implementation of IIOE;
- 2) Being equipped with an institutional mechanism for Quality Assurance;
- 3) Conducting institution-based teacher's professional development in collaboration with IIOE;
- 4) Developing online courses and resource sharing;
- 5) Appointing an IIOE coordinator within each partner HEI;
- 6) Providing opportunities for more women and girls to benefit from IIOE in local context

### 3.1 Being Equipped with Basic Infrastructures (Software and Hardware) for the Implementation of IIOE

Partner HEIs must be equipped with basic hardware, software and network broadband. The suggested basic requirements are:

- 1) Basic network broadband with speed of at least 10MB/s (Mega Bytes per second);
- 2) Basic computer configuration installed with an operating system Window 7 or above, CPU Intel i3 3<sup>rd</sup> Generation or above, memory 4 GB (Giga Bytes) or above, hard disk 100 GB or above and internet browsers (IE, Chrome or Firefox), etc.

### 3.2 Being Equipped with an Institutional Mechanism for Quality Assurance

IIOE endeavours to support partner HEIs to enhance their capacity for higher education quality assurance and enhancement. The IIOE QA framework has been developed to guide partner HEIs to implement quality online and blended learning courses since some partner HEIs may not have a robust QA framework and/or mechanism. The IIOE QA framework is an advisory framework for supporting partner HEIs to ensure the quality of teaching and

learning during IIOE implementation. At the same time, partner HEIs must have a national or institutional QA framework and/or mechanism for teaching and learning in place. The IIOE QA framework, together with partner HEIs' national or institutional QA mechanism already in place, ensures more effective IIOE implementation.

### **3.3 Conducting Institution-based Teacher's Professional Development in Collaboration with IIOE**

It is expected that teachers of partner HEIs have certain capacity for IIOE implementation in the local context and successful implementation of IIOE will continuously promote teachers' ICT competencies. IIOE will provide teachers of partner HEIs with professional development. To benefit a broader spectrum of local teachers, trained teachers will be required to serve as trainers or key teachers for their affiliated HEIs to conduct professional development.

### **3.4 Developing Online Courses and Resource Sharing**

IIOE encourages joint contribution and shared benefits of resources among all partner HEIs. Partner HEIs are encouraged to develop their own quality online courses and share them with other partner HEIs. It is recommended that each partner HEI develops at least one online course from the second year of joining the IIOE initiative. By means of joint contribution and shared benefits of online courses, a professional learning community of competent teachers with the ICT competencies will be developed and the repository of quality online courses will be enlarged.

### **3.5 Appointing an IIOE Coordinator within Each Partner HEI**

An internal IIOE coordinator for each partner HEI should be appointed in order to facilitate the delivery of the IIOE courses by the partner HEIs. The IIOE coordinator of partner HEIs should be able to coordinate across faculties and units (such as registrar, technical support and quality assurance).

The IIOE coordinator within partner HEIs will undertake the following tasks: to participate in the professional development that IIOE organises; to organise professional development for teachers in their own HEIs; to coordinate inter-faculty and inter-unit communication and collaboration within the HEI; to conduct QA guided by the IIOE framework in collaboration with the IIOE secretariat; to write and submit the IIOE implementation report periodically, etc.

### **3.6 Providing Opportunities for More Women and Girls to Benefit from IIOE in Local Context**

The design of IIOE is inclusive. In addition to catering to the needs of marginalised communities, IIOE provides opportunities for more women and girls to have access to quality higher education. These opportunities enabled by ICT such as the IIOE online learning platform could enhance the access of women and girls to quality higher education. Partner HEIs will prioritise women's rights in the local implementation of IIOE, including providing women and girls with more opportunities for learning and professional development.

## 4

## Support from IIOE

In order to optimise the mobilisation of international resources, IIOE adopts a multi-party collaboration mechanism that includes UNESCO-ICHEI, UNESCO-ICHEI's partner HEIs, top HEIs, partner enterprises, and international/national/regional organisations. All partners play a significant role in the initiative to ensure the sustainability and scalability of the IIOE implementation.

UNESCO-ICHEI is responsible for the overall governance of IIOE that includes management of online learning platform, courses, and resources, coordination among partners, evaluation of IIOE, upgrade and improvement of IIOE, organisation of sharing and communication, and enhancement of partnership.

Apart from the above responsibilities of UNESCO-ICHEI, IIOE will provide partner HEIs with support as explained and elaborated from section 4.1 to 4.7. These support components aim to build a sustainable environment for quality online and blended learning.

- 1) Management of the IIOE online learning platform;
- 2) Provision of quality and cutting-edge online courses;
- 3) Support of the IIOE overall operations;
- 4) Capacity building of partner HEIs;
- 5) Provision of technical support;
- 6) Organisation of the IIOE international partner meetings;
- 7) Production of the IIOE global report.

### 4.1 Management of the IIOE Online Learning Platform

The IIOE online learning platform, which is sponsored by Tencent Charity Foundation, is open to partner HEIs. UNESCO-ICHEI will be responsible for and bear the cost of the management and maintenance of the IIOE platform. UNESCO-ICHEI will provide the server and will be responsible for the cost of deploying this server.

## 4.2 Provision of Quality and Cutting-Edge Online Courses

Based on local situation of partner HEIs in Africa and Asia-Pacific, IIOE designs its own curriculum which focuses on “discipline-related, TVET-related and teachers’ professional development on ICT in education” for developing ICT competencies of teachers. Modelling the principle of “teaching someone how to fish is more effective than simply giving someone a fish”, IIOE would pay much attention to elevate partner HEI’s capacity of self-development and provide professional development opportunities for their teachers.

Based on the above concerns, the curriculum embodies the following characteristics:

- 1) Focusing on cutting-edge ICT-related disciplines to meet the demands of outstanding high-tech talents in developing countries in the digital era, and to close the gap between developed and developing countries;
- 2) Adding TVET-related courses to meet the demands of practical talents in the process of industrialization and modernization of developing countries;
- 3) Introducing enterprise certification courses to bridge partner HEIs and job market to create more employment opportunities for learners;
- 4) Designing teacher professional development courses to empower future and self-development of the teachers and the HEIs they serve;
- 5) In the medium- to long-term, building an ecosystem of joint contribution and shared benefits systematically integrates course resources tailored to partner HEIs’ needs into their curriculum.

At the same time, IIOE will develop an assessment system to assess teachers’ capacity on ICT in education. The assessment system includes two components assessing comprehensive capacity and professional capacity on ICT in education. An assessment report can be automatically generated after assessment.

## 4.3 Support of the IIOE Overall Operations

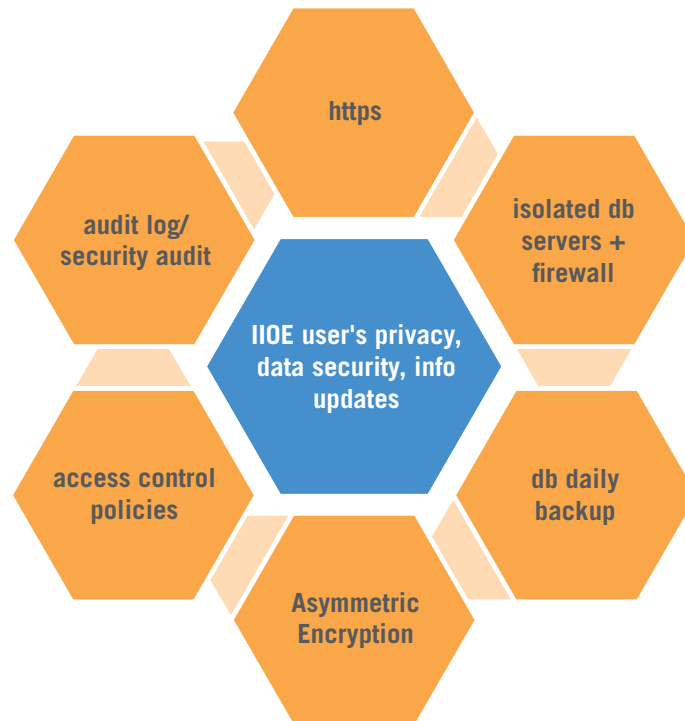
As UNESCO-ICHEI is responsible for overall operation and management of IIOE, several working groups will be set up to take charge of different aspects of the IIOE platform management. These working groups will be responsible for management and maintenance of the IIOE platform, procurement and integration of courses, organisation of relevant professional development, facilitation of the IIOE implementation, supervision and evaluation of the IIOE implementation, and upgrade and improvement of the IIOE platform.

