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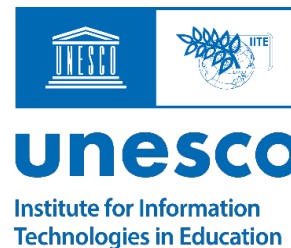
Institute for Information
Technologies in Education



GLOBAL PRACTICES EVALUATION & ASSESSMENT TOOLKIT

**Advancing Artificial Intelligence-Supported
Global Digital Citizenship Education**

Promoting Digital Literacy Best Practices Across Global Contexts to Advance Educational Equity



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EXECUTIVE SUMMARY

The UNESCO Institute for Information Technologies in Education (IITE) was established as an integral part of UNESCO by the General Conference of UNESCO at its 29th session (November 1997) and is located in Moscow, Russian Federation. IITE is the only UNESCO Category 1 Institute that holds a global mandate for ICT in education. In line with the new Education 2030 Agenda, IITE has developed its strategic priority areas to meet new demands and tasks ahead. The mission of IITE in the new era is promoting the innovative use of ICT and serving as facilitator and enabler for achieving Sustainable Development Goal 4 (SDG 4) through ICT-enabled solutions and best practices. This toolkit, supported by the Online Learning Consortium (OLC), is published in partnership with Shanghai Open University (SOU) to build on collected best practices regarding artificial intelligence, digital literacy, and digital citizenship instruction for lifelong learning and success and to provide policy makers and practitioners with an evaluation framework and assessment instrument to benchmark strategic improvements in the design, delivery, and implementation of supporting learning and engagement practices.

The development of educated active global citizens through global digital citizenship education literacy is an essential element of learning across the lifespan. From early education to higher education to lifelong learning educational experiences, the development of global digital citizenship education literacy allows learners to access experiences and concepts that transcend time, place, and space. Beyond individual benefits, digital citizenship education literacy not only allows learners to develop as individuals but also promotes societal benefits in developing learners to act responsibly according to social norms and practices concerning their uses of technology (Kara, 2018; Ribble, 2008) within and beyond professional and civic life domains (Milenkova and Lenzhova, 2021).

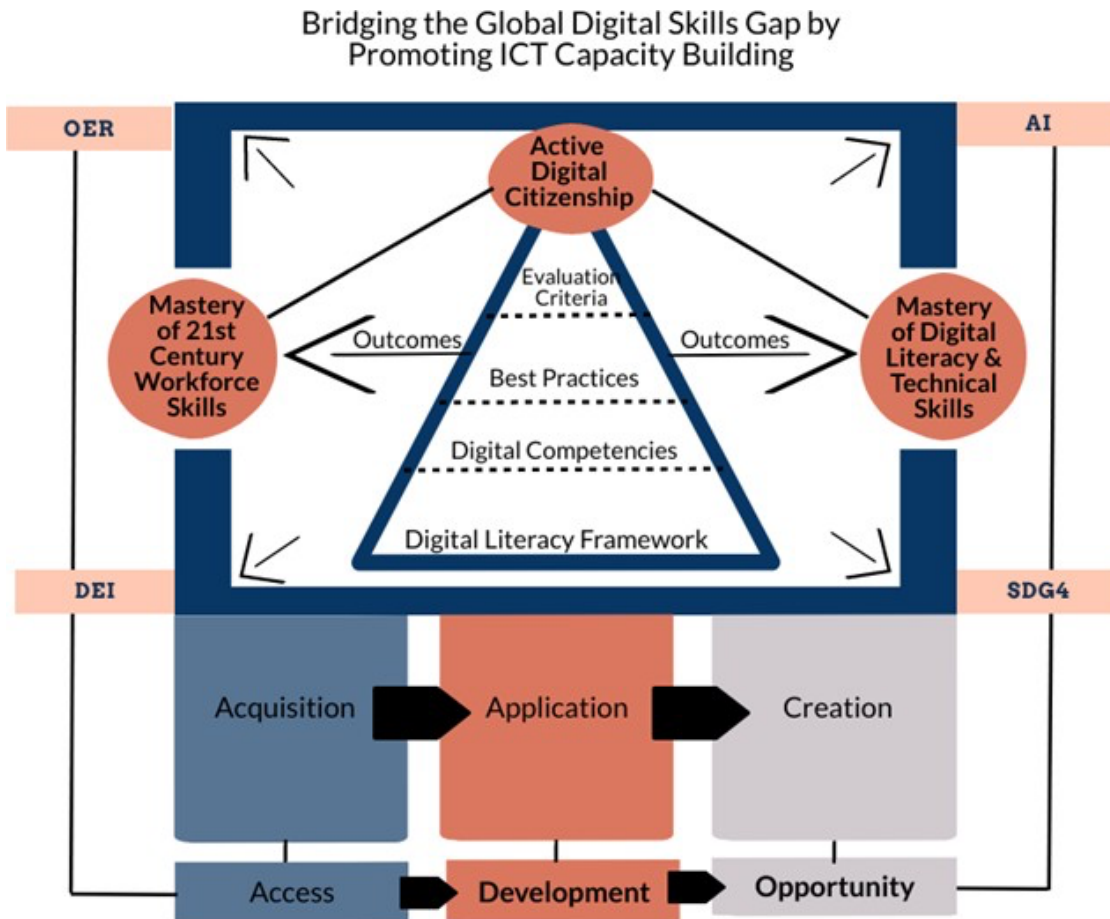
To promote global citizenship education across a global scale, this document presents a model framework evaluation and assessment instrument to bridge the global digital skills gap through information communication technology (ICT) capacity building. The model framework contained here includes digital citizenship education literacy indicators, and assessment practices together with literature and best practice case studies from across the globe. The model framework is rooted in findings culled from current scholarly literature and the findings of a 2022 study conducted at the request of the UNESCO Institute for Information Technologies in Education (IITE) and funded by Shanghai Open University, titled *UNESCO Institute for Information Technologies in Education (IITE) Study on Digital Literacy and Digital Citizenship Education*. In sum, this work examines perspectives, insights, and best practices for digital literacy and digital citizenship education.

