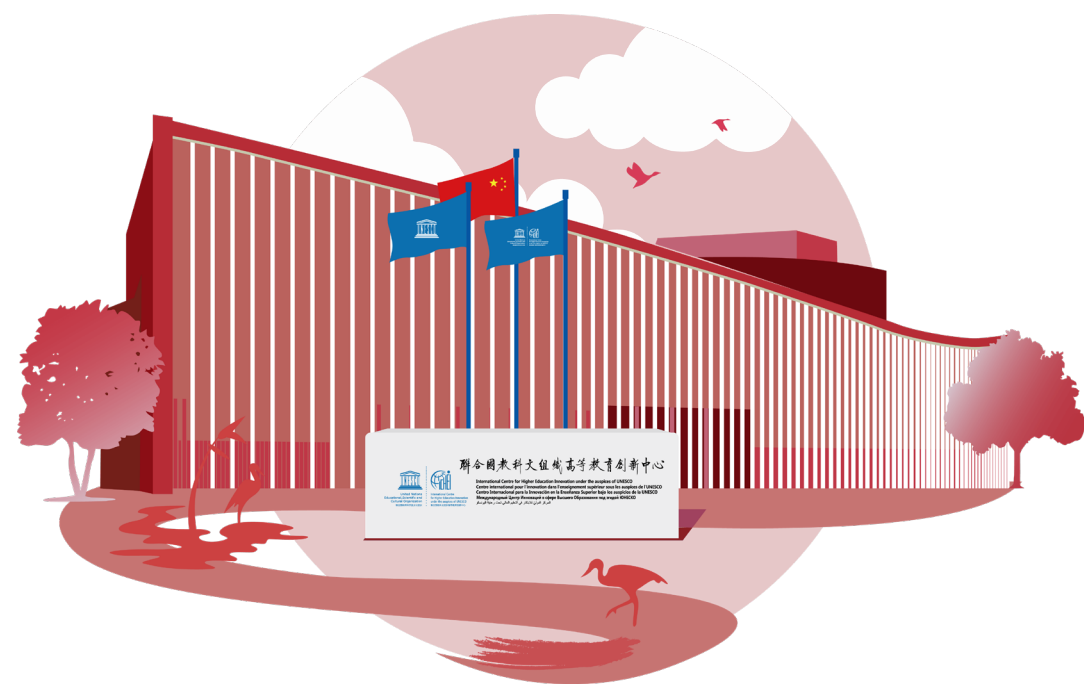




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Transforming higher education
for lifelong learning:
How are micro-credentials evolving?

CLOUD - Connecting Leaders Online for University Digital Transformation

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

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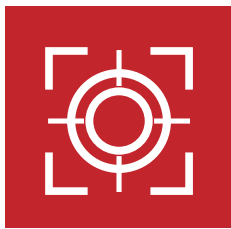
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CLOUD: Letter from the guest editor

Micro-credentials are evolving, with macro challenges ahead

Facing growing uncertainties in life and work, we need useful professional training and learning opportunities. Micro-credentials—a narrow set of validated skills acquired through life experience, work, or study—are widely promoted as a solution for more work-ready and demand-driven training and assessment. However, diverse learners, entrepreneurs, and employers struggle to access and make use of promises and offerings for professional development. How can we effectively navigate credential confusion, ensuring that our choices align with our individual learning needs, unique circumstances, and personal goals? How are providers of micro-credentials and artificial intelligence (AI) applications evolving to enhance learner wellbeing and promote access to decent work? UNESCO is facilitating ongoing dialogue about the value and dimensions of an international quality framework for micro-credentials in Asia and the Pacific and worldwide.

This special edition of *CLOUD* shines a light on practitioners with a perspective on the value, key questions, and limitations of micro-credentials in diverse settings. While there are well-documented examples of micro-credential usage in Europe and North America, how do most of the world's young learners in Asia-Pacific and beyond navigate a complex array of options to improve themselves and their job outlook? The contributors to this edition offer insights into how our global community faces common challenges to develop and manage quality micro-credentials that deliver value for learners and society.

- **Towards lifelong learning systems** - UNESCO's *Borhene Chakroun* and *Katerina Ananiadou* introduce common principles and concepts of micro-credentials for lifelong learning. Their focus highlights micro-credentials as one of many emerging tools to address specific skills and knowledge that are needed in the labor market. In the Asia-Pacific region, *Libing Wang* introduces an ecosystem approach to enable fair recognition of micro-credentials as part of UNESCO Bangkok's efforts to transform traditional higher education. These initiatives aim to make lifelong learning opportunities more inclusive, efficient, and relevant, aligning with Sustainable Development Goal Four (SDG4).
- **Policy-driven approaches** - As the largest university-based micro-credential programme in the United States, *Cynthia Proctor* reviews successes and challenges from a policy-based approach to micro-credentials. The

inclusive approach empowers learners, faculty, industry, and course providers from 64 campuses across New York State.

- **Diverse needs among low- and middle-income countries (LMIC)** - Building from local educational settings and workforce needs is crucial. *James Keevy, Carla Pereira, and Kelly Shiohira* from JET Education Services in South Africa point out that among many LMICs, the emphasis on the credential aspect of micro-credentials is significant, particularly the need to link formal and non-formal learning opportunities. There is a risk that micro-credentials will be further commercialized by widely available yet inadequate solutions to serve the public good. This concern is heightened by limited access to digital technologies and fewer jobs available, even for those with formal qualifications.
- **Learning from cross-sector collaborations and providers** - The Xi'an Jiaotong-Liverpool University (XJTLU) is shifting professional development paradigms through games and customized learner experiences. *Olivia Yiqun Sun, Charlie Reis, Yezi Yang, and Yexiang Wu* draw on research and practice to understand deep gamification. As an example of micro-credentialing for teacher professional development, *OS-EASY* in China showcases a Cloud Computing Certification. Offered through UNESCO-ICHEI's platform for teacher training at the International Institute of Online Education (IIOE), the joint effort highlights how universities and online providers are partnering to improve higher education teaching and learning through the cloud.
- **Higher education leaders are responding** - Senior leaders from the International Information Technology University (IITU), Kazakhstan show practical analysis and implementation of micro-credentials at IITU. Vice-Rectors *Akkyz Mustafina* and *Yevgeniya Daineko* and Head of Department *Madina Ipalakova* unpack strategic insights for senior administrators.
- **Youth leaders see results in faculty transformation** - Young professional *Muhammad Bijaksabara Hikmawan* links learner experiences with national policy in Indonesia, including how faculty are benefiting from targeted micro-credentials in pedagogy. Youth voices and experiences of individual faculty transformations offer compelling examples to be more efficient and effective at Indonesia's largest open university, Universitas Terbuka.
- **Deep dive interviews** - Section two of the special edition includes three interviews led by UNESCO-ICHEI. The aim is to explore how micro-credentials fit in the wider transformation of education. This includes Professor *Zhu Zhiting's* rich insights on teacher professional development and how micro-credentials can support digital transformation of higher education. *Riche-Mike Wellington* discusses work with faculty in Ghana and expanding related initiatives and institutes to deliver on the African Union's Agenda 2063 and UNESCO's operational strategy of priority Africa. *Cristóbal Cobo* from the World Bank's EdTech team underscores how innovation, including generative AI, limitations of technology, and knowledge systems can be approached to make lasting change.
- **Better policy and planning** - The third and final section provides an overview of much needed data on demand for micro-credentials and the need for better blueprints to inform quality frameworks. In an excerpt of their policy brief, *Michaela Martin and Peter Van der Hijden* underline how short courses and validation of competencies must be inclusive—delivering on our promise for equal access to skills and full qualifications. In a forward-looking piece, *Rupert Ward* unpacks 'learning fitness' and potential for a universal micro-credential framework to support learning and earning. To close, UNESCO-ICHEI and UNESCO Bangkok highlight ongoing work on how micro-credentials can support continuing professional development of higher education teaching personnel.

Through this special edition of *CLOUD*, I am sure that you can find new stories and inspiring perspectives to build your community of practice. Join in to share examples of transformation, skills development, and lifelong learning. This debate needs your views—UNESCO needs your views—to encourage innovation, manage emerging digital solutions, and deepen accountability. What we learn is that there are gaps in our understanding and uptake of micro-credentials. We need a more systematic and open approach to promote skills-based hiring that is unbiased and based on equal opportunity. To do that, we need relevant and accountable learning systems that empower individual learners, not only in terms of employment, but also for our personal wellbeing. Micro-credentials can help drive new collaborations and deeper understanding about ourselves and our communities around us.

Thank you to the International Centre for Higher Education Innovation under the auspices of UNESCO (UNESCO-ICHEI) for the partnership and this opportunity. Through this special edition of *CLOUD*, I hope you enjoy a tour of a diverse microcosm around micro-credentials, and the inspiring stories of transformation. There are many more to come.

Wesley Teter, PhD
Guest Editor



Foresight and Landscape

- The Role of Microcredentials in Supporting Lifelong Learning
- Micro-credentials: An Important Part of a Bigger Ecosystem
- Lessons Learned from Implementing the Largest University-Based Microcredential Programme in the United States
- Beyond the Micro in Micro-credentials: Implication for Low- and Middle-Income Countries
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- Experience in Implementing Micro-Credentials Programmes at IITU, Kazakhstan
- Spicing Up Professional Development with Gamification and Interactivity: A Case of Maximising Engagement for an Advanced Higher Education Fellowship Programme in China
- Cloud Computing Certification Aims to Improve the Digital Capabilities of Universities

The Role of Micro-credentials in Supporting Lifelong Learning

About the authors



Borhene Chakroun

Borhene Chakroun is an engineer and has a PhD in Education Sciences from Bourgogne University in France. Borhene worked, during the 1990s, as trainer, chief trainer, project manager. He has also worked as short-term consultant for the EU, World Bank and other international organisations before coming to the European Training Foundation (ETF) in 2001. At the ETF, Borhene worked as Senior Human Capital Development specialist. He is now Director of Policies and Lifelong Learning Systems Division at UNESCO-HQ. Borhene conducted a range of policy reviews and skills systems diagnosis in different contexts. He has authored and co-authored various articles and books in the field of skills development and lifelong learning. Much of his most recent work focuses on global trends in reforming education and training systems and global agenda for skills development in the context of the 2030 Sustainable Development Agenda. He is also the coordinator of the Global Education Coalition launched by UNESCO to respond to the COVID-19 crisis.

Katerina Ananiadou has been a Programme Specialist with UNESCO-UNEVOC since March 2011. In this role she is responsible for knowledge management and research activities in the field of TVET and for implementing and promoting cooperation and capacity development activities within the UNEVOC Network. She is also the focal point for UNEVOC's thematic work on youth and skills and coordinator of the Latin American and Caribbean region of the UNEVOC Network.

Prior to joining UNESCO Katerina worked for four years as a policy analyst at the Centre for Educational Research and Innovation (CERI) of the OECD, among others on systemic innovation in VET and the New Millennium Learners project. Before that she was a researcher at the Institute of Education in London, specialising on adult literacy and numeracy and workplace learning. Her academic background is in Psychology and Cognitive Science which she studied at the Universities of Athens (BA), Cardiff (MSc) and Warwick (PhD).



Katerina Ananiadou

Micro-credentials are becoming increasingly popular, being often promoted as a new and more flexible way of recognizing knowledge, skills, and competencies, and as a tool for allowing individuals to progress in their learning by collecting and 'stacking' learning outcomes in a flexible way and at their own pace.

Micro-credentials are therefore often considered as a means of accessing flexible learning pathways; the latter have been advocated in the Education 2030 Agenda where they are defined as *'entry points and re-entry points at all ages and all educational levels, strengthening links between formal and non-formal structures, and recognition, validation and accreditation of the knowledge, skills and competencies acquired through non-formal and informal education'* (UNESCO, 2015).

Micro-credentials can also help to respond to the rapidly changing skill needs in the labour market. The fact that they are shorter and more focused in terms of content than traditional training programmes and qualifications means that they can be quickly developed to address specific skills and knowledge that

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are needed in the labour market. They also allow individuals to acquire new skills or update their knowledge quickly and in an agile way so that they can fill emerging skills gaps.

Another potential asset of micro-credentials is their greater portability across real geographic borders compared to more

traditional qualifications that are often not recognized by employers or professional bodies in different countries or regions.

However, acceptance and recognition of micro-credentials by employers and policymakers are hampered for a range of reasons. One important issue that prevents the acceptance of micro-credentials

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is that of the definition. There is no universally recognized definition that clearly communicates to lay users, particularly learners and employers, what micro-credentials are. In recent years, policymakers, researchers, and other stakeholders have produced their own definitions, both advancing scholarship in the area, but sometimes also causing more confusion.

To address this challenge, UNESCO recently proposed the following common definition of micro-credentials, based on extensive consultations with a multitude of experts from different professional and geographical backgrounds:

A micro-credential:

- is a record of focused learning achievement, verifying what the learner knows, understands, or can do;
- includes assessment based on clearly defined standards and awarded by a trusted provider;
- has stand-alone value and may also contribute to or complement other micro-credentials or macro-credentials (referring to traditional qualifications or certificates), including through recognition of prior learning.
- meets the standards required by relevant quality assurance (UNESCO, 2022).

Besides the definition, there is a host of other challenges related to the wider acceptance of microcredentials. These include determining whether micro-credentials complement or replace qualifications, or both; the vast range of providers and partnerships who provide micro-credentials, which can create confusion and lack of trust; the lack of a common understanding on the quality of these new credentials and the difficulties in ensuring robust quality assurance mechanisms, especially as many of the actors operate outside of the regulated education and training sectors; and the lack of research and convincing evidence of micro-credentials' efficacy so far, and their impact on learners' employment outcomes or progression to further learning.

Perhaps this last point may be the main weakness of these new types of credential so far. Micro-credentials may be offering exciting possibilities but in many cases the benefits are yet to be realized or proven. Most agree that further research is needed to test their efficacy, including the frequent claim that they offer an efficient way to upskill people at work. Research from the European space for example suggests that the added-value of micro-credentials in the labour market is in sectors where employees need to learn new skills and technologies quickly; in that sense these types of credentials appear to be complementary to more traditional or longer qualifications rather than as intending to replace them (Cedefop, 2022).

Another proclaimed added value of micro-credentials is their potential to improve equity and inclusion in learning, by opening up pathways to learning to a range of individuals that would not have access to conventional forms of learning and accreditation. Micro-credentials are more likely to leverage digital tools and innovative practices to promote accessibility and inclusivity,



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It is important to keep in mind that micro-credentials are only one of many tools that may contribute to the achievement of the wider lifelong learning agenda while taking into account its limitations.

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especially for marginalized or underrepresented groups, for example by providing distance or hybrid modes of participation, self-paced learning and focus on relevant knowledge and skills. For example, global learning platforms such as Coursera provide digital content that can be accessed in different ways; videos have subtitles in many languages and their transcripts can also be downloaded and read offline. Using the offline mode, the material of any course can be downloaded in advance (UNESCO, 2023). By addressing barriers to access, micro-credentials could make education more equitable and responsive to the diverse needs of learners. However, once more little robust evidence

exists as to whether such promises are being fulfilled, such as for instance numbers of learners from marginalised groups that follow micro-credentials courses and/or achieve relevant certifications.

Micro-credentials can be a valuable tool in the promotion of lifelong learning. They have the potential to support individuals in their pursuit of continuous education and development, and personal growth throughout their lives, helping them to adapt to the ever-changing demands of the labour market and encouraging a positive learning mindset. At the same time, it is important to keep in mind that they are only one of many tools that may contribute to the achievement

of the wider lifelong learning agenda while taking into account its limitations. UNESCO (2023) provides a set of recommendations addressed to policymakers who wish to better understand how they can use micro-credentials in their efforts to improve their lifelong learning systems. In its TVET strategy, UNESCO also advocates for the development of an international quality framework for micro-credentials, including standards for quality assurance and principles for stacking and interoperability (UNESCO, 2022). Achieving a shared understanding and consensus around these issues is a necessary step for wider acceptance and further use of micro-credentials.

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Micro-credentials: An Important Part of a Bigger Ecosystem

About the author



Libing Wang is chief of the Section for Educational Innovations and Skills Development, UNESCO Bangkok. This article is an edited version of a talk during the UNESCO-MEXT Joint Workshop on Micro-Credentials: Building Consensus for Fair Recognition in Asia and the Pacific in Osaka, Japan, in August 2022 and was first published on University World News.

Micro-credentials are by no means new, with many, such as short-term courses, having been offered by different providers for years. Most have centred around outreach and continuing professional development (CPD) for the training of skilled workers and professionals.

Compared to macro-credentials, such as full degree or qualification programmes, micro-credentials can be a tool to downsize and shorten longer learning programmes for greater agility, flexibility and diversity.



Micro-credentials are by no means new, with many, such as short-term courses, having been offered by different providers for years.



UNESCO published a report, *Towards a Common Definition of Micro-Credentials*, earlier this year and is preparing another, *Short Courses, Micro-Credentials, and Flexible Learning Pathways: A blueprint for policy development and actions*.

Both provide a basis for further discussion of various facets of micro-credentials, from academic recognition and quality assurance (qualifications frameworks) to mobility, three interconnected pillars of UNESCO's portfolio on higher education in the Asia-Pacific region.

Academic recognition

One of the most critical issues related to micro-credentials is their recognition for further study or employment by government authorities, higher education institutions and employers. Without recognition they cannot be integrated into national and international learning ecosystems.

UNESCO's conventions on academic recognition, including the *Tokyo Convention*, officially known as *the Asia-Pacific Regional Convention on the Recognition of Qualifications in Higher Education*, mainly focus on the recognition of qualifications which give people access to higher education, for example, school leaving diplomas and certificates, and recognition of higher education qualifications, including those held

by refugees and displaced persons.

They also cover recognition of partial studies and prior learning, as well as qualifications acquired through non-traditional modes.

In line with the articles and provisions mentioned in these conventions, it is natural and justifiable to extend the recognition portfolio into small learning units like micro-credentials because they constitute prior learning or partial learning, formal, non-formal or informal learning.

The joint statement on COVID-19 issued by parties to the *Tokyo Convention* in October 2020 calls for strengthening recognition of qualifications obtained via non-traditional modes, including online

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and blended learning. Furthermore, micro-credentials were confirmed as one of the committee priorities during the Third Session of the Tokyo Convention Committee held online in October 2021.

The National Information Centres (NICs) on academic recognition in parties to the **Tokyo Convention** can, for instance, expand their provision to cover the recognised or accredited micro-credential programmes on their national portal and the portal of Asia-Pacific Network of National Information Centres (APNNIC).

Other countries are being encouraged to set up a national quality register for the purpose of academic recognition of micro-credential programmes between countries in the region and beyond.

UNESCO is collecting examples of how micro-credential programmes have been recognised across the region, including from relevant government authorities, higher education institutions and industry, both by providers and consumers.

Quality assurance of micro-credentials

In the past, short-term courses and other small learning programmes were less regulated in terms of quality assurance and were not part of national and international learning ecosystems. This has to change.

Quality assurance is about course content, pedagogy and modalities of delivery, as well as the requirements for accrediting course providers and should apply to both macro- and micro-credential programmes. The concept of 'fit for purpose' also needs to be addressed for micro-credentials.

The former can be addressed by developing and implementing National Qualifications Frameworks (NQFs) as tools to define and achieve learning outcomes. Integrating micro-credentials into the NQFs means their integration into the national learning ecosystem. This can prevent learning fragmentation.

The alignment of micro-credential programmes with the NQFs and relevant national subject-specific quality standards could be mandatory or voluntary, with accredited programmes getting onto national quality registers for public information and transparency.

Eventually, faculty members, frontline teachers and trainers should be able to design and implement their micro-credential programmes based on learning objectives and outcomes, pedagogical considerations, delivery modalities, learning assessment and learning resources.

They should also be able to ensure that their micro-credential programmes are aligned with upstream frameworks such as NQFs and national subject-specific quality standards.

Accrediting micro-credential programme providers can also add tremendous value to the quality enhancement of the programmes. Accreditation criteria should include physical and academic infrastructure, the quality of

teaching personnel and internal quality regulations to ensure the quality delivery of micro-credential programmes.

The accreditation system can enable non-traditional providers, such as professional bodies and enterprises and NGOs, to join forces with higher education institutions to offer micro-credential programmes.

Impact on student mobility

The issue of student mobility has not received much focus in relation to Sustainable Development Goal 4 (SDG 4). However, SDG target 4b is explicitly about mobility and calls for more scholarships for students

from developing countries.

Scholarship providers, both public and private, in the region are fairly diverse, with support for mobility ranging from full and partial degree programmes, split-site joint learning programmes and various short-term exchange programmes and courses.

The Asia-Pacific region has some of the largest sending and receiving countries where student mobility is concerned (for example, Australia, China, India, Japan, South Korea, etc). Inter- and intra-regional student mobility is also expanding with a significant proportion of it focused on short-term exchange courses and programmes.

The Collective Action for Mobility Program of University Students in Asia (CAMPUS Asia), initiated by the governments of China,

Japan and South Korea, is a useful example of international mobility programmes. Many of its activities are short-term student exchange programmes supported by credit transfer and accumulation systems among partner institutions from the three East Asian countries.

Similar mobility programmes have also been in operation in the region, such as the Asian International Mobility for Students (AIMS) Programme run by the SEAMEO Regional Centre specialising in higher education and development (SEAMEO-RIHED), the ASEAN Experiential Learning Programmes (AELP) offered by the ASEAN University Network (AUN) and the EU-SHARE Scholarship programme for short-term (one semester) intra ASEAN and ASEAN-EU mobility.





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Implementing and recognizing micro-credentials will facilitate short-term student mobility in the region and beyond, whether in person or virtually.

By linking short-term exchange programmes with the concept of micro-credentials, we hope that micro-credential-based mobility programmes can lead to the establishment of common subject-specific quality standards among partner institutions and eventually to the development of a common qualifications framework for countries in the region.

Benefits of micro-credentials

It is clear that small learning units have long been part of higher education provision. What is new with micro-credentials is the idea that they should be integrated into learning ecosystems to ensure quality delivery and recognition and avoid learning fragmentation. With this in mind, we can identify their potential benefits.

First, micro-credential programmes are more accessible and affordable for learners, especially those who would otherwise not have the opportunity to study for macro-credentials at conventional higher education institutions.

Secondly, they can help make higher education provision more

efficient and relevant, especially when it comes to employment-oriented and market-driven learning programmes. Small can mean agile, responsive and relevant. Higher education providers can split their degree and qualification programmes into stand-alone components or modules with mechanisms for stakeholder engagement to enhance relevance and alignment of micro-credential programmes with their respective NQFs and subject-specific quality standards.

Thirdly, micro-credentials make personalised and flexible learning possible. Learners can pick their micro-credential programmes from different providers, learn at their own pace, accumulate their learning

at credit banks and eventually claim their CPD credits and full qualifications.

Fourth, they pave the way for non-traditional higher education providers, especially those on the demand side, such as enterprises and professional bodies, to develop small learning programmes as part of a national learning ecosystem and contribute to the increasing relevance of learning programmes.

We need to look at higher education from a holistic perspective and recognise that both micro- and macro-credentials are part of the learning ecosystem. We should not therefore go to the other extreme of promoting a 'fast food' type approach and lose our

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Using micro-credentials, a 'one-size-fits-all' approach can give way to 'fit-for-purpose' solutions.

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patience with macro-credentials, such as degree programmes.