## 4.4 Capacity Building of Partner HEIs

The capacity of teachers from partner HEIs are a key influencing factor for the IIOE implementation as partner HEIs take in charge of local implementation. IIOE will organise systematic and thematic trainings for HEIs teachers and staff to improve their capacity of ICT in education. The teacher professional development, which combines on-site and online training, will cover the IIOE platform management and utilisation, ICT competencies for online

teaching, discipline-related and TVET-related online courses content and application, etc. The training participants will include teachers, technical staff, administrators and policy makers.

## 4.5 Provision of Technical Support



**Figure 5: IIOE Technical Support**

In view of possible network limitation of developing countries, the IIOE platform will be deployed on a cloud server and be equipped with basic server(s) along with content delivery network (CDN) service, in order to ensure partner HEIs have the access to the resources. Through CDN, platform access speed, downloading documents 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 is equipped with the function of data storage (e.g. the time of using platform, accomplished rate of the courses, etc.) for conducting research related to online and blended learning. Personal data of members would not be accessed and used. Technically, IIOE will take the following measures to ensure members' information security and protect its privacy.

- 1) Hypertext Transfer Protocol Secure (HTTPS) will be adopted to ensure the data integrity and confidentiality through secure communication.
- 2) The local databases of both UNESCO-ICHEI and partner HEIs are deployed on the servers. They are isolated from extranet, and only allow intranet access. The firewall will be set up to assign specific Internet Protocol (IP) addresses for assessing the servers.
- 3) A daily backup of the IIOE database will be performed.



- 4) The IIOE platform will use Asymmetric Encryption Algorithms as data encryption.
- 5) The internal protection mechanism of the databases, including unauthorised data viewing, false data modification and data unavailability, is enforced.

Besides, UNESCO-ICHEI will sign an agreement with the developer/provider of cloud server to ensure the security of members' personal information.

## 4.6 Organisation of IIOE International Partner Meetings

IIOE's operation is a long-term collaborative and improving process. It is desirable for the IIOE partners to meet regularly to share experiences, lessons learnt and also challenges encountered. UNESCO-ICHEI will hold international meetings for IIOE partners on a regular annual basis. The organisation of the IIOE international partner meetings aims to keep all partners updated with important issues facing the IIOE implementation and to discuss the latest development and trends in higher education. By means of such meetings, IIOE will develop a feedback loop that enhances the IIOE implementation in all partner HEIs.

## 4.7 Production of IIOE Global Report

IIOE is an innovative initiative of education supply and collaboration mechanism, which is based on UNESCO-ICHEI's work on education development projects over the years. IIOE is the outcome of the application of ICT innovations in higher education, and it is also the bridge to address the ICT competencies gap between partner HEIs and their economies. The IIOE implementation in partner HEIs will generate rich cases and data for higher education research and scholarship to develop evidence-based practices and policies. UNESCO-ICHEI will work with international and regional partners to produce IIOE global reports to share IIOE's experiences of education innovations worldwide; such promising practices and lessons learnt that will inform and support more HEIs in developing countries to draw upon the potential of ICT for higher education development and reforms.



## 5

# Support of IIOE Partner Enterprises and UNESCO

Partner enterprises provide vital support for the design and implementation of IIOE. IIOE establishes a strong network of partner enterprises to provide relevant support for online courses, infrastructure development, technical support, and software and hardware deployment.

As a UNESCO Category 2 centre in higher education, UNESCO-ICHEI has closely worked with UNESCO headquarter, Category 1 institutes and regional offices. UNESCO is the leading UN agency in education and has great achievements in setting standards or regulations in higher education qualification, quality assurance, and teachers' ICT competency development, etc. The design and implementation of IIOE are carried out with close communication and discussions with UNESCO, and fully respect UNESCO's global priority for Africa and gender equality. The design and implementation of IIOE in partner HEIs will enjoy strong support from the UNESCO system in facilitating the IIOE implementation such as mobilisation of more online course developers/providers, the solution of languages (most online courses are in English), facilitation in the IIOE QA Framework implementation and evaluation, and production of the IIOE global report.

## 6

## IIOE Strategies and Actions: From Situation Analysis to Implementation

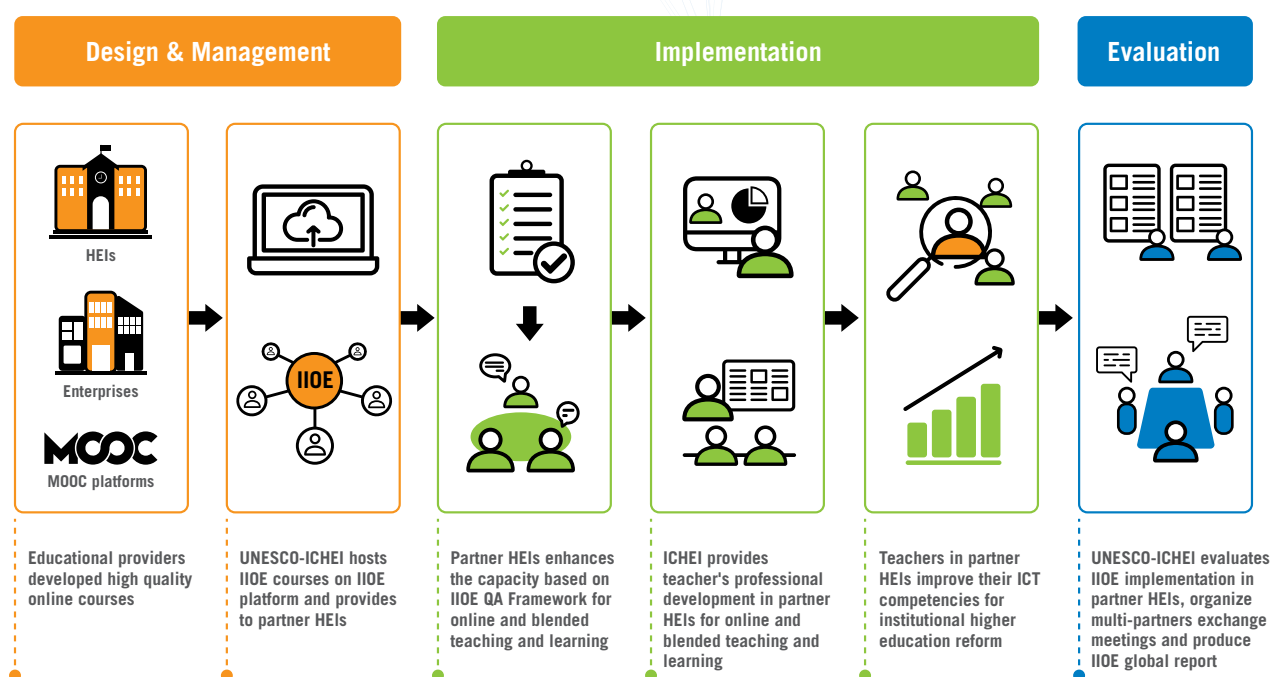


Figure 6: IIOE Rationale

### 6.1 Situation Analysis

Based on UNESCO-ICHEI's experiences in helping partner HEIs in Africa and Asia-Pacific to improve higher education development, most HEIs expressed the need of professional development for teachers to conduct innovative teaching, improvement of university infrastructure, quality courses especially STEM courses and scholarship programs, etc.

