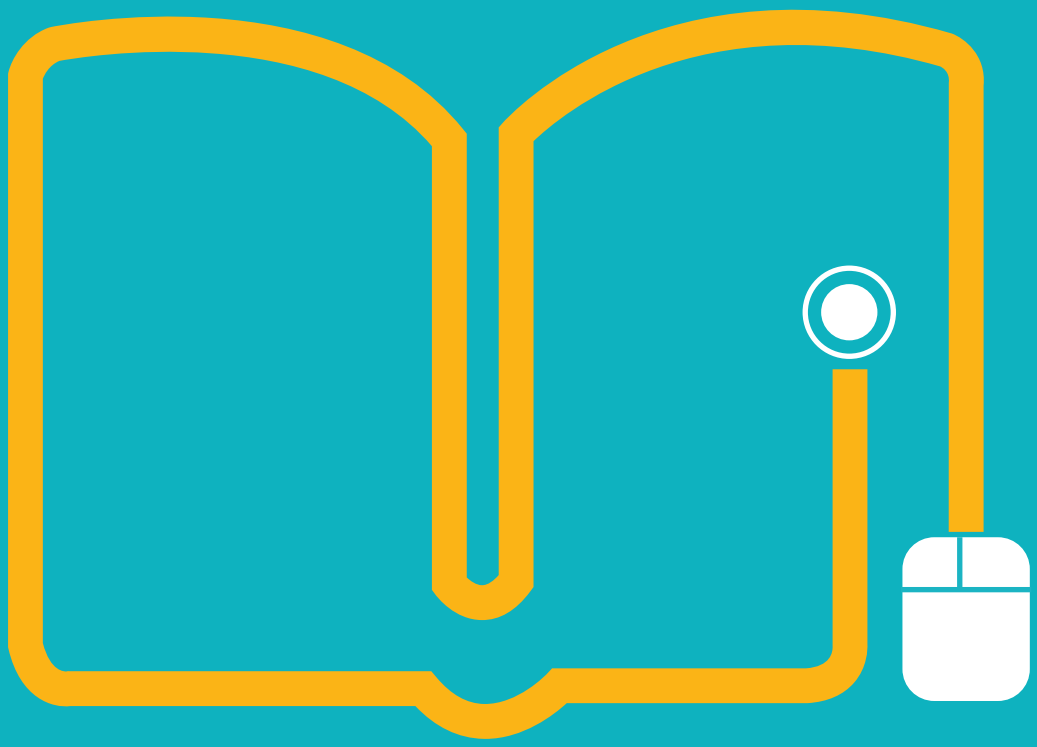
# REALIZING EDUCATION FOR ALL

# IN THE DIGITAL AGE



T20 JAPAN 2019

G20 2019 JAPAN

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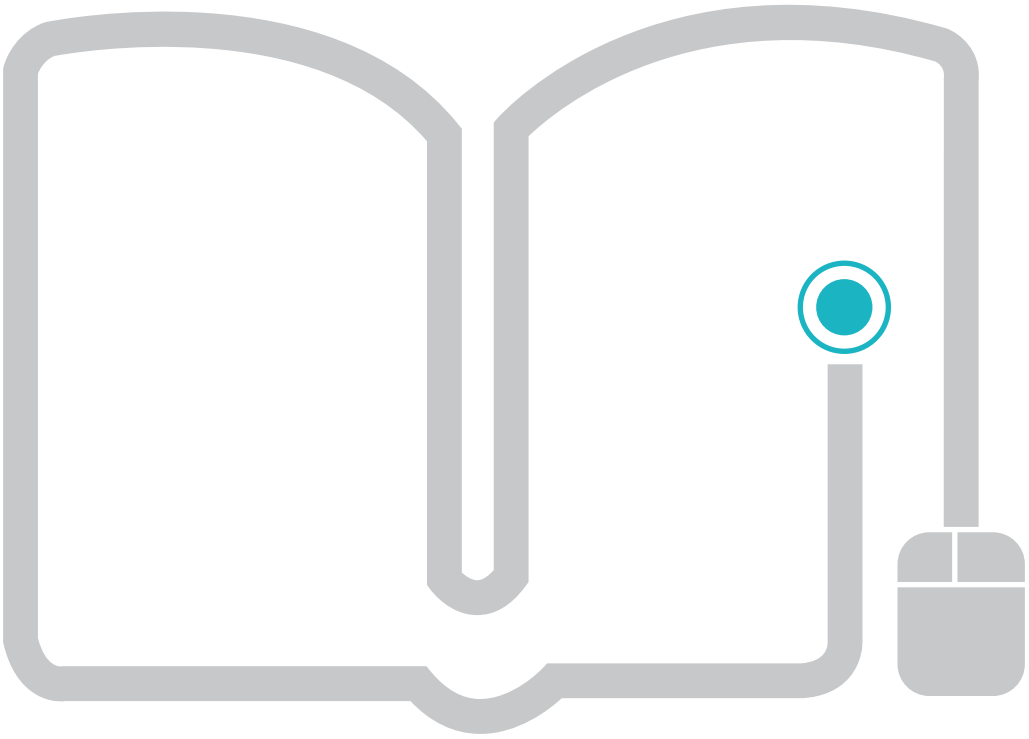

