Working Paper – ASEM Expert Group Digitalisation

Background

At the ASEM Education Ministers Meeting (ASEMME7) in Bucharest, Romania, in May 2019 the Ministers highlighted the opportunities of digitalisation for connectivity and collaboration between Asia and Europe and hence introduced digitalisation, alongside Sustainable Development, as a transversal theme of the ASEM Education Process. In order to engage the ASEM members and stakeholders in a dialogue on how digitalisation can promote connectivity and collaboration between Asia and Europe and to identify synergies on activities in the field of digital learning and teaching, a new ASEM Expert Group focusing on digitalisation was established.

The ASEM Expert Group Digitalisation paper presents an analysis of the challenges and opportunities which digital transformation provides for higher education, VET and lifelong learning systems in Asia and Europe. Based on this analysis the paper provides key messages for ASEM policymakers at interregional, regional, and sub-regional levels in the areas that need enhanced attention in order to support an equitable digital transformation within education systems.

Introduction

The COVID-19 pandemic has shown that incorporating digital tools into education systems is vital in ensuring continuity of support to learners in crisis periods. The transformative aspect of information and communication technologies (ICTs) is nevertheless not a new phenomenon but has been reinforced by the pandemic. The fourth industrial revolution, characterized by the convergence of digital and technological innovations, has made it imperative that higher education institutions and TVET reinvent themselves in order to adapt to the changing demands of society and the labour market.

Switching from mostly traditional in-class education to online teaching and learning has affected higher education institutions and TVET providers across all ASEM member countries during this pandemic. Digitally enhanced learning, including MOOCs[1] or virtual exchange as well as blended learning modes, has the potential to foster collaboration and is hence often considered an important instrument in making education and academic mobility more accessible. At the same time, the pandemic exposed inequalities in internet access, availability of devices[2] and uneven development of digital skills among populations. There is no question that some people's education has suffered since COVID caused school shutdowns[3].

Even though the pandemic accelerated the transformation towards more digitally enhanced education provision, digitalization has the potential to extend into all spheres of education – not just in teaching and learning, but also in the administration and policy spheres of education.

The paper looks at challenges and opportunities of digitalization, enabled or facilitated in the sphere of education, and advises ASEM policymakers on key issues that need to be addressed to transform education and hence make it more flexible to respond to current and future demands. The main goal of the paper is to provide key messages which focus on ensuring that the digital transformation in

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[1] MOOCs: Massive Open Online Course
[2] New report on global broadband access underscores urgent need to reach the half of the world still unconnected (unesco.org)
[3] One year into COVID-19 education disruption: Where do we stand? (unesco.org)

education is inclusive and leaves no one behind. The members of the Expert Group Digitalisation have identified four key areas to foster this transformation in higher education and TVET.

First, the digital infrastructure which is needed to provide innovative learning environments and the accompanying administrative infrastructure, making personal learning data accessible to the individual learner. Second, enhancing international exchange and mobility through the use of digital tools. Third, as digitalisation is not just a response to the pandemic, but education is entering a new age and will take a new shape, the chapter "futures of (lifelong) learning" examines lifelong learning in the digital era. Fourth, the paper focuses on the area of quality assurance and recognition. Providing quality education and recognising learning developments is paramount to allow learners to move freely. The members of the Expert Group consider these four key areas as interconnected and efforts in all these areas is what will advance the digitalisation agenda.

The Asia-Europe Meeting has a very diverse membership of countries and regions of great socio-economic differences. The members of the ASEM EG Digitalisation consider it fundamental that the digital transformation in education is inclusive, human-centred, sustainable and transparent. Digitally supported education must be accessible, flexible and serving individual learning needs, in a lifelong learning and learner-centred perspective. Further, it needs to be high quality as well as being instrumental for improving quality of life. Digitally enhanced learning within the ASEM Education Process shall offer collaboration opportunities for learners everywhere in ASEM countries, to work together on global challenges, notably through virtual exchanges.