The evaluation and assessment toolkit is designed to help educators and education systems across the world to access the benefits of global digital citizenship education opportunities deployed at scale for learners from diverse backgrounds, countries, and communities advance society, organizations, and individuals. With a focus on this explicit effort, we globally prepare citizens to be competitive, embrace life-long learning, and meet 21st century workforce demands.

INTRODUCTION AND FRAMEWORK

The UNESCO digital citizenship framework developed in the preceding best practices case study collection and literature review is centered within the equity-focused practices of open educational resource (OER) adoption and artificial intelligence (AI) in the pursuit of equity through the advancement of Diversity, Equity, and Inclusion (DEI) practices and U.N. Sustainable Development Goal (SDG) 4, which emphasizes the achievement of equitable, inclusive, quality educational experiences and lifelong learning opportunities for all (United Nations, n.d.). The framework bridges the global digital skills gap by promoting information and computing technology (ICT) capacity building, as shown in the figure below: “Bridging the Global Digital Skills Gap through ICT Capacity Building.” The foundational pillars supporting the framework, and the corresponding cross-national case studies collected, aim to promote the advancement of DEI through the achievement of SDG4 by developing global educational equity and fostering mastery of 21st-century workforce skills, digital literacy, and digital citizenship.

Figure 1. UNESCO IITE Analytical Framework



The lower portion of Figure 1 depicts the developmental learning process for students. This process consists of acquiring skills, applying skills, and creating knowledge in connection with 21st-century workforce skills, digital literacy, and digital citizenship. A second co-process located in the figure below the developmental process provides learners with access to digital infrastructure and skills, development of digital literacy skills, and opportunities resulting from the mastery of 21st-century workforce skills, digital literacy and technical skills, and active global digital citizenship.

The core elements of the digital literacy framework, depicted in the pyramid located in the center of Figure 1, were developed from the collected data of the aforementioned literature review and cross-national study. The digital literacy framework elements include digital competencies, best practices, and evaluation criteria, emerged from this study's data collection and analysis processes. The linkage of these components creates a bounded system to explore cross-national educators' innovative strategies, barriers, and challenges in the development of global digital literacy, 21st-century workforce skill development, digital literacy and technical skills, and digital citizenship for all learners.

The utility of the framework is the triangulation of educational best practices, evaluation criteria, and guidance for educators across the world in creating lifelong learning experiences to develop learners' digital literacy skills, 21st-century workforce skills, and human skills through active digital citizenship, creating opportunities for all learners and advancing global educational e-equity. This toolkit aims to deliver actionable results therein. The key outcomes of this project will detail and deconstruct digital competencies into cross-curriculum core educational best practices for educators, along with evaluation criteria and guidelines to provide metrics for success.

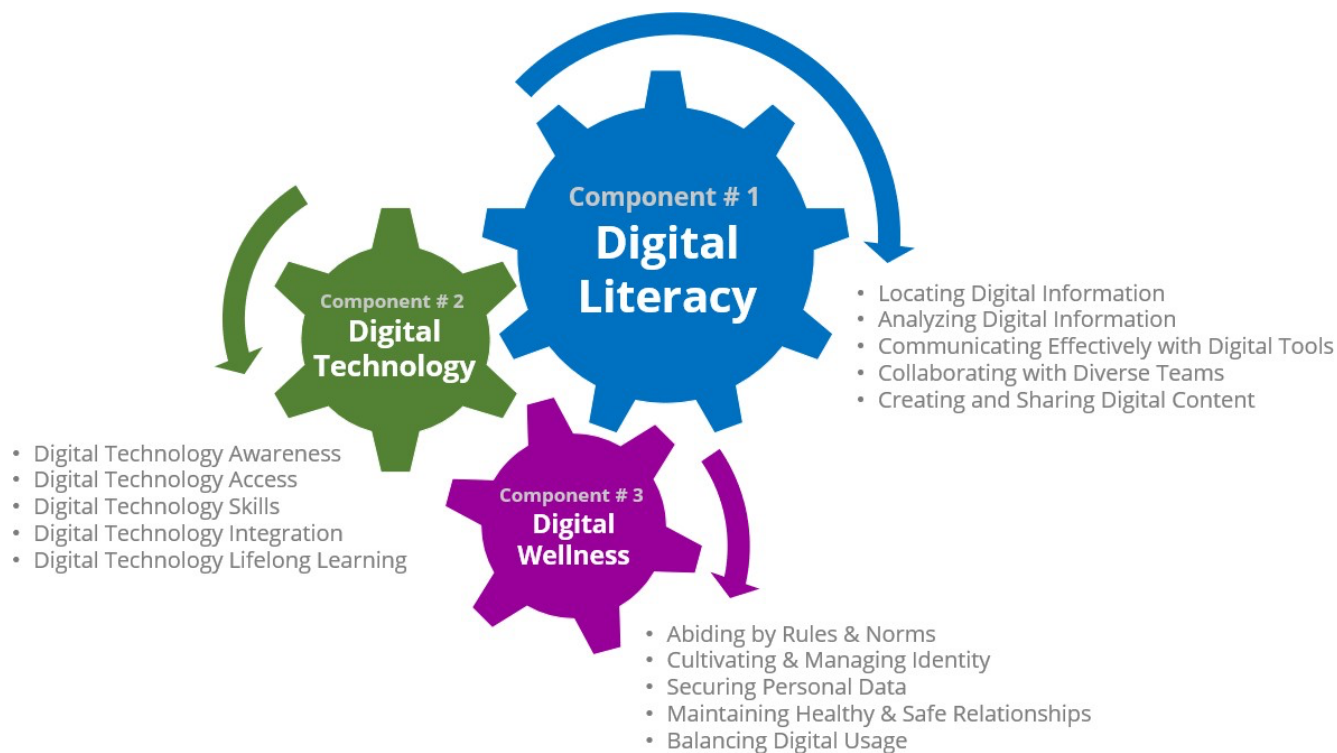
The adopted framework "*Bridging the Global Digital Skills Gap through ICT Capacity Building*" was built through the synthesis and expansion of current digital literacy models, including Canada's Center for Digital and Media Literacy Digital Literacy Model (n.d.), the DQ Global Standards Report (2019), the Meta-Framework of Digital Literacy (Martinez-Bravo et al., 2021), and UNESCO's Digital Literacy Global Framework (2018). Other works consulted include Bashay (2020), Broadband Commission Working Group on Education (2017), United Nations Department of Economic and Social Affairs Sustainable Development (n.d.), UNESCO Asia-Pacific Regional Bureau of Education (2015), Rahman & Aziz (2021) and Zucchetti, et al., (2019). Data gathered from 20 cases spanning 13 different countries detailing digital literacy, digital competencies, best practices, and assessment strategies also provide educational policymakers and leaders with the emerging indicator system and assessment test. They may be used to measure global digital citizenship education practices and programs to address, micro, meso, and macro challenges and to develop students' acquisition, application, and creation of knowledge as active global digital citizens.