Using micro-credentials, a 'one-size-fits-all' approach can give way to 'fit-for-purpose' solutions. In the long term, higher education

needs to broaden its ambitions and offerings in order to contribute to the holistic development of learners and the peaceful and sustainable development of communities and societies.

Lessons Learned from Implementing the Largest University-Based Micro-credential Programme in the United States

About the author



Cynthia Proctor is the Director of Communications and Academic Policy Development at the State University of New York (SUNY) System. With SUNY for over 20 years, she develops and supports the implementation of SUNY academic policy (applicable to all 64 campuses). Central to her work was the creation and now advancement of SUNY's award-winning microcredential policy, working to provide transformational career opportunities and pathways to initial and advanced degrees—for existing learners, adult learners, and incumbent workers at every level. Ms. Proctor holds a Master's degree in Strategic Public Relations from George Washington University and a bachelor's degree in Public Relations/Journalism from Utica College.

The State University of New York (SUNY) is just reaching the five-year mark (with some pandemic interruption) of implementing a System-wide Microcredential Policy. Clear lessons are emerging, successes are being scaled, and new goals have been set to address challenges and explore new opportunities. All work is aligned with key pillars set by SUNY's Board of Trustees and Chancellor John B. King, Jr., including student success; research and scholarship; diversity, equity, and inclusion; and economic development and upward

mobility.

SUNY is the largest comprehensive system of public higher education in the United States with 64 campuses located across New York State, serving approximately 1.4 million learners each year. The System includes community colleges, technology colleges, liberal arts and science institutions, and doctoral institutions including R1 (universities classified as R1: very high research activity) research centers and medical centers. SUNY campuses are both

large and small, in urban centers and rural communities. Consistent across all campuses is status as an economic driver, often serving as the largest employer in the communities in which they are located.

SUNY's policy-driven approach to micro-credentials centers on faculty innovation, partnerships with industry, and stackable pathways to degrees. Micro-credentials have been integrated across every sector of SUNY campus and major award level—undergraduate and



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graduate. Soon SUNY will have micro-credential programmes at 57 of its 64 campuses with a catalogue of over 600 microcredentials.

In a competitive environment where so many offer short-term credentials, SUNY has encouraged a niche for higher education that is responsive to regional and state needs and that leverages the power of student/faculty interaction, student supports, career and academic guidance. Specific lessons learned, briefly highlighted here, can (and have been) broadly adapted by other higher education institutions.

Developing micro-credentials for multiple audiences has emerged as one of the strongest components of SUNY's programme, making micro-credentials accessible to more New Yorkers, with campuses excelling at serving their local and regional communities, and multi-campus solutions to state-wide challenges:

- For existing students, the priority is immediate recognition of skills and knowledge in the major or complementary to the major, helping the student earn a fellowship or prepare for graduate school, to encourage persistence and completion, and to help students compete in the job market. Examples: Forensic

Accounting Skills and/or Cyber Security Fundamentals for the accounting major; Interprofessional Collaborative Practice (IPCP) for health-related majors.

- For SUNY employees, alumni, and working professionals, the goal is professional development through updated or specialized skills to keep pace in their current job or advance. Examples: Science of Reading Fundamentals for educator preparation alumni and current teachers; Nursing Home Administration; Healthcare Administration; Data Science in Engineering.

- For New York business and industry, the focus is on upskilling incumbent workers and/or building new pipelines of employees for

emerging industries. Examples: Wind Energy Technology; Applied Electronics for Manufacturing Technicians; Micro-Nano Fabrication Safety.

- For adult learners who are unemployed/underemployed, the goal is a supportive pathway to earn academic credentials leading to gainful employment and economic mobility, that also serve as a steppingstone to advanced credentials including the degree. This includes SUNY's partnership in the Lumina Foundation's Racial Equity for Adult Credentials in Higher Ed (REACH) grant initiative. Examples: Supply Chain Management; State Certified Surveying Technician; Civil Engineering Technician, Advanced Office Management.



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● For P-12 (Preschool-12th grade) partners, state and governmental agencies and community organizations, the focus is micro-credentials designed to address workforce challenges that dominate a particular region or the state. See this link for a recent example: <https://www.governor.ny.gov/news/governor-hochul-announces-5-million-partnership-expand-direct-support-professional>

SUNY microcredentials: 1) provide the skills, knowledge, and experience to allow the learner to obtain a job or advance in a job; and 2) wherever possible, provide a pathway to additional credentials, including an initial or advanced degree. No matter the intended audience, quality microcredential development requires workforce data, partnerships, strong internal and external communications, and technology resources.

“No matter the intended audience, quality micro-credential development requires workforce data, partnerships, strong internal and external communications, and technology resources.”

Localities, states, and national governments regularly produce data on in-demand occupations, salaries, job openings, new industries, and more. Each time a new microcredential is developed, this data must be considered and tested. A best practice that has emerged for SUNY is the lead faculty member meeting with a small focus group (3-4 companies/organizations) to discuss a proposed microcredential (informed by available data) and specifically, the proposed skills to be mastered. Done during the development phase, these conversations lead to stronger, more focused micro-credentials.

Essential to all microcredential work are internal and external communications plans. Internally, a prospective student might reach out to admissions, financial aid, the registrar, the bursars office, or even an individual academic department to ask about micro-credentials. Be sure each of these offices is ready to respond—in the short-term by providing everyone with information about where new microcredentials are listed and who the key contacts will be; and in the long term by integrating the micro-

credential programme into the routine operations of the institution.

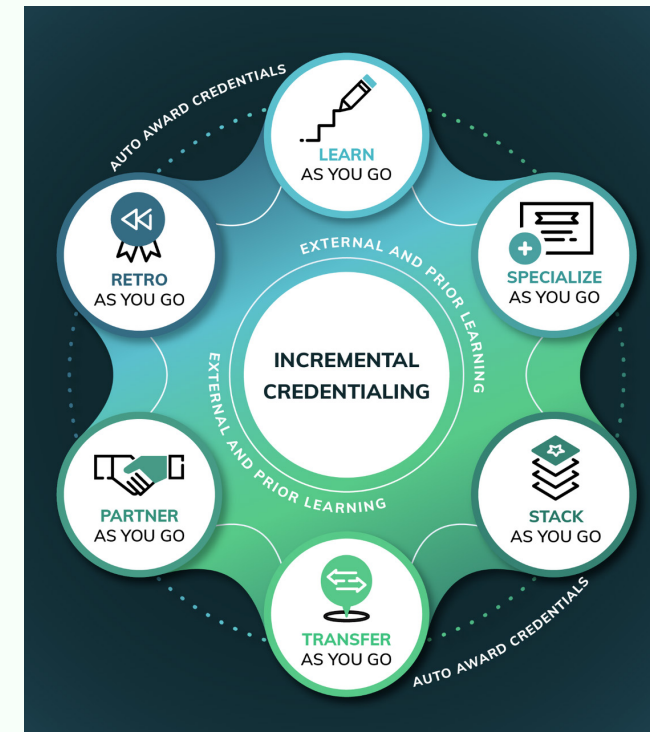
External communication to local, regional, and state partners on SUNY's microcredential work has been key to programme growth and securing state support, including financial aid for qualified part-time microcredential students and inclusion in state-wide directories. External communication with prospective students is also essential. Based on search data and frequently asked questions, students want easy access to essential data: clear descriptions noting connection to workforce, skills mastered, cost, time to completion, whether delivery is available online, stackability to certificates or degrees, and one click buttons to get more information and to register. SUNY will launch an enhanced microcredential directory (<https://www.suny.edu/microcredentials/microlist/>) with easy access to this information.

Another lesson centers on the use of technology to not only inform quality delivery of online micro-credentials but to support 'infrastructure' development. Monitoring persistence, completion,



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The SUNY Credential as You Go Movement



<https://credentialasyougo.org/>

Related engagement in the state, national and international dialogue on micro-credentials: SUNY is proud to be part of the Credential as You Go movement (<https://credentialasyougo.org/>), working to share best practices through Playbooks or guides and by bringing together stakeholders from across the country to collaborate. Note that one focus of Credential as You Go is using Credit for Prior Learning (CPL), to support adult learners in particular; work that SUNY applauds.



and next steps after micro-credential completion, measuring student and partner satisfaction, and tracking wage and employment data are necessary data elements that require cooperation by admissions, registrars, institutional research, and information technology staff. SUNY benefited from the development of guidance by the registrar at its Genesee Community College, for example, to integrate micro-credential student data into the student information system and the degree auditing system used by most SUNY campuses, but still has

more work to do to ensure reliable and consistent data reporting.

Finally, student support, including access to faculty, tutoring, the library, and academic and career guidance, are essential components of an effective micro-credential programme. SUNY began providing micro-credential takers with a 'SUNY Global ID' to provide access to campus resources. New work with career development officers and academic advisors to begin shortly will detail and improve access to these resources.

Taken together, lessons learned to date underscore SUNY's mission and identified priorities and begin to illuminate the essential niche higher education can serve in the microcredential space—advancing adult education, improving academic/industry partnerships, fostering faculty innovation, supporting student academic and career success, and driving community and economic development. SUNY invites you to follow its progress at: (<https://www.suny.edu/microcredentials/>.)

Beyond the Micro in Micro-credentials: Implication for Low- and Middle-Income Countries

About the authors



James Keevy

James Keevy is an experienced policy researcher that has worked in South Africa, Africa and internationally for the last 30 years. Following 13 years at the South African Qualifications Authority in research policy and international liaison capacities, he joined JET Education Services in 2014 as the chief executive. His specific areas of expertise include qualifications, the recognition of learning, digitalisation, and the professionalisation and migration of teachers. He has worked closely with several international agencies, including the OECD, ILO, World Bank, Commonwealth Secretariat, Commonwealth of Learning, SADC Secretariat, African Union Commission and others. At present his main expertise lies in the ability to oversee large multinational research and evaluation teams to execute programmes in a robust and efficient manner.

Carla Pereira is an experienced researcher working primarily in the South African education sector. She worked for JET Education Services for over 18 years in various research and management roles until she resigned as its Chief Operations Officer in 2020. She is currently an independent consultant, based in Europe, and a senior research associate for JET has worked on several youth development and TVET upskilling projects. Her most recent achievements include leading the #OpenUpYourThinking SADC Researchers Challenge UNESCO ROSA and Open Society Foundation over Apr. – Sept. 2020 which involved leading and coordinating 75 multi-disciplinary junior to senior researchers that resulted in eight theme reports and a synthesis paper for SADC policymakers and researchers.



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Kelly Shiohira is the Executive Manager for the Research and Data Ecosystems Division at JET Education Services. A strategist and researcher with a specialized focus on educational interventions in low-income environments, her fifteen years of experience spans literacy, school improvement, workforce development, and the integration of AI into educational settings. She has collaborated with global organizations to launch impactful initiatives, including an award-winning literacy-through-technology programme in multiple African languages. Holding master's degrees from the University of Pennsylvania and Rhodes University, Kelly is currently focused on innovative credentialing, improved labour market signalling, and the development of a student competency framework for Artificial Intelligence with UNESCO. Her recent work in credentials includes publications on innovative technologies for the African Continental Qualifications Framework as well as micro-credentials research for the ILO, World Bank and UNESCO. In addition, her insights into the role and implications of AI in skills development have found a broad audience through presentations, webinars and published articles.

Introduction

It is rather difficult to be involved in global education discussions today and not be confronted with the notion of micro-credentials (European Commission, 2020; European Training Foundation, 2022; Malaysian Qualifications Agency, 2020; National Council for Vocational Education and Training India, 2022; Nuffic, 2022; African Continental Qualifications Framework, 2022). The definition of a micro-credential following a global consultation process commissioned by UNESCO in 2021 provides a useful reference point (UNESCO, 2021):

A micro-credential is a record of focused learning achievement verifying what the learner knows, understands or can do; includes assessment based on clearly defined standards and is awarded by a trusted provider; has stand-alone value and may also contribute to or complement other micro-credentials or macro-credentials, including through recognition

of prior learning; and meets the standards required by relevant quality assurance.

In this brief contribution, we argue that this trend towards micro-credentials is in fact a proxy for something more substantive taking place as our very understanding of credentialling changes. In our view, the focus on the 'micro' part of micro-credentials is just a veneer; what is really happening is that the classic OECD definitions of formal, non-formal and informal learning (OECD, 2021) are dissipating, as technological developments have accelerated to the point that digital schemas can be effectively engineered using open architectures that are designed around the individual as a sovereign user (Chakroun & Keevy, 2023).

Micro-credentials in low- and middle-income countries (LMICs)

In our recent work that has included collaborations with various international entities such as UNEVOC (2021), the ILO and UNICEF (2023), we have covered interesting case studies across a number of low- and middle-smaller-chunk income countries (LMICs) ranging from India to Brazil, as well as African countries.

The trend we see is that more developed countries are actively engaging in developing micro-credentials, with a stronger focus on data interoperability and data privacy standards. In most of these countries, micro-credentials represent recognition of smaller chunks of non-formal training or learning and tend to comfortably coexist in open learning ecosystems, structured around citizens as sovereign users, and in more seamless ways that involve both supply and demand side actors (OECD, 2021). In these contexts there are well-defined use cases of micro-credentials being actively pursued as part of continuing professional development (CPD) programmes, as well as in new

areas of interest such as coding, and as a part of workplace requirements (ILO & UNICEF, 2023).

Many LMICs are currently grappling with establishing frameworks for micro-credentials. Several initiatives are currently underway to work with LMICs, often in partnership with more developed countries, to address this area (see for example UNICEF 2023, and the Potential of Micro-credentials in Southern Africa [PoMiSA] programme that is due to start in 2024). An important feature in LMICs, and which differs somewhat from more developed countries, is the opportunity to address long-standing concerns of overly bureaucratic and formalised systems that are more difficult to navigate by citizens. Critically, in LMIC contexts, these constraints are further compounded by limited 'access to digital technologies, the supportive electrification infrastructure, and the capacity of the labour market to absorb unemployed youth especially those living in rural areas' (UNICEF 2023, 9). To add to the complexity, the interface between formal recognition schemas (such as qualifications frameworks) and the non-formal sector can be difficult to navigate, and mostly reliant on some form of 'translation' process, such as the recognition of prior learning (RPL). To move beyond these constraints, the trend we have observed is towards national initiatives to develop micro-credential frameworks that map out the complementarities and pathways to formal systems. In these cases, the emphasis is placed more on giving citizens the benefit of having their full set of credentials, including both formal and non-formal, represented in a format that would be accepted by prospective employers. In some cases, micro-credentials are seen as a way to increase alignment between formal education and the labour market, with industry-developed courses even mandated in tertiary education

“ while in LMICs, the flexibility is also important, but we see a greater emphasis on the 'credential' part of micro-credentials: more encompassing forms of representation that include formal and non-formal learning.

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training programmes in some cases (IYF, 2022).

We have illustrated some extreme differences between developed countries and LMICs above to illustrate a point: in more developed countries the emphasis is on the 'micro' part of micro-credentials: increased flexibility based on more manageable chunks of learning; while in LMICs, the flexibility is also important, but we see a greater emphasis on the 'credential' part of micro-

credentials: more encompassing forms of representation that include formal and non-formal learning. We would be the first to admit that there are numerous exceptions to the opposing examples we have sketched above. What is more important is that LMICs become aware of these different dynamics and how to manage them.

Some practical considerations for LMICs that are exploring micro-credentials

Drawing on some of our current work (ILO & UNICEF 2023; UNICEF 2023; PoMiSA 2023) we want to suggest the following practical considerations for policymakers in LMICs that are exploring the more formal integration of micro-credentials into their education and training systems.

Firstly, existing qualifications frameworks could be used as a point of departure, but these frameworks will have to become more digital and more agile. Data privacy laws are also very important and should be factored into the process to protect the vulnerable and make these technologies and codes available in open and free formats.

Secondly, try to avoid proprietary solutions by drawing on international and local developments that are based on open and accessible architectures. Data-rich digital learning credentials, such as is being developed through the European Digital Credentials for Learning Infrastructure, provide a firm foundation for semantic interoperability across European countries. The work of the Groningen Declaration Network (GDN) is also important. On the

“ There also exists an opportunity for LMICs to critically reflect on their education and training systems and how these systems can better prepare their citizens who may live in a context where access to digital technologies is more limited, and fewer jobs are available, even for those formally qualified.

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African continent, the development of the African Qualifications and Credential Platform (AQCP) will commence in 2024, with a direct ambition to support African countries and make the technology

available to manage qualifications and credentials (European Training Foundation 2023).

Thirdly, and perhaps this is a consideration that may be

more contested, our view is that existing national quality assurance systems, including qualifications frameworks and now also micro-credentials, specifically in LMICs, stand the risk of being outpaced by more technologically advanced commercial solutions that will inevitably become more widely available. Policymakers need to be aware of this risk and take a proactive stance in managing this for the public good.

In conclusion, the hype around micro-credentials can probably be ignored with the hope that it will soon pass. It is not difficult to demonstrate the weaknesses and even inconsistencies in these debates. In our view, there also exists an opportunity for LMICs to critically reflect on their education and training systems and how these systems can better prepare their citizens who may live in a context where access to digital technologies is more limited, and fewer jobs are available, even for those formally qualified. This is the critically important discussion to be held in LMICs, and micro-credentials provide a mechanism to do so.

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Shaping Tomorrow: How Micro-Credentials Are Redefining Indonesian Education

About the author



Muhammad Bijaksabara Hikmawan is a student at Universitas Terbuka (UT) currently majoring in Governmental Science. His academic journey includes a prestigious full bachelor scholarship from RBN Institute and the 2022 Indonesia International Student Mobility Award (IISMA). This honor led him to an enriching academic exchange at Korea University, where he served as a Student Representative.

Bijak's journey takes an exciting turn as he becomes a valuable addition to UT's International Relations & Partnership team. Here, his passion for nurturing global collaborations, expanding educational horizons, and championing internationalization aligns seamlessly with the university's mission of making higher education accessible to all.

In a bustling classroom in Jepara, Central Java, the air is charged with excitement. Mr. Ahmad Syukur, was seen patiently guiding his students through an engaging lesson on the human respiratory system. Students, invested in their tasks, assembled bottles, straws, and balloons to make a model of the respiratory system. The room resonated with the sounds

of inflating and deflating balloons, mirroring lungs in action. It was a day where learning came alive, and every student left the room with a smile, carrying newfound knowledge and memories to cherish. But it was not always like that. Just a year ago, Ahmad was confronted with outdated teaching methods, declining student participation and a plateau in grades. He often

found it challenging to effectively communicate concepts to his students, which slowly chipped away at his confidence. Fortunately, a turning point arrived when he received the Micro-credential Scholarship Programme, something he would later describe as a 'life-changing' programme.

As the 21st century unfolded, the

world's educational scene began to change rapidly, heavily influenced by digital advancements. It was a call to act, and no longer just an option to evolve. Indonesia, with its rich diversity and unique challenges, felt this pressure deeply. With the world becoming increasingly unpredictable - a term often coined as the VUCA (Volatility, Uncertainty, Complexity, Ambiguity) era, Indonesia faced a clear choice: to adapt swiftly or to risk being left behind. It was during this transformative period that the young and energetic Minister of Education and Culture of Indonesia, Nadiem Makarim, introduced the 'Freedom to Learn' or 'Merdeka Belajar' policy. The essence of 'Merdeka Belajar' was to provide an educational system that genuinely caters to students, nurturing their dreams, igniting their spirit, and ultimately unlocking their potential. This was not just about changing curricula or teaching methodologies, but about revolutionizing the very ethos of learning in Indonesia, making it more organic, individualized, and impactful. Having such a vision is one thing, but making it a reality across Indonesia with its vast stretches of islands and diverse communities is another challenge altogether. While the Merdeka Belajar Policy was indeed a pivotal stride, 2021 saw the rise of another key player in Indonesia's educational arena: micro-credentials.

At the helm of the efforts to enhance Indonesia's education system is Direktorat Jenderal Guru dan Tenaga Kependidikan (Ditjen GTK), an integral arm of the Ministry of Education, Culture, Research, and Technology of Indonesia. Their primary mission revolves around the enhancement and development of teachers, educators, and related personnel, ensuring they are equipped with current methodologies and techniques that align with global standards. Recognizing the urgent need to address educational disparities and upgrade the skills of educators,

Ditjen GTK, in collaboration with LPDP (The Indonesia Endowment Funds for Education), launched the ambitious Micro-credential Scholarship Programme. With a vision to uplift and modernize the teacher's competency in Indonesia, this programme specifically targets educators across all levels, from kindergarten to university lecturers. By partnering with world-renowned educational institutions like Harvard, Stanford, and Monash University, the programme aims to offer top-tier, specialized education to its participants. But, why micro-credentials? The choice of micro-credentials as the cornerstone of this initiative reflects the global shift towards more modular and flexible learning. These compact courses enable educators to acquire specific skills in a shorter timeframe, making it immensely practical. Moreover, they're designed to have immediate real-world application.

To give a clearer picture of how this programme works and its real-

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The choice of micro-credentials as the cornerstone of this initiative reflects the global shift towards more modular and flexible learning.

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world impact, let's circle back to the story of Mr. Ahmad Syukur. Ahmad is a young and eager teacher at SDN Kalipucangwetan which located in Jepara, a rural region of Central Java. He always believes that teaching should be more than just textbooks and grades. For him, it's about adding real values to his students' lives. Before his transformative journey, Ahmad's perception of 'numeracy' was limited. Like many, he mistakenly equated numeracy solely with mathematics and numerical calculations.

Ahmad's dedication to teaching and his yearning for professional growth led him to be accepted into the Micro-credential Scholarship,

forefront of numeracy education. Furthermore, the learning didn't stop after this bootcamp. The educators embarked on a six-month journey wherein they had to conceptualize, create, and implement a real-world study plan. This capstone project was closely monitored and mentored, ensuring that the education imparted wasn't just theoretical but had palpable impacts on the ground.

Upon returning to SDN Kalipucangwetan and integrating his newfound knowledge, Ahmad witnessed transformative changes. Student participation surged remarkably. More importantly, the students began to display a heightened capacity for critical

Ahmad's impressive achievements didn't go unnoticed. In recognition of his outstanding efforts to boost numeracy education, Jepara's local government honored him with the 'Leading Teacher in Numeracy' award. Subsequently, SDN Kalipucangwetan, owing to its commendable performance, was granted an increase in BOS funds. In this context, BOS stands for 'School Operational Assistance', a financial mechanism in Indonesia aimed at supporting and ensuring the continued delivery of quality education.

For Ahmad, the Micro-credential Scholarship Programme was a real eye-opener. It wasn't just about learning; it was about understanding

answers in the world. He also discovered a new dimension of teaching and education. With a more personalized teaching plan, Ahmad was able to cater to each student's unique strengths and weaknesses. This approach enabled him to achieve previously unreachable goals, breaking down complex concepts into digestible chunks, and creating an environment where every student felt seen, heard, and understood. It was no longer about teaching to the masses, but about understanding and nurturing each individual, guiding them towards their own potential.

This revelation drove him to spread the word, and he was determined to share its value continuously not only to his students but also to his fellows. Using his social media platforms, Ahmad began to craft educational content that highlighted the importance of numeracy and critical thinking. His passion led to the creation of 'Numeracycycle', a dedicated community for teachers focusing on numeracy. Here, educators came together, sharing tips, best practices, and experiences, making it a hub for effective teaching strategies. More than just sharing, he consistently inspired and motivated his fellow teachers to continually seek opportunities for self-improvement and upskilling.