Key messages

Digital infrastructure

The EG Digitalisation…

1. urges the ASEM Ministers of Education to invest in the creation and provision of digital infrastructure for education. Equal access to digitally enhanced education requires widespread access to the internet and technological devices. Moreover, learners need to acquire adequate digital skills in order to master new technologies.
2. emphasizes that the interoperability of platforms and systems, which ensures seamless integration with one another, is crucial in order to create a seamless learning and administrative environment for learners.
3. calls on the ASEM member states to promote joint research on technology frameworks for (smart)[4] education in order to support the building of digital infrastructure for digitally supported education and to establish a common understanding for the construction of this infrastructure in Asia and Europe.

International exchange and mobility

The EG Digitalisation…

1. highlights that the digital transformation of education facilitates better exchange of data among institutions, by digitalising current interinstitutional agreements and making it easier to share information. The interoperability of networks will be vital in ensuring the long-term

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[4] SmartEDU-brochure.pdf (unesco.org)

connections between European and Asian institutions to facilitate student and staff mobility. Further, learners should be able to "own" their individual learner data, which they can consult and share with whomever they want, wherever, whenever; thus, facilitating their mobility in education and in the labour market.

2. considers Collaborative Online International Learning (COIL) as one instrument to make mobility more inclusive[5]. The EG members hence call on ASEM Ministers of Education to promote virtual exchange opportunities which engage non-mobile learners in virtual mobility and intercultural exchange. Through Collaborative Online International Learning (COIL), learners as well as teachers engage with peers in geographically distant locations and from different linguistic and cultural backgrounds and have the opportunity to develop a range of 21st century skills[6] such as global citizenship.

Futures of (lieflong) learning

The EG Digitalisation…

1. would like to emphasize that designing a flexible curriculum in the digital era means investing in the digital transformation of both higher education and TVET. Investing in the human capital of educational organizations and the digital competences of teachers and learners is essential when designing current and future lifelong learners' pathways. The EG members urge ASEM Ministers of Education to invest in teacher training and support continued professional development programmes for teachers and educators across ASEM countries. Promoting teachers' upskilling and their ability to use digital tools for pedagogy, in particular fostering capacity building for blended learning, as well as addressing digital illiteracy is crucial.

2. calls on ASEM member states to coordinate their education policies with national policies for digital connectivity (ubiquitous access to the internet), social policies (to support disadvantaged groups and individuals) and employment policies in order to ensure equal access and inclusive lifelong learning. Sharing good practices and learning from each other in these policy fields can help to facilitate policy conditions which appropriately facilitate and promote inclusive lifelong learning.

3. urges the ASEM Ministers of Education to promote research in identification of enablers and challenges for the transition of existing education and training systems to truly accommodate lifelong learning and learner mobility and to promote policy frameworks and tools to support the system-wide digital transition.

4. emphasizes that the availability of high-quality Open Educational Resources (OER) is critical for the successful implementation of lifelong learning. With the help of digitalisation processes, quality content already developed by experts and credible sources can be made available online.

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[5] assuming that learners have access to digital devices and digital skills training

[6] "An overarching concept for the knowledge, skills and attitudes citizens need to be able to fully participate in and contribute to the knowledge society […] Most frameworks seem to converge on a common set of 21st century skills or competences, namely: collaboration; communication; Information and Communication Technology (ICT) literacy; and social and/or cultural competencies (including citizenship). Most frameworks also mention creativity, critical thinking and problem solving. Across the various frameworks it is acknowledged that ICT is at the core of 21st century skills […]" Twenty-first century skills | International Bureau of Education (unesco.org)

Quality assurance and recognition

The EG Digitalisation…

1. highlights that online learning offers by educational providers should be fully integrated into existing quality assurance approaches and covered by internal and external quality assurance processes. Specific guidelines may be needed to ensure a comprehensive understanding of the specific challenges and quality concerns to be taken into consideration in the area of online learning.