Chief in deviation from previous models and this framework is the integration of previously unlinked components of digital citizenship, digital literacy, and artificial intelligence and a clear and explicit recognition that instruction and learner support across the various levels of development, backgrounds, and regions cannot be limited to primary and secondary instruction. In fact, explicit teaching across traditional K-16 global education system and networks and holistic life-span efforts to stay current with advances in technology tools and current conceptions of digital literacy are key to mastering and maintaining workforce skills, competency, individual and societal success.

INDICATOR SYSTEM

INDICATOR SYSTEM DRIVER
Sustainable Development Goal 4 (SDG4)–Quality Education (UNESCO, n.d.) <i>Ensure inclusive quality education and promote lifelong learning opportunities for all.</i>
To support the work of SDG4, this indicator system supports educators, communities, and countries in fostering digital citizenship by: <ul style="list-style-type: none">• Fostering critical digital literacy, digital technology, and digital wellness skill sets that promote equity, preparing individuals to living as lifelong learners and active, responsible citizens• Developing individual agency that supports sustainable development, sustainable lifestyles, human rights, gender equality, peace and nonviolence, global citizenship, and appreciation for cultural diversity, and a deep understanding of the impact of one’s role and the role of one’s country on the broader world

Figure 2. Indicator System Major Components and Topics



ESSENTIAL INDICATORS		
Themes	Topics	Aligned Literature & Case Sources
Digital Literacy <i>Supporting individuals as they locate and analyze digital information, digitally communicate and collaborate, and create digital content.</i>	Locating Digital Information Individuals can <i>locate digital information</i> to answer questions and solve challenges	Carretero et al., 2017; NACE, 2019; Edvolve, 2021; Case Study #8, Turkey: Balikesir University; Case Study #10, Australia: National Cyberstart Initiative; Case Study #12, Malaysia: Cybersecurity Malaysia Initiative; Case Study #13, South Korea: Community Media Foundation
	Analyzing Digital Information Individuals can <i>analyze digital information</i> , understanding that it varies in value, quality, and reliability and that media can influence individual perceptions and social actions	Edvolve, 2021; Case Study #10, Australia: National Cyberstart Initiative
	Communicating Effectively with Digital Tools Individuals can <i>communicate in written and verbal forms effectively with digital tools</i> to varying audiences	CED, 2015; Carretero et al., 2017; Kim & Choi, 2018; NACE, 2019; Case Study #3; Spain: Navarra University; Case Study #8, Turkey: Balikesir University; Case Study #10, Australia: National Cyberstart Initiative;
	Collaborating with Diverse Teams Individuals can <i>digitally collaborate with diverse teams</i> in their communities and across the globe	CED, 2015; Carretero et al., 2017; NACE, 2019
	Creating and Sharing Digital Content Individuals can <i>create and share digital content</i> responsibly	Carretero et al., 2017; Case Study #3; Spain: Navarra University; Case Study #10, Australia: National Cyberstart Initiative; Case Study #13, South Korea: Community Media Foundation
Digital Technology <i>Supporting individuals as they become aware, access, and cultivate skills to leverage modern digital technologies (e.g., artificial intelligence, adaptive learning, open educational resources) for learning, work, leisure, and active civic engagement across their lifespan with their communities, nation, and world.</i>	Digital Technology Awareness Individuals understand and are <i>aware of digital technologies</i> that support their learning, work, and life as a citizen	Kim & Choi, 2018; Case Study #2, Shanghai University for the Elderly; Case Study #4, China: Department of Education of Zhejiang Province
	Digital Technology Access Individuals have <i>access to digital technologies</i> that support their learning, work, and life as a citizen	Case Study #2, Shanghai University for the Elderly;; Case Study#4, Case Study #5, Saudi Arabia, King Khalid University; China: Department of Education of Zhejiang Province; Case Study #6, Chengdu Open University; Case Study #7, Sichuan Dream Realization Disabled Public Welfare Center