The growing importance of micro-credentials becomes evident. The statistics from the Micro-credential Scholarship programme, led by Ditjen GTK, are telling. **Starting with 25 participants in 2021, the numbers grew to 200 in 2022 and 425 by 2023, with expectations of further growth in 2024.** These figures highlight the Indonesian government's dedication to advancing and inspiring its educators, and furthermore, the trust it holds to the learning mode of micro-credentials. Compact, focused, and time-efficient, micro-credentials allow educators to learn without taking long breaks from their main responsibilities. Despite their

shorter duration, they offer valuable, immediately applicable knowledge. This direct applicability sets them apart from broader courses like MOOCs and insights from standard seminars or webinars.

In simple terms, 'Merdeka Belajar' set the dream, and micro-credentials provided the tools. In the

most remote corners of Indonesia, countless educators like Ahmad are waiting, their vast potential yet to be fully realized. Together, with the right resources and commitment, we can unlock that potential, shape a future where Indonesian education is as unique as every student walking its corridors.

“ These figures highlight the Indonesian government's dedication to advancing and inspiring its educators, and furthermore, the trust it holds to the learning mode of micro-credentials. Compact, focused, and time-efficient, micro-credentials allow educators to learn without taking long breaks from their main responsibilities. ”



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more specifically into the Numeracy Professional Learning Programme for Indonesian Teachers, crafted by Monash University. Ahmad, along with 32 other passionate educators from diverse regions of Indonesia, was given a lifetime opportunity. They underwent a 10-day intensive bootcamp, rich in content and hands-on practical lessons, delivered by experts at the

thinking, viewing problems from multiple perspectives and deriving holistic solutions. The numbers spoke for themselves. According to an official report by the Ministry of Education, the numeracy scores at SDN Kalipucangwetan in 2023 skyrocketed by a staggering 299.94% compared to the previous year. Such exponential growth was previously unfathomable.

the true depth of numeracy. He came to recognize that numeracy wasn't limited to simple arithmetic or rote calculations. It encompassed critical thinking, problem-solving, logical reasoning, and the ability to interpret and analyze data in meaningful ways. Numeracy was about fostering an innate sense of curiosity, encouraging students to question, explore, and seek



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Experience in Implementing Micro-Credentials Programmes at IITU, Kazakhstan

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In the era of the fourth industrial revolution, where labour market demands often change rapidly, traditional higher education is constantly searching for new teaching technologies utilizing modern digital trends. One solution for rapidly preparing and retraining the workforce for the digital economy is through training

programmes known as micro-qualifications. The implementation of micro-qualifications and micro-certifications is an evolutionary approach that transforms the landscape of higher education. In a world where professional skills often take precedence over academic knowledge, micro-certification programmes offer a

targeted curriculum tailored to the demands of the labour market and aligned with the technologies and equipment used in production.

Society has come to understand that the principle of 'lifelong learning' is not just a slogan but a necessity for an individual's success in a competitive environment.

Editor Notes: 'Micro-qualification' means a part of a formal outcome of an assessment and validation process which is obtained when a competent authority or body determines that an individual has achieved learning outcomes to given standards, such as qualifications from part of the European Qualification Framework. Comparatively, micro-credential refers to a sub-unit of a credential or credentials that could accumulate into a larger credentials or be part of a portfolio. According to the European Training Foundation, micro-credentials are 'underpinned' by quality assurance, always based on learning outcomes and assessment.



<https://www.etf.europa.eu/sites/default/files/2023-06/Micro-Credential%20Guidelines%20Final%20Delivery.pdf>

The need to obtain professional qualifications without having a higher education diploma has become a relevant and crucial procedure. The realization of micro-qualifications (micro-credentials or micro-degrees) within the framework of acquiring specific competencies in a narrow field, either through educational institutions or well-known educational platforms, or within the corporate universities & training centres of large companies, has become a reality. Specialists [1, 2, 4, 5] and educational organizations pay particular attention to this issue in their articles, research, and reports.

In the UNESCO report *Towards a common definition of micro-credentials*, the key characteristics of micro-qualifications [1] are defined as follows:

- a clearly defined set of competencies in a specific area;
- assessment of knowledge, skills, and abilities by a trustworthy organization;
- independent value; no need for validation by other documents, such as a diploma;
- accreditation.

From Figure 1, which was generated using the Google Trends service to track the popularity of micro-credentials, it is evident that over the last 5 years, there has been a growing demand for micro-credentials.

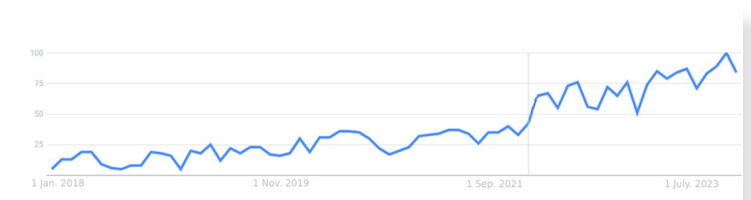


Figure 1. The demand for micro-credentials worldwide from 2018 to 2023

Requests for micro-qualifications, according to Google Trends data (Figure 2), are originating from Australia, New Zealand, Canada, Ireland, Malaysia, and other countries.



Figure 2. The top 5 countries with the highest number of queries on micro-credentials

Many countries, such as the United Kingdom, the United States, Belarus, and others including Kazakhstan [2], are introducing their regulatory documentation to

oversee the process of awarding micro-credentials or micro-degrees. One of the experts in the working group responsible for developing the regulatory framework for micro-

qualifications in Kazakhstan, S. Omirbayev, believes that each university should formulate its own concept of micro-degrees [3].



These challenges highlight the need for greater standardization, improved access to assessment resources, and collaboration between educational institutions and employers to ensure the successful implementation of micro-credential programmes in Kazakhstan.



In the State Compulsory Standard for Higher Education of the Republic of Kazakhstan, the following definitions are provided [4]:

■ micro-credential – a set of knowledge, skills, and competencies obtained after completing a short period of study, enabling the performance of specific work functions;

■ nano-credit – a standardized unit of measurement for a small volume of educational material, having an independent and self-contained nature;

■ stackable degrees – a combination of skills and competencies from different fields or areas of professional activity, obtained through formal and informal education.

The process of awarding micro-credentials in Kazakhstan involves the assessment and verification of specific skills and knowledge. This is typically carried out through educational institutions or qualification assessment centers.

However, there are some limitations that hinder the implementation of this programme. For example, difficulties arise in standardizing assessments, as there are no unified criteria for different fields of study. There is also limited access to resources for conducting practical skills assessments. Additionally, employers may face challenges in defining competencies during

micro-credential training and in recognizing and accepting these credentials.

These challenges highlight the need for greater standardization, improved access to assessment resources, and collaboration between educational institutions and employers to ensure the successful implementation of micro-credential programmes in Kazakhstan.

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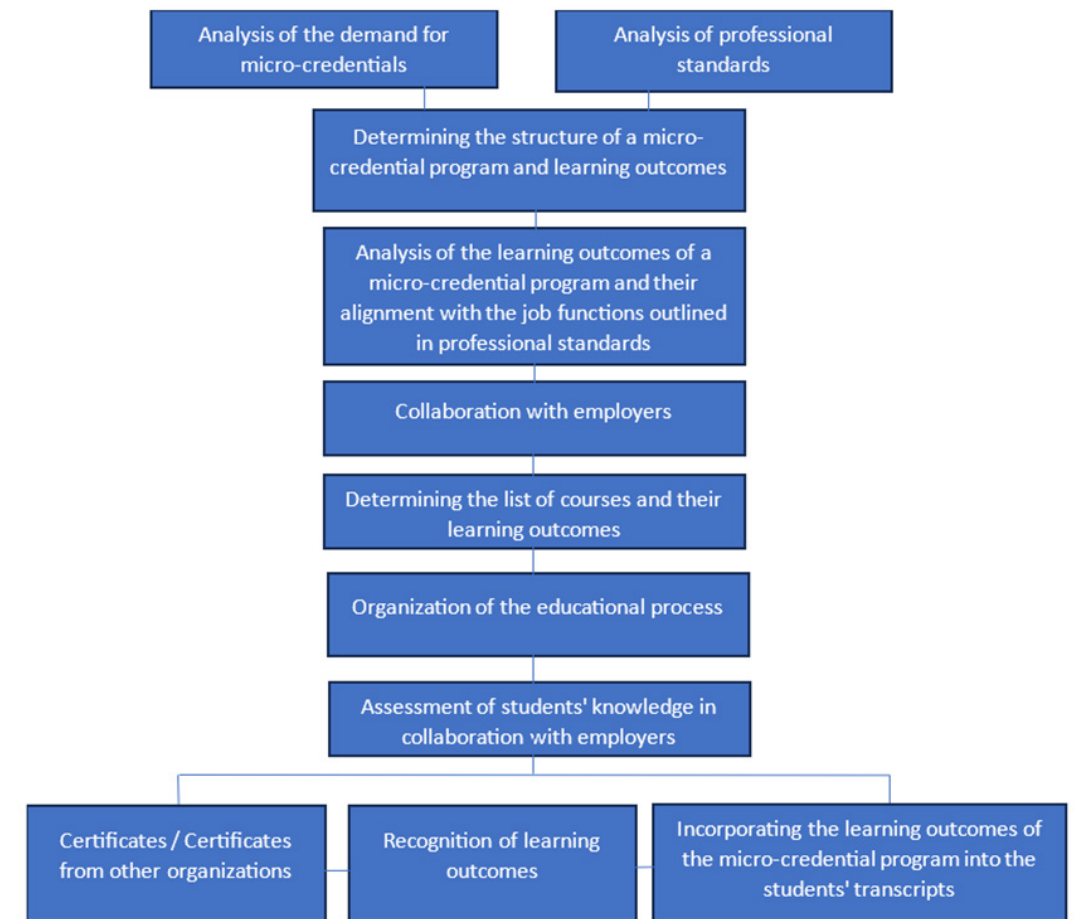
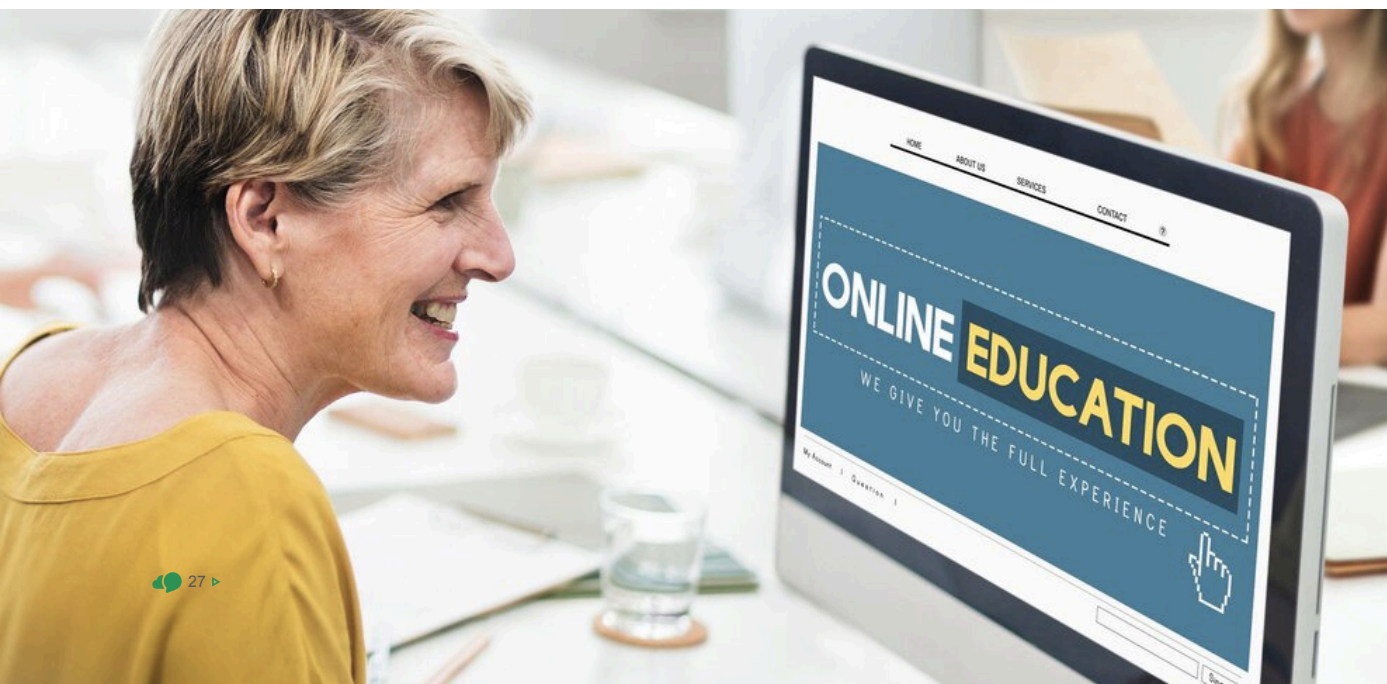


Figure 3. The implementation scheme for micro-qualifications at the IITU

Taking into account the regulatory documents of the Republic of Kazakhstan [3, 6] and international experience [5], the International Information Technology University (IITU, Almaty, Kazakhstan) has developed its structure for micro-qualification programmes and proposed an implementation scheme (Figure 3).

The implementation concept of micro-credentials at IITU consists of several stages. In the first stage, it is necessary to analyze the demand for micro-credentials and the presence of corresponding national professional standards. In the second stage of micro-

credential determination, it's important to define the structure of the programme and its learning outcomes. There is a need to compare the learning outcomes of the micro-qualification with the job functions outlined in professional standards. In the third stage, for collaboration, the university identifies employers with whom it coordinates the list of courses and internships and organizes the educational process for the micro-credential programme.

In the final stage, upon completion of the micro-credential programme and passing all exams, participants receive certificates for

the attainment of micro-credentials.

At IITU, micro-qualification programmes function both as standalone programmes for individuals with secondary or post-secondary education and as supplementary educational programmes integrated into higher education programmes. In the event of recognizing the educational outcomes of a micro-credential programme in students' transcripts, all the disciplines from the micro-credential programme are included by educational programme coordinators.

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It's worth noting that special attention is given to the methodology of teaching micro-credentials, providing a systematic approach to education, and enabling learners to acquire specific, narrow skills or competencies related to a particular profession.

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Micro-degrees are actively popularized in Massive Open Online Courses (MOOCs) on major global platforms such as Coursera, edX, Udacity, and others. For example, Coursera, in collaboration with tech giants like IBM and Google, promotes the attainment of micro-degrees in the form of professional certificates from partner companies. In Kazakhstan, based on the Rules for Recognizing Non-Formal Education approved by the Ministry of Education and Science of the Republic of Kazakhstan [6],

universities facilitate the recognition of professional certificates.

It's worth noting that special attention is given to the methodology of teaching micro-credentials, providing a systematic approach to education, and enabling learners to acquire specific, narrow skills or competencies related to a particular profession. Modern micro-credential learning formats include online courses, lectures, seminars, workshops, practical masterclasses and more. Learners are provided

with materials created using immersive technologies, virtual simulators, gaming systems, and other tools that simulate production processes.

Learners have access to the IITU's labs of mixed reality, robotics, and data analytics, as well as modern equipment and specialized software used by employers. After assessing the knowledge and skills acquired by learners, employers would allow them to participate in real-world projects, processes, and

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Table 1. The registry of micro-credential programmes at IITU

No.	Field	Level	Title of the micro-credential programme	Employer partner	Educational programme that includes the micro-credential
1	B061	Undergraduate	System Administrator	Suretter Software LLP	6B06106 Computer Systems and Software Engineering
2	B061	Undergraduate	Modelling and Visualization	—	6B06118 Immersive Technologies
3	B061	Undergraduate	Web Programmer	EPAM	6B06110 Software Engineering
4	B061	Undergraduate	Robotics	—	6B06107 Cyberphysical Systems
5	B061	Undergraduate	Java Developer	Digital Agency NIDGE, «Magnum Cash&Carry» LLP	6B06101 Computer Science
6	B061	Undergraduate	BI Analyst	Digital Agency NIDGE, «Kcell» JSC	6B06101 Computer Science
7	B061	Undergraduate	Machine Learning Specialist	Digital Agency NIDGE, «Kcell» JSC	6B06112 Data science
8	B062	Undergraduate	Specialist in Measurement of FOCL	«Optical Technologies» LLP	6B06201 Telecommunication Systems and Networks
9	B062	Undergraduate	Specialist in Base Station Parameter Measurement	«Optical Technologies» LLP	6B06203 Mobile Telecommunication Technologies
10	B063	Undergraduate	Network Administrator	«Internet society»	6B0630 Networks Security

production. IITU has established its registry of micro-credential programmes (Table 1), which is updated annually.

Therefore, all-new micro-credential programmes will be created based on the following criteria:

- developing skills approved by leading employers;
- the programme's volume not exceeding 15-20 credits (450-600 academic hours);
- ensuring the quality assessment of knowledge with learner

- verification;
- corresponding to the bachelor's or master's degree level;
- recognition of non-formal and informal learning outcomes;
- a transcript including the

results of additional educational programmes or an attachment to the certificate with details of the learning outcomes, hours of instruction, and the level achieved.

Experts [5] believe that micro-credentials will play a pivotal role in the future of education and

learning systems. They will help make education and training more effective.

Research indicates that the integration of micro-certification into universities is transforming education, directing it towards flexibility, relevance, and lifelong

learning. Micro-credentials, at the intersection of traditional educational practices and innovative methods, serve as a guide for preparing professionals to meet the contemporary challenges of society.



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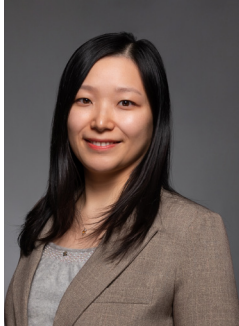
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Spicing Up Professional Development with Gamification and Interactivity: A Case of Maximising Engagement for an Advanced Higher Education Fellowship Programme in China

About the authors

The Educational Development Unit (EDU) is a core part of Xi'an Jiaotong-Liverpool University (XJTLU)'s Academy of Future Education. As a department driven by the notion that learning and learners matter, EDU is also the University's primary networking platform. It aims to assist staff in evidencing service from the University by providing multiple opportunities for engagement.

Educational Developer  Olivia Yiqun Sun	Charlie Reis  Director of the Educational Development Unit	Instructional Designer  Yezi Yang	Yexiang Wu  Instructional Designer
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Overview

In this article, we show you how a team of instructional design experts from Xi'an Jiaotong-Liverpool University transformed the learning experience into an immersive journey that fosters active participation, empowering learners and professional growth by infusing gamification elements and embracing emerging technologies such as the HTML5 Package (H5P).

Imagine an online class where you just read and watch videos, and then post your thoughts on a forum for others to read. Boring and plain, right? Would you rather try your best to escape from peril, overcome an obstacle, or better experience curriculum while engaging in deep learning?

The pursuit of designing an engaging learning experience has long intrigued educators, and the task becomes even more formidable when it comes to asynchronous learning. A team of educational developers undertook the challenge head-on. Their goal? To recreate a personalised and interactive professional development programme that captivates learners at their own pace.

Blended and hybrid learning has seen a surge in popularity since the outbreak of COVID-19 pandemic, as it provides learners with increased flexibility and diversified methods to engage with the learning materials. Additionally, this learning mode enables learners to personalise their learning experience according to individual preferences and needs. However, designing effective blended or online courses that maintain student engagement and motivation can be challenging. In Xi'an Jiaotong-Liverpool University (XJTLU), a group of educational developers experimented with incorporating interactive learning content using emerging technologies such as H5P, along with the implementation

of gamification elements, to make asynchronous learning experience more interactive, enjoyable, and engaging.

The course to be adapted is called Active Learning and Student Engagement and is part of the Advance HE Fellowship programme at XJTLU. In completion of the programme, participants (teachers in the university) will be awarded the Fellowship, which is often necessary for employment as an instructor in UK-style institutions. The course goal is to introduce a few active learning strategies and showcase how technologies can be used to make the activities more engaging, enjoyable, and inclusive. Furthermore, the course aims to encourage participants to reflect on how they may integrate these strategies into their own teaching practices.

In its previous format, the course was delivered through a

two-hour workshop, during which the instructors would introduce the activities and technologies through hands-on experiences. However, choosing activities and technologies to include in a mere two-hour workshop proved to be difficult due to the abundance of options available and the diverse interests of the participants. To address this limitation, a creative solution emerged: transforming the workshop into an asynchronous course designed as a series of captivating digital escape rooms hosted on Moodle, XJTLU's Learning Management System (LMS).

In this revamped format, participants must navigate through various digital escape rooms, progressing from one room to another (Figure 1). Their ultimate goal is to collect the coveted trophy and the attendance code. (Figure 2). To successfully move forward, participants must not only

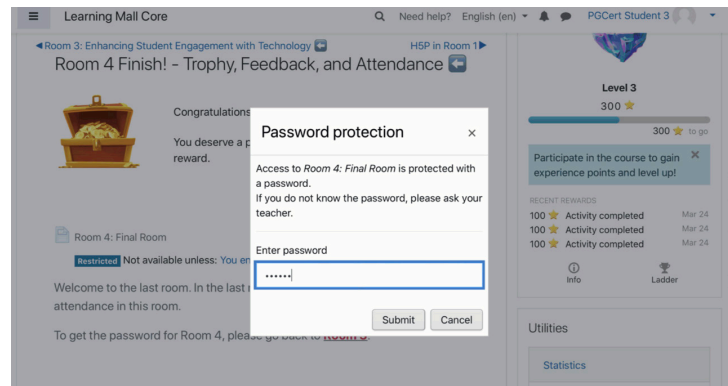


Figure 2. A snapshot of students being prompted to enter the password for a digital room

engage with their preferred learning materials but also demonstrate their level of acquisition of specific knowledge by entering the correct password for the next room. This innovative approach provides an

immersive and interactive learning experience, allowing participants to explore at their own pace and actively demonstrate their understanding and mastery of the course content at the same time.