2. calls on the Ministers of Education to decide, at the national level, how to apply (internal) quality assurance mechanisms to micro-credentials if an incorporation of micro-credentials into national qualifications frameworks (NQFs) is feasible. Internationally, the EG urges ASEM Ministers of Education to cooperate and to explore the use of NQFs, regional qualifications frameworks (RQFs), the World Reference Levels, UNESCO's *Global Convention on the Recognition of Qualifications concerning Higher Education*[7] and the respective regional conventions – the Lisbon and Tokyo Conventions - to include, make transparent, and recognise micro-credentials.

3. emphasizes that national and regional qualifications frameworks[8] should be designed and implemented to ensure, among other outcomes, pathways that allow learners to move between different types of providers e.g. between higher education and TVET. Exchange on existing case practices will be of particular interest and should be supported in the ASEM Education context.

4. calls on the Ministers of Education to initiate international dialogue on data accuracy and data privacy in order to secure the privacy of personal data and prevent fraud across the digital learning spectrum.

5. acknowledges that competency frameworks[9], shared knowledge, standards and platforms can contribute to meeting the needs of lifelong learners within a wide network of educational institutions across Asia and Europe. The EG members hence encourage national and/or regional policymakers[10] in their role as agenda-setters to support and promote digitally enhanced learning and digital learner data mobility and its roles in lifelong learning[11].

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[7] Global Convention on the Recognition of Qualifications concerning Higher Education (unesco.org)

[8] Guidelines on Developing and Strengthening Qualifications Frameworks in Asia and the Pacific: Building a Culture of Shared Responsibility https://unesdoc.unesco.org/ark:/48223/pf0000265652

[9] e.g. TPCK - Technological Pedagogical Content Knowledge, Mishra & Koehler, 2006; UNESCO ICT Competency Framework for Teachers (ICT-CFT), 2018; ISTE Standards for Educators, 2017; Chinese teacher's ICT application standard (MOE, 2014); Digital Competence Framework for Educators (DigCompEdu)

[10] Asia-Pacific Regional Strategy on Using ICT to Facilitate the Achievement of Education 2030. https://bangkok.unesco.org/sites/default/files/assets/article/ICT%20in%20Education/files/amfie-2017asia-pacific-regional-strategy.pdf

[11] Qingdao Declaration: International Conference on ICT and Post-2015 Education: Seize Digital Opportunities, Lead Education Tran...; International Conference on ICT and Post-2015 Education: Seize Digital Opportunities, Lead Education Transformation: Qingdao Declaration; 2015 (unesco.org)

Digital infrastructure

The basis for adapting to the transformation of education and for meeting the new demands is the creation and provision of digital infrastructure and innovative learning and administrative environments.

Digital infrastructure, including broadband internet access, digital devices, and access to high-quality digital learning resources, are the basic principles for equitable digitally supported learning, teaching and (virtual) learner mobility, which ensures that learners can study easily, be engaged and learn effectively at any time and any place, in any way and at any pace.

A study from the International Association of Universities (IAU)[12] has shown that differences in access to the internet prevail and that there is still room for improvement in the ASEM region[13]. The survey further highlighted huge differences for rural and urban populations. An issue that should be addressed to achieve more inclusiveness. 68% of the European respondents[14] said that the digital infrastructure was not an obstacle at their institutions. For the Asia-Pacific region 44% did not consider it an obstacle. These figures lead to the assumption that still a considerable percentage of respondents consider the digital infrastructure at their HEIs to a certain extent as an obstacle.

For promoting creative and innovative lifelong learning environments which enable digital learning and learner mobility, the following aspects need to be considered:

- **Learning devices and support**: All students and educators need access to a digital learning device. The learning devices should have/ possess inclusive features to ensure that students with different learning needs can also access digital resources.
- **Digital learner data**: For true lifelong learning, learners should have the ability to consult and share their own learner data with whomever they want, wherever, whenever[15].
- **Seamless connectivity**: All students and educators need to be supported in becoming global collaborators through seamless internet connectivity at their education institution, at home, or in their community, freeing learners from artificial time-based or geographical constraints.
- **Data privacy**: Educators' and students' use of technology needs to appropriately balance the benefits of personalized learning, data-driven decision-making and innovation with the priority to protect and secure personal information.
- **Interoperability**: In order to create a seamless learning environment and ensure cooperation and exchange of knowledge amongst different institutions, interoperability of digital platforms needs to be ensured.
- **Public services**: Public service for digitally enhanced learning can ensure better support for large-scale education and personalized training and promote the development of education fairness and quality improvement.
- **Inclusion and equity:** Digitally enhanced learning and teaching should take the needs of students and educators from disadvantaged backgrounds into account.