ESSENTIAL INDICATORS		
Themes	Topics	Aligned Literature & Case Sources
Digital Technology (continued)	Digital Technology Skills Individuals have the <i>skills to effectively use and evaluate digital technologies</i> that support their learning, work, and life as a citizen	CED, 2015; Kim & Choi, 2018; NACE, 2019; Case Study #8, Turkey: Balikesir University; Case Study #10, Australia: National Cyberstart Initiative; Case Study #13, South Korea: Community Media Foundation
	Digital Technology Integration Individuals <i>integrate digital technologies into their lives</i> to support one another and enhance quality of life	Lee & Baykal. 2017; Case Study #3, Spain: Navarra University; Case Study #5, Saudi Arabia, King Khalid University; Case Study #14, Ecuador: Universidad de las Americas and Internacional del Ecuador; Case Study #15, Kenya: M-Shule Platform; Case Study #16, Uruguay: PAM Platform; Case Study #17, United States: University of Michigan; Case Study #18, Australia: Universities of Sydney and Melbourne; Case Study #19, United States: Universities of North Carolina and Illinois; Case Study #20, United States: New York University Abu Dhabi
	Digital Technology Lifelong Learning Individuals <i>apply an interconnected holistic and continuous lifelong learning approach to digital technologies</i> throughout their lifespan	Ribble, 2008; UNESCO Bangkok, 2015; Kim & Choi, 2018; Case Study #10, Australia: National Cyberstart Initiative; Case Study #12, Malaysia: Cybersecurity Malaysia Initiative; Case Study #13, South Korea: Community Media Foundation
Digital Wellness <i>Supporting individuals as they navigate modern digital technologies to abide by rules and norms, cultivate and manage a healthy digital identity, secure their data, and maintain a healthy balance of online and offline activities.</i>	Abiding by Rules & Norms Individuals <i>understand and abide by rights, laws, rules, and norms</i> governing digital tools and resources	Edvolve, 2021; ISTE, 2021b; Case Study #11, Singapore: National Cyber Wellness Program
	Cultivating & Managing Identity Individuals <i>cultivate and manage a healthy digital identity</i> across their lifespan, aware that it is constructed and permanent	Edvolve, 2021; ISTE, 2021b; Case Study #2: China: Shanghai University for the Elderly; Case Study #11, Singapore: National Cyber Wellness Program
	Securing Personal Data Individuals <i>apply strategies to secure their data</i> , maintaining their privacy and safeguarding personal data appropriately	ISTE, 2021b; Case Study #10, Australia: National Cyberstart Initiative; Case Study #12, Malaysia: Cybersecurity Malaysia Initiative

ESSENTIAL INDICATORS		
Themes	Topics	Aligned Literature & Case Sources
Digital Wellness (continued)	Maintaining Healthy & Safe Relationships Individuals <i>maintain healthy and safe relationships</i> while using digital tools, treating others and one's self with respect	Kim & Choi, 2018; ISTE, 2021b; Case Study #11, Singapore: National Cyber Wellness Program; Case Study #12, Malaysia: Cybersecurity Malaysia Initiative
	Balancing Digital Usage Individuals <i>balance digital usage</i> , reflecting on their routines and creating a healthy mix of online and offline activities	Kim & Choi, 2018; Southgate, 2020; Edvolve, 2021; Case Study #3; Spain: Navarra University; Case Study #11, Singapore: National Cyber Wellness Program