By tapping the potentials of ICT, UNESCO-ICHEI has been working with its partners to help solve the urgent needs in its partner HEIs in Africa and Asia-Pacific. UNESCO-ICHEI has established an active and extensive network including enterprises, leading HEIs and international organisations, and conducted many long-term projects to its partner HEIs, such as ICT-related capacity building workshops for its partner HEIs' teachers and staff, establishment of smart classrooms, provision of scholarships, exchange of faculty. These engagements have

enhanced the capacities of UNESCO-ICHEI's partner HEIs, the capacity of their teachers and staff, as well as the teaching and learning infrastructure and facilities.

The IIOE initiative was planned under this context, and the idea of IIOE was based on the situation analysis of higher education demands from its partner HEIs. UNESCO-ICHEI has also conducted several formal and informal meetings on the IIOE initiative with international experts from universities, international organisations, and has intensively discussed the design of IIOE.

## 6.2 Design and Development

The design of IIOE is guided by IIOE's functions and roles. Apart from the realisation of IIOE's functions, the key to the success of IIOE is the quality of courses and their implementation. Therefore, UNESCO-ICHEI worked together with international experts on online education to design the QA system of IIOE.

The design of the IIOE QA framework is based on the need to guarantee quality implementation of the IIOE programmes/courses in partner HEIs. The IIOE QA framework aims to provide a comprehensive guidance to help partner HEIs to create conditions to implement IIOE programmes/courses and it could also be used as a tool to assess if a HEI is qualified or ready to implement IIOE. The main function of the IIOE QA framework is not to examine or judge a HEI's capacity to conduct IIOE, but to provide partner HEIs an opportunity and guidance to improve their institutional capacity to implement IIOE. The essence of the IIOE QA framework is not only about setting a standard, but also facilitating HEIs to create qualified conditions/environment for quality online teaching and learning.

The development of the IIOE QA framework draws upon international and regional QA frameworks. The promising practices and lessons learnt from these frameworks are adapted and contextualised for IIOE and HEIs in developing countries, and conflict and crisis areas. The IIOE QA framework is developed by a team of higher education and online education experts, and education specialists working on projects in Africa and Asia-Pacific.

Based on a comprehensive literature search, the international, regional, and national QA frameworks identified and analysed could be categorised into four types based on the following purposes: (1) accreditation; (2) benchmarking; (3) certification; and (4) advisory framework<sup>11</sup>. The frameworks that are examined include the *Quality Assurance Toolkit for Distance Higher Education Institutions and Programmes* by Commonwealth of Learning (COL), *AVU QA Framework for Open, Distance and eLearning Programmes* by African Virtual University (AVU), *Quality Criteria for Distance Education: Quality Criteria and Case Studies from South Africa* by National Association of Distance Education Organisations of South Africa (NADEOSA), and *Quality Assessment for E-learning: a Benchmarking Approach* by European Association of Distance Teaching Universities (EADTU), the quality assurance framework from Asian Association of Open Universities (AAOU), etc. **Table 1** shows the mapping of these QA frameworks based on the four categories.

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11 Ossiannilsson, E., Williams, K., Camilleri, A. F., & Brown, M. (2015). *Quality models in online and open education around the globe. State of the art and recommendations*. Oslo: International Council for Open and Distance Education (ICDE).

	Accreditation	Benchmarking	Certification	Advisory Framework
International				COL
Regional	CAL-ED (Latin-America) <sup>12</sup>	ACODE(Australasia) <sup>13</sup> ; EADTU(Europe)	<i>E-xcellence</i> by EADTU (Europe)	ACDE (Africa) <sup>14</sup> ; AVU (Africa) AAOU(Asia) <sup>15</sup>
National	CHEA (U.S) <sup>16</sup> ; QAA (U.K) <sup>17</sup> ; UAE (UAE) <sup>18</sup>			NADEOSA (South Africa)

Table 1: Mapping of QA Frameworks

From the examination of the above mentioned international, regional and national QA frameworks related to online education, the IIOE QA framework covers three areas: **Management**, **Products** and **Services**, with six components identified from referred QA frameworks (Table 2) to quality assure the development and implementation of online and blended courses of IIOE in partner HEIs.

The general principle of each component is discussed and then expanded into a number of criteria that could be regarded as good practices. The criteria of each component are detailed in **Appendix 2**.

3 General Areas		Six Components
1	<b>Management</b>	Institutional policies and mission
2		Learning infrastructure and resources
3	<b>Product</b>	Development and implementation of online and blended programme/course
4	<b>Services</b>	Learner assessment and evaluation
5		Learner learning support and progression
6		Professional development and support for teachers and staff

Table 2: Six Components under Three Areas of IIOE QA Framework

.....  
12 Latin American and Caribbean Institute for Quality in Distance Education (CAL-ED)

13 Australasian Council on Open, Distance and E-Learning (ACODE)

14 African Council for Distance Education Quality Assurance and Accreditation Agency (ACDE)

15 Asian Association of Open Universities (AAOU)

16 the Council for Higher Education Accreditation (CHEA)

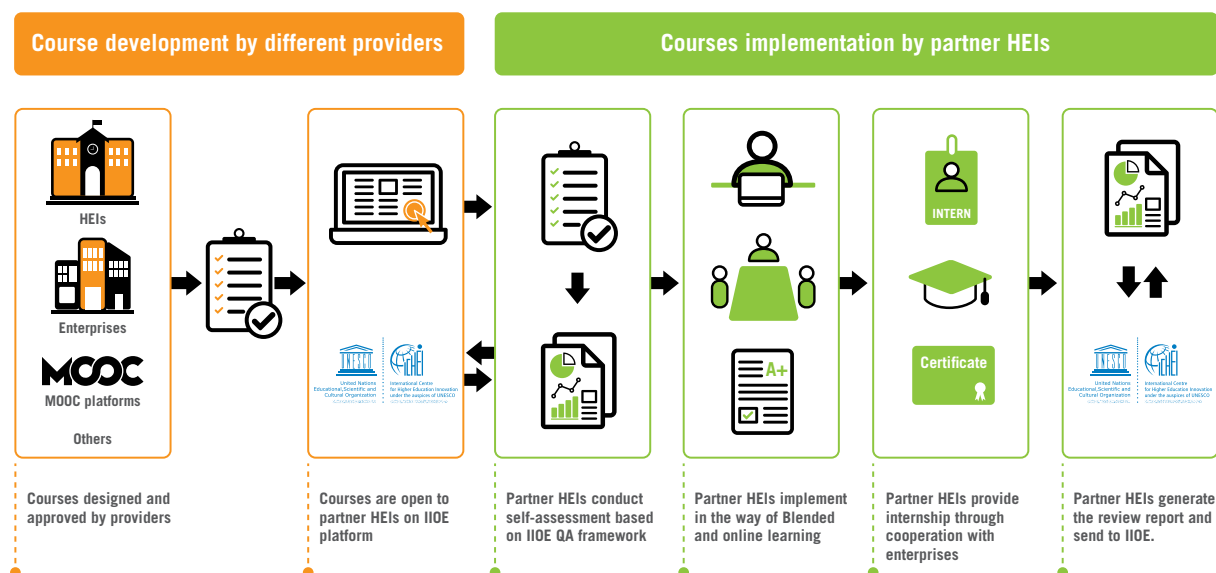
17 Quality Assurance Agency for Higher Education (QAA)

18 *e-learning Standards for Licensure and Accreditation* by Commission for Academic Accreditation, Ministry of Higher Education and Scientific Research, United Arab Emirates