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[12] Higher education in the digital era: The current state of transformation around the world in the digital era; IAU, 2019: technology_report_2019.pdf (iau-aiu.net)

[13] 38% of the European respondents describe the national internet infrastructure as 'very satisfactory'. In Asia and the Pacific 12% of the respondents consider the national infrastructure 'very satisfactory'.

[14] 61% of the respondents of the comprehensive consultation represent public HEIs. The majority of respondents were faculty members, heads of departments or staff members.

[15] Groningen Declaration Network: https://www.groningendeclaration.org/wp-content/uploads/2019/12/groningendeclaration_final_final-1.pdf

- **Continuous improvement culture:** A continuous evaluation of the learning and teaching experience is important (including effectiveness of technology infrastructure, quality learning content, and professional development) in order to ensure that the use of technology is effective and meaningful.

International exchange and mobility

"We live in a world in which not only people and jobs, but also programs and institutions, are increasingly internationally mobile. Qualified people are more mobile as they are increasingly able to traverse borders in an expanding global context […] Education institutions are also engaging in international partnerships and increasingly using new information and communication technologies to provide alternative ways to deliver education services"[16]

The digital transformation enables more and more frequent mobility through the use of digital tools, for example through virtual exchange programmes. Yet, the digital transformation does not only enable virtual mobility, it can also be used for stimulating, administering and implementing physical learner mobility, through the use of digital credentials and digital administrative collaboration.

Learner-centricity
International exchange and mobility opportunities should follow the approach of learner-centricity, allowing students to personalise their learning components based on their needs and to ensure that the automatic recognition of learning acquired during the exchange is seen as the norm.
Learner-specific education has been increasingly listed as an important strategic priority. Student-centred learning has, for example, been outlined as a priority in the Bologna process[17] for more than a decade, focusing on overcoming the challenges inherent to traditional education and bringing innovative solutions that allow for more flexibility. Giving learners the possibility to play a larger role in choosing their learning pathways and owning their own digital learner data will, undoubtedly, help build a new generation of learners who are proactive in pursuing opportunities relevant for their personal lifelong learning development.

Digital Learner Data
Digital learner data are critical to making lifelong learning a reality for our citizens/learners. With the advent of ever more personalised educational offers and a widening array of modes of delivery, learners will move from being education consumers to active creators of their own lifelong learning career. In other words, institutions will have to accommodate learner-centricity. This hinges on the availability of administrative learner data to the learners themselves, so they can use them in the same way as citizens nowadays manage their purchases and transfers through online bank accounts. Learners should have the possibility to consult and share their digital learner data with a view to seeking admission or advanced standing in educational programmes, seeking recognition for their educational and work related attainments, bringing in their digital learner backpack/portfolios for job interviews etc.[18]. Initiatives such as the Europass Digital Credentials Infrastructure (EDCI) try to provide just that in the European Union (and beyond)[19]. ASEM partners should maintain a dialogue on good practice examples fostering digital learner data exchange.

Interinstitutional agreements (incl. interoperability)

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[16] James Keevy & Borhene Chakroun (2015): Level-setting and recognition of learning outcomes – The use of level descriptors in the twenty-first century; UNESCO: Level-setting and recognition of learning outcomes: the use of level descriptors in the twenty-first century - UNESCO Digital Library

[17] EHEA, Student-centred learning: European Higher Education Area and Bologna Process (ehea.info)

[18] As advocated by the Groningen Declaration Network and as described in James Keevy & Borhene Chakroun (2019) Digital Credentialing: Implications for the recognition of learning across borders.

[19] Europass Digital Credentials Infrastructure | FUTURIUM | European Commission

The digital transformation of education can also facilitate better exchange of data among institutions, for instance by digitising current interinstitutional agreements and making it easier to share up-to-date information about administrative contacts, courses and mobility windows, resolving many issues faced with current paper agreements that are often shared by mail.