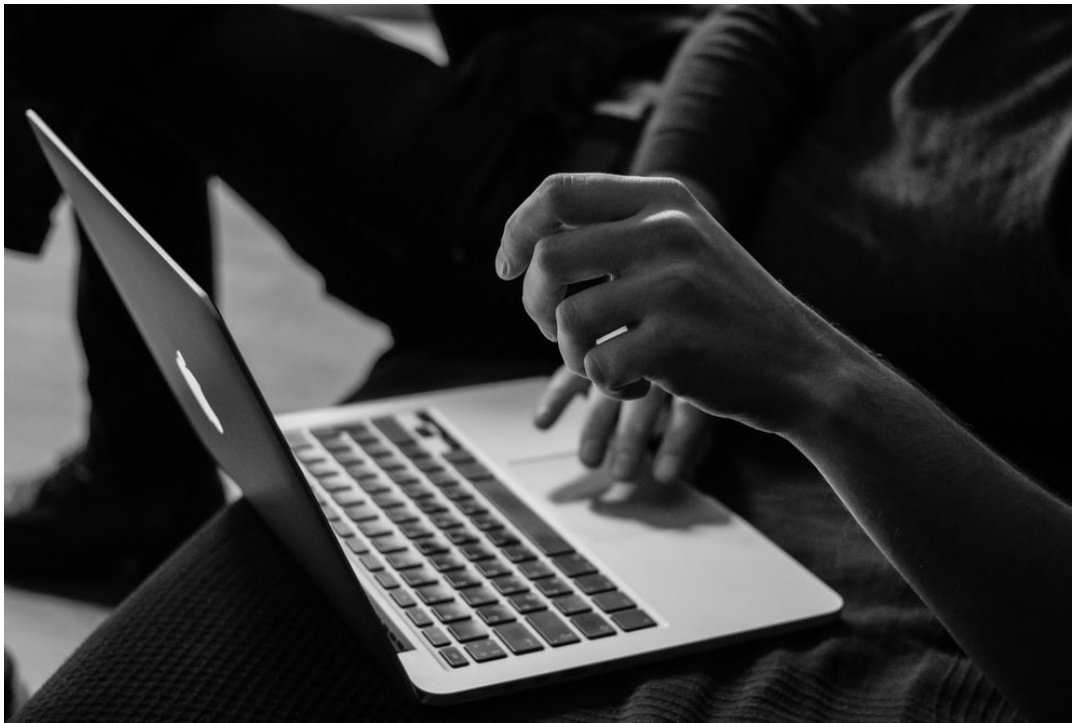


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ASSESSMENT TESTS

Assessment Test Overview

Qualities of digital citizenship are inherently bounded in a foundation of individuals taking agency over their digital literacy skills, use of digital technologies, and strategies for digital wellness to actively support their community, nation, and world in promoting equity and social justice, upholding basic and equal digital rights. This section presents two systems to support the work of educators and leaders as they reflect on their digital citizenship efforts and develop plans for continuous improvement. These systems are built upon the deep research and literature in the area, but also from the cases that have been collected that value learning experiences that:

- Center the learner, developing learner agency around crucial skills in ways that are flexible and adaptable to their needs;
- Provide opportunities that are connective, reflective, and active;
- Promote a spirit of lifelong learning, setting the stage for holistic continuous learning and improvement throughout the lifespan; and
- Are supported through community and national investments and policy.

This section begins with a system for educators as they work to develop educational experiences that support their learners—no matter where they might be in their lifespan—in not only becoming aware of crucial digital citizenship skills in the areas of digital literacy, digital technologies, and digital wellness, but actively participating in guided practice that supports them in developing agency. This section concludes with a system for leaders of educational entities (e.g., schools, community centers, employer professional development units, etc.), communities, and nations as they engage in work regarding investments and policy to support educators across their districts, communities, and nations to create curriculum that supports digital citizenship in the key areas outlined in the Educator Assessment System. It is crucial that researchers, educators, and policymakers are active partners in creating digital citizenship educational experiences that support the acquisition, application, and creation of key skills that provide access, development, and opportunity as a foundation for equity and social justice, upholding basic and equal digital rights.

A System for Educators

In a proactive approach to support lifelong learning, this system for educators focuses on providing educational experiences for individuals when they are in the learning zone, as opposed to the panic or comfort zones (CareerPrepped, n.d.) when it is far too late or too early to engage in skill development. In this learning zone, the system provides three focus areas on which educators can center their support of digital citizenship:

- **Digital Literacy:** supporting individuals as they locate and analyze digital information, digitally communicate and collaborate, and create digital content.
- **Digital Technology:** supporting individuals as they become aware of, access, and cultivate skills to leverage modern digital technologies (e.g., artificial intelligence, adaptive learning, open educational resources) for learning, work, leisure, and active civic engagement across their lifespan with their communities, nation, and world.

- **Digital Wellness:** supporting individuals as they navigate modern digital technologies to abide by rules and norms, cultivate and manage a healthy digital identity, secure their data, and maintain a healthy balance of online and offline activities.

Educators may use the Educator System to review their current digital citizenship curriculum or as they seek to develop curriculum and educational experiences that support digital citizenship. Inspired by Ribble's (2008) four-stage technology learning framework, the assessment system scale focuses on advancement through awareness, guided practice, and modeling with an adapted fourth category that focuses on experiences centering learner agency which encourages, as identified in Accenture (2018), experiential learning, lifelong learning, and partnerships across spectrums to serve the lifespan. This system was created to integrate and build upon the deep research and literature in the area, but also from the cases that have been collected to further support individuals developing key digital citizenship skills.

However, it is important to acknowledge that these skills are complex and this tool is not necessarily exhaustive or exclusive to account for the varying educational experiences needed throughout the lifespan. Thus, educators can adapt it for their specific needs to grow their digital citizenship curriculum in service of ensuring inclusive quality education and promoting lifelong learning opportunities for all (UNESCO, n.d.) by:

- Fostering critical digital literacy, digital technology, and digital wellness skill sets that promote equity, preparing individuals for lives as lifelong learners and active, responsible citizens
- Developing individual agency that supports sustainable development, sustainable lifestyles, human rights, gender equality, peace and nonviolence, global citizenship, and appreciation for cultural diversity, as well as a deep understanding of the impact of one's role and the role of one's country on the broader world

Educator Assessment System

Indicators	Does Not Exist (0)	Creates Awareness (1)	Provides Guided Practice (2)	Models Strategies & Behaviors (3)	Centers Agency (4)
Digital Literacy					
<i>Supporting individuals as they locate and analyze digital information, digitally communicate and collaborate, and create digital content.</i>					
Locating Digital Information	The experience does not support learners in locating digital information	The experience creates awareness for learners regarding how to locate digital information to answer questions and solve challenges	The experience includes an educator providing guided practice in locating digital information to answer questions and solve challenges	The experience includes an educator modeling ways to effectively locate digital information to answer questions and solve challenges	The experience promotes individual agency to locate digital information to answer questions and solve challenge in service of being an active learner, employee, and/or citizen
Analyzing Digital Information	The experience does not support learners in analyzing digital information	The experience creates awareness that digital information varies in value, quality, and reliability and how it can influence individual perspectives and larger social actions	The experience includes an educator providing guided practice in analyzing digital information and reflect on the impact of influence	The experience includes an educator modeling ways to effectively analyze information and apply reflections of influence	The experience promotes individual agency to analyze information and apply reflections of influence in service of being an active learner, employee, and/or citizen
Communicating Effectively with Digital Tools	The experience does not support learners in communicating effectively with digital tools	The experience creates awareness of how digital tools can support written and verbal communication among varying audiences	The experience includes an educator providing guided practice in using digital tools to communicate in written and verbal forms among varying audiences	The experience includes an educator modeling ways to effectively communicate in written and verbal forms among varying audiences	The experience promotes individual agency to communicate effectively in written and verbal forms to varying audiences in service of being an active learner, employee, and/or citizen