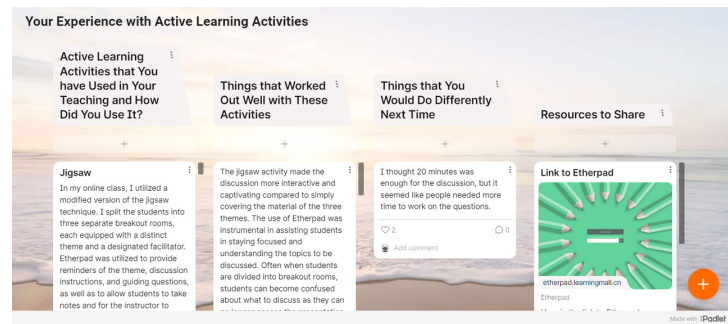


Figure 3. A snapshot of the Padlet activity in which participants can share their ideas and experiences

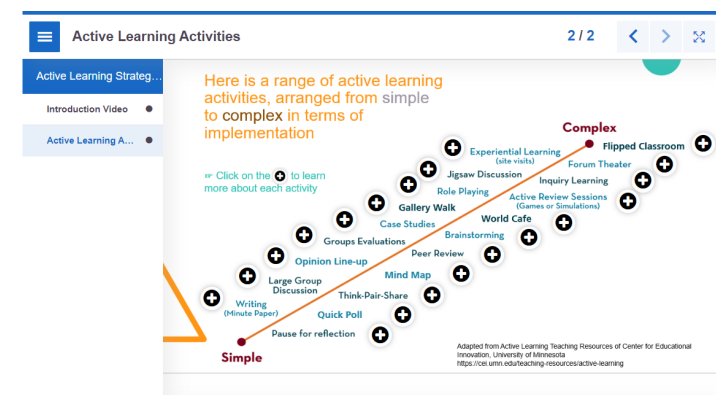


Figure 4. A snapshot of the interactive book activity in which the learners will be able to click on the '+' to learn more about the activities of their choice, and scan the QR code to play with the H5P activity

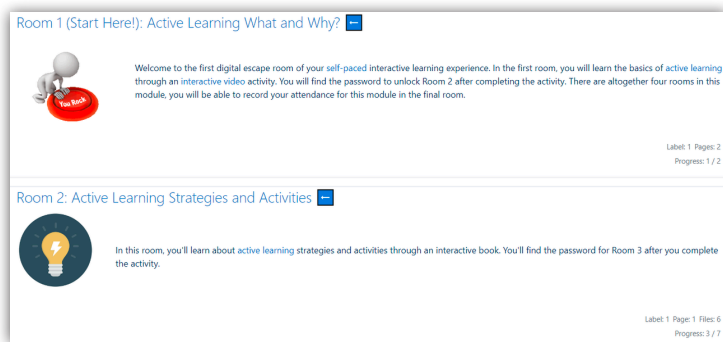


Figure 1. A snapshot of the first two digital escape rooms

Inside each room, participants can immerse themselves in a wealth of interactive resources. Engaging in animated videos where quizzes are seamlessly incorporated can promote active learning and provide a real-time assessment. In addition, a network of links serves as a guide to supplementary materials, unveiling comprehensive insights and fostering a deep understanding of the course topics. Students are given the freedom to explore interactive resources, which allows them to handpick and customise their learning experiences with the active learning activities that intrigue them most. Besides, they can interact and collaborate with their peers through an embedded Padlet, which offers participants a platform to collectively construct knowledge and share teaching practices, fostering a dynamic and enriching learning community (Figure 3,4).

To infuse excitement and enhance the visibility of learning progress, we used the 'Level up!' function in Moodle (Figure 5). Upon completing activities, participants can earn badges and accumulate experience points, adding a sense of achievement and progression to their learning journey. Both participants and instructors can monitor their accomplishments and track progress through a leader board. This leader board fosters a sense of healthy competition, motivating participants to strive for excellence and showcasing their educational milestones.



“Students are given the freedom to explore interactive resources, which allows them to handpick and customise their learning experiences with the active learning activities that intrigue them most.”

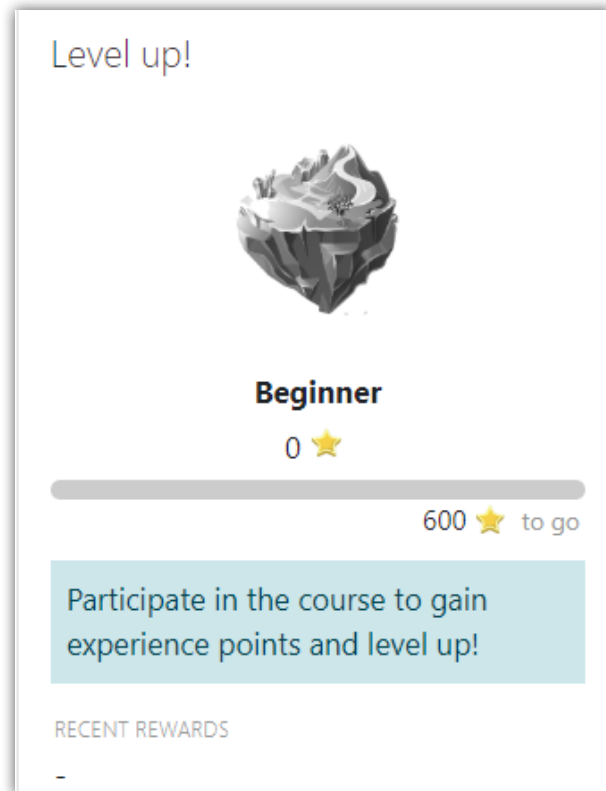


Figure 5. A snapshot of the 'Level up!' function with badges, points, and leader board

Within the course, the course development team at XJTLU incorporates meta-design tips to showcase the thoughtful construction of activities. These tips serve as a guide for learners who appreciate specific design elements and wish to explore and implement similar approaches in their own teaching practices. By sharing these insights, the team empower the participating educators to adopt and incorporate successful design strategies, thus cultivating creativity and innovation in their own educational endeavours.

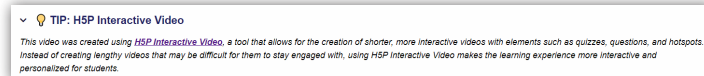


Figure 6. A snapshot of the meta-design texts using the H5P Accordion activity. The text is collapsible

Learners found that the use of H5P improved their performance, productivity, and effectiveness in learning (Figure 6). To evaluate the impact of this innovative approach, a survey was conducted among the 51 participants in the course. The findings with a 67% completion rate demonstrated a strong positive response from learners, with an 80% satisfaction rate towards the learning materials, 84% towards the activity design, and 76% towards the layout. Participants also expressed their appreciation for the interactive nature of the H5P activities and the escape rooms as they found the H5P features efficient in ensuring focused engagement with the learning materials. One participant wrote, 'Finding the password to escape from one room is a very efficient way to make sure learners really pay attention to the learning materials.' Another participant also wrote, 'I like the interactivity and engagement that are afforded by H5P activities. For example, I can spend more or less time on any questions or activities in class or out of class depending on my preference and interest.' The survey results also suggests that self-paced learning relieved the stress of a real-time workshop. 'I can try many times for certain questions,' a participant said, 'no pressure from peers or teachers when answering the question.'

However, the survey also sheds light on a challenge in course design: the need to expand assessment beyond lower-order thinking skills to encompass higher-order thinking skills within the password-enabled escape room.

Designing an asynchronous course goes beyond simply compiling videos on a website or a learning management system. It entails a meticulous approach, involving the strategic chunking of learning materials, thoughtful content structuring, and the incorporation of elements to track learners' progress. Leveraging digital escape rooms, gamification elements, and H5P has proven highly effective in creating engaging and enjoyable self-paced learning experiences within asynchronous courses. These innovative tools serve as vehicles to enhance learner engagement, making

the journey both captivating and fulfilling.

We will also look towards the future and introduce the concept of deep gamification (gamification considered along a spectrum as it embodies Webb's (1997) Depth of Knowledge) as a guiding principle of design for learning to ensure that digital learning activities are constructively aligned.

The idea is that gamification and competition are a starting point but insufficient for gamified curriculum and learning design, as some participants engage in competition

for their own sake rather than for learning. Deep gamification (Figure 7) calls for the game, scores, completion, and involves the demonstrations of stated learning outcomes, rather than merely the solution to puzzles or achieving high scores in competition. The essential aspect of this depth is that it reaches all learners through the game by requiring students to express their conceptual knowledge of learning outcomes as a component of game design for learning. A further step is to involve students in game design and test play.

DEEP GAMIFICATION

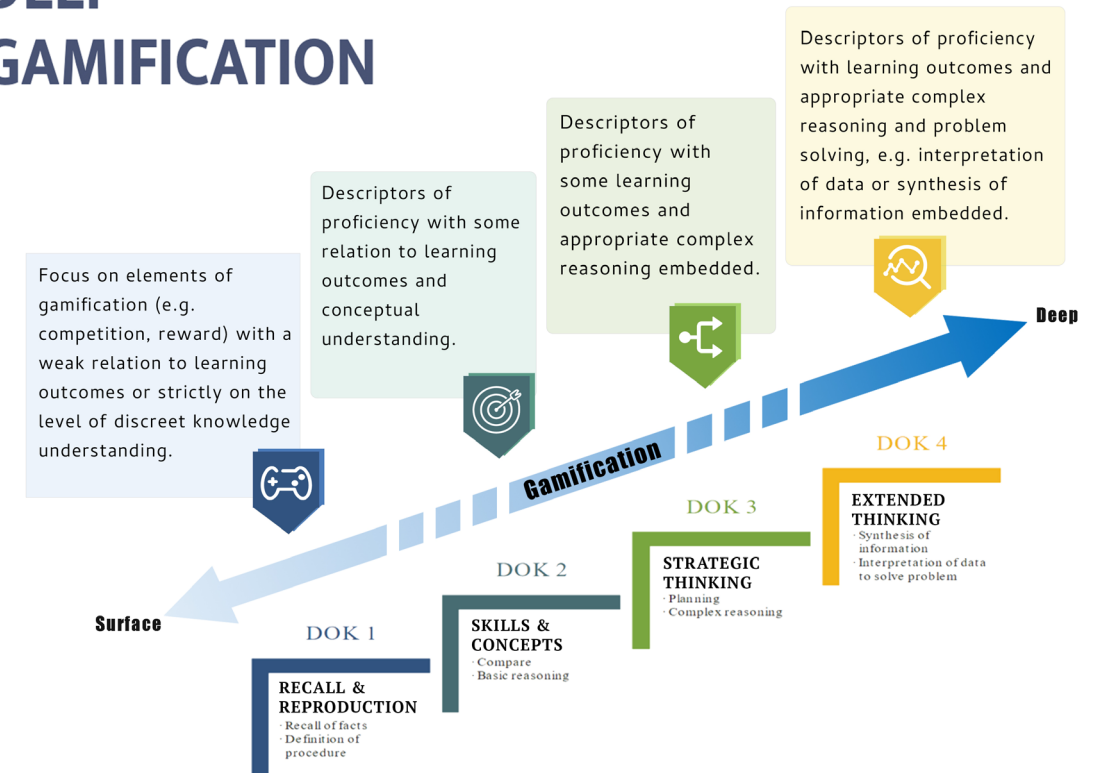


Figure 7. the Deep Gamification concept

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Cloud Computing Certification Aims to Improve the Digital Capabilities of Universities

About the author



OS-EASY Group Holding Ltd. (hereafter referred to as: OS-EASY) was established in 2013. As a participant in the formulation of China's cloud computing technology standards and developers of educational cloud computing technology, OS-EASY has become one of the leading brands in education desktop cloud field. The company deeply integrates digital twin technology, cloud computing, IoT, big data, etc., to provide technical and course support for the setting of cloud computing majors in colleges and universities, and offer the talent training for cloud computing lecturers and students. In the future, OS-EASY will continue to promote the application of cloud computing practical teaching, ICT management and service models to the practice of cloud computing capabilities.

Challenges faced by cloud computing talent training

With the rising trend of cloud computing technology, the demand for relevant talent has increased in various industries. In response, many universities have accelerated the training of front-end technical talents in new fields. However, cultivating practical and innovative talents that meet social needs still faces many challenges.

With the rising trend of cloud computing technology, the demand for relevant talent has increased in various industries. In response, many universities have accelerated the training of front-end technical talents in new fields.

■ There is a lack of ICT managers and lecturers for cloud computing in colleges and universities.

■ Knowledge acquisition in the field of cloud computing lacks systematic courses and practical environment support, and it is difficult to achieve 'unity of knowledge and action' in learning.

■ With the rapid development of society, the learning of knowledge and skills is becoming increasingly fragmented, while systematic and long-term learning is highly time-consuming and poses difficulty for learners in taking a large amount of time to concentrate on their studies.

■ How to create cloud computing technology training in vocational teaching, night school, online school, continuing education in colleges and universities to empower teaching & learning anytime and anywhere, and achieve the goal of lifelong education?

OS-EASY Cloud Computing Certification System

OS-EASY experts and UNESCO-ICHEI jointly launched a series of micro-certifications on topics including cloud computing, desktop cloud and big data to meet the demand of the workforce. The micro-certification course system combines theory with practice. The course learning characterises instant learning, structured knowledge and splitting, which can improve skill development (Figure 1).

Through OS-EASY ICTE micro-certification examination and training, a group of high-level interdisciplinary talents who are innovative and tech-savvy that meet the demand of job markets have been trained to support the high-quality education development. OS-EASY certification will plan and create technical talents in the field of cloud computing from the global

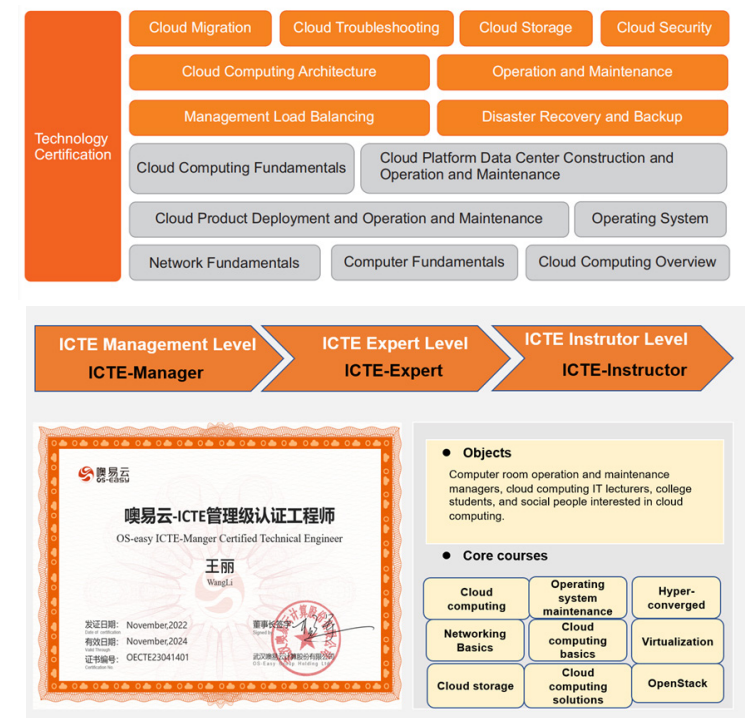


Figure 1. ICTE certification system architecture

The OS-EASY ICTE Micro-certification Courses

OS-EASY ICTE (ICT Education) micro-certification provides comprehensive online learning for multiple fields such as cloud computing, desktop cloud, big data, so as to realize online learning anytime and anywhere, and test the learning outcomes through examination + practice. With no prior knowledge required, you can learn cutting-edge technical knowledge such as cloud computing, network, storage, and KVM virtualization technology, which helps students, teachers, and educational practitioners master the principles, installation, and use of desktop cloud-related technologies to quickly obtain scenario-based skills.

<https://www.iioe.org/#/home/more/layout/isbranchaef30191-7702-419d-94f3-9a7d2b245f09>





OS-EASY Signing MOU with Hubei University of Technology © OS-EASY

dimension of cloud computing. Three certification levels are identified: ICTE management level, ICTE expert level, and ICTE Instructor level, covering multiple relevant cloud computing technologies.

OS-EASY Cloud Computing Capability Certification —— Features of the ICTE Micro-Certification

■ **Adhere to the ICTE trends and cutting-edge technologies, covering cloud computing, big data, virtualization technology, and other technical directions.** Each certification course has specific knowledge points.

■ **One-stop online video learning and online examination, providing scenario-based experiment manuals:** OS-EASY ICTE micro-certification is designed for developers and partners, providing comprehensive online video learning and online examination, and is easy to operate.

The cloud-based experiments offer real laboratory experience for learners to quickly complete experimentation tasks, and combine theoretical learning with practical operation, so that everyone can truly apply what they have learned.

■ **Multi-role technology learning for students, teachers, administrators, etc.:** Aiming at the actual application scenarios of desktop cloud, the course content is designed by role, so that learners can easily master the core courses and become professionals in specific fields.

■ **Contribute to the ecosystem of teachers' professional development and build a learning society of lifelong learning:** Integrating teachers' formal learning and informal learning, online learning and offline learning, so that teachers no longer become 'isolated islands' in the process of professional development. Moreover, the courses combine resources of teachers, enterprises, educational research institutions and experts, enabling learners to use the fragmented time to learn anytime, anywhere.

University-enterprise alliance

and university evaluation

OS-EASY actively promotes the education-industry integration between universities and enterprises, helping to resolve major structural contradictions between talent education supply and industry demand.

OS-EASY cooperates with 200+ colleges and universities nationwide for exploration and enhanced practice, and has undertaken more than 300 collaborative education projects of the Ministry of Education of China. Projects such as University-enterprise joint laboratories will accelerate the construction of a cloud computing talent education system.

The OS-EASY Cloud Computing Certification ICTE-U Programme helps colleges and universities to train cloud computing capabilities, and jointly promotes the teaching personnel in leadership, cloud computing lecturers, and student certification joint training systems within the university, including curriculum systems, teacher training, and building practical training environment (Figure 2).

The OS-EASY Cloud Computing



Figure 2. Multiple Levels of the OS-EASY ICTE

Certification ICTE-C Programme intend to set up a cloud computing certification center in a certain country, which helps other local colleges and universities across the country to cultivate cloud computing teachers and establish a cloud computing training system.

OS-EASY and Hubei Second Normal University jointly organized the Cloud Computing Python

Practical Training Camp. Through Python learning and practical training, students can master the complete set of development processes such as design, coding, debugging, self-testing, and deployment.

Hu Xing, member of the Standing Committee of the Party Committee and deputy secretary of Hubei Second Normal University

commented: 'University-enterprise cooperation is an innovation in the training system of applied talents, and the best way to combine theory and practice to realize the training of applied new engineering cloud computing talents. The comprehensive practical training project helps the school to have the professional training ability of forward-looking Cloud Computing!'

OS-EASY and Hubei University of Technology jointly established a cloud computing major, through cloud computing professional course learning and practical training, to achieve breakthroughs in professional talent training and professional skills. Chen Yi, a student from the School of Computer Science, Hubei University of Technology, said: 'After graduating from the cloud computing major, I clearly understand the ability requirements of cloud computing-related companies for college students, and my personal practical ability has been greatly improved. I got a position as an IT management architect in a multinational enterprise!'



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02

Deep Dive

- Prof. Zhu Zhiting: Changing the Paradigm of Teachers' Professional Development
- Artificially Intelligent: How a Universal Micro-Credential Framework Can Help Our Education Systems in Better Supporting, Facilitating, and Evaluating Learning and Earning
- Riche-Mike Wellington: Priority Africa on the Move
- Cristóbal Cobo: A Rearview Mirror to See the Future

Prof. Zhu Zhiting: Changing the Paradigm of Teachers' Professional Development

About the author



Professor Zhu Zhiting is a lifetime professor of East China Normal University (ECNU), a Ph.D. Supervisor in Educational Technology, chief expert of the Education Informatization Technical Standards Committee of the Ministry of Education of China, and a distinguished expert of UNESCO-ICHEI. This interview focuses on Professor Zhu's recent research and new concepts. In light of the work direction of UNESCO-ICHEI, Professor Zhu was invited to share his insights and reflections on higher education digital transformation and the empowerment of teachers.

A resilient education system

■ **UNESCO-ICHEI:** You shared the concept of 'adaptability' about education transformation at the International Symposium on Digital Transformation in Higher Education organized by the UNESCO-ICHEI on February 28. The theory implies that the education system should build 'resilience' in the face of external shocks such as pandemics, and that resilience building should be gradually transformed into a 'new normal' of systemic change. How can teacher professional development training enhance the resilience of institutions and the education system as a whole? What should be done?

Prof. Zhu Zhiting: Before the pandemic, the education system had merely considered such problems. However, by

conducting relevant research after the pandemic, we realized that the governmental sectors and institutions at home and abroad had considered how to cope with sudden force majeure factors. That's why many countries have State of Emergency laws for coping with unforeseen circumstances.

There exists a lack of research on resilience in education. As our country has the basic information technology capabilities in emergency actions, we were able to maintain learning despite institutional closure. Inevitably, during the pandemic, our education system encountered various difficulties, but we also gained new experiences. For example, in the past, teachers did not have any experience or capabilities to conduct micro-classes, but they ended up with practical solutions according to local circumstances, such as using mobile phones to make the lessons. This has developed teachers' 'resilience'. As a researcher in

educational technology, we are concerned about how the education system, including higher education, should utilize digital technologies to support these teaching practices, referring to the 'digital resilience' issue.

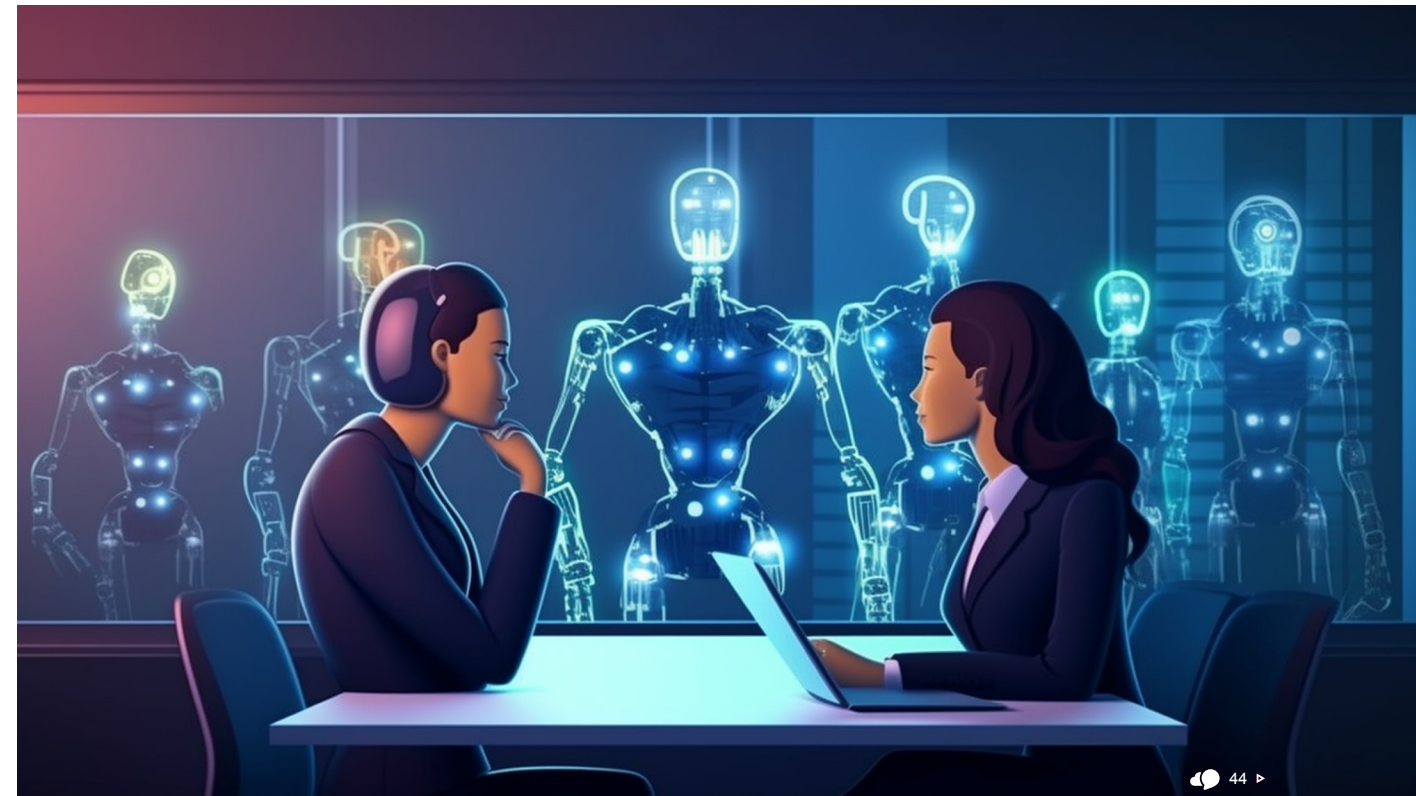
Digital infrastructure construction is key to resilience. Such construction for education in China is not far behind that of most developed countries. But we should also be aware that basic facilities (e.g., network connectivity) alone are not enough. Another aspect is human resilience. Teachers need to develop their digital literacy and skills for providing teaching resources and services in digital contexts. Students need the ability to face complexity, cope with challenges, and deal with risks in the digital world. Therefore, building digital resilience places greater demands on the education system, and raises a top-down question - how can humans thrive in the digital age?