The Erasmus Without Paper initiative[20] is a clear example of how higher education institutions can exchange data without requiring them to use a centralised system. Instead, common data standards were adopted to allow for the interoperability of already existing systems, providing a more seamless and unified experience for academic staff managing mobilities.

This interoperability of networks will be vital in ensuring the long-term connections between European and Asian institutions to facilitate student and staff mobility as institutions will increasingly rely on digital systems that handle the exchange and processing of data.

Virtual and blended mobility
The role of virtual learning components in the context of blended mobility also needs to be clearly defined to ensure that virtual learning components are not treated as a replacement for attending classes in person, but rather as an additional dimension that can widen the available opportunities that a learner has, helping develop new skills and competencies that are relevant for the 21st century.

The digital transformation allows non-mobile learners to engage in virtual exchange opportunities and take courses abroad virtually. Through COIL (Collaborative Online International Learning) meaningful exchanges between teachers and students with peers in geographically distant locations and from different linguistic and cultural backgrounds can be promoted. COIL-initiatives include the use of internet-based tools and innovative online pedagogical methods. Via COIL-initiatives students and teachers are given the opportunity to develop various 21st century skills such as global citizenship and digital literacy. These acquired skills could be recognized via micro-credentials and aligned with the curricula of the COIL-involved institutions. The design of a mutual language and a shared understanding of skills and competences is indispensable for this to be successful in a partnership between institutions and across countries.

Futures of (lifelong) learning

"The illiterate of the 21st Century will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn", Alvin Toffler (1971)

Learning happens through formal, non-formal and informal[21] activities throughout one's life. Lifelong and life-wide learning includes learning activities for people of every age, in any possible environment (educational institutions, workplace, family, community, etc.) and using different modalities (formal, non-formal and informal education), which together respond to a wide range of learning-related needs and demands. Education should be less about accumulating knowledge and training at a younger age only, but about learning more; learning to create; learning to socially emancipate; and learning to become more proficient professionally. In this context, education providers should reorient and broaden their offerings in a way that learners can be accommodated throughout their lifelong learning career.

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[20] Erasmus without paper: EWP (erasmuswithoutpaper.eu)
[21] Formal learning is intentional and takes place in an organised and structured environment. Non-formal learning – while equally intentionally – occurs outside formal learning environments; it is usually based on the learner's objective to master a particular set of skills or area of knowledge. Informal learning – understood as "daily life learning" – is decoupled from educational institutions and unintentional, in a sense that it is undertaken not with a particular learning purpose in mind.

Lifelong Learning in the digital era

While the paradigm of lifelong learning predates today's digital world, it becomes dramatically redefined in the context of digitalisation. In the wake of increased speed in technology progression, society and the labour market demand increasingly complex skills. The transformational nature of technologies can quickly make redundant or downgrade already acquired knowledge, urging learners to reskill and upskill. In order to not jeopardize greater inclusion in education, a holistic approach to lifelong learning should include human capital, social capital, identity capital and cultural capital.[22] Educational offers delivered through new technological ways and means should aim at accumulating and articulating together some or all of these different types of capital, which will eventually not only serve the employability of the individual learners, but enable them to fully participate in society.

The redefinition of lifelong learning in the digital era may increasingly blur the boundaries between all forms of learning including general secondary, technical and vocational education, higher education and workplace learning as well as between public and private providers of learning.

Both higher and vocational educational institutions that currently target certain groups through traditional, more linearly constructed programmes will need to accommodate their learning offerings to provide for continuous upskilling and updating throughout the learner's active working life. They will have to remain relevant for lifelong learners as a more and more usual part of the student audience, by offering quality and digitally available resources and more flexible and stackable (short-cycle) learning units to their offer.

The global pandemic has acutely illustrated how opportunities offered by digitalisation may be hindered by unequal access to infrastructures or appropriate conditions to learn in a digital world. This is also of particular importance in a lifelong learning context, where social inclusion and equity are key goals. Ensuring appropriate conditions for learners including access to their own digital learner data, as well as designing curriculum and learning opportunities in a way that generate added value through digitally enhanced learning, would be key.