Indicators	Does Not Exist (0)	Creates Awareness (1)	Provides Guided Practice (2)	Models Strategies & Behaviors (3)	Centers Agency (4)
Collaborating with Diverse Teams	The experience does not support learners in collaborating with diverse teams	The experience creates awareness of strategies to digitally collaborate in diverse teams within their communities and across the globe	The experience includes an educator providing guided practice in digital collaboration in diverse teams within their communities and across the globe	The experience includes an educator modeling ways to effectively collaborate digitally in diverse teams within their communities and across the globe	The experience promotes individual agency to collaborate digitally as a part of diverse team in their community or beyond in service of being an active learner, employee, and/or citizen
Creating and Sharing Digital Content	The experience does not support learners in creating and sharing digital content	The experience creates awareness of ways to responsibly create and share digital content	The experience includes an educator providing guided practice in creating and sharing digital content	The experience includes an educator modeling the effective creation and methods of sharing digital content	The experience promotes individual agency to create and share digital content in service of being an active learner, employee, and/or citizen
Digital Technology <i>Supporting individuals as they become aware, access, and cultivate skills to leverage modern digital technologies (e.g., artificial intelligence, adaptive learning, open educational resources) for learning, work, leisure, and active civic engagement across their lifespan with their communities, nation, and world.</i>					
Digital Technology Awareness	The experience does not support learners in becoming aware of foundational and emerging technology tools	The experience creates awareness of how foundational and emerging digital technologies	The experience includes an educator providing guided practice in exploring foundational and emerging digital technologies	The experience includes an educator modeling the effective exploration of foundational and emerging digital technologies	The experience promotes individual agency to explore foundational and emerging digital technologies in service of being an active learner, employee, and/or citizen
Digital Technology Access	The experience does not support learners in accessing crucial digital technologies	The experience enables access to crucial digital technologies	The experience includes an educator providing guided practice in accessing (e.g., downloading, logging in) crucial digital technologies	The experience includes an educator modeling how to access effectively (e.g., downloading, logging in) crucial digital technologies	The experience promotes individual agency to access and support others accessing crucial digital technologies in service of being an active learner, employee, and/or citizen

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GLOBAL DIGITAL CITIZENSHIP EDUCATION TOOLKIT**

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Indicators	Does Not Exist (0)	Creates Awareness (1)	Provides Guided Practice (2)	Models Strategies & Behaviors (3)	Centers Agency (4)
Digital Technology Skills	The experience does not support learners in developing digital technology skills	The experience creates awareness of skills needed to leverage digital technologies	The experience includes an educator providing guided practice using digital technologies	The experience includes an educator modeling the effective use of digital technologies	The experience promotes individual agency to use digital technologies in service of being an active learner, employee, and/or citizen
Digital Technology Integration	The experience does not support learners in integrating digital technologies into their lives	The experience creates awareness of how learners can integrate digital technologies into their lives to support others and enhance quality of life	The experience includes an educator providing guided practice using digital technologies into their lives to support others and enhance quality of life	The experience includes an educator modeling the effective integration of digital technologies into their lives to support others and enhance quality of life	The experience promotes individual agency to integrate digital technology to support others and enhance quality of life in service of being active learner, employee, and/or citizen
Digital Technology Connectedness & Lifelong Learning	The experience does not support learners in adopting a holistic, lifelong learning approach	The experience creates awareness among learners that digital technologies are constantly emerging and holistically intersect in their learning, work, citizenry, leisure, and/or home life throughout one's lifespan, necessitating a lifelong learning and continuous improvement approach	The experience includes an educator providing guided practice working with digital technologies as they emerge and evolve across contexts and parts of life	The experience includes an educator modeling effective strategies for working with digital technologies as they emerge and evolve across contexts and parts of life	The experience promotes individual agency to work with digital technologies in a way that holistically intersects contexts (e.g., learning, work, citizenry, home, leisure) and parts of life (e.g., PK12, higher education, early adulthood, adulthood, elderly) in service of being an active learner, employee, and/or citizen

Indicators	Does Not Exist (0)	Creates Awareness (1)	Provides Guided Practice (2)	Models Strategies & Behaviors (3)	Centers Agency (4)
Digital Wellness <i>Supporting individuals as they navigate modern digital technologies to abide by rules and norms, cultivate and manage a healthy digital identity, secure their data, and maintain a healthy balance of online and offline activities.</i>					
Abiding by Rules & Norms	The experience does not support learners in understanding and abiding by rights, laws, rules, and norms governing digital tools and resources	The experience creates awareness among learners regarding the rights, laws, rules, and norms governing digital tools and resources	The experience includes an educator providing guided practice applying rights, laws, rules, and norms of digital tools and resources	The experience includes an educator modeling the effective application of rights, laws, rules, and norms of digital tools and resources	The experience promotes individual agency to apply rights, laws, rules, and norms of digital tool and resource for use in service of being an active learner, employee, and/or citizen
Cultivating & Managing Identity	The experience does not support learners in cultivating and managing a healthy digital identity	The experience creates awareness among learners that digital identity has permanency and is something that is constructed, cultivated and managed across their lifespan	The experience includes an educator providing guided practice in constructing, cultivating, and managing digital identity	The experience includes an educator modeling effective strategies for constructing, cultivating, and managing digital identity	The experience promotes individual agency to construct, cultivate, and manage their digital identity in service of being an active learner, employee, and/or citizen
Securing Personal Data	The experience does not support learners in securing their personal data	The experience creates awareness among learners that they need to take an active role in securing their data to maintain their privacy and safeguard their personal data	The experience includes an educator providing guided practice in learners actively securing their data to maintain their privacy and secure their personal data	The experience includes an educator modeling effective strategies for actively securing data to maintain privacy and secure personal data	The experience promotes individual agency to secure their data to maintain privacy and secure their personal data in service of being an active learner, employee, and/or citizen