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Asian Development Bank Institute
Kasumigaseki Building 8F
3-2-5, Kasumigaseki, Chiyoda-ku
Tokyo 100-6008, Japan
www.adbi.org

# Contents

# Foreword

As a result of developments such as the adoption of the Universal Declaration of Human Rights and the inclusion of education in the United Nations' Sustainable Development Goals for 2030, education has come to be perceived primarily as a public good and seen in the eyes of the disfranchised as a path for liberation and change. The promise of education has become synonymous with better opportunities and outcomes, including higher incomes, better health, more even distribution of income, increased social cohesion, and overall well-being.

However, this promise has not yet materialized everywhere. Through national and international evaluations and other accountability systems, we know that many countries and economies are not ensuring quality education for all. Millions of children and youth still walk the path without the necessary tools to realize their potential amid economic, political, and social strife.

The risks related to this unfortunate situation are not only associated with the unfulfilled right to quality education but also with the emergence of the fourth Industrial Revolution, or what became known as "the future of work." With the growing use of automation, big data, and artificial intelligence, human labor is being substituted increasingly by machines or algorithms. These developments pose great challenges to both advanced and emerging economies.



New jobs will certainly be created, but not for the same people. This demands that governments and communities act with a sense of urgency, since the competencies required to succeed and prosper in this new environment will certainly be different than those prevalent today. The challenges are twofold: to achieve the spread of access to high-quality education to all, and to rethink education in a way that enables all people to deal with this rapidly changing environment in both their work and social lives.

The challenges faced by governments in the field of education are complex and demand a host of well-crafted policies and programs to ensure that all citizens can access, learn, and build skills throughout their lives. This calls for the mobilization of global expertise and collaboration. To achieve this objective and vision and truly realize the promise of education, we must work together to think in novel ways and tackle both the educational "challenges of the past"—which still haunt the lives of millions of children and youth worldwide—and the as yet unclear challenges of the future.

Think tanks around the world are coming together to try to address these huge challenges. As part of this movement, the Think20 (T20) aims to support the Group of Twenty (G20) process by discussing and making policy recommendations. As T20 members, we have challenged ourselves to think, produce evidence, and look for new solutions in order to develop recommendations for education policy that will help to achieve an economically prosperous, environmentally sustainable, and socially inclusive future.

Education joined the G20 and T20 agenda for the first time during the Argentine presidency of 2018. The education-related policy briefs from the 2018 T20 were collected in a book, which was the forerunner of this current volume.[1]

The inclusion of education has continued under the Japanese T20 chairship of 2019. In 2019, the responsibility for education in the T20 was split between two Task Forces, those on "*2030 Agenda for Sustainable Development*" and "*The Future of Work and Education for the Digital Age*." The former Task Force has concentrated on the spread of high-quality, basic education to developing economies, while the latter has focused on the challenges arising from the various technological developments associated with the Digital Age.