## 6.3 Implementation

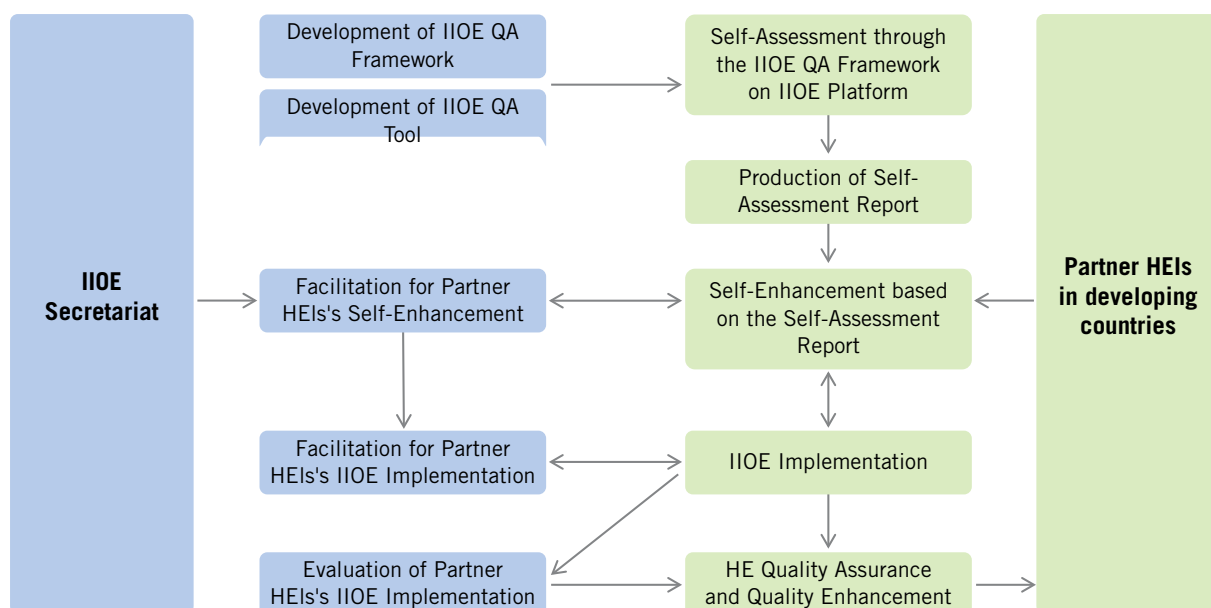
IIOE's partner HEIs shall be responsible for implementing IIOE in local contexts. Apart from the roles of partner HEIs as indicated in Section 3, it will be essential that they could implement IIOE by following the IIOE QA framework and mechanism.

The implementation flow of the IIOE QA framework is elaborated as below and visualised in **Figure 7**:



**Figure 7: The Implementation Flow of the IIOE QA Framework**

To assure the implementation of programmes/courses within the IIOE QA framework and to sustain partner HEIs' own QA system at the same time, the mechanism of the IIOE QA framework implementation is designed and presented in **Figure 8**:



**Figure 8: Mechanism of the IIOE QA Framework Implementation**

## 7. Monitoring and Evaluation

The IIOE initiative has been developed for HEIs in developing countries of Africa and Asia-Pacific. Monitoring and evaluation (M&E), which includes both formative and summative evaluation, is an integral part of the initiative. The main aim of the M&E is to examine how IIOE builds the capacity of partner HEIs for increasing and enhancing their learners' access to quality higher education. The specific objectives of M&E are to:

- 1) identify the strengths and limitations of the IIOE initiative design, implementation and achievements;
- 2) review the IIOE online learning platform including its usability and functions;
- 3) review the IIOE online programmes/courses and tools, and provide suggestions for improvement;
- 4) draw vital lessons learnt and promising practices from implementation among partner HEIs to build a mechanism for mutual sharing and learning;
- 5) identify the key success factors of the IIOE initiative for each phase of implementation;
- 6) recommend initiative enhancements and relevant follow-up activities; and,
- 7) document the impact of the IIOE initiative and forecast the potential impact on the capacity of partner HEIs and their teachers, and learner learning engagement and outcomes.

The M&E will be conducted at two interdependent levels: **the partner HEI level and the IIOE Initiative level**. At the HEI level, the M&E include the self-assessment of the institution based on the IIOE QA framework, and the annual progress report auto-generated by the IIOE platform. At the IIOE initiative level, three Global Reports will be produced over five years, of which the 2020 report will be introductory about the setting up of IIOE, the 2022 report will include a mid-term formative evaluations, and the 2024 one will include a summative evaluation. The key findings from the M&E will guide IIOE stakeholders to reflect upon and enhance the IIOE initiative during each phase and the implementation across phases.

A **results framework** is developed based on three aspects: the expected deliverables of IIOE aligned to the mission and aims of IIOE (see section 2.1), the HEI-level M&E plan and the initiative-level M&E plan. The results framework with indicator setting and M&E plans could be further improved during the IIOE implementation, and they could be localised based on the local contexts of partner HEIs.

Aligning to the expected deliverables of IIOE, the results framework is developed with six categories of indicators that include six outcome indicators (key performance indicators, KPI) and fifteen output indicators. Most of these indicators could be automatically generated by the IIOE online platform. For details of the results framework please refer to **Appendix 3**. If a partner HEI wants to report other indicators more relevant to its own context, they could contact the IIOE Secretariat to explore whether their preferred indicators could be automatically generated by the platform. It is to be noted that, only when the outcome/output indicators and their targets are measurable and clear, could the deliverables of the IIOE initiative and how they have or have not been achieved be evaluated.

The HEI-level M&E will include periodical (annually) HEIs' self-assessment, assessment of ICT competencies for teachers, and the **Annual Progress Report** which will be a major output of the HEI-level M&E. It can be auto generated on the IIOE platform with limited engagement by the IIOE Coordinators of partner HEIs. More specifically, the Annual Progress Report of HEI presents progress regarding the 23 indicators under six expected deliverables of IIOE listed in the results framework.

**The IIOE Global Report** is the major product of the initiative-level M&E. The Global Report will be produced by IIOE secretariat, IIOE partner HEIs and international higher education experts, and be released every two years.





## 8

# **IIOE as a Springboard towards Education 2030 in Higher Education and SDG4**

IIOE is a collaborative effort led by UNESCO-ICHEI, its partner HEIs in developing countries of Africa and Asia-Pacific, enterprises and HEIs in China. This initiative is guided by the Belt and Road Initiative which upholds the Silk Road Spirit - “peace and cooperation, openness and inclusiveness, mutual learning and mutual benefit”, to promote and build up collaborative development mechanism among countries by means of talent cultivation and exchange.

IIOE will support developing countries to solve their problem of resource shortage and lack of quality assurance in higher education; it will support partner HEIs in developing countries to cultivate more ICT-related talents to contribute to the national economic development, so as to narrow the gap between developing countries and developed countries; it will support developing countries to realise higher education reform in a digital era, and accelerate national economic reforms.

IIOE is an effort guided by the Belt and Road Initiative of China that aims to promote mutual learning among different countries, and promote world peace and development. At the same time, IIOE provides specific strategies for realising UN SDG 4, and help partner HEIs in developing countries to realise the targets of Education 2030, enhance international collaboration in higher education, promote knowledge exchange, and provide quality and inclusive access to lifelong learning.

## Appendix 1: Phases and Ways for Course Integration, Sharing, Development and Protection

### 1. Integrating Courses by Phases

Based on the curriculum, IIOE plans to integrate the courses by phases. IIOE will integrate a large number of basic online course resources in the first phase, serving for teacher professional development. In the medium- to long-term, the goal of IIOE course integration is to shape an ecosystem of joint contribution and shared benefits among partner HEIs, to ensure the sustainability and applicability of course resources.