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Building digital resilience places greater demands on the education system, and raises a top-down question - how can humans thrive in the digital age?

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Another debatable concept is 'resilience' itself. Whether 'resilience' is worth promoting depends on its degree. Generally, resilience refers to something being hit and then going back to original position. However, we are not sure whether the education system should go back to 'the original' after the pandemic. We have spent three years supporting learning under crisis, with abundant information technology resources. We should consider how to turn the helplessness of 'not being able to go back' into the awareness of 'not going back'. At present, we are facing digital transformation in education, and we need to think about how the experience, resources, and platform support capacities gained during the pandemic should be transformed to promote digital transformation. Such 'transformation' is meaningful, but also very challenging. 'Resilience' means double effects in this way. If 'resilience' is exaggerated, it might turn to unnecessary adherence to the original position or rejection of new trends. But in the education system, we are more inclined to

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In the education system, we are more inclined to the idea that 'resilience' means openness, flexibility, and adaptivity.

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the idea that 'resilience' means openness, flexibility, and adaptivity.

For 'digital resilience' to be open and flexible, it is important to build an ecosystem for education digital transformation. A sustainable ecosystem should be resilient, and be able to adapt to society and accept human intervention. Therefore, I propose 'building a technology-integrated digital learning ecosystem' as the foundation for developing smart education.

Information technology and teacher professional development activities

■ **UNESCO-ICHEI: You have just shed light on two questions - what is resilience, and why it is important to build an ecosystem for digital transformation. From the perspective of higher education institutions, both questions can focus on teachers. Teachers will resist change if they are too 'resilient'. Therefore, does the professional development of teachers also require a collaborative and holistic ecosystem? Within such an ecosystem, what might be the forms of professional development (PD) activities?**

Prof. Zhu Zhiting: I believe that in terms of teachers' professional development (TPD), China has taken more steps in the basic education stage, represented by the 360 Programme, which provides 360 hours of training for basic education teachers within five years. The '360 Programme' began in the early 20th century, including researching the standardized training for teacher competencies, and several projects to improve



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teachers' IT application skills. Currently, the focus has gradually shifted to digital transformation and innovation. However, it is an undeniable fact that carrying out TPD activities in higher education has been difficult, as the work of university teachers is highly individualized and differentiated.

It is delighted to see the Ministry of Education has launched the pilot construction projects of virtual teaching and research laboratories in colleges and universities since 2020. Till now, there have been more than 600 laboratories under construction. The basic goals include establishing students' moral character, improving talent training capacity, utilizing modern information technology, exploring new forms of organization for the frontline teaching workforce, creating a community of practice for teaching and education quality, guiding teachers to improve their ability, and providing support for the high-quality development. The construction tasks of virtual

teaching and research laboratories include innovating teaching and research forms, strengthening teaching research, co-developing quality resources, and conducting teacher training.

Another question is how to integrate information technology with teachers' professional development in the information age. 'Information skills' used to refer to skills such as image searching and slides production, online course development, etc. After the experience of maintaining learning during the pandemic, most teachers have learned to teach online or create micro-teaching videos, and a number of high-quality MOOCs have been produced for mass teaching. The Smart Education of China Platform (<https://www.smartedu.cn/>) shares online courses selected by Chinese universities, virtual simulation experiments, digital teaching materials, etc. In all, the platform is becoming an ecosystem, while the key step is to develop smart disciplinary tools, especially

virtual simulation modeling software.

One topic I've been thinking about recently is called high-conscious learning. Large language models (LLM) such as ChatGPT are able to answer almost all kinds of questions, but how to describe the questions appropriately to get effective feedback to support deep learning is a process of 'thought programming'. We are investigating how to embed this idea in 'prompts design', which is a new direction of prompt engineering.

Sustainable mindset in talent cultivation

■ **UNESCO-ICHEI: Developing discipline-based tools and relevant smart platforms actually requires for more educational technology development. You just mentioned the lack of**



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subject-based learning support tools and related intelligent platforms, in fact, has placed new requirements for the technical level in the field of education. There are already some mature disruptive technologies on the market, such as GPT 4.0, which, although still a commercial product by nature, have already impacted the education system. Regarding our needs for future talent development, what do you think are the competencies required for college and university faculty amidst the emergence of these new technologies?

Prof. Zhu Zhiting: One dilemma faced by university teachers is the excessive pressure on scientific research, which resulted in lack of time for them to improve their teaching. A few years ago, five professors from different disciplines at the Massachusetts Institute of Technology in the United States jointly put forward the concept of 'building affordable universities', which reflects the problem that the current education system is unable to adapt to the sustainable development of the society. This is because life is divided into three mutually exclusive phases: 30 years of schooling, 30 years of work, and 30 years of retirement. 'Affordability' refers to diversified and personalized development, which requires multiple resources, while information technology offers great support. Currently, the education system in many regions, including higher education institutions, lacks the diversity mindset. For example, high grades are considered as the only goal. The wide range of possibilities offered by digitization can help to break patterns of such linear mindset and create diversified evaluation systems.

The mission of university teachers has four aspects, including teaching, research, social service and cultural inheritance. Teaching and research are the most fundamental ones, but how to balance these two aspects is

a problem for many teachers. Under the premise that many promotion systems focus on research, we may change the teaching style from 'teaching' to 'learning'. The change in teaching style implies not only a change in educational philosophy, but also in the role of the teacher. Teachers should transform from a lecturer to a facilitator to students learn effectively. The future world should be a Cyber-Physical-Social Systems (CPSS) highly integrated with social spaces, learning activities and scenarios will be more diversified in such an ecosystem, which will definitely lead to reconceptualizing teachers' abilities.

■ **UNESCO-ICHEI: In many higher education systems today, there is a rigid requirement for teachers to obtain relevant certifications before joining the system, such as the Teaching Qualification Certificate in Mainland China. However, such qualification exams are generally one-time and only target the entry stage. Yet, if the future teaching scenarios continually change,**

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There was a need for leaner faculty structures in the higher education sector.

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the requirements for teachers' professional development will also dynamically evolve. When a one-time certification is no longer applicable, what methods can we employ to timely and effectively assess teacher capabilities, and even offer appropriate training?

Prof. Zhu Zhiting: Currently, a role-based hiring approach is popular in some companies, where liquid agile teams are formed based on project needs. Rather than hiring talent for fixed positions, talents are hired based on specific skillset roles. This hiring method allows for more refined and flexible management. In the higher education sector, there's a similar trend. Although most higher education institutions still offer tenure-track positions, which essentially means a 'lifelong teaching position', there were proposals last year suggesting the need for leaner faculty structures in the higher education sector. 'Leaner' means fewer tenured teachers, with an individual faculty member possibly serving multiple departments or institutions based on their strengths and capabilities. For any institution that needs to operate, building a detailed employment relationship based on skills and roles is a cost-effective method. Current initiatives or projects including micro-skills and micro-certifications also emphasize cultivating role-based capabilities.

Moreover, the dynamic requirements for teachers' abilities imply that their competencies need to be continually updated and expanded. While certain essential aspects of education, such as care and responsibility, remain unchanged, many skills are transformative. For example, the well-known Bloom's Taxonomy in the field of education initially drew most attention to the 'cognitive domain'. While the framework mostly focused on achieving lower-level goals, there exists a lack of connection between 'affective' and 'psychomotor' domains. However, I believe that if we envision the

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For any institution that needs to operate, building a detailed employment relationship based on skills and roles is a cost-effective method.

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'cognitive domain' as a pyramid, and the 'affective' and 'psychomotor' domains as two inverted pyramids, a perfect coupling relationship can be formed between them. Some foundational knowledge acquisition doesn't inherently possess significant affective or psychomotor value, but many affective and psychomotor objectives can stimulate rich cognitive values.

Recently, I've noticed that skill-based education gradually becomes an international trend. For instance, the OECD has recently introduced an Education 4.0 framework centered around skill-based learning. Stanford University has also proposed the concept of 'open-loop university' in recent years, in which 'axis-flip learning' is an attempt to shift from knowledge-based to skill-based learning. What's so appealing about skills? In brief, while knowledge acquisition does not necessarily drive skill development, skill-based learning stimulates both knowledge acquisition and the formation of attitudes and values. Especially in an era of rapid advancement in artificial intelligence, general

'knowledge' – or the act of acquiring knowledge – has been relatively replaced by machines. Therefore, in this context, skills become crucial.

Possibilities for large-scale education digital transformation

■ **UNESCO-ICHEI: As a UNESCO Category-2 Centre, UNESCO-ICHEI is concerned about the initiatives proposed by UNESCO, such as promoting affordable and equitable opportunities for teacher professional development. Given the current circumstances, skill-based learning demands high standards from training providers. Therefore, for countries that might not have strong resource allocation, providing high-**

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quality training resources poses a significant challenge. Do you think digital transformation is a potential solution to this challenge? Would forming a network of alliances among institutions also be a viable strategy for transformation?

Prof. Zhu Zhiting: In the short term, I believe the essence of digitalization is to de-boundary or break boundaries, allowing everyone to share their outstanding, high-quality resources. However, excellent resources do not necessarily translate into outstanding learning outcomes. Take MOOCs (Massive Open Online Courses) as an example, which are now highly evolved, because of the varying difficulty thresholds of these courses, the target audiences need to be

differentiated. So, when discussing resource supply, we need to consider diversity. The advantage of technology is that it can promote diversity, and supports the large-scale expansion of MOOCs at an extremely low marginal cost.

Technology simultaneously connects physical, information, and social spaces. As mentioned earlier, changes in teaching scenarios lead to shifts in student activity patterns, which subsequently cause transformation in teachers' roles and skill requirements. In Baoshan District, Shanghai, an experiment called 'Peer Smart Teaching' is being tested. Within a teaching team, members skilled in instructional design are designated as instructional designers; those proficient in lecturing and teaching are recognized as lecturers; others,

adept at interacting closely and communicating effectively with students, take on the role of learning companions; there are also roles like support technologist. Teachers from different backgrounds and institutions form a team, and develop teaching plans to be shared with each school.

This approach essentially leverages the advantage of the 'Strengths-Based Development'. A person's weaknesses can't be addressed in a short period; hence, we need to shift our problem-solving mindset. For example, I still can't type with all ten fingers, but that doesn't hinder me from writing papers, and I'm quite prolific at it. Spending a few months intensively training in keyboard typing might be feasible, but I haven't deliberately practiced it. Therefore, I believe

the most cost-effective approach is to form a team of individuals who excel in different areas; because no country can develop a solution once and for all. Only by continuously adjusting the approach, coupled with the support of information technology platforms, promotion at the policy level, construction of technology and ecological environment, and human capacity development, can we form a tailor-made action plan.

Micro-certification: a new pathway for teacher professional development

I have noticed the rise of micro-learning in the international community in recent years, which is a method that integrates (the) advantages of multiple learning pathways. This involves confirming learning achievements through micro-credentials, including micro-certificates, micro-programmes, and nanodegrees. In this way, for university students, it forms a 1+X model, which means one degree/diploma plus multiple skill certificates. The degree indicates your potential, while the skill certificates prove your capability. For those already in the workforce, they can obtain 'Stackable Certificates' through distributed learning to achieve advanced professional qualifications.

At the School of Open Learning and Education of East China Normal

University, we have developed a micro-credential programme targeted at K-12 teachers, which has been promoted nationwide and received positive feedback. Now, in collaboration with UNESCO-ICHEI, we are building on our successful experiences to develop a micro-certification programme focused on digital upskilling for university teachers. Next, we will collaborate with various parties to develop a micro-credential programme for teachers' capacity building in AI-enhanced education.

Artificially Intelligent: How a Universal Micro-Credential Framework Can Help Our Education Systems in Better Supporting, Facilitating, and Evaluating Learning and Earning



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About the author



Rupert Ward is a former Special Advisor to the Royal Household and Project Lead for iDEA (idea.org.uk), one of the most successful digital badging solutions implemented to date, with widespread adoption in over 95 percent of all countries globally, that in 2022 represented a fifth of all digital badges ever issued. He is a National Teaching Fellow and Professor of Learning Innovation at the University of Huddersfield. He has authored two books on personalised learning, led a national project for the UK Quality Assurance Agency in skills, badging and micro-credentialing, and co-developed one of the world's most successful technology acceptance models (GETAMEL). Rupert is an Executive Board Member of the International Council on Badges and Credentials (ICoBC) and is the Executive Dean at the Sino-British College in Shanghai, China.

In the accelerating age of Artificial Intelligence (AI), we must think carefully about the learning fitness of human intelligence. Like physical fitness, learning fitness is something humans must develop and invest in as we journey through life. 'Survival of the fittest' is often misconstrued through an emphasis on physical fitness. Yet, it means an appropriate fitness to the environment and is of utmost importance for an individual's lifelong success. Be it in developing our capabilities for learning success in a formal education context, or the competencies needed to thrive in work contexts, how well people adapt their learning fitness, is

critically important.

The Universal Micro-Credential Framework (UMF) provides a mechanism for current education and work-based systems to address two types of learning fitness. Firstly, how an individual quickly adapts to a rapidly changing environment, and secondly, enabling people to get themselves 'lifelong learning fit'. The UMF helps education and work-based professionals translate current systems to align with changing industry norms and prepare learners for quickly evolving opportunities.

Education institutions need a UMF in part because educational approaches have changed little in two centuries. Education systems were developed in response to a seismic change from an agrarian to an urban industrial economy. Alongside imparting socio-cultural values, as the population coalesced, and an increased recognition of human rights, the predominant focus of formal education was to prepare human capital for work, as countries competed economically. Two of the key challenges, therefore, were a focus on measuring and harnessing human capital. Measurement enabled a small number of people

to be selected to run factories and an expanding government infrastructure; and, to harness the workforce, schools were required to function as a childcare solution, freeing parents to work.

Today, we face another seismic change, one long predicted yet one we are poorly prepared for. In the accelerating age of AI, we must adapt quickly to a fully technology-enabled semi-automated society where many of today's job roles can, and most probably will, be done by or supported by AI and robotics. Once again, we face similar key challenges in today's hyper-competitive environment - How might we more effectively harness human potential? How can we evaluate human performance more effectively?

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We know about the effectiveness of social and experiential educational models, such as observational, dialogic, and participatory models, and yet many in our current education systems fear or aren't enabled to move beyond traditional teaching and learning practices.

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As AI and robotics permanently alter the structure and ways we work and learn, they will also change which competencies are sought, and the capabilities that our educational institutions will invest in and develop for learner agency and success. We must, therefore, look closely at how we might better align and adapt our approaches between formal educational and workplace learning.

Our educational systems are historically predicated on a behavioural model of learning -- knowledge is assumed to be transmitted from teacher (as expert) to learner (as novice), with little learner agency or feedback loops. In the last twenty years, technology, especially since the advent of web-based and social technologies, has, for the most part, made this approach outdated and redundant. Yet, in most (or many) cases, we continue to persist with adopting this learning model even though knowledge can and is developed in a multiplicity of ways. We know about the effectiveness of social and experiential educational models,

such as observational, dialogic, and participatory models, and yet many in our current education systems fear or aren't enabled to move beyond traditional teaching and learning practices. In such an environment, we further assume that learners cannot be trusted to construct, co-create, and lead their own learning, and choose the skills they feel they need to better their lives and the skills expected of them to access and thrive in different employment contexts.

It is because of our rapidly changing socio-technological environment, and the need to accommodate both existing ways of doing things (for now), that we must implement solutions to support and prepare key stakeholders in the education and skills ecosystems: employers, educators, and learners. Learning experiences at school, vocational institutions, colleges, universities and in the workplace will be AI-supported and personalised. This is something the UMF is designed to foster and guide - How might we transition to AI-supported personalised learning?

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Key to the Universal Micro-Credential Framework is understanding current structural impediments, including the gap between what is taught (in formal education), and what is sought (in workplace skills and practices).

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Key to the UMF is understanding current structural impediments, including the gap between what is taught (in formal education), and what is sought (in workplace skills and practices). This we call the

in less controlled contexts (poor weather, heavy traffic, opposite side of the road). In short, there is contextual dissonance.

The Capability-Competency

mapping of a far more personalised, aligned, and comprehensive learner-earner pathway.

This enables us to do something new and innovative. Educational

whether for entry into courses and jobs, or for continuous professional development and re-skilling or upskilling. By personalising more precisely signalling achievement, we can accelerate job progression and facilitate quicker and more meaningful jobs, educational and life transitions.

The UMF leverages existing institutional processes, norms, and language to cross-translate education and work-based achievements into a personalised

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The Universal Micro-Credential Framework leverages existing institutional processes, norms, and language to cross-translate education and work-based achievements into a personalised learner and employment record.

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learner and employment record (LER) -- a digital record of learning and work experiences that can be linked to an individual and combined with other digital records for use in pursuing educational and employment opportunities. As learners curate their LERs into the emerging infrastructure of digital skills wallets or passports, these digital enablers provide a more comprehensive way to collect, access, store, share, and use 'learner-earners' learning and employment information, to access programme, work, and pathway opportunities with fewer barriers. These policy-based

initiatives bring in governments and edtech organisations into the skills and education ecosystems. If codesigned with learners as well as employers and education providers, they may also support individuals with navigating transitions (e.g. education to/from work, work to work). Learners will also potentially have access to more granular skills-based data and information, empowering personalised pathway choices and agency in formal programmes, work-based pathways when creating their own lived learning-work pathway opportunities.



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Capability-Competency Chasm. It exists because educators and employers focus on different things. In education, we mostly focus on developing individual capabilities, in the same way that driving instructors teach you to pass a driving test. Learners demonstrate they are capable of independent driving in a controlled formal context. Employers, however, seek evidence of independent driving

Chasm highlights that educators and employers are using quite different indicators and language (learning outcomes in education develop learner capabilities, performance goals in work develop competencies). The UMF bridges this chasm by using a skills profiling approach to serve as a common language or translator, the missing link, between capabilities and competencies, enabling the skills

institutions can swiftly recognise granularised learning experiences and assets, opening up many opportunities including issuing and recognising badges, micro-credentials and external learning resources (whether learning occurs in education, work, or alternative and informal contexts). Granularised content evidencing the learning experience, can be recognised with micro-credentials in multiple ways,



Granularised learning, as it is more personalised, may also recognise the impact of learning resources developed outside traditional 'educator as expert' approaches, and content more effectively constructed in social settings. These experiences may be both more representative of lived experiences and more accommodating to a learner's neurodiversity as well as the multiplicity of styles, ways, and contexts within which people may learn. This alone will give learners more support, and greater inclusivity because their achievements in these settings more openly recognise a diversity

of backgrounds, identities, prior experiences, and so much more in terms of how learning occurs and is demonstrated throughout one's life.

As we look to the future, the UMF provides a guide. In tandem with a set of design patterns that together form a change management methodology, it offers a blueprint for educational institutions and employers that wish to enable more agency for people to succeed, and on their terms, regardless of where they are on their personalised learner-earner journeys.

By leveraging the UMF we can

have more fruitful conversations regarding the role of automation in education and the workplace, supporting people as they transition. We can better identify and more quickly recognise achievements that we seek to encourage in society, (using badges and micro-credentials as evidences of learning signals and mechanisms for learning-work transitions and lifelong learning). With this enabling framework, such as the UMF that engage multiple stakeholders within the education and skills ecosystems, we are likely to witness access to more equitable opportunities, as well as more motivated and persistent learners

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By leveraging the Universal Micro-Credential Framework we can have more fruitful conversations regarding the role of automation in education and the workplace, supporting people as they transition.

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as their personalised learner-earner journeys become more relevant to their needs, goals, and lived experiences. It will also reflect the greater attunement between the abilities and skills they require for lifelong success, however they define it, and provide for more flexible and cost-effective ways to advance.

We need to improve our learning fitness, by evolving and adapting to meet changes in our environment and by better representing individual achievement. The UMF provides a mechanism to enable us to do this.

Riche-Mike Wellington: Priority Africa on the Move

About the author

Currently serving as the Chief Programme Specialist at the Ghana Commission for UNESCO, **Riche-Mike Wellington** has been a revered technocrat in Ghana and UNESCO affairs over the past 22 years. He began his diplomatic career at the Ghana Commission for UNESCO in 2001 and rose through the ranks to become the Secretary-General between 2013-2017. Mr Riche-Mike Wellington is well recognized for having initiated major UNESCO projects of strategic importance in the education, sciences and culture sectors in the African region, including but not limited to the upgrades to UNESCO Category 2 status of the Institute for Educational Planning and Administration (IEPA) and the African Institute for Mathematical Sciences (AIMS) Ghana.



Mr. Wellington has participated in all UNESCO General Conferences since 2005, providing technical guidance to Ghana delegations, the Africa Group, and the Permanent Delegation of Ghana to UNESCO. He has been

instrumental in Ghana's continuous presence on the UNESCO Executive Board since 2013. As an ardent promoter of international best practices in the UNESCO fields of competence, Riche-Mike continues to advocate for Open

Science and Open Educational Resources in multilateral space to accelerate Africa's development and promote integration and a culture of peace on the Continent.

■ **UNESCO-ICHEI: As the world charted its way to the post-pandemic era, university teachers are forced to directly face the challenge of ensuring a smooth reopening of universities. Could you please give an example to introduce what measures or activities have been implemented in Africa to improve the state of being or to build the capacity of university teachers?**

Dr. Wellington: The COVID-19 pandemic brought about one of the world's most defining moments for education. The unprecedented global health crisis affected every sector of societal life. The UNESCO Institute for Statistics (UIS) estimates that over 1.5 billion students and youth around the world were affected by school and university closures resulting in massive learning losses.

Prior to the pandemic, many African governments and higher education Institutions had deployed distance and digital learning programmes to mitigate the challenge of large class sizes that had characterized the 'brick and mortar' classroom mode of engaging learners in

both public and private spaces. The emergence of the pandemic therefore heightened these learning methods as a response strategy to continuously engage students during the lockdown conditions. These digital transformations presented a good opportunity for African higher education institutions to invest in digital infrastructure to harness its dividends in education. Thus, universities across the African Continent prioritised the development of systems and structures for the continuous capacity building of university teachers and students towards efficiency and mastery in digital learning.

The University of Ghana, the Ahmadu Bello University of Nigeria, and the University of Lagos, Nigeria, embarked on a digitalisation drive to transform teaching and learning in the post-pandemic era. The digitalisation programme included among other schemes equipping classrooms and lecture halls with digital infrastructure and modern information and communications technology (ICT) interactive equipment, including the construction of hotspot comfort zones on campus to facilitate digital

teaching and learning.

Regarding faculty members, there was capacity development in the adoption and utilisation of digitalised methodologies. Periodic training was organised on the use of the universities' learning management systems (LMS) and relevant platforms. Newly appointed faculty were trained on digital competencies including the use of digital equipment for teaching and learning. Meanwhile, training and coaching were conducted for intermediate and advanced-level faculty members in these universities and lecturers were encouraged to participate in online webinars to familiarise themselves with online engagements. Another useful initiative was the appointment of e-learning ambassadors in various departments to serve as champions and focal points to lead the digital transformation agenda of these universities.