Among their many policy briefs, the two Task Forces have produced recommendations that articulate different dimensions of education policy and technology-driven transformations. We hope this second set of education-related policy briefs will inspire subsequent T20s to include education policy as a key dimension that must be considered if we are to foster a prosperous future for all.

**Peter J. Morgan**
Senior Consulting Economist and Vice Chair of Research, Asian Development Bank Institute, Japan
Lead Co-Chair of Task Force 7: *The Future of Work and Education for the Digital Age*

**Nobuko Kayashima**
Vice President, Japan International Cooperation Agency, Japan
Co-Chair of Task Force 1: *2030 Agenda for Sustainable Development*



[1] Fundación Santillana. 2018. *Bridges to the Future of Education: Policy Recommendations for the Digital Age*. Buenos Aires, Argentina: Fundación Santillana. https://t20argentina.org/wp-content/uploads/2018/09/Bridges-to-the-Future-of-Education-Policy-Recommendations-for-the-Digital-Age.pdf.

# Acknowledgments

This publication is the outcome of a collective effort. During 2019, many people and organizations have been actively involved in the T20 process. This book reflects their hard work and commitment.

We would like to thank the members of the education group under the T20 Task Force on "2030 Agenda for Sustainable Development": Dr. Kazuhiro Yoshida, Hiroshima University; Mr. Shimpei Taguchi, JICA; Mr. Shinichiro Tanaka, JICA; Ms. Alejandra Cardini, CIPPEC; Dr. Mathias Urban, Dublin City University; Dr. Javier González, SUMMA; Mr. David Instance, Brookings Institution; Dr. Natasha Ridge, Sheikh Saud bin Saqr Al Qasimi Foundation for Policy Research. We also thank the education-related members of the T20 Task Force on "The Future of Work and Education in the Digital Age": Dr. Ramiro Abrieu, CIPPEC; Dr. Romina Bandura, CSIC; Dr. Paul Grainger, University College London; Dr. Bihong Huang, ADBI; Dr. Angela Lyons, University of Illinois; Dr. Cyn-Young Park, Asian Development Bank; and Dr. Martín Rapetti, CIPPEC.

We would also like to thank David Hendrickson and Adam Majoe of ADBI for their great efforts to produce this book so quickly.

# Introduction

**Peace, Prosperity, and a Sustainable Future Begin with Investment in Quality Education Today**

Education is a key driver for sustainable development (UNESCO 2018). The entire global community has been determined to ensure that all human beings can fulfill their potential in dignity and equality; to protect the planet so that it can support the needs of the present and future generations; to ensure that all human beings can enjoy prosperous and fulfilling lives; to foster peaceful, just, and inclusive societies through a global partnership for sustainable development (United Nations General Assembly 2015). Education plays fundamental roles in facing these challenges and transforming our world. In other words, *inclusive and equitable quality education and lifelong learning opportunities for all* are indispensable elements for achieving all of the Sustainable Development Goals (SDGs); failing to accomplish these objectives is unacceptable.

Based on this recognition, all stakeholders, including Group of Twenty (G20) member countries, have been working together and are committed to providing quality education to meet the basic learning needs of all people. This work has accelerated, especially since the World Conference on Education for All, held in 1990 in Jomtien, Thailand, where education was reconfirmed as a human right. However, there are currently 64 million children of primary school age, 61 million of lower secondary school age, and 138 million of upper secondary age who are out of school (UNESCO Institute for Statistics). These are children and youth excluded and marginalized for various reasons—poverty, disability, gender, ethnicity, other sociocultural barriers, and conflicts, among others. Poor quality of education further aggravates public trust in education. This leaves, alarmingly, 617 million children—more than half of children in the world at primary and lower-secondary education—failing to achieve minimum proficiency levels in reading and mathematics (UNESCO Institute for Statistics 2017).