#### ► Phase I: Basic online course resources

In the early stages of the project, IIOE will integrate a number of basic online course resources by series and major from partner HEIs and enterprises globally to serve for teacher professional development. The course resources will include but not limited to the following majors: Cloud Computing Technology and Application, Data Science and Big Data Technology, Internet of Things Engineering, Intelligent Science and Technology. The courses are mainly in English, with some in French. There will also be a small number of courses delivered in Chinese and translated into English by iFLYTEK simultaneously.

#### ► Phase II: Jointly contributed and shared courses

IIOE will make full use of the basic online course resources to carry out professional development training for teachers, to help partner HEIs' teachers develop their own online courses. It is recommended that each partner HEI develops at least one online course from the second year of joining the IIOE initiative. The courses will be free of charge and will be sharing with other partner HEIs on the platform.

#### ► Phase III: More support and service for using the courses

As the number of partner HEIs grows, more high-quality and localised online courses will be integrated to the platform. IIOE plans to provide more support and service to maximise the usage of these courses, including the provision of on-demand courses to partner HEIs and the application of these courses for teaching and the set-up of new academic programmes.

### 2. Sharing Course Resources

Partner HEIs are encouraged to share their online courses on the platform, that draws on the Silk Road Spirit of “peace and cooperation, openness and inclusiveness, mutual learning and mutual benefit” and build bridge of academic exchanges and international collaboration among HEIs. However, the courses shared to the platform should satisfy two conditions: a) The courses should be approved by the partner HEI and meet the related criteria of online courses. b) The courses are free of charge to share with other partner HEIs on the platform.

The courses on the platform are free of charge when sharing on the IIOE platform. Certification courses provided by enterprises are also free of charge to learners on the platform. Some partner HEIs' needs may go beyond the IIOE Secretariat's capacity, while other partners

on the platform might be able to help. In this case, the IIOE Secretariat can help connecting both parties for further communication and negotiation. However, the IIOE Secretariat will neither engage in nor intervene these communication and negotiation.

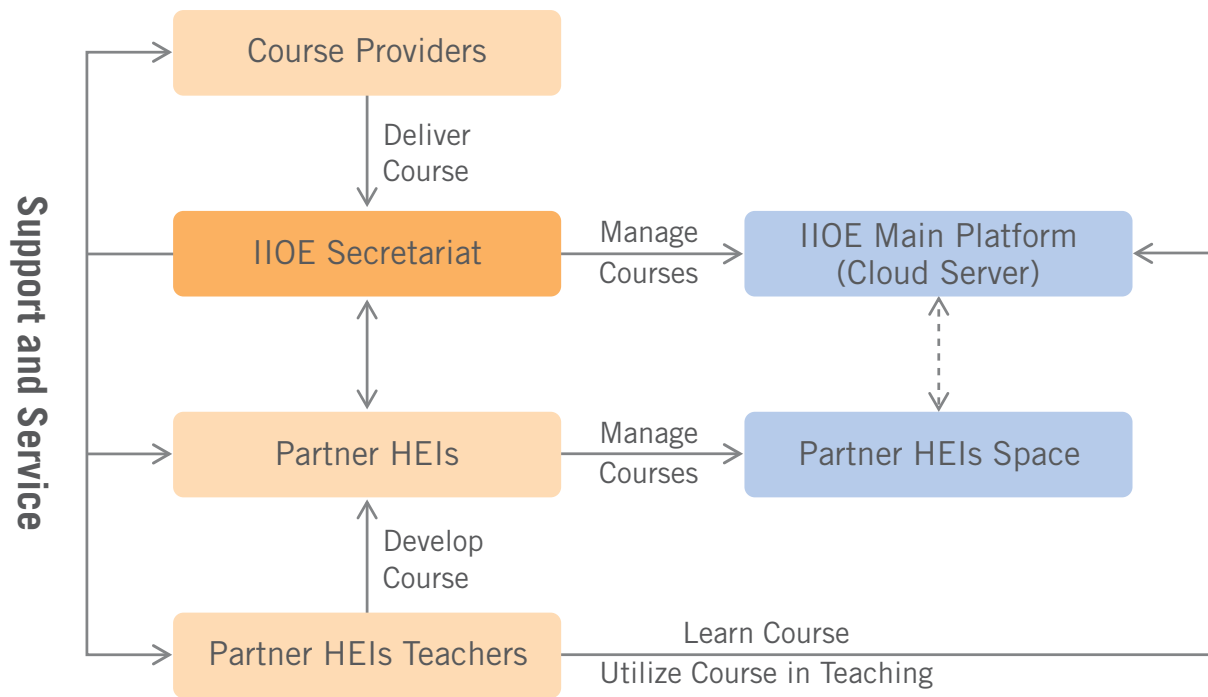
### 3. Protecting Intellectual Property Rights of Courses

IIOE respects the intellectual property rights. IIOE will keep original course materials and show the name(s) and affiliation(s) of course developers/providers on the platform. At the same time, IIOE also will protect the intellectual property rights of the courses on the platform through technical methods. The course developers/providers, including HEIs, enterprises, teachers and other contributors, should ensure the courses provided have no copyright dispute and problems. The partner HEIs can only learn and use the courses on the platform. Any secondary editing and commercial use of the courses are prohibited.

### 4. Maximising the Usage of Course Resource

UNESCO-ICHEI as the IIOE Secretariat is responsible for setting up, managing and maintaining the IIOE platform, which gathers course resources from course providers. All courses can be accessed to 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 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 his or her 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 newly developed course on the IIOE platform, teachers need to get approval from their institutions.



**Figure 9: The Process of Course Implementation**

## 5. Providing Course Support and Service

In order to make use of the course resources more effectively and efficiently, more support and service will be provided for teachers' application and localisation of course resources in teaching and course development. These support and service are summarised as below:

- Providing professional development opportunities, organising training of trainers for key teachers and supervisors;
- Providing tools and resources for course utilisation and development;
- Organising teams of experts to address problems teachers encountered during course learning, utilisation and development;
- Providing quality assurance (QA) suggestions to promote online and blended learning, and guiding partner HEIs on the development and implementation of quality online courses.

Based on the above support and service, the IIOE Secretariat designs the following support and service mechanism.