**ADVANCING ARTIFICIAL INTELLIGENCE- SUPPORTED
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Promoting Digital Literacy Best Practices Across Global Contexts to Advance Educational Equity

Indicators	Does Not Exist (0)	Creates Awareness (1)	Provides Guided Practice (2)	Models Strategies & Behaviors (3)	Centers Agency (4)
Maintaining Healthy & Safe Relationships	The experience does not support learners in creating and maintaining healthy and safe relationships while using digital tools	The experience creates awareness among learners that they need to be cognizant of creating and maintaining healthy and safe relationships while using digital tools across contexts, treating others and one's self with respect	The experience includes an educator providing guided practice in learners creating and maintaining healthy and safe relationships while using digital tools across contexts, treating others and one's self with respect	The experience includes an educator modeling effective strategies for creating and maintaining healthy and safe relationships while using digital tools across contexts, treating others and one's self with respect	The experience promotes individual agency to create and maintain healthy and safe relationships while using digital tools across contexts in service of being an active learner, employee, and/or citizen
Balancing Digital Usage	The experience does not support learners in balancing digital usage	The experience creates awareness among learners that digital usage should be balanced, necessitating frequent reflection around one's routines and creating a healthy mix of online and offline activities	The experience includes an educator providing guided practice for learners as they reflect and apply their reflections around balancing online and offline activities	The experience includes an educator modeling effective strategies for balancing online and offline activities	The experience promotes individual agency to balance digital usage in service of being an active learner, employee, and/or citizen

Educator Assessment System Scoring

The Educator Assessment System consists of three broader themed areas (i.e., digital literacy, digital technology, and digital wellness). They help to identify five indicators that can assist educators as they develop and assess their educational experiences, focusing on a four-point scale with differentiating qualities between awareness, guided practice, modeling, and being centered in agency. The following scale consisting of sixty points might be employed to benchmark achievement and continuous improvement efforts:

Points Achieved	Assessment	Continuous Improvement Reflection Questions
54-60	Exemplary	<ul style="list-style-type: none"> • How might your experience center individual agency? • How might your experience support a holistic and interconnected look at using digital tools across the lifespan in support of being an active learner, employee, and/or citizen?
48-53	Acceptable	<ul style="list-style-type: none"> • How might your experience utilize modeling to enable learners to see effective strategies in action? • How might your experience support deep reflection and discussion around digital technology use?
42-47	Needs Minor Improvement	<ul style="list-style-type: none"> • How might your experience leverage guided practice for learners to explore and use digital technologies in a safe environment? • How might your experience provide opportunities to interact with an educator and peers to deepen digital technology use?
41 and below	Needs Major Improvements	<ul style="list-style-type: none"> • How might your experience include or miss the different areas and their indicators? • How might your experience create awareness of how digital technologies can be used?

A System for Educational Entities, Communities, Nations, and Global Partnerships

In an effort to create a holistic approach and partnership between educators and their associated systems (i.e., educational entities, communities, and nations), a system was developed to assist leaders in supporting educators in cultivating and facilitating crucial digital citizenship skills in digital literacy, digital technology, and digital wellness. This support is provided by ensuring adequate:

- **Investment** (e.g., time, money, and resources): educational entities, communities and nations invest in digital citizenship by gathering key stakeholders, acquiring knowledge, developing strategies, and enacting purposeful investments;
- **Policy**: educational entities, communities and nations create policies to support digital citizenship by gathering key stakeholders, acquiring knowledge, developing strategies, and enacting purposeful policies; and
- **Connection**: educational entities, communities and nations connect globally to promote digital citizenship by gathering key stakeholders, acquiring knowledge, developing strategies, and enacting purposeful connections.

Individuals in positions of leadership, informally or more formally, in educational entities (e.g., school districts, community centers, employer professional development units), communities, and nations around the globe may use the Educational Entity, Community, Nation, and Partnership Assessment System to develop strategies for purposeful investment, policy, and connection strategy in support of ensuring inclusive quality education and promoting lifelong learning opportunities for all (UNESCO, n.d.) by:

- Fostering critical digital literacy, digital technology, and digital wellness skill sets that promote equity, preparing individuals for lives as lifelong learners and active, responsible citizens
- Developing individual agency that supports sustainable development, sustainable lifestyles, human rights, gender equality, peace and nonviolence, global citizenship, and appreciation for cultural diversity, as well as a deep understanding of the impact of one's role and the role of one's country on the world

The advancing scale of a 0-4 assessment system scale that expands on the model framework of acquisition, application, and creation—adding a crucial final category for educational entities, communities, and nations to acknowledge enactment of key investment, policy, and connection strategies to fully acknowledge the growth journey between acquisition and access, application and development, and creation and opportunity.