Inclusion, equity, and quality, with an emphasis on learning outcomes, are priorities and intertwined issues that must tackled. Moreover, education is expected to prepare learners to realize their potential in their respective environments, where work and life are influenced by globalized economic and social activities, social and cross-national mobility, and the rapid progress of technologies. In this trend, work and life need to be adjusted to foster sustainability in the foresight of Industry 4.0, Society 5.0, and the emergence of artificial intelligence.

The G20 can play a crucial and catalytic role in realizing such a vision of education. G20 Japan, in line with the foregoing, sets education high on the agenda. It emphasizes investment in high-quality education to promote sustainable economic growth, generate innovation, and solve social issues for building resilient and inclusive future societies.

We, the Think20 (T20), fully support this position. During 2018, under the Argentine presidency, G20 included education for the first time as one of its Working Groups. Building on this momentum, under Japan's presidency, the T20 has addressed a broad range of education issues within the framework

of two of its task forces to contribute to G20 policy discussions: *"2030 Agenda for Sustainable Development (Task Force 1)"* and *"The Future of Work and Education for the Digital Age (Task Force 7)."* The scope of Task Force 1 broadly corresponds to that of the G20 Development Working Group and covers aspects of the SDGs, where education is included. Task Force 7 deals with the educational topics discussed at T20 in 2018 under the same thematic labeling and is included this year to maintain continuity, with a particular focus on digitalization.

T20 Policy Briefs have been produced based on our rigorous analyses and provide insightful recommendations for the attention of, and action by, the G20 leaders and their partners at large. The education issues discussed in the two task forces are inseparably related, and accordingly, this book contains nine policy briefs drawn from the work of these task forces.

The education policies and global commitments concerning the present education systems need to work simultaneously on multifaceted problems. This complicates the reform processes in both developing and developed countries. Conventional and domestic-centered knowledge built around existing practices will not be enough to reach those marginalized children to provide them with quality education.

The first step is to examine the different existing contexts and their obstacles to accessing quality education. This is analyzed by Tanaka, Taguchi, Yoshida, Cardini, Kayashima, and Morishita in *"Transforming Education towards Equitable Quality Education to Achieve the SDGs."* Good practices around the world should be made available to frontline education practitioners. Innovative practices will require governments to promote the participation of much broader players, from the nongovernmental and private sectors as well as local communities, to work together.



Although the global and national figures on gender equality in education have significantly improved, they mask stark variations within countries. Ridge, Kippels, Cardini, and Yimbesalu argue in *"Developing National Agendas in Order to Achieve Gender Equality in Education (SDG 4)"* that baseline data are essential for good understanding of such realities and their reasons, as well as for producing evidence-based recommendations. For instance, the lack of gender sensitivity in curricula and teacher training, inadequate infrastructure (such as toilets for girls), school violence, and pregnancy are some of the causes of these disparities. Increased public funding is urgently needed for in-depth research from multisectoral perspectives and for taking national and global action.

The learning outcomes in the present and future contexts require not only visible cognitive knowledge and skills to be acquired by learners but also non-cognitive ones, such as interpersonal, problem-solving, critical thinking, conflict-managing, and emotion-managing skills; these are often referred to as soft skills or 21st century skills. These skills constitute essential elements of Education for Sustainable Development and Global Citizenship Education. Early childhood development (ECD), or early childhood education and care (ECEC), can be highly instrumental in nurturing these skills. However, Urban, Cardini, Guevara, Okengo, and Romero warn that children in vulnerable conditions are not accessing an appropriate quality of ECD/ECEC services, and policies on early childhood programs are developed in isolation from the pressing issues of sustainable development. Their policy brief, *"Early Childhood Development Education and Care: The Future Is What We Build Today,"* explains how the realignment of policies and practices of ECD/ECEC is urgently needed.