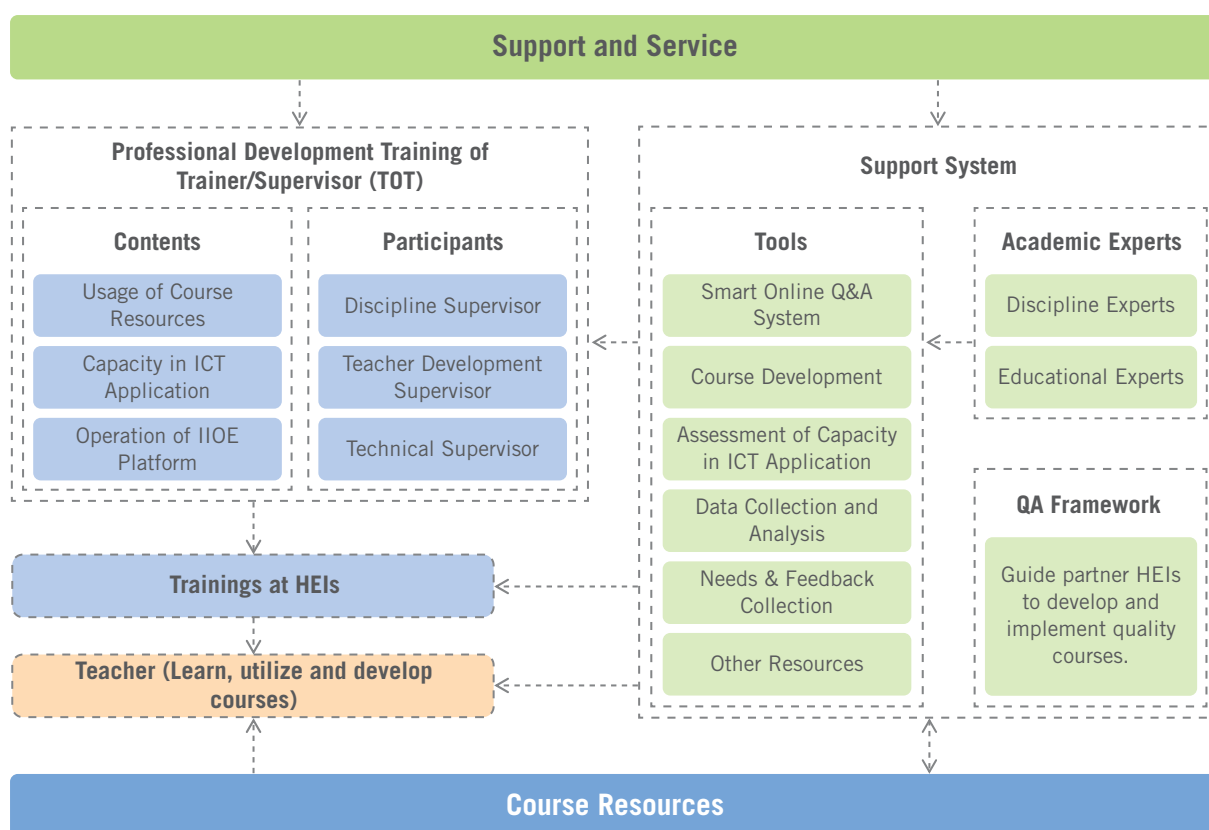


Figure 10: Mechanism of Course Support and Service

## 6. Providing Training, Experts and Tools to Support Teacher Professional Development

Based on the Mechanism of Course Support and Service, the IIOE Secretariat will provide the following support for teacher professional development: a) Building capacity for key teachers; b) Providing tools and resources for promoting teachers' capacity on ICT in education; c) Organising a team of experts to support teacher professional development; and d) Providing QA guidelines for online courses.

### 6.1 Building Capacity for Key Teachers

IIOE will make full use of online course resources on the platform to provide on-site and online professional development for key teachers from partner HEIs to improve their ICT competencies. It consists of three components:

- **How to use the IIOE platform for teaching and learning**, including the operation of the platform, access and usage of resources, QA framework, data collection and analysis, and how to use the platform for teaching;
- **How to use ICT to enhance teaching and learning**, including the development of online courses, how to carry out online and blended teaching, and how to use modern methods and ICT tools in teaching;

- **How to use the online course resources for teaching**, including core courses under the programmes of Cloud Computing Technology and Application, Data Science and Big Data Technology, Internet of Things Engineering, Intelligent Science and Technology, etc.

### *6.1.1 Target Participants*

The professional development training activities of the IIOE Secretariat follow the model “training of trainers (TOT)” to ensure the sustainability and scalability of the project. IIOE Secretariat is responsible to organise trainings for key teachers. After the training, key teachers are expected to organise training for other teachers within their affiliations with the assistance from the IIOE Secretariat if necessary. Qualified training participants (key teachers) will be selected by partner HEIs, with the selection criteria proposed by the IIOE Secretariat. Initially, it is suggested that each partner HEI has six quotas for training. There are three types of participants: a) **technical personnel** who oversee the operations, training and maintenance; b) **professional development personnel** who are responsible for teachers’ capacity building; c) **discipline-related personnel** who are in charge of development of disciplines and/or courses.

### *6.1.2 Training Mode*

Training can be conducted in two modes, i.e. **online and on-site**. Online trainings focus on the usage of IIOE platform; while on-site trainings focus on how to use ICT to enhance teaching and learning and how to use the online course resources for teachers’ own courses. The training will last for 2 to 3 weeks.

## **6.2 Providing Tools and Resources for Promoting Teachers’ Capacity on ICT in Education**

IIOE will offer a series of tools and resources to support course usage and ICT application. These tools and resources include smart online question and answering (Q&A) system for interactive teaching and learning, online course development, assessment of teachers’ capacity on ICT in education for learning evaluation, data collection and analysis for learning monitoring, as well as needs and feedback collection for facilitating quality assurance and enhancement of online course resources.

### *6.2.1 Smart Online Q&A System*

During the initial stage of IIOE, the IIOE Secretariat will organise a team of experts to conduct timely remote Q&A for teacher, addressing academic and technical issues during course learning, utilisation and development. In the meantime, the IIOE Secretariat will collaborate with relevant experts to establish a basic database covering frequently asked questions and answers for courses. By collecting questions online, this database will be gradually refined to become an AI-based smart online Q&A system for interactive teaching and learning.

### *6.2.2 Online Course Development*

IIOE will provide tools for online course development serving the whole cycle of course development, including course design (e.g. syllabus, teaching materials, quiz, class discussion, test and homework, exams, etc.), approval, delivery and update. Teachers can build, edit, update, and utilise their own online courses on the platform. Other than aforementioned teacher trainings, guidelines for online course development will also be made available to teachers.

### *6.2.3 Tools of Assessing Teachers' Capacity on ICT in Education*

IIOE will develop an assessment system to assess teachers' capacity for ICT in education. The assessment system includes two components assessing **comprehensive capacity** and **professional capacity** for ICT in education. An assessment report can be automatically generated after completing the assessment.

- **Assessment of comprehensive capacity for ICT in education** is based on the UNESCO ICT CFT (Version 3). It assesses teachers' capacity following six dimensions of understanding ICT in education policy, curriculum and assessment, pedagogy, application of ICT competencies, organisation and administration, and teacher professional learning.
- **Assessment of professional capacity for ICT in education** is based on core knowledge and competencies required by ICT-related disciplines. The assessment can assess teachers' capacity or level in the areas of cloud computing, big data, internet of things, artificial intelligence and other ICT-related areas.

### *6.2.4 Data Collection and Analysis for the Monitoring of Learning*

IIOE will collect and analyse data on the platform to monitor the usage of course resources. There will be dashboards visualising related indicators auto generated on the IIOE platform. At the initial stage of the IIOE implementation, both quantitative and qualitative data will be collected from the platform. These data include but not limited to duration of the courses, number of courses utilised, number of courses uploaded, number of courses developed and online interaction, etc. Each year, IIOE shares the data and analyses for teaching and research only with partner HEIs who join the IIOE initiative. Personal privacy and data security will be strictly protected with relevant regulations and technical guidelines.

### *6.2.5 Needs and Feedback Collection*

IIOE platform provides partner HEIs with a channel to communicate on needs and feedback emerging during implementation, so as to build, adjust and improve implementation at partner HEIs by delivering quality course resources and teacher trainings responding to those needs and feedback. To maximise the usage of online courses on the platform, IIOE Secretariat will provide resources including software, policy guidelines and documents to support teachers on course learning, utilisation and development.

### 6.3 Organising a Team of Expert for Teacher Professional Development

IIOE will establish a repository of academic experts to (a) address academic and technical issues encountered, and (b) support teacher trainings. The repository consists of two categories of experts: one being experts in different disciplines, and the other being educational specialists. In terms of the first category, these experts will be selected based on the available disciplines on the platform, including Cloud Computing, Big Data, Internet of Things, Artificial Intelligence, Block Chain, Robotics, E-Commerce, and Certification Courses. Educational specialists in the second category should have rich experiences in the research and practice of educational technologies, educational management, as well as curriculum and instruction. There will be 1-2 experts per discipline or field under these two categories.