Personalised and flexible learning pathways

The digital transition made learners geographically more independent from the traditional brick and mortar education institutions. It enables more open, personalized and differentiated forms of acquiring knowledge. Educational institutions increasingly respond to this trend and should continue to do so. In this perspective, learners need to be able to think through their own learning needs, navigate different education and training offers, and design their personal learning pathways. Recognising learning achievements, for instance through digital credentialing, is indispensable since lifelong learners increasingly seek to document their personal learning path.

Artificial Intelligence (AI)-driven learning platforms can be an additional tool to address learning needs. Based on a learner's or employee's profile, AI has the potential to identify suitable future courses to continue scaffolding the professional development of a learner. Transparency and open source technologies are essential in this context, as algorithms shall support, but not control our knowledge and awareness of learning opportunities.

Open Educational Resources

The availability of high-quality Open Educational Resources (OER) is critical for the successful implementation of lifelong learning. With the help of digitalisation processes, quality content already developed by experts or otherwise credible sources can be made available online for all those who are interested in learning of certain areas of knowledge and upgrade their skills individually or collaboratively.

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[22] 8th ASEF Regional Conference on Higher Education (ARC8): https://arc.asef.org/wp-content/uploads/2021/01/ARC8_EG2_Seamus_OTUAMA_summary.pdf

Quality assurance and recognition

While QA tools and systems already operate in full transparency in higher education provision of digital and online learning, they are less transparent in TVET which in the vast majority of ASEM member states belongs to another sector within education (secondary education or TVET) and is thus ruled by different legislation. Given the widespread uptake of distance and online learning, accelerated by the pandemic, transparency is needed to demonstrate that the quality of online education is as well assured as that of traditional programmes. Further, the issue of data protection as well as data accuracy and fraud are issues to be considered in ensuring quality education and recognition of digitally enhanced learning.

Online learning
In the digital era, education and training is not only provided by accredited formal education institutions but also by other entities such as companies and non-formal learning providers, which raises questions of quality assurance and recognition. Quality assurance of online learning should be based on the same standards as any education provision. However, specific indicators might be needed to fit the purposes of online learning, as different quality issues may arise, and traditional indicators of quality may not be similarly applicable to online learning (teacher-student ratio; drop-out rates, etc.). These QA procedures need further to be backed up by calling on experts in the field of online learning.

Education providers
For online or blended education provision by higher education and TVET institutions, in principle, the same basic criteria and good practice related to quality assurance apply in equal measure to digitally provided learning. As different quality concerns may arise in an online environment compared to traditional face-to-face education, specific support and guidelines may be needed to raise awareness of and provide advice on the specific quality issues related to e-learning. These could include issues such as student engagement (how to ensure student participation in the development of the learning process in an online environment), teacher training and skills (are the skills needed the same? Should specific training be provided to teachers engaged in online education?); the specific role support staff have in online learning (technical environments etc.); the availability, reliability and user-friendliness of virtual learning environments; support to students and access to learning resources. All of these are important also in face-to-face education, but specific issues arise in an online environment.

Non-traditional educational providers
As quality assurance processes apply only to provision by HEIs and TVET (or in any case education bearing formal credit, or leading to recognised certificates/diplomas/degrees), other providers, such as companies, remain outside the formal QA mechanisms, e.g. for MOOCs or micro-credentials. For online learning offered by non-traditional providers, transparency is key in achieving broad recognition of the achieved learning outcomes. From a QA perspective this entails the use of commonly agreed standards, especially with regard to the "envelope", i.e., the credential itself describing the result of the learning process, that should at least include information on the formal QA processes applied. Possible ways to integrate such credits or courses into mainstream education and thus the sphere of quality assurance, can be done through (low threshold) RPL mechanisms, for example, or the establishment of voluntary quality labels.