In distance education, tutors and staff were prepared through training on various themes to design and deliver online instructions using appropriate instructional methodologies in the digital space. Tutors were trained in courseware

Ghana Commission for UNESCO

The Ghana Commission for UNESCO started as a Committee for UNESCO Affairs in 1953 when Ghana became an Associate Member of UNESCO. On 11 April 1958, when Ghana attained full membership of UNESCO, the Ghana Cabinet approved the reconstitution of the National Committee under the new title 'Ghana Commission for UNESCO'. National Commissions are unique institutions found in all Member States of UNESCO serving as the official link between their Governments and UNESCO. The Ghana Commission for UNESCO is an Agency under the Ministry of Education. (cr. Ghana Commission for UNESCO)



design and interactives, innovative online practices, as well as online assessment tools and practices. Attempts were equally made to support students in these universities to effectively engage in online learning.

■ **UNESCO-ICHEI:** It's great to learn that actions are taking place at different levels and that there are already actions turning to be successful practices. In the context of Africa, there are multiple initiatives, including the Teacher Task Force at UNESCO which you're involved in, aiming to facilitate university teachers in the transition and transformation process. As the Chief of Programmes at the Ghana Commission for UNESCO, what are your and your organisation's roles in these initiatives?

Dr. Wellington: My role as the Chief of Programmes at the Ghana Commission for UNESCO in these interventions was situated in that of the Commission as a liaison office for the government of Ghana on UNESCO matters. The Commission facilitates contacts and creates the needed interfaces among the many actors in education service delivery. National Commissions for UNESCO have had a critical role in contributing to the Global Priority Africa Programme, including the prospects to engineer partnerships and funding to address the challenges of the Continent, particularly, issues relating to the Education 2030 targets.

Convinced of this role, the Commission and key stakeholders on the Continent, including UNESCO, organised the Africa

Regional Conference on Global Priority Africa in September 2022 to strengthen the relevance, effectiveness, and overall strategic positioning of the Global Priority Africa Programme to address Africa's contemporary challenges. The conference adopted the present Accra Declaration which converges the common strategic priorities and outlines a clear agenda for African National Commissions for UNESCO to contribute to reimagining the Global Priority Africa Programme for the benefit of the Continent. Among the key issues at the conference was Priority Africa Flagship Programme 1 - 'Campus Africa', where African key stakeholders urged UNESCO and partners to support its effective implementation, including the creation of a common digital platform as well as capacity strengthening in

digital competencies in Africa. The strengthening of African higher education digital transformation is rooted in the Africa Union's Vision 2063 towards 'an integrated, prosperous and peaceful Africa, driven by its own citizens and representing a dynamic force in the global arena'.

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The strengthening of African higher education digital transformation is rooted in the Africa Union's Vision 2063 towards 'an integrated, prosperous and peaceful Africa, driven by its own citizens and representing a dynamic force in the global arena'.

African Institute for Mathematical Sciences (AIMS)

Founded in 2003, the AIMS Global Network has already expanded to South Africa, Senegal, Ghana, Cameroon, and Rwanda with hopes to catalyze the socio-economic transformation on the Africa Continent. AIMS has been recruiting and providing top African talents with the skills, knowledge, networks, and inspiration to take up careers in teaching, industry, business, and governance. The activities of AIMS Ghana as a UNESCO Centre of Excellence Category II, focus on six distinct but inter-related institutional strategies: postgraduate training; cutting-edge research for innovation and solution in Africa; industry leading academic partners; impactful public engagement; communication that drives results internally and externally, and organizational excellence for sustainability. The unique training programme teaches analytical thinking and problem-solving skills which exposes students to many applied fields relevant to Africa's socio-economic transformation. The mission is to enable Africa's brightest students to flourish as independent thinkers, problem solvers and innovators capable of propelling Africa's future scientific, industrial, educational, and economic self-sufficiency.

The Commission also facilitated Ghana's participation in the UNESCO Imagine Learning programme – an e-learning initiative for Anglophone West Africa supported by UNESCO, UNICEF, and the World Bank. It seeks to establish a sub-regional platform for Gambia, Ghana, Liberia, Nigeria, and Sierra Leone and develop tools and resources for strengthening the capacities of teachers and school leaders in open-source distance learning. The programme helped to build the capacities of over 5000 teachers in the five participating countries in the West Africa sub-region.

driven by its own citizens, representing a dynamic force in the international arena', indicating the significance of bottom-up, collaborative efforts in regional development. Established in 2012, AIMS Ghana is an Africa-based network for postgraduate training, research, and outreach in mathematical sciences. Taking the AIMS Ghana as an example, how does African higher education establish a network and collaborate closely?

Dr. Wellington: The establishment of the African Institute for Mathematical Sciences (AIMS) in Ghana was influenced by Ghana's strategy to promote economic development by creating a knowledge-based economy driven by technological advances. AIMS recognises that science and technology are powerful forces for progress in the global economy,

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■ **UNESCO-ICHEI:** As you've introduced, in its Agenda 2063, the African Union has updated the vision of 'The Africa We Want', quoted 'an integrated, prosperous and peaceful Africa,

Performance on the Regional Meeting of African National Commissions for UNESCO (© Ghana Commission for UNESCO)



while mathematics underpins a large part of modern life. Without sufficient mathematical training, Africans will be unable to access the full power of new technologies to solve contemporary problems. Besides, Africa's greatest resource is its people.

The AIMS Ghana Centre is thus addressing developmental challenges in Science, Technology, and Innovation (STI) capacity building through education. Capacity in these fields is pivotal for Africa's transformation and for 'The Africa We Want.' Africa's continued low investment in science and technology is manifest in the declining quality of science and engineering education at all levels of the educational system.

The AIMS Ghana programme is designed for young talented African youths who reside in Africa. Students are admitted from diverse backgrounds in Science, Technology, Engineering and Mathematical Sciences (STEM). To be admitted at AIMS Ghana, the applicant must be a national from an African country, 30 years of age or below, and have a university degree in mathematics, physics, computer science, engineering, business, or other scientific fields, but with a substantial mathematics component. Within the selection process, AIMS Ghana strives to ensure regional and gender balance by recruiting 30% of the applicants from the host country (including females) and at least 30% females from diverse regional, national, and cultural backgrounds. It is only when higher education institutions or relevant entities are internally diverse in the first place can they genuinely learn and benefit from meaningful multilateral collaborations.

AIMS develops scientific, technical, and entrepreneurial competence by creating a critical mass of well-rounded scientists

with excellent problem-solving skills, capable of creative thinking and genuine innovation. The AIMS model emphasises partnerships and collaboration, so AIMS Ghana collaborates with both national and international universities as well as industry. The academic partners are involved in curriculum development, research, student recruitment, lecturing, assessment, evaluation, grading, and award of degrees. Industry partners are involved in joint research, workshops, seminars, and internships of mutual interest.

The AIMS network connects with tertiary education institutions across Africa for graduate recruitment, research collaboration, and academic exchanges. To harness the objective of using home-grown solutions for Africa's development, it is imperative for African leaders to avail resources to AIMS and sister institutions to build the capacity of young Africans, especially in mathematical sciences, for sustainable growth.

■ **UNESCO-ICHEI: Following the thread, AIMS Ghana has also achieved significant results as an important player in this regional partnership while functioning as a UNESCO Category II Centre. What can UNESCO Category II Centres do in the participation of pan-Africa or even global networks?**

Dr. Wellington: As a UNESCO Category II Centre of Excellence, AIMS Ghana focuses on creating an ecosystem of transformation - one that directly enables the transformation of Ghana and Africa by building human capital and skills in Science, Technology, Engineering and Mathematics (STEM). Through this partnership, AIMS Ghana has extended its programmes to meet the needs of educators in Ghana through the Master of Mathematical Sciences for Teachers programme. The objective of the programme is to equip mathematics teachers

at the secondary level with 21st-century mathematical skills toward improved content and methodology in teaching mathematics, as well as facilitate an in-depth understanding of mathematical foundations relating to core secondary school curricula and applications of modern mathematics.

As of December 2022, AIMS Ghana had graduated 497 young men and women from 27 African countries, 33% being female. In a recent longitudinal study of AIMS Alumni, 68% remained in Africa contributing to the Continent's growth and sustainability. The top five areas where AIMS alumni are contributing to the African economy are higher education, ICT (mainly Data Science), academic research, finance, and health.

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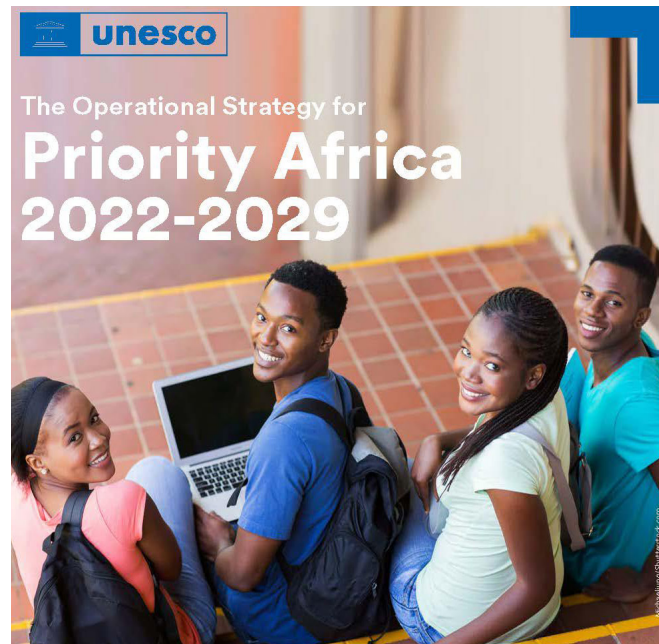
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▼ Globally, women make up about 28% of the workforce in science, technology, engineering, and math (STEM), and men vastly outnumber women majoring in most STEM fields. AIMS Ghana and its partners have held a historic forum across three major university campuses in Ghana to commemorate the 2023 International Day of Women and Girls in Science (IDWGIS) on 10th February 2023. (© AIMS Ghana)

UNESCO Operational Strategy of Priority Africa 2022-2029

Africa is one of UNESCO's two global priorities, along with gender equality. The *Operational Strategy for Priority Africa 2022-2029* published in 2022 has been developed based on consultations with Member States, including the UNESCO Africa Group, programme sectors at Headquarters, field offices in Africa and the Bureau of Strategic Planning. It also took the evaluation of the previous *Strategy 2014-2021* conducted by the Internal Oversight Service into account. This Operational Strategy contains introduction of the general background, implementation plan, relevant stakeholders, as well as flagship programmes. To achieve 'an integrated, prosperous and peaceful Africa, driven by its own citizens, representing a dynamic force in the international arena', Africa will need to address innovatively the major challenges it faces, while seizing the opportunities they present.



The work of AIMS Ghana as a UNESCO Category II institute reinforces the Campus Africa programme under the Operational Strategy of Priority Africa, which is briefly mentioned in the first

question. It is time for AIMS to also review its face-to-face learning approaches and integrate technology into blended approaches to increase access and participation in its well-sought-after programmes

across the Continent. This is where UNESCO and its global partners could explore strategic collaborations in the context of Campus Africa to push forward the Global Priority Africa agenda.

■ **UNESCO-ICHEI: With tremendous advancement in technology, there is an increasing number of organisations and programmes worldwide starting to provide free and accessible learning resources for socio-economically marginalised groups. In addition to AIMS Ghana's equitable admission policy that we've just discussed, what are some existing gaps and corresponding strategies in Ghana to ensure inclusivity and accessibility, especially in remote or disadvantaged areas, to reach and train teachers and education managers?**

Dr. Wellington: In 2018, Ghana set out to reimagine teaching and learning to meet the demands of 21st-Century education in a 12-year strategic plan – '*Education Strategic Plan (ESP) 2018-2030*'. The aim of ESP, among others, is to improve equitable access to and participation in inclusive education at all levels.

There are existential gaps in the teacher-to-pupil ratio in Ghana as projected by UNESCO. Also, UNESCO data on trained teachers in Ghana projects below the world average. The face-to-face delivery approach to training, coupled with the limited infrastructure and spaces in the training schools' places limitations on access to education by all persons interested in teacher education. The Covid-19 pandemic has only served to exacerbate this need.

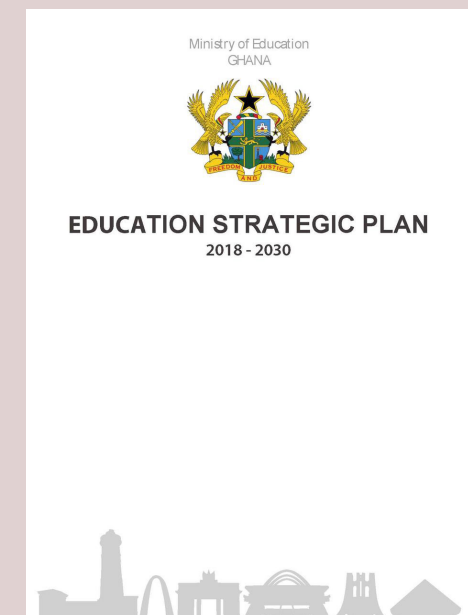
Teacher education in Ghana has undergone many reforms involving curricular changes, restructuring of teacher education institutions, and upgrading the three-year diploma qualification into a four-year Bachelor of Education degree to raise the status among those considering a career in teaching. Currently, there are 48 colleges of education and two universities using one common educational curriculum for basic and secondary school education.

All colleges in Ghana adhere to the principles of inclusiveness in education. Access to colleges of education in Ghana is open to all

people who meet the requirements for admission – holders of the West Africa Secondary School Certificate Examination need

Ghana Education Strategic Plan 2018-2030

The Education Strategic Plan (ESP) 2018–2030 for Ghana is the third in a series of strategic plans that have been produced since 2000 and follows from the ESP 2010–2020. The latest version of the ESP integrates the changing social, economic, and educational landscape domestically and internationally, and incorporates the most updated timeframe for the Sustainable Development Goals (SDGs). With a series of four-year implementation plans, the ESP represents the consensus among internal and external stakeholders regarding the need to raise learning outcomes and standards in all educational institutions, and at all levels of education, and to ensure that no child is left behind. There are three defining themes running through ESP 2018-2030, namely focusing on improved learning outcomes, prioritising policies and resources given limited capacity, and raising awareness for efficient education systems with relevant reforms.



credit passes (A1-C6) in Six (6) subjects comprising Three (3) Core subjects, including English Language and Core Mathematics, and Three (3) Elective subjects relevant to the course of study. The government provides monthly stipends to students at the colleges of education to support their upkeep and practicum sessions.

In the same vein, education managers are experienced teachers who have opted to go into management or individuals who have attained higher education qualifications with specialised skills in school leadership, accounting,

and management. The Institute of Educational Planning and Administration (IEPA) – a UNESCO Category II Institute – for instance, is mandated to train education managers and administrators in Ghana. Access to higher education is open to all Ghanaians who meet the requirements for education and can pay the requisite fees for the period of study.

■ **UNESCO-ICHEI: Besides quality and equitable education, lifelong learning has now become another buzzword. We are excited to learn that Accra, the capital city of Ghana, has been**

nominated as the World Book Capital of 2023 by UNESCO, which is a renowned initiative encouraging the comprehensive development of city residents through the continuous creation, sharing and dissemination of knowledge through lifelong learning. What role do you think higher education, or the digital transformation of higher education, can play in boosting lifelong learning and a sustainable community?

Dr. Wellington: The concept of World Book Capital by UNESCO acknowledges the power of books and reading as cornerstones to a

more inclusive, equitable, peaceful, and sustainable society. The World Book Capital Network (WBCN) cities are thus committed to promoting freedom of expression, copyright, education, and knowledge sharing through books and reading as cornerstones to achieve a more inclusive, equitable and sustainable society. The Book Capital concept, while contributing to the culture and wealth of Ghana also presents an opportunity to develop the book and creative arts industries as well as skill-up the youth through the transformative power of reading for societal development. Furthermore, due to its diverse linkages, the Government of Ghana and its development partners have seized the opportunity to deepen actions to advance the SDGs.

Higher education as knowledge hubs play a central role in societal transformation for sustainable development. Through education and lifelong learning opportunities, individual members of society are equipped with the knowledge, skillsets, and mindsets necessary to navigate societal problems for development. For that reason, Ghana, for example, was intentional in choosing the theme of the Accra World Book Capital - 'Reading to connect minds for Social Transformation' – the theme which resonates with UNESCO's mission to *'build the defences of peace in the minds of men and women'* highlights the importance of the transformative power of books and the culture of reading to changing mindsets as well as creating bonds for peace and development. Higher education is better placed to champion this course, particularly in Africa.

Digitalisation has also proven to promote access, inclusivity, and equity in higher education in Ghana. For this reason, the government of Ghana strives to balance equity and inclusion in education, by creating the enabling environment for stakeholders to continuously engage in the higher education

space towards achieving the goal of Ghana becoming a 'learning nation'. To increase equitable access to tertiary education, state and non-state actors are harnessing the power of technology in distance learning. With EdTech solutions, investments related to the construction of schools and classrooms could be extended with a focus on efficacy. Some have

zero-rating of the cost of internet data for educational purposes. On the issue of evidence of learning, there is a need for capacity-building in digital content development, particularly for Africa where traditional educational materials could be converted digitally to immediately applicable, evidence-informed, bite-sized modular content, with robust assessment

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Traditional educational materials could be converted digitally to immediately applicable, evidence-informed, bite-sized modular content, with robust assessment tools, for easy accessibility and appreciation by students and faculty.

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argued about equity considerations relating to the cost of internet data, as well as how to prove evidence of learning in this digital learning approach. To address these equity considerations, government partnerships with telecommunication companies have resulted in some cases the

tools, for easy accessibility and appreciation by students and faculty – this is where I see UNESCO-ICHEI and partners leading the way to explore partnerships with African governments and Higher Education Institutions in this area.

UNESCO World Book Capital

UNESCO adopted the 31 C/Resolution 29, in 2001, establishing the World Book Capital (WBC) programme and naming Madrid as the first WBC city in 2001. Cities designated as UNESCO World Book Capital undertake to carry out activities with the aim of encouraging a culture of reading and diffusing the Network's values in all ages and population groups, both within and beyond national borders. Through the WBC programme, UNESCO acknowledges a city's commitment to promote books and foster reading during a 12-month period (between one World Book and Copyright Day, 23 April, and the next) as well as into the future. In September, 2021, the Director-General of UNESCO, Audrey Azoulay, named Accra (Ghana) as UNESCO World Book Capital for 2023, following the evaluation of the World Book Capital Advisory Committee. To learn more, please kindly find the attached article by Sarah Osei and Riche-Mike Wellington, Reading is Given a Big Boost in Accra, Ghana.



Accra World Book Capital, 2023





Activities for Accra World Book Capital 2023 will include the introduction of mobile libraries to reach marginalised groups, the holding of workshops to promote reading and writing of books in different Ghanaian languages, the establishment of skills and training centres for unemployed youth and the organisation of competitions to showcase Ghanaian arts and culture and promote inclusivity. (© UNESCO, 2023)

Higher education digital transformation in distance learning methods has the potential to address complex challenges which otherwise could not be easily addressed using traditional methods. Micro-credentialing approaches as a tool to address the continuous professional development of untrained teachers in the private sector space of African countries could be one of the innovative ways of addressing the continuous development of teachers in Ghana and Africa as a whole.

■ **UNESCO-ICHEI: Could you please take one or two more examples to elaborate in detail**

how these programmes or strategies will help to address the needs for lifelong learning and open education resources in Africa, especially called by teachers and education managers?

Dr. Wellington: To keep pace with the rapid changes in education matters, it is important to institute measures for the continuous improvement of teachers and education managers to catch up with global trends and embrace digitalisation to mitigate the education gaps. Micro-credentialing approaches to teacher development must be explored to address gaps in teacher education. *The*

UNESCO Recommendation on Open Education Resources framework allows government collaboration within Member States to support open-licensed teaching and learning materials adaptable to deprived communities. In this direction, it is important to embrace EdTech solutions to the delivery of education to address the gaps in access and inclusivity in the face-to-face approach.

I can take the work of Instill Education in Ghana, Kenya, and South Africa as another example; Instill Education sets the pace of leveraging technology to improve access, quality, community, and continuous professional

UNESCO Recommendation on Open Educational Resources (OER)

As defined by UNESCO, Open Educational Resources (OER) are learning, teaching and research materials in any format and medium that reside in the public domain or are under copyright that have been released under an open license, that permit no-cost access, re-use, re-purpose, adaptation and redistribution by others. *The Recommendation on OER*, adopted by UNESCO's General Conference at its 40th session on 25 November 2019, is the first international normative instrument to embrace the field of openly licensed educational materials and technologies in education.

To support its implementation among Member States, UNESCO established the OER Dynamic Coalition to support networking and sharing of information to create synergies around the 5 areas of action of the recommendation: (i) building capacity of stakeholders to create, access, re-use, adapt and redistribute OER; (ii) developing supportive policy; (iii) encouraging inclusive and equitable quality OER; (iv) nurturing the creation of sustainability models for OER, and (v) facilitating international cooperation.



development of teachers and school leaders in hard-to-reach communities. Considering the diversity and sparse location of higher education facilities, coupled with issues of limited infrastructure and education finance in low-income countries in Africa, enabling open distance and digital learning approaches to teacher and education manager

training will increase access, enhance digital skills of trainees, and complete coursework at their own pace and leisure, allowing them to prioritize careers, family, and other societal responsibilities. What is more urgent, is the need for African governments and the telecommunication community to collaborate toward making internet connectivity more affordable and

accessible to enable institutions to benefit from cyberspace interactions effectively.

Additional Reading: Reading is given a big boost in Accra, Ghana

About the authors

Sarah Osei, Regional Lead, Instill Education (West Africa) & Riche-Mike Wellington, Chief Programme Specialist, Ghana Commission for UNESCO. This blog post was first published in the biweekly newsletter Education in Africa, hosted by Riche-Mike Wellington, with minor edits.

Accra, the capital city of Ghana, has been named as the UNESCO World Book Capital for 2023, the fourth city in Africa to receive this title. The title stemmed from a presentation of a strong programme in the city targeting young people and their ability to contribute to the culture and wealth of Ghana through the transformative power of reading and creative writing. The winning of this title demonstrate the giant strides Ghana and Africa are making in developing the book and creative arts industries, as well as skillup the youth for socio-economic development.

The programme targets marginalized groups that have high levels of illiteracy, including women, youth, street children, and persons with disabilities. The year-

long programme seeks to provide institutional support for lifelong learning and stimulate the culture of reading and creativity to positively impact Ghanaian society towards achieving the national goal of becoming a learning nation. The programme is expected to impact about 100,000 children, youth, and adults across the country.

The programme is broken down into six broad thematic areas. The **first** is to transform minds and promote lifelong learning through a series of reading promotion activities targeting the youth nationwide. The **second** is to provide schools and communities with books and reading infrastructure, including the construction of a facility in Accra for reading and creative writing. The **third** is to promote the Florence

Agreement and the publication and use of books in Ghanaian languages to revamp the Ghanaian book industry. The **fourth** is to promote creative skills to address rising unemployment, substance abuse, truancy in schools, and teenage pregnancy among the youth, as well as equip the youth and the disadvantaged with 21st-century skills toward socio-economic transformation. The **fifth** is to promote fundamental human rights to advance the right of access to information through books and encourage the art of publishing. The **sixth** is to safeguard and promote Ghanaian arts and culture towards inclusivity and diversity of cultural expressions within the context of acceptable cultural norms.