## Appendix 2: IIOE QA Framework

Sub-Component	Assessment area	Description of Assessment Area (under each component of IIOE QA framework)
<b>Component 1:</b> <b>Institutional policies and mission</b> <p>The accredited institution has established well-understood administrative policies and mechanisms on procedures, efficient management and administrative capacity, physical facilities and resources adequate, partnership, etc. for the proper operation of online programmes/courses and the discharge of its obligations to all its learners.</p>		
<b>1. Mission</b>	Goals and objectives for online and blended learning	The institution has clearly defined goals and objectives for online and blended learning initiative in the institution mission.
	Strategic plan	The institution has a strategic plan in place that drives and supports quality online and blended learning.
	Equity and access	The institution identifies and addresses equity and access issues when planning for online and blended learning.
<b>2. Planning</b>	Organisational structure	The institution's organisational structure enables quality online and blended learning.
	Policy for quality assurance	There is an institutional policy for quality assurance of online and blended learning.
	Policy for teachers and staff appraisal	There is a monitoring and appraisal policy and system that ensures accountability and motivation of teachers and staff in developing and implementing online and blended learning.
<b>3. Policies</b>	Policy for teacher workload	There is an institutional policy for teacher workload based on credit hours (than based on the number of contact hours that are face-to-face or online).
	Policy for ICT competencies of teacher	There is an institutional policy that requires ICT competencies among its teachers.
	Policy for inclusivity	There is an institutional policy that promotes inclusivity regardless of gender, political ideology, religion, ethnicity, and socioeconomic situation.
<b>4. Collaboration and partnership</b>	Availability of internal partnerships	There are partnerships and collaborations (e.g. within and across faculties, and between different centres and units) in place within the institution to support online and blended learning.
	Availability of external partnerships	There are partnerships and collaborations with other institutions and organisations (e.g. HEIs, educational enterprises, international organisations, etc) to support online and blended learning.

Sub-Component	Assessment area	Description of Assessment Area (under each component of IIOE QA framework)
<b>Component 2:</b> <b>Teaching and learning Infrastructure and Resources</b> The accredited institution has adequate and appropriate teaching and learning infrastructure and resources to conduct quality academic programmes/courses through online and blended learning. The institution uses technological innovations in educational transactions for enriching the learning experiences it provides to learners and manages the institution in a technology enabled way for effective institutional functioning.		
<b>5. Financial and administrative provisions</b>	Financial provisions	The institution has made financial provisions for the maintenance and operations of technology infrastructure and resources for online and blended learning.
	Administrative provision	The institution has made administrative provisions for the maintenance and operations of technology infrastructure and resources for online and blended learning.
	Budget allocation	The institution allocates budget to support quality online and blended learning.
<b>6. Infrastructure and resources provision</b>	Technical infrastructure and resources	The technical infrastructure and resources of the institution could support online and blended learning.
	Teaching and learning infrastructure and resources	Teaching and learning infrastructure and resources (online and offline) support online and blended learning.
	Accessibility of infrastructure and resources	Infrastructure and resources are accessible to all teachers and learners for online and blended learning.
<b>7. Infrastructure and resources management</b>	Guidelines and procedures for management and maintenance	The institution has clear guidelines and procedures for the management and maintenance of teaching and learning infrastructure and resources.
	Professional development on the maintenance and management of infrastructure and resources	There are professional development opportunities for technical staff improve their capacity in maintaining and managing the infrastructure and resources.
	Review of infrastructure and resources	The institution conducts regular reviews of infrastructure and resources and their usage.

Sub-Component	Assessment area	Description of Assessment Area (under each component of IIOE QA framework)
<p align="center"><b>Component 3:</b></p> <p align="center"><b>Development and Implementation of Online and Blended Programmes/courses</b></p> <p>Programmes and courses are developed and delivered to meet the needs of different types of learners, employers and society and to encourage access to quality education. The course materials clearly present the intended learning outcomes, teaching-learning activities, assessments and learner learning support. Assessment methods effectively test and measure learners' achievement of the stated learning outcomes of programmes/courses. Also, programmes/courses should address the needs of the target learners in the context of market demand and lifelong learning.</p>		
<b>8. Programmes/ course planning and development</b>	Programme/course description	For each programme/course, there are publicly accessible description that clearly indicate: 1) the admission criteria, 2) learning outcomes, 3) teaching and learning strategies, and 4) assessments.
	Programme/course learning outcomes	The programme/course learning outcomes are aligned to the institutional learning outcomes (graduate attributes), and the occupation/vocation competency standards.
	The alignment of programme/course design	The learning outcomes, teaching and learning strategies and assessment methods of the online programmes/courses are aligned and appropriate for the level and purpose of the programmes/courses.
	Consistency of course hour	When the online lessons are integrated into programmes/courses, there is no change on the numbers of contact hours/credit hours.
	Online and face-to-face learning are complementary	The online lessons are used to support and be supported by face-to-face learning activities.
	Internship opportunities	There are opportunities for internship or other ways of developing employability competencies.
	Work-based learning for practice-oriented programme/course	In the case of practice-oriented programmes/courses, work-based learning forms an integral part of the programme/course, and where appropriate, placement in a work-based environment is an essential component of the programme/course.
<b>9. Feedback</b>	Teaching and learning interactions	There are teacher-learner, and learner-learner interactions in the programmes/courses.
	Means/channels of interaction between online teaching and learning	Teachers use a range of online platforms and channels to interact with learners.
<b>10. Staffing</b>	Competent teachers	Competent teachers (disciplinary/subject/pedagogical/online and blended learning) are in place to ensure the quality implementation of programmes/courses.

Sub-Component	Assessment area	Description of Assessment Area (under each component of IIOE QA framework)
<b>11. Flexibility</b>	Recognition of previous learning experience	Previous learning experience and degree verification with other institutions offer flexibility to learners.
<b>12. Internship and Practice-based Learning Activities</b>	Availability of face-to-face practice-based learning activities	There are face-to-face practice-based learning activities to complement online and blended learning.
	Availability of infrastructure and resources for practice-based learning activities	There are infrastructure and resources available (e.g. space, facilities, staff, etc.) to practice-based learning activities.
	Availability of partnership	There are partnerships that support and facilitate the internship.
<b>13. Programme/course evaluation</b>	Monitoring and evaluation mechanisms	There is a set of mechanisms (e.g. online programme committee, online teaching and learning committee at various levels, quality assurance committee, etc.) in place to monitor and evaluate the design and implementation of programmes/courses regularly.
	Online Programme/course evaluation methods	Programme/course evaluation includes learner evaluation of teaching and learning, graduate employment survey, teaching reflection, etc.
	Professional bodies and industry stakeholders review programmes/courses	Professional bodies and different industry stakeholders are invited to review the programmes/courses.

Sub-Component	Assessment area	Description of Assessment Area (under each component of IIOE QA framework)
<p align="center"><b>Component 4:</b> <b>Learner assessment and evaluation</b></p> <p>Assessment of online programmes/courses is properly managed, and meet the requirement of institutional, national accreditation bodies and enterprises. The institution publishes its academic grading policy and applies it with fairness, consistency and transparency. Evaluation is based on the stated programme and course learning outcomes.</p>		
<b>14.Assessment design and alignment with learning outcomes</b>	Clear assessment information	There is clear assessment information (including learning outcomes, assessment tasks, assessment criteria and rubrics, assessment procedure and deadlines, etc.) provided in all programmes/courses.
	Variety of assessment forms	The assessments include formative and summative assessments, assessment of online lessons and face-to-face practice-based learning activities and internship.
<b>15.Grading</b>	Availability of grading system	The institution has an system for grading assessments.
	Application of marking guidelines	The marking guidelines are applied to all programmes/courses.
	Availability of appeal system	A system is in place for learners to appeal about their grades.
<b>16.Examination process</b>	Plagiarism measures	There is a system in place to regulate plagiarism issues in assessments;
	Arrangement for assessments	Arrangements for locally administered assessments are secured and monitored.
	Confidentiality of assessments	There is a system to ensure the confidentiality of the assessments.