Assessment of online learning
An important point in the assessment of online learning relates to the verification of the students in the online test situation. Certain instruments, like voice recognition and typing pattern recognition can guarantee that the learner taking the test is verified. A reliable adaptive trust-based system has been recently created by the TeSLA[23] project which is free to use for all HEIs. A further point in the assessment of online learning, especially in courses that cater to a large number of learners, such as MOOCs, is peer feedback and assessment. In MOOCs the numbers of students can be so high that

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[23]TeSLA project: https://tesla-project-eu.azurewebsites.net/how-it-works/

individual feedback by teachers becomes impossible. New ways of assessment include crowd sourcing techniques whereby peers provide feedback to one another. This peer-to-peer feedback and increased self-assessment are developments that are likely to increase and will be beneficial to enhance the quality.

Quality assurance and recognition of micro-credentials
Micro-credentials have proliferated in some countries in recent years.[24] They attract learners as they are more easily accessible and make education more modular, more flexible and more inclusive. They are especially convenient for lifelong learners as they can be more readily managed around work and personal life than more time-consuming traditional study modes. Employers and governments see the potential for supporting upskilling and reskilling in response to the rapid transformation in societies and labour markets. Emerging jobs will require new skills, and for such a transition people will need to keep up-to-date, and to learn new skills quickly, for which micro-credentials can offer a solution.

Micro-credentials are offered by universities, TVET providers and private organisations. They span a vast range of learning experiences and subjects. Recently, they have mushroomed so rapidly that quality assurance systems need to catch up to properly ensure their quality and recognition (across sectors). Perhaps the main QA challenge is the process called stacking, whereby different credentials are aggregated and combined into a larger degree or other qualification. While the flexibility of their acquisition suits learners, the complexity of such combinations and their unfamiliarity to regulators and institutions inhibits their evaluation and understanding, and so their recognition.

In Europe, the answer to QA worries appears to be to mainstream micro-credentials into established qualifications systems, thereby including application of (internal) QA processes. Micro-credentials are one item on the EU's Skills Agenda[25], the European Union's new initiative to modernize education and training. The European Commission's current consultation on micro-credentials (which may lead to legislation and common measures among the EU member states) explores common standards for their quality and transparency, accreditation of trusted providers, and inclusion in NQFs and the European Qualifications Framework (EQF).

If micro-credentials are indeed eventually included in national qualifications frameworks alongside more formal or established qualifications, that would certainly raise their standing and visibility and so boost their take-up by learners and recognition by employers.

In the Asia-Pacific region, Australia, New Zealand, and Singapore are notable leaders in micro-credential provision and recognition. The New Zealand Qualifications Authority records them, subject to criteria and standards, in a register and allows them to be stacked towards obtaining a qualification. In Singapore, the government subsidises people to take programmes including those leading to micro-credentials, support which has intensified during the pandemic.

Micro-credentials and validation of non-formal and informal learning
Micro-credentials can have stand-alone value and may also contribute to or complement other micro-credentials or macro-credentials, including through recognition of prior learning. For example, a micro-credential, especially when bearing an NQF level, could facilitate the transfer of an individual's learning

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[24] There are no definitions of micro-credentials *in law* in Asia or Europe, though there are several definitions in *use*. See for example: European approach to micro-credentials.
Essentially, micro-credentials are documented statements that acknowledge outcomes achieved and assessed, for small volumes of learning, made visible in the form of a badge, certificate, or endorsement, whether issued in a digital or paper format.
[25] European Skills Agenda - Employment, Social Affairs & Inclusion - European Commission (europa.eu)

achievements from non-formal education to formal studies, from (C)VET[26] to HE, such as recognition of EQF Level 5 qualification units to contribute to accessing and attaining a bachelor programme. Unnecessary and expensive repeat learning would be reduced.

Closing statement

In this working paper the ASEM Education Expert Group Digitalisation made a number of recommendations to policymakers and highlighted various ongoing trends and developments in the context of digitalisation in (higher) education. We urge the ASEM member countries to continue sharing their experiences and good practices and to learn from each other in the best interest of our region's learners, to make education as accessible and inclusive as possible.

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[26] CVET: continuing vocational education and training