Educational Entity, Community, Nation, and Global Partnership Assessment System

Indicators	Non-Existent (0)	Discussing (1)	Acquiring (2)	Applying (3)	Enacting (4)
Investment <i>Educational entities, communities and nations invest in digital citizenship</i>	The educational entity, community or nation does not invest in digital citizenship	The community or nation has gathered key stakeholders to discuss investments in digital citizenship	The community or nation is in the process of acquiring knowledge to develop their investment in digital citizenship	The community or nation has applied what they have learned to create digital citizenship investment strategies	The community or nation has enacted an investment strategy that puts individuals at the center, flexibly and actively supporting learning, work, leisure, and citizenry across one's lifespan in a continuous, lifelong learning approach
Policy <i>Educational entities, communities and nations create policies to support digital citizenship</i>	The community or nation does not have policies supporting digital citizenship	The community or nation has gathered key stakeholders to discuss policies to support digital citizenship	The community or nation is in the process of acquiring knowledge to inform policies to support digital citizenship	The community or nation has applied what they have learned to create digital citizenship policies	The community or nation has enacted policies that puts individuals at the center, flexibly and actively supporting learning, work, leisure, and citizenry across one's lifespan in a continuous, lifelong learning approach
Connection <i>Educational entities, communities and nations connect globally to promote digital citizenship</i>	The community or nation does not connect globally to promote digital citizenship	The community or nation has gathered key stakeholders to discuss connections to promote digital citizenship globally	The community or nation is in the process of acquiring knowledge to inform connections that promote digital citizenship globally	The community or nation has applied what they have learned to create global digital citizenship connection strategies	The community or nation has enacted a strategy that connects individuals in their own community or nation to the larger world that puts individuals at the center, flexibly and actively supporting learning, work, leisure, and citizenry across one's lifespan in a continuous, lifelong learning approach

Community, Nation, and Global Partnership Assessment System Scale

The Community, Nation, and Global Partnership System inherently supports the three themed areas (i.e., digital literacy, digital technology, and digital wellness) and their related indicators from the Educator Assessment System by identifying three areas in which communities and nations can support digital citizenship through three scaled (0-4) indicators of investment, policies, and connectedness. With the total of twelve points possible, the following scale might be employed to benchmark achievement and continuous improvement efforts:

Points Achieved	Assessment	Continuous Improvement Reflection Questions
11-12	Exemplary	<ul style="list-style-type: none"> • How might your educational entity, community, or nation enact investment, policy, and connection strategies to better support digital citizenship? • How might you share your investment strategy, policies, and connections with other educational entities, communities, or nations to be a true steward of digital citizenship across your community, nation, or globe?
9-10	Needs Minor Improvement	<ul style="list-style-type: none"> • How might you acquire and build digital citizenship knowledge that can be applied to developing investment strategy and policy within your educational entity, community, or nation? • How might you grow mutually beneficial relationships with other educational entities, communities, or nations to promote active digital citizenship educational experience throughout an individual's lifespan?
8 and below	Needs Major Improvements	<ul style="list-style-type: none"> • How might you gather key stakeholders within your educational entity, community, or nation to discuss challenges related to digital citizenship, as well as investments and policies that may be needed? • How might you connect to other educational entities, communities, or nations to explore, build upon, and collaborate on successful digital citizenship practices?

Closing Call to Action

Through the efforts of policymakers, institutional leaders, educators, and researchers, AI-supported global digital citizenship education is poised to catalyze the nexus moment created through the increased demand, reach, reliance, and advancement of online, blended, and digital learning due to the global health pandemic. Existing and emerging digital literacy and digital citizenship frameworks provide essential knowledge and skills to determine policy-related, institutional, and educational best practices and assessment strategies regarding digital citizenship education. The use of these tools will help to benchmark and ensure a deeper understanding of the commonalities, nuances, and strengths of existing digital citizenship policies and digital literacy frameworks. Thus targeted advances can be made to ensure more equitable outcomes in lifelong learning across the globe.

This framework first and foremost acknowledges the need for educators, leaders, and researchers to understand and embrace the holistic need to nurture and continually develop people's digital literacy, digital technology, and digital wellness skillset throughout their learning lifespan (PK, K-12, higher education, young adulthood, adulthood, and elderly). Fostering critical digital literacy, digital technology, and digital wellness skill sets promotes equity and prepares individuals for lives as lifelong learners and active, responsible citizens. Similarly, developing individual agency that supports sustainable development, sustainable lifestyles, human rights, gender equality, peace and nonviolence, global citizenship, and appreciation for cultural diversity, as well as a deep understanding of the impact of one's role and the role of one's country on the broader world are important and noted outcomes of this aspect of our lifelong learning.

Educators: Educators need to identify, cultivate, and develop curriculum and lesson plans that focus on digital literacy, digital technologies, and digital wellness in a way that moves from awareness to guided practice to modeling to agency. This framework compels partnerships across spectrums (e.g., K12, higher education, employer, community, family) to provide active, real-world experiential learning. Educators are also entrusted with showing how the topics and learning components evolve and will change through time, compelling the updates that facilitate true lifelong learning.

Policy Makers and Leaders: Global leaders must invest (with time, money, and resources) in digital citizenship education that is learner-centered and focuses on agency development through the lifespan, particularly in evolving areas (e.g., emerging technologies and applications). The policies that support digital citizenship, with examples cited from developing and advanced countries around the world, must be expanded and be implemented for global citizens at-scale.

Researchers: As this framework is just the beginning of important analysis into the interconnectedness of digital learning fields and components, researchers are needed to test the assessment systems and extend scholarship should be extended in these areas. As the size of data sets grow, we anticipate the opportunity to further refine and focus this analytical framework.

Regardless of country, region, or specific role, we each can contribute to the best practices and assessment strategies needed to advance global digital citizenship education across the world, thereby creating, a more sustainable, equitable educational future, especially for marginalized learners. This will advance SDG 4 and ensure positive global change.

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