Sub-Component	Assessment area	Description of Assessment Area (under each component of IIOE QA framework)
<p align="center"><b>Component 5:</b> <b>Learner learning support and progression</b></p> <p>Registered learners are supported by the provision of a range of opportunities for tutorial and interaction by local partner universities. Contact tutoring, assignment tutoring, mentoring, counselling (both online and face-to-face), and the stimulation of peer support structures to facilitate their holistic learning progression.</p>		
<b>17. Learner learning support at institutional level</b>	Availability of Mechanisms and resources for learner learning support	There are institutional mechanisms and resources (including learning support staff) to support learners throughout the duration of their online and blended learning.
	Variety of learner learning support	There are a variety of support (e.g. workshop, help desk, online enquiry, counselling and career guidance, etc.) open and accessible to learners.
<b>18. Learner learning support at programme/course level</b>	Built-in learner learning support in programmes/courses	Learner learning support is built into the programme/course development and implementation.
	Support from teachers	Teachers support learners to monitor and manage their learning progress and outcomes in the programmes/courses.

Sub-Component	Assessment area	Description of Assessment Area (under each component of IIOE QA framework)
<b>Component 6:</b> <b>Professional development and support for teachers and staff</b> Support and professional development services is attainable to teachers (academic/teaching staff), administrative and technical staff, for them to realise professional development, and sustainably contribute professionally to the development, delivery and support of online programmes/courses.		
<b>19. Support for teachers and staff</b>	Availability of technical support	Technical support (online and/or onsite) is available to teachers and staff.
	Availability of pedagogical/ instructional design support	Pedagogical/Instructional design support is available to teachers.
	Availability of administrative support	Administrative support is available to teachers and staff.
	Support for programme/ course development	Teachers are encouraged and supported (intuitional level, faculty level and/or department level) to develop and implement online and blended learning in their programmes/courses.
	Support for reflection and sharing	Teachers are encouraged and supported to reflect and share experiences on online and blended learning design and implementation.
<b>20. Professional development for teachers and staff</b>	Professional development on online and blended learning	Professional development on online and blended learning (technical and pedagogical) are provided for teachers and staff.
	Professional development on ICT competencies	Professional development on ICT competencies are provided for teachers and staff.
	Availability of Time	Teachers and staff are provided with time to engage in professional development on online and blended learning.
	Responsibility	Professional development of teachers and staff is the responsibility of the individual, faculty and/ or department.
	Appraisal	Professional development on online and blended learning is a part of teachers and staff appraisal.
	Availability of support resources	Support resources for professional development (online training resources, guideline, planning templates) are available for teachers and staff.

## Appendix 3: IIOE Results Framework

Statement	Indicator	Data Source/ Mean of Verification	Disaggregation
<b>Deliverable 1: Enhanced ICT in education capacity</b> of teachers from partner HEIs and their ability to conduct quality teaching with ICT	<b>Outcome 1: Number of participating IIOE teachers that have demonstrated improved ICT in education competencies</b> (based on the ICT competency assessment delivered by the IIOE platform) <i>Note: Participating teachers refer to those who have completed/cited at least one IIOE course or attended an IIOE professional development session. Same below.</i>	Automatically generated by platform + ICT competency assessment delivered each year after teacher registration	HEI, gender, teaching exp, disciplinary areas, qualification and job title
	Output 1.1: Number of teachers from partner HEIs that have completed/cited at least one course on the IIOE platform	Automatically generated by platform	HEI, gender, teaching exp, disciplinary area, qualification and job title
	Output 1.2: Number of staff from partner HEIs that have participated in the IIOE professional development sessions	Automated by platform + annual teacher survey	HEI, gender
	Output 1.3: Number of registered IIOE users	Automatically generated by platform	HEI, gender, account type, teaching exp, disciplinary area, qualification and job title
	Output 1.4: Users' course learning time on the IIOE platform	Automatically generated by platform	HEI, gender, account type, teaching exp, disciplinary area, qualification and job title



Statement	Indicator	Data Source/ Mean of Verification	Disaggregation
<b>Deliverable 2:</b> <b>Enhanced partner HEIs' capacity to support an online and blended learning ecosystem</b> to realise higher education reforms	<b>Outcome 2: Number of partner HEIs that have demonstrated an improvement in the self-assessment of their capacity to support an online and blended learning ecosystem</b>	Automatically generated by platform + QA-based self-assessment delivered each year after HEI's IIOE participation	N/A
	Output 2.1: Percentage of teachers who have drawn on IIOE course resources in their teaching	Automatically generated by platform	HEI, gender, teaching exp, disciplinary area, qualification and job title
	Output 2.2: Percentage of participating teachers who have started developing their own online courses on the IIOE platform	Automatically generated by platform	HEI, gender, teaching exp, disciplinary area, qualification and job title
	Output 2.3: Number of IIOE professional development sessions conducted	Automated by platform (online session) + recorded by IIOE Secretariat (off-line session)	HEI
	Output 2.4: Number of students taught by a teacher who has completed/ cited an IIOE online course or attended an IIOE professional development session	Annual teacher survey	HEI, gender, disciplinary area

Statement	Indicator	Data Source/ Mean of Verification	Disaggregation
<b>Deliverable 3:</b> Provision of quality online courses for partner HEIs to meet their <b>demand for quality higher education resources</b>	<b>Outcome 3: Number of IIOE courses that have received positive feedback (an average rating &gt;2.5 in course feedback)</b>	Automatically generated by platform through course feedback collected upon completion of learning or citing in teaching	Course providers, disciplinary area
	Output 3.1: Number of courses available on the IIOE platform	Automatically generated by platform	Course provider, disciplinary area
	Output 3.2: Number of courses on the IIOE platform completed by at least one teacher	Automatically generated by platform	Course provider, disciplinary area
<b>Deliverable 4:</b> <b>Personalized talent cultivation</b> based on the <b>talent demand of socio-economic development in the digital era</b> using artificial intelligence	<b>Outcome 4: Percentage of participating teachers that agree or strongly agree that the learning experience was personalized</b>	Automatically generated by platform through feedback collected upon completion of course learning, citing course in teaching, or IIOE training conducted online	HEI, gender, teaching exp, disciplinary area, qualification and job title
	Output 4.1: Number of teachers that have followed the recommendation of the course selection generated by the ICT competency assessment on the IIOE platform	Automatically generated by platform	HEI, gender, teaching exp, disciplinary area, qualification and job title

Statement	Indicator	Data Source/ Mean of Verification	Disaggregation
<b>Deliverable 5:</b> Bridge between higher education graduates and competencies demand of labour market so as to enable higher education to meet the demands of the countries' economic development	<b>Outcome 5: Percentage of participating teachers that agree or strongly agree that he/she is confident about developing a course that prepares learners for the demand of the industry</b>	Automatically generated by platform through feedback collected upon completion of course learning, citing course in teaching, or IIOE training conducted online	HEI, gender, teaching exp, disciplinary area, qualification and job title
	Output 5.1: Number of teachers who have completed/cited at least one TVET- related course on the IIOE platform	Automatically generated by platform	HEI, gender, teaching exp, disciplinary area, qualification and job title
<b>Deliverable 6:</b> Improved access to quality higher education for female teachers and learners and marginalised communities in developing countries	<b>Outcome 6: Number of female teachers active on the IIOE platform.</b> ('active' means that log-in activity could be recorded in the past quarter)	Automatically generated by platform	HEI, teaching exp, disciplinary area, qualification and job title
	Output 6.1: Number of female teachers registered on the IIOE platform	Automatically generated by platform	HEI, teaching exp, disciplinary area, qualification and job title
	Output 6.2: Number of female staff from partner HEIs who have attended IIOE professional development sessions	Automated by platform + annual teacher survey	HEI, teaching exp, disciplinary area, qualification and job title
	Output 6.3: Number of female students who have taken courses taught by a teacher who has completed/ cited an IIOE online course or attended a professional development session	Annual teacher survey	HEI, disciplinary area

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