Being a World Book Capital

means much more than a reading campaign to many Ghanaians and Africans. For many, it is an opportunity for the government, local and international partners to leverage its diverse linkages to education and culture to deepen collective actions towards meaningful progress in the 2030 Sustainable Development Goals (SDGs). Others have also argued that the project could serve as a catalyst for investment in the creative and cultural sectors to enable this growing sector to provide decent jobs for the teeming young men and women.

As documented in the *National Spotlight Report on Ghana* the government of Ghana is making great strides in education through several interventions such as:

making secondary education free; establishing STEM Centers; developing adapted curricula at all levels; improving the quality of teachers and the teaching profession; and promoting the use of digital technologies to improve access, equity, and inclusiveness to guarantee a just and sustainable society. But there is still much more work to be done to improve the quality of education to make Ghanaian youth competitive and relevant in the changing world of work. It is time for Ghana and African governments to be intentional about developing the skill sets of young people to be creative and innovative citizens successful in this 21st Century society and workplaces.

Ghana has also made progress in literacy development through

drama, poetry recitals, drum language, dance, and choral music - all of which are central to the goals of Accra World Book Capital and present moments for students to use diverse representations for communications. Notwithstanding these successes, the indigenous African culture and the rich Ghanaian heritage are gradually losing value among young people, leading to cultural assimilation with other cultures. In that context, there is the need to support the creative and arts industry to preserve and promote the rich Ghanaian traditional cultures amid the intense acculturation environment. This will help to safeguard Ghanaian and African identity.



▲ H.E. Nana Addo Dankwa Akufo-Addo, President of the Republic of Ghana, reading with a grade school pupil during the launch of Accra World Book Capital, 2023 at the Accra International Conference Centre AICC.

Cristóbal Cobo: A Rearview Mirror to See the Future

About the author



Cristóbal Cobo (Juan Cristóbal Cobo Romani) is a Senior Education Specialist at the World Bank Group and a core member of the World Bank's global EdTech team, where Dr. Cobo focuses on the effective and appropriate use of new technologies in education in middle- and low-income countries and emerging markets around the world.

Dr. Cobo has spent 20 years working at the intersection of the future of learning, cultures of innovation and human-centred technologies across both developed and developing countries. Before joining the World Bank in 2019, Dr. Cobo worked for Ceibal Foundation in Uruguay (2014-2019), University of Oxford (2009-2019) and Latin American Social Sciences Institute

(FLACSO) in Mexico (2005-2010). He has also served as an external Evaluator for the Inter-American Development Bank, the National Science Foundation and MIT Press (US), International Labour Organization (UN), and the International Development Research Centre (Canada).

■ **UNESCO-ICHEI:** When we're talking about applying technology to education today, ChatGPT, for example, there are many comments or opinions discussing on whether the technology could empower education professionals or with more opportunities, with higher efficiencies or whether the high tech might actually be replacing

humans in the education field or even dominate the narratives of education. What are your suggestions to get along with such a rapid change? For instance, how do we extend our capabilities by utilising technology, but also maintaining our self-consistency in this very rapidly changing environment? Also, would you believe the

necessity of disruptive innovation as mentioned by Clayton Christensen, saying that we have to completely destruct the status quo to be able to create something more innovative?

Dr. Cobo: Okay, those are a lot of questions, and they are very important, but you are asking the most complex discussions that are

currently taking place. Let me try to address some of them. The first thing to say is this tension that we are witnessing today has nothing new, although it feels like this is a cutting-edge discussion. The deficiency of information systems has raised this concern several times in history and probably much more in the last 50 years. Perhaps you know that in the 1970s, people in the banking sector were worried that human tellers were going to disappear because ATMs were all over the place. Now let's fast-forwards, the banks today offer all sorts of digital services (in ATMs, but also on your phone), but when you encounter a problem, you have to talk with a human being.

I think there are a lot of lessons

in many areas that we should take into perspective. And Marshall McLuhan used to say 'We drive into the future using only our rearview mirror'. And I think it's a good idea to have a look at this rearview mirror to keep the perspective. We have always had the temptation to think that everything is new and disruptive. We tend to think that no acceleration has ever been as fast as the current one. And the truth is that our society has been in this stage of constant change for quite some time. That doesn't mean that the changes of today are not fascinating, but we have to learn from history.

The second thing has to do with the fact that education always navigates the tension between

cutting-edge technology and the traditions that our institutions carry out. It means that while institutions are building knowledge 'on the shoulders of giants', at the same time, they are also a lighthouse to explore what will be the future and what is beyond the horizon. We have to understand that the ethos of the university always has this tension. On the one side, it looks forward, but at the same time, it brings the enlightenment of ideas from the past to the future. I think this tension is beautiful, but at the same time, it's natural in the conflicts that we are encountering today between technological disruption and education. Let me tell you, this tension is not only reflected in higher education but at all levels.

World Bank EduTech Podcast

The World Bank Podcast speaks with Ministers of Education, EdTech entrepreneurs, and educators globally. The existing 65 episodes recorded in English, French, and Spanish have been listened to 20,000+ times in 170+ countries.

The Podcast is available across Apple Podcast, Google Podcasts, and Spotify. To enjoy the Podcast, please scan the QR code.



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This tension between 'today' and 'tomorrow' is constantly happening.

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The third thing, this current discussion today is in terms of those jobs that may be displaced by artificial intelligence, which again is not new. It has been announced many times polarising the position between lost jobs or new jobs. I think we must be more creative than simply saying 'Humans versus machine: who is going to win that contest?'. I prefer the idea of humans plus machines working together. It is easier said than done, though.

Now, these changes are not something that happens overnight. For instance, when we invest time to learn how to ride a bicycle, we have to scratch the floor a couple of times before learning how to ride a bike, right? So society will need to adapt to some extent in terms of incentives, regulations, and protective policies. But throughout that transition, we will move to something completely different. What usually happens with technology in this field is enormous excitement for the

short-term changes, and not that much excitement for the long-term transformations. That is very important because probably in 2 or 3 more years, not many will be talking about ChatGPT (or similar generative technologies). After all, it won't be a novel thing anymore. People will probably assimilate generative technologies in their work and social practices and move into a different discussion.

Probably the changes that we are expecting to see today will flourish later. This tension between 'today' and 'tomorrow' is constantly happening. That allows me to move to the last part of your question. The relation between short and long-term changes, and to what extent these changes need to be totally disruptive or not. Disruption is the promise of innovation that we often hear. We should explore how to enable cycles of 'inclusive disruption', meaning generating changes to benefit society as a whole (or a very large portion of it), promoting disruptions wisely, and at the same time taking safeguards embracing additional actions to secure that these changes won't amplify inequalities. Every time a new technology emerges, those who are already well prepared will benefit more from it. It will be important to consider extra help, more support, and additional guidance for those who might be in a more fragile situation. Instead of disruptive innovation, I will suggest a more inclusive perspective on disruption.

■ **UNESCO-ICHEI:** Thank you so much. Your comments on the rearview mirror remind me of a quote from Steve Jobs, who once said that sometimes we don't really have to focus on what is happening right now at this time. Because when you look back, you'll see that all your pasts, which are dots, will connect into a line and show your pathway. Reflecting on your views on disruptive innovation,

I was thinking about the idea of resilience. When talking about building up resilience in the education system, there are already scholars objecting to the idea of full resilience as it means going back to the original way anyway and not making any changes. Therefore, some scholars are advocating for an individual-based liquid agile team to organise teachers. In a liquid agile team, a person will be able to move within the organisation doing different roles. Do you think liquid agile teams can be a potential solution to the dilemma between resilience and 'stubbornness'? Would it be an effective way to enhance the equity or inclusiveness of education?

Dr. Cobo: Broadly speaking, most people who spend some time in education might know that education systems are very

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I think the pandemic will be remembered as an intensive cycle of reinvention and adaptation for many.

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different from 'liquid'. That means that education systems tend to be very solid with very clear pathways. You can even see very early in the career progression of a professional in education, known with certain clarity, the stages of an educator in the years ahead. I believe teachers, in most cases, although they might not be rotating in different departments of their organisation, have an incredibly flexible and adaptable profession because they need to combine real-time cognitive tasks with other social and emotional capacities in front of dozens of students, several times per day. In one day, they need to be experts. They need to be team builders. They need to play the role of psychologists. They need to be mentors as well as role models. I mean they do such an incredible job that, within a day, they have to transform their profile by adopting all these different roles and activities. We could say that the title described on the plaque outside the educator's office doesn't change that often. However, their role demands to be incredibly adaptive, transformative and flexible. We need to be open to

the idea of offering, and exploring more flexibility for educators in their career progression. I think the challenge is to equip educators with tools to help them navigate an environment that is challenging and constantly changing. For me, the best lesson is the pandemic. Many teachers were not trained to teach remotely, and they had to reinvent themselves overnight to do this job of teaching from a distance, some with more success than others. I think the pandemic will be remembered as an intensive cycle of reinvention and adaptation for many.

■ **UNESCO-ICHEI:** In the post-pandemic era, do you forecast the current digital divide among different education systems will persist, though we expect an equitable innovative disruption in the future? What kind of key digital capacities should the teaching professionals, especially university teachers, have or prioritise to reduce the digital gap and to pursue an

equitable education in the future?

Dr. Cobo: That's a great question. Let's start with the digital divide, and then we go to the question about capacity.

One of the interesting things about 'divide' is, that it is basically a moving target, as many other things related to development. At some point, to feel 'included' was in fact having access to electricity, and then it expanded to having access to connectivity, and then it transitioned into having access to a core set of digital skills. Now, you might have all those things, but if you do not have a basic literacy in terms of AI in the forthcoming years you could be completely excluded. It is a very challenging and at the same time a fascinating topic because governments, education institutions, and other organisations need to calibrate all the time what it means to be included (and how to avoid exclusion). If we don't take those additional measures, we might end up (without even wanting it) expanding inequities because some communities will be more adaptive

▼ In Nigeria, the Edo Basic Education Sector and Skills Transformation Operation is one of the notable recent projects of the World Bank Group in the field of Education and Technology. The project leverages technology to improve teaching and learning processes in basic education and has institutionalized remote learning EdoBEST@Home programme to provide access to all students outside school. (Text adapted from The World Bank; Photo ©Sanumiloluwa Modupe Dawodu, The World Bank)



to transformations than others. Now, even in an environment where access to infrastructure and basic knowledge are in place, we might stagnate and replicate obsolete models of education. Change resistance can also happen in fully digital environments.

In relation to your question about capacity, what is the main skill that I consider a big enabler? I would say critical thinking. Let me unpack critical thinking because different people understand it differently. It is a concept that needs to be clarified. I believe that teaching professionals have a fascinating role that is not only being the messengers of new content on certain knowledge (as we know today knowledge is all over the place), but also teaching to be 'coders' and 'decoders' of knowledge. What does it mean to be a 'coder' and a 'decoder' of knowledge? Let's say a 'decoder' means someone who can unpack something complex into parts. If you want to explore ChatGPT, for instance, it's quite likely that you will need to understand the strengths and the weaknesses of that technology. What does it mean? If you ask a question, you should be able to read the answer and identify the weaknesses and flaws of the system. Meaning you will decode the message in such a way that you separate what is reliable from what is not. If you are exposed on the internet to fake news, you should be able to 'decode' that information to see what is useful and what is not, what is 'signal' and what is 'noise'. University professionals are exposed to a huge amount of information every day, and they need to be able to distinguish the difference between knowing and understanding. One thing to note is that 'decoding' means not only filtering information but also understanding the context in which certain information was created. For instance, a piece of a message can be either considered an opinion or a fact depending on the context and being able to 'decode' is really important.

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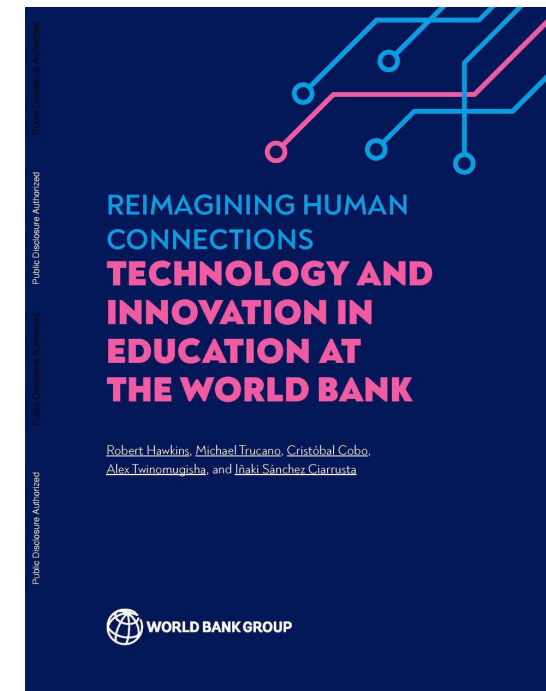
And now 'coding' is something that is also extremely valuable. To 'code' we need to speak different languages - I mean languages in a general sense. For example, academic languages in scholarly

journals are fantastic, but today that's not enough. If we want our messages to be relevant and to achieve different communities, we will have to 'code' our knowledge in different languages, on different platforms for different communities, and by understanding and being sensitive to the context. For me, all these things are part of the definition of critical thinking: being able to 'code' and 'decode' in ways that we can bring our expertise to filter information, contextualise, transform, translate, and share it effectively with different communities. For me, this is a foundational skill required for university professionals or teaching professionals today (and quite likely will be increasingly so in the future).

■ **UNESCO-ICHEI:** Thank you so much for the clear explanation of coding and decoding. The discussion reminds me of a book by Professor Paul Willis, *Learning to Labour*. In this book, he advocated for an anthropological or ethnographical way to interpret the education system, because we are so used to an academic or top-down way to explain what is happening in the education system, especially for those policymakers. But probably a more authentic or genuine way to respond to a quest in a local education system would be observing what is happening in the community, coding and decoding the thoughts and behaviours of people involved in that community.

I do have a question about this methodology. If we're about to scale up an education programme in the world in pursuit of equity, we are very experienced in having a very general framework or instruction for all these local member states or member programmes. While we still want to keep the authenticity of the local community and to solve local educational problems, how do we

Reimagining Human Connections : Technology and Innovation in Education at the World Bank



Education technology — or 'EdTech', the use of hardware, software, digital content, data, and information systems in education — supports and enriches teaching and learning and improves education management and delivery. Published in 2020, this report reveals World Bank's vision for EdTech, 'Reimagining Human Connections to Transform Teaching and Learning for All.' The working strategy of the World Bank Group to realise the vision is to discover evidence-based technology solutions in education; deploy solutions, at the pilot level and at scale; and diffuse this knowledge widely across policy makers and support capacity development to better use this new knowledge.

The Report also introduces an inter-related set of five principles which education policies and initiatives that utilise EdTech should embrace to maximise human engagement. The use of EdTech should be guided by a clear purpose and focus on educational objectives; reach all learners; empower teachers; engage an ecosystem of partners; and rigorously and routinely use data to learn what strategies, policies and programmes are effective to maximise student learning.

The Report is currently available in Arabic, Chinese, English, French, Portuguese and Spanish.

strike the balance point between the top down methods and also the bottom up observations?

Dr. Cobo: I believe there is always a big risk in running consultations only among 'experts' and building publications and

guidance frameworks, as you said, that resonate only within the expert community, which can be very sound and very strong based on evidence. But there's always a challenge to contrast or confront those frameworks with the reality or those who think differently, those

who might be coming from other communities and might not be considered experts in the academic sense, but who are knowledgeable in the environment where they are coming from.

Here, it is critical to ensure that

people in grand-scale organisations have a bi-directional approach, including both top-down and bottom-up methods, while ensuring quality and also keeping channels open to maintaining diverse perspectives in terms of languages, cultures, or disciplines. It's a beautiful challenge because you have to be open to different perspectives.

■ **UNESCO-ICHEI:** You are not only a global expert working with a very diverse team, but also very active on the social media delivering EdTech updates to your subscribers, who are from different cultural contexts and speaking different languages. I was wondering what importance do you find to disseminate

EdTech information to the masses, not just to the EdTech scholar community? What tweaks would you make before or delivering messages to scholars in the EdTech field and to the general audiences?

Dr. Cobo: It resonated with what we discussed about 'coding'

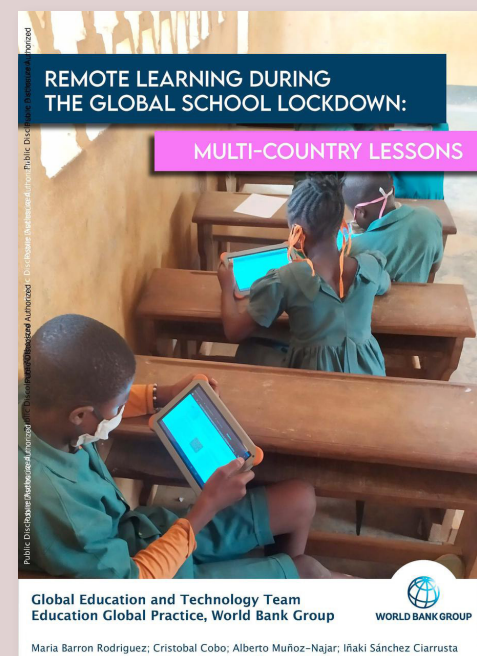
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It is really important in the world of education and technology: to separate the hype from the hope.

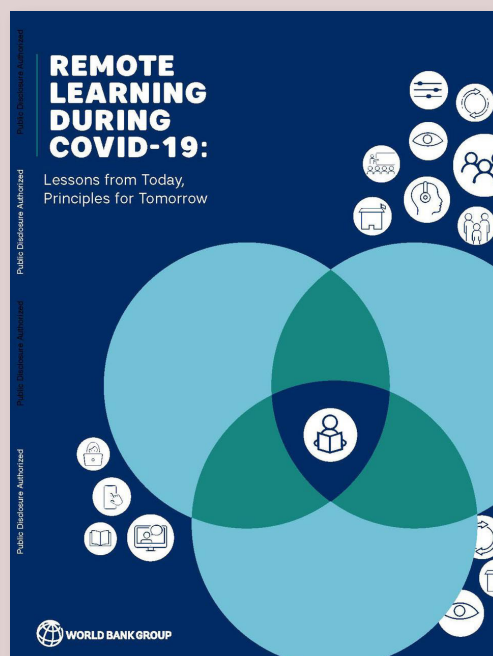
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Remote Learning During the Global School Lockdown

The World Bank has led a research project in 2020 to provide guidance and technical assistance to optimize country effectiveness in the design and execution of remote learning strategies. The findings are published in the format of twin reports to analyse how the education crisis due to pandemic has amplified inequalities and also document a unique opportunity to reimagine the traditional model of school-based learning.



► **The Multi-Country Lessons** Report is a 2-volume qualitative study conducted between May and November 2020 to understand the perceived effectiveness of remote and remedial learning solutions implemented across 17 countries. The second volume of the study consists of an interactive report, where readers can actively engage with the report data and findings.



► **The Lesson from Today, Principles for Tomorrow** Report has been developed in conjunction with *Remote Learning During the Global School Lockdown: Multi-Country Lessons* but using mixed-method approach. It seeks to summarise applicable lessons for policymakers and focuses on the period from March 2020 to October 2021 and addresses a different yet relevant set of key questions from the Multi-Country Lessons research.

and 'decoding', right? 'Decoding' means being able to understand the context and the communities that are in this context. I'm coming from the academia where there are traditional tracks for knowledge dissemination mostly known as publication in peer review journals. Some other tracks and platforms have increasingly gained momentum, but those additional new spaces are no more important than academic papers. We need both classic and more dynamic spaces for knowledge sharing and creation of new ideas.

For over 15 years, I've been working very closely with the education community. I've been talking with faculties and teachers in many countries, and I learned that, as some people might say, educators are 'knowledge hungry' and always open to new ideas that they can 'decode', and adapt to bring them into their classrooms. Given that educators usually have busy schedules, the more you help them access well-curated information, the better. Let's use the example of artificial intelligence and education again. There are hundreds and hundreds of publications about this topic

nowadays. It is easy to get lost (or waste hours searching for useful content). If we support educators in identifying those reports that can be short, concise, clear, and actionable, it will help them save a lot of time revising the information needed. In order to do that, you need to build trust.

The second idea, at least the way I see it, it is really important in the world of education and technology: to separate the hype from the hope. There is a lot of enthusiasm for digital technologies because they are catchy, shiny, and always bring this promise of change (which is good and important). In many cases, if those promises weren't there, you and I wouldn't be able to be talking to each other from different parts of the planet (and interview with over 8000 miles between the journalist and the interviewed). At the same time, it is important to remember that technology-driven social changes are not automatic. Here is the key to separating the promise from the implementation; the product from the process; the access to information from the effective use of that information; the number of times that a learner

uses a platform with to what extent the learner really learns something relevant in that environment. The more we help translate that critical analysis, evidence, or trend, the better. We are living in a world that embraces the massive adoption of information technologies, therefore it is important to have critical users in the digital society. We need educators who challenge the neutrality of technology, the effectiveness of its impact on learners, and the transactional costs of putting a screen between a teacher and a student. If those questions don't come early in the game, we might encounter problems later on.

I have tremendous respect for educational professionals, but I'm cognizant of the limited time they have. I always try to stand in their shoes because I fully admire their work and try to share information that I consider could add value to their work or their discussions. That doesn't mean that all the things that I share online are relevant to them. I understand that many of them can be considered extremely boring or irrelevant, but I tried to make a little contribution to that field.

■ **UNESCO-ICHEI:** I have read your blog and was very impressed by the specific recommendations and clearly bolded lines you provided for teachers to follow. Just like we discussed a little bit earlier about the liquid agile team, I acknowledge that it would be a huge burden for teachers to actually to cope with so many trivial tasks and grand expectations at the same time. Working as the chief editor of *CLOUD*, I have also been constantly contemplating how to translate articles or materials to mass audiences in different cultural or professional contexts. I understand the challenge and necessity of thinking in others' shoes, and I really appreciate what you have done so far.

The last questions on my end would be relevant to your personal experiences as a global expert in many different organisations. What role do you believe international organisations, such as UNESCO, can play in the digital transformation of higher education, especially compared with local governments and policymakers? Also, how can international organisations' involvement contribute to shaping policies and practices that will uphold the right to education in this digital era?

Dr. Cobo: I'm not in a position to say what UNESCO has to do or anything like that, but I can tell you what I value from UNESCO in this context. In a nutshell, UNESCO and organisations alike can help to build the 'architecture of the future', although that architecture might not be visible to everybody at the same time. It is helpful to lay the foundations for where the coming generation will stand. An example that many are familiar with is the sustainable development goals (SDGs), where you define challenges that are the result of very large consultations with experts

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I'm all about long-term changes, which doesn't mean that we cannot change things in the short term.

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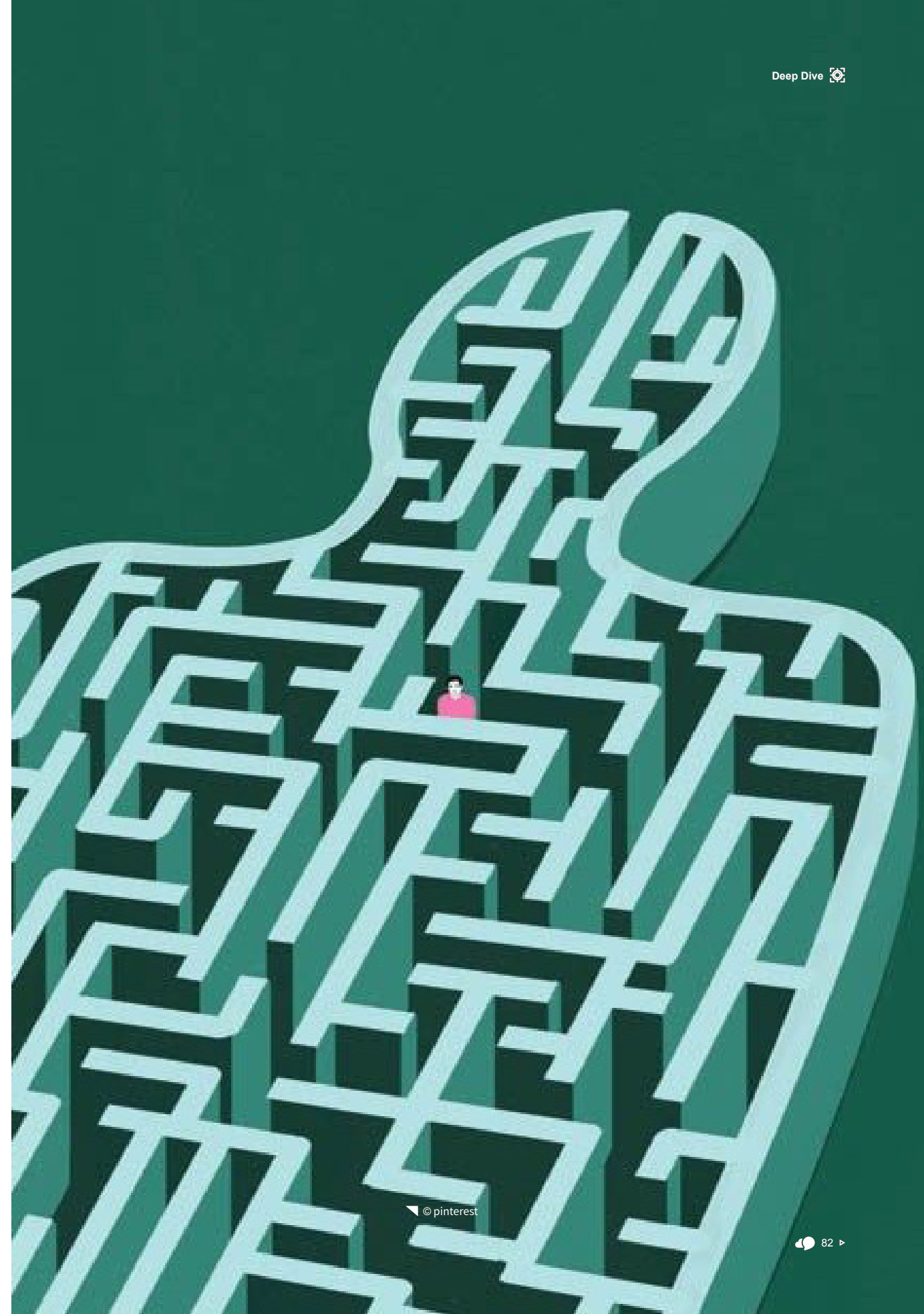
and non-experts, academics and people from the street. Then, a way of structuring those goals is based on priorities that help countries, academia, multilateral, and civil society to navigate together.

If you prioritise the goals of common interest, it's much easier to build a consolidated global agenda. Nobody wants to see illiteracy, child labour, or global warming expand, but the approach

to address those problems might be different depending on the organisations and contexts. When we have defined these common goals, it is much easier to align people with different expertise and combine their contributions with a long-term perspective. If you take as an example the role of ministers of education in different regions of the world, according to some studies, they last in their position only 24 months on average. How many deep changes can you make in only 24 months in a position at the Ministry of Education? A minister will have to probably 1) run consultations and listen to different communities; 2) prioritise otherwise it is unlikely that you will be able to implement all; and 3) rely on those who will be coming after you to ensure some continuity. The only way to achieve sustainability and consistency will be to work on long-term agendas. When we study outstanding education systems from the last half of the century, we learn they succeeded, among other aspects, because they aligned different parties, visions, or perspectives. The key to success is to define common goals that go beyond a specific interest.

I'm all about long-term changes, which doesn't mean that we cannot change things in the short term. The challenge is to be open to new changes, but at the same time having a clear navigation route for the future.

In that sense, I think UNESCO is a strong player that really helps us look at education, from the perspective of the future. Let's think for a second about the kids who are attending school today. Many of them will be living in the 22nd century. So, we have to think about their future. We need to work today considering their challenges. In that sense, UNESCO is a major lighthouse for education today and tomorrow.



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03

Digits and Tales

- Micro-Credentials for Higher Education Teacher Professional Development
- Extended Resources

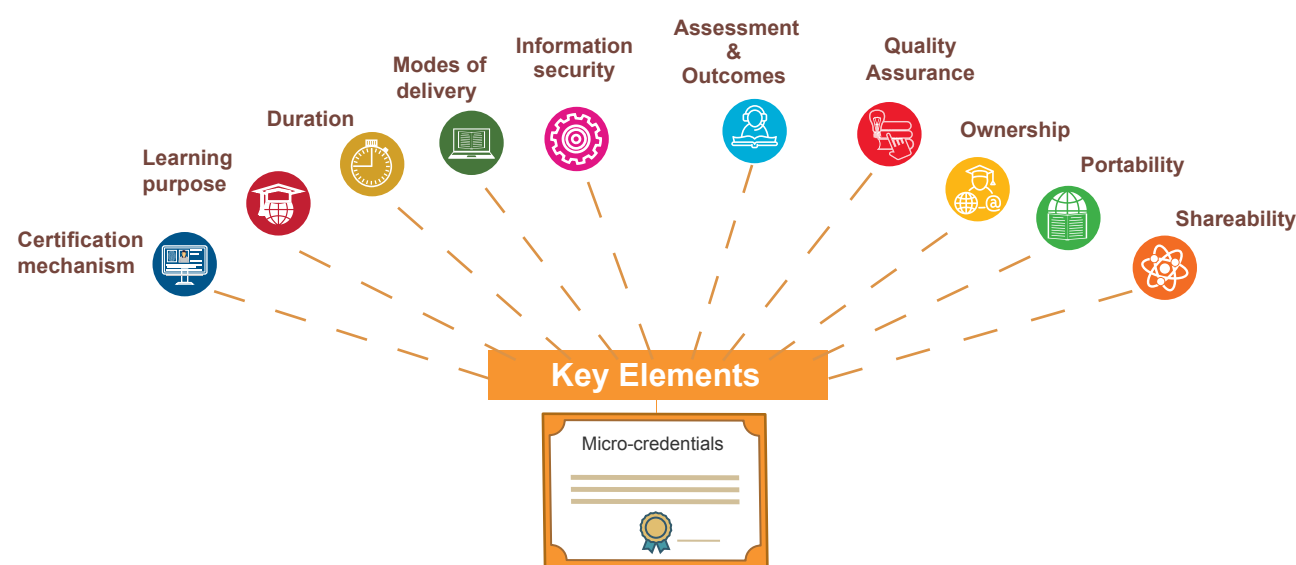
Micro-credentials for Higher Education Teacher Professional Development

1. Understanding Micro-credentials

Building on UNESCO’s definition, micro-credentials can be briefly described as a small volume of certified competencies acquired through life experience, work, or study. Micro-credentials are increasingly being promoted as a novel and flexible way to recognize knowledge, skills, and abilities. In the context of higher education faculty training, micro-credentials can empower teachers to enhance their digital skills and professional development through various flexible learning paths with the aim to promote quality and equitable higher education, and expand lifelong learning opportunities.

In 2024, UNESCO-ICHEI and UNESCO Bangkok will continue to explore the potential around micro-credentials to enhance continuing professional development of higher education teaching personnel in Asia and the Pacific. To learn more, contact: iioe@ichei.org or eisd.bgk@unesco.org.

2. What are common micro-credential characteristics founds in recent policy documents?



Reference: <https://unesdoc.unesco.org/ark:/48223/pf0000381668>

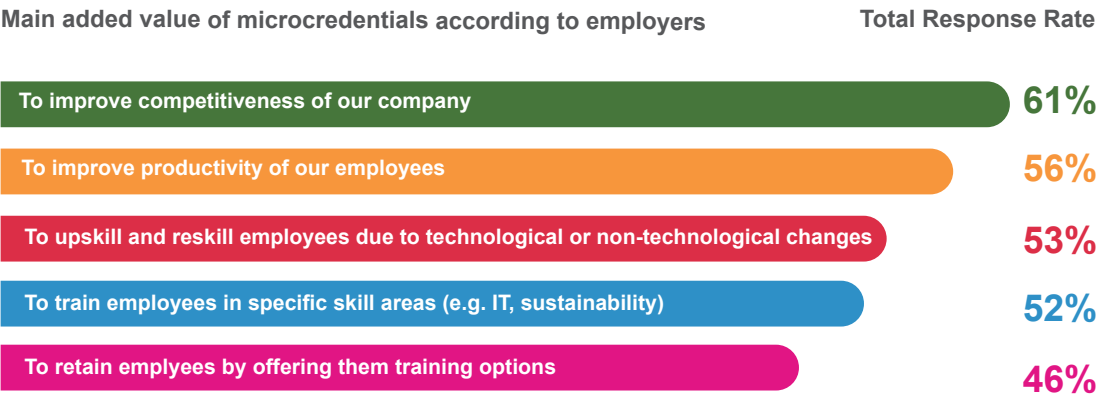
3. Growing Demand for Lifelong Learning

Worldwide **267 million** young people **aged 15-24** are not in any form of employment, education, or training.

Reference: UNESCO (1 March, 2024). Skills for work and life. <https://www.unesco.org/en/skills-work-life>

4. Estimating the growing need for micro-credentials

The European Centre for the Development of Vocational Training (Cedefop) surveyed a range of stakeholders in Europe—including employees, students, adult learners, unemployed individuals (N=730), and vocational education and training providers (N=134 VET institutions)—to assess the perceived value and growing needs associated with micro-credentials. While the sample size is small and not representative globally, the insights offer useful understanding of demand and gaps in usage.



Note: respondents were given multiple choice options. Source: surveys of stakeholders representing employees, students and adult learners, and individuals who are unemployed (N=730).



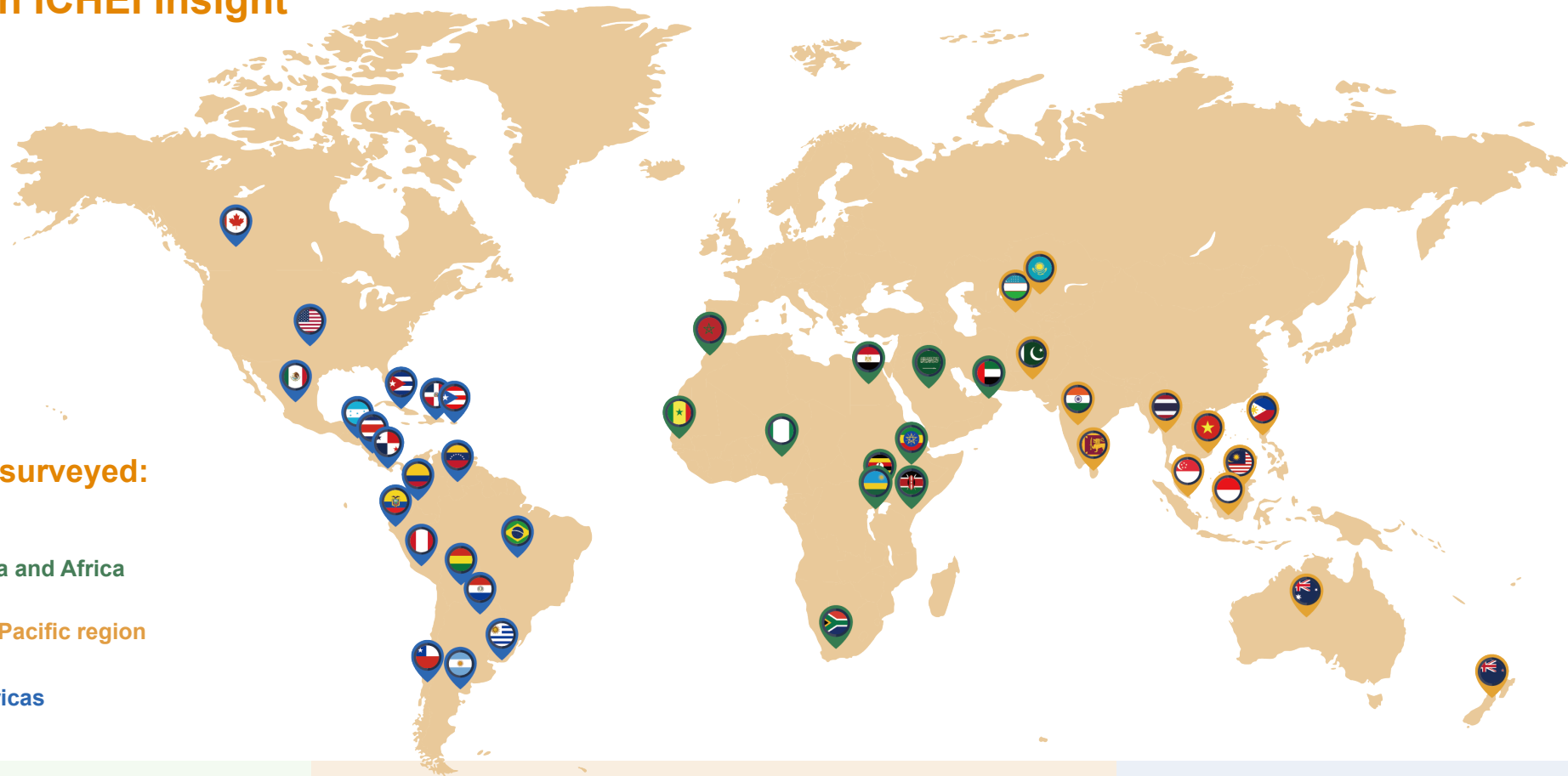
Note: Respondents were given multiple-choice options. Source: Survey of organisations representing VET providers (n=134).

Reference: Cedefop (2023). Microcredentials for labour market education and training: the added value for end users. Luxembourg: Publications Office. Cedefop research paper.<http://data.europa.eu/doi/10.2801/141643>

5. Evaluating Global Readiness for Micro-credentials: an ICHEI Insight

Countries and regions surveyed:

-  11 countries in West Asia and Africa
-  13 countries in the Asia-Pacific region
-  19 countries in the Americas

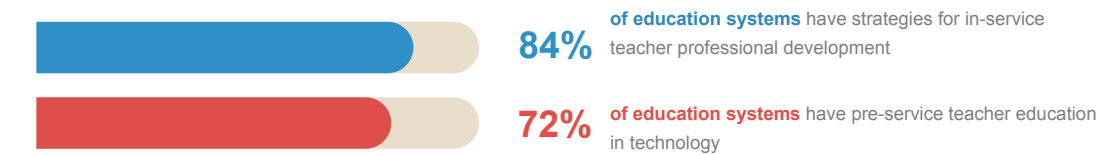
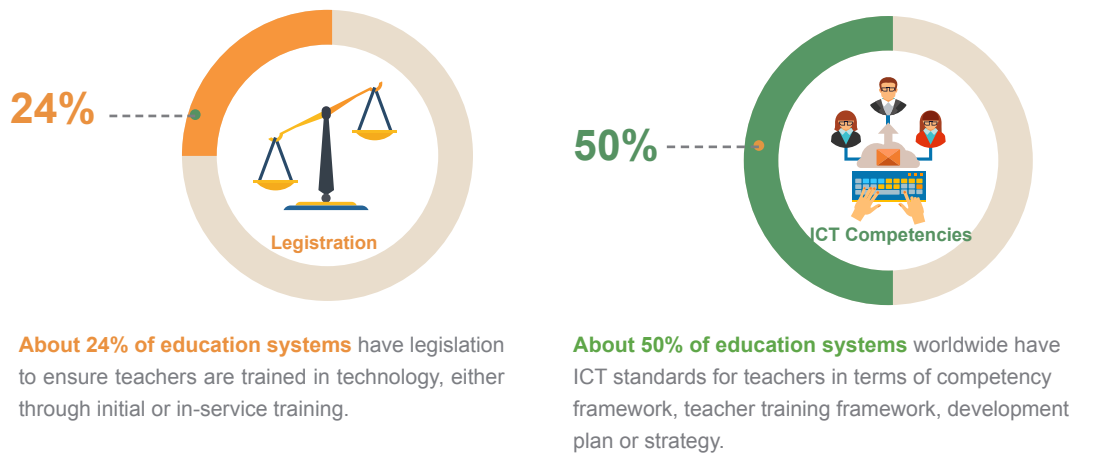


2 countries	The United Arab Emirates, Saudi Arabia	established national-level teacher standards/ competency frameworks for teachers
3 countries	The United Arab Emirates, Saudi Arabia, and South Africa	have started to formulate policies and priorities for certified training of college teachers
6 countries	Uganda, Rwanda, Nigeria, Kenya, Ethiopia, Egypt	have incorporated UNESCO ICT-CFT into primary and secondary school teacher training
7 countries	Egypt, Morocco, Nigeria, Senegal, Ethiopia, Uganda, Rwanda	policies and practices related to teacher certification training and micro-certification are still in the infancy

3 countries	Australia, New Zealand, Singapore	have established full implementation of micro-credentials and ecology
1 country	Malaysia	has taken a series of initiatives in the construction and development of relevant resource frameworks
4 countries	India, Indonesia, Thailand, Philippines	regulatory measures are rare or in early stages
5 countries	Pakistan, Sri Lanka, Vietnam, Kazakhstan, Uzbekistan	are still learning the nascent stage of micro-credential awareness

2 countries	USA, Canada	have extensive experience and resources in qualifications frameworks and certified training
4 countries	Honduras, Mexico, Panama, Peru	have completed the conceptual design of national qualifications frameworks
5 countries	Chile, Colombia, Costa Rica, Brazil, Dominican Republic	are in the implementation phase
8 countries	Argentina, Bolivia, Cuba, Paraguay, Puerto Rico, Uruguay, Venezuela, Ecuador	do not currently have national qualification frameworks

6. Education systems support teachers in developing technology-related professional competencies



Reference: <https://gem-report-2023.unesco.org/technology-in-education/>

7. Supporting Micro-credentials: Who are the key stakeholders?

Learners, employers, higher education institutions, and regulatory & accreditation bodies have different priorities and expectations for the rollout of micro-credentials.

Stakeholders	What's at stake?
Learners	Evidence of achievement, personal success, future employment and career opportunities
Employers	Indication of graduate employability, employee skills and provision of ongoing training and professional development
Educational Institutions	Reputation, relevance of course offerings, relationship with industry partners, quality and integrity of qualifications
Accreditation Bodies	Relevance and fit-for-purpose nature of credentials to meet current and future professional needs
Quality Assurance Agencies and Regulators	Quality and coherence of credentials, and alignment to intended learning outcomes

Reference: <https://microcredentials.eu/>; <https://jil4d.org/index.php/ejl4d/article/view/525/617>

8. IIOE Certified Training: A Global Learner Overview

By now, training programmes on **5 topics** have been built and delivered at IIOE, including: *Cloud Essentials for Higher Education Workforce*, *Teaching Video Design and Production*, *Logicalisation & Visualisation of Teaching Presentation*, *AI-General Level* , and *Big Data-General Level*.



Processes of Earning Micro-credentials



Extended Resources

Towards a common definition of micro-credentials



Education changes lives, and micro-credentials, done well, can be a force for good as part of or to supplement and complement formal education systems, and prepare a wider range of learners across the lifespan to lead better lives and healthier communities. A much needed step towards advancing these outcomes for all, including the most vulnerable, is to agree on howbest to define micro-credentials in ways they are easily and universally understood.

This study set out to address the first of those challenges, coming to a consensus on a proposed definition, in the hope of assisting the field to move towards a common definition. This report proposes a definition arrived at through a consensus-building process by a global expert panel.

<https://unesdoc.unesco.org/ark:/48223/pf0000381668>



Short courses, micro-credentials, and flexible learning pathways: a blueprint for policy development and action: policy paper



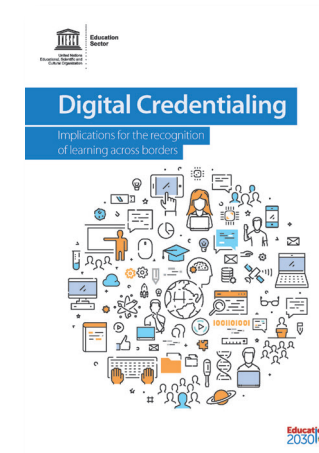
The paper discusses existing definitions and proposes a universal working definition for micro-credentials developed by UNESCO; it draws on country experiences, studies, and projects from all world regions, and highlights good practices.

The study also assesses 10 challenges and identifies actions that could contribute to the successful roll-out of short courses and micro-credentials. These include a functioning national qualifications framework, transparent recognition procedures, internal and external quality assurance, reliable assessment, facilities for digital storage, funding for learners and providers, and stakeholder engagement. Lastly, success also requires the development of easily accessible digital registers of learners' achievements, micro-credential qualifications, short courses, providers, assessors, awarders, quality assurance agencies, credential evaluators, employers, and job and promotion opportunities.

<https://unesdoc.unesco.org/ark:/48223/pf0000384326>



Digital credentialing: implications for the recognition of learning across borders



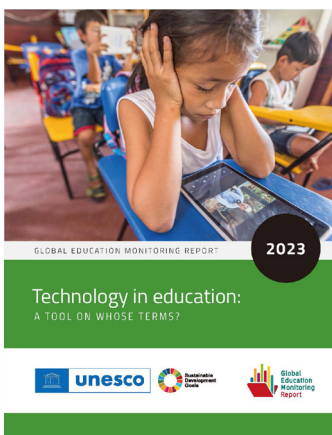
Digital learning records and open data sources are complementing traditional qualifications repositories, while challenging the conventional models of credential evaluation, as both for-profit and non-profit verification agencies come to the fore as important players. These changes trigger many questions about the trustworthiness of data, interoperability of systems, and most critically the ubiquity of the standards – both learning standards and technology standards – that govern the new and dynamic landscape.

This report offers a critical assessment of digital credentialing based on a review of recent literature and a series of interviews with key actors. It aims to promote increased synergies between these developments and the quality assurance systems that have become closely associated with the implementation of a new generation of qualifications frameworks internationally.

<https://unesdoc.unesco.org/ark:/48223/pf0000264428>



Global education monitoring report, 2023: technology in education: a tool on whose terms?



The adoption of digital technology has resulted in many changes in education and learning, yet it is debatable whether technology has transformed education as many claim. The Report shows that regulations for technology set outside of the education sector will not necessarily address education's needs. Those in decision-making positions are asked to look down at where they are, to see if technology is appropriate for their context, and learning needs. And, finally they are asked to look forwards, to make sure their plans fit their vision for sustainable development.

The report underscores the importance of learning to live both with and without digital technology; to take what is needed from an abundance of information but ignore what is not necessary; to let technology support, but never supplant, the human connection on which teaching and learning are based.

<https://unesdoc.unesco.org/ark:/48223/pf0000385723>