International learning assessments, such as the Program for International Student Assessment, the Programme for the International Assessment of Adult Competencies, and Trends in International Mathematics and Science Study, rely on useful metrics and provide comparable information about students' performance and systemic bottlenecks. However, to understand how students are actually taught and to learn how to attain outcomes that can meet societies' present and future needs requires different approaches. Istance, Mackay, and Winthrop, in *"Measuring Transformational Pedagogies across G20 Countries to Achieve Breakthrough Learning: The Case for Collaboration,"* advocate that actionable data on teacher collaboration, continuous school improvement, and activities outside the school should be made available for countries to facilitate pedagogical transformation.

Teachers are undeniably at the core of delivering high-quality education services. González, Castillo, Costin, and Cardini offer insights from Latin American experiences in *"Teacher Professional Skills: Key Strategies to Advance in Better Learning Opportunities in Latin America."* For teachers to be able to implement effective teaching, they should have professional competencies that comprise content knowledge and pedagogical skills. These competencies can be nurtured through pre-service training and in-service professional development programs to benefit a large pool of the teaching force by using information and communication technology. The policy brief claims that effective teaching and learning only occur when a coherent framework of systematic change functions at the school, local, and larger system levels.



Digitalization and other forms of technological advancement have the enormous potential to improve our lives to make them more prosperous and sustainable, changing the sceneries of the future of work. There is a great risk, however, that people in vulnerable conditions and low-skilled jobs might fail to capture the benefits and could be left behind.

Digital skills need to be incorporated not only in basic education systems but also in technical and vocational education and training (TVET), tertiary levels of education, and lifelong learning programs. The content of such programs needs to be personalized, localized, and targeted to meet the specific needs of people in vulnerable conditions. A holistic approach should be considered for lifelong learning by encompassing education and training at schools and in nonformal and informal settings, including through work-based learning and by incentivizing the public and private sectors to invest in skills acquisition. These topics are addressed by Lyons, Kass-Hanna, Zucchetti, and Cobo in *"Bridging the Gap between Digital Skills and Employability for Economically Vulnerable Populations,"* and by Park in *"Lifelong Learning and Educational Policies to Capture Digital Gains."*

Furthermore, the public notion that TVET is inferior to academic paths must be reversed. At the same time, the disconnection between education and work should be corrected by promoting closer collaboration between the players in education and employment. This could significantly improve employability. According to Bandura and Grainger in *"Rethinking Pathways to Employment: Technical and Vocational Training for the Digital Age,"* this will enable best practices and information related to better labor market outcomes to become more widely available.

A good example that shows how digital skills can contribute to realizing an inclusive society is the use of financial technology (fintech). This is giving rise to new styles of consumption and business. Taking advantage of digital financial literacy is likely to become important for excluded and marginalized people. As Morgan, Huang, and Trinh claim in *"The Need to Promote Digital Financial Literacy for the Digital Age,"* national strategies and programs on financial education need to be developed by inviting multisectoral stakeholders.

Issues of education are no longer prevalent in a unique sphere and cannot be solved within one. To fulfill the expected roles of education in the context of the SDGs, we must join hands with people in different sectors and places whose participation in advancing educational development has not been active enough. It is in this sense that education has a critical role as an enabling means to transform our world. The G20 leaders are invited to make all necessary efforts so that Education for Sustainable Development is truly a key enabler of all the other SDGs (United Nations General Assembly 2018).

We are pleased to report that members of two T20 Task Forces related to education have worked in a cross-boundary mode with a spirit of collaboration. The benefits are highly promising. We trust that the policy recommendations proposed in these and other education-related policy briefs will help navigate the discussions among the G20 leaders and trigger global and national action.



**Kazuhiro Yoshida**
Professor and Director, Center for the Study of International Cooperation in Education, Hiroshima University, Japan
Co-Chair of Task Force 7: *The Future of Work and Education for the Digital Age*

**Alejandra Cardini**
Director of the Education Program, CIPPEC, Argentina
Co-Chair of Task Force 7: *The Future of Work and Education for the Digital Age*

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Task Force 1: *2030 Agenda for Sustainable Development*

(i) *Transforming Education towards Equitable Quality Education to Achieve the SDGs.* Shinichiro Tanaka, Shimpei Taguchi, Kazuhiro Yoshida, Alejandra Cardini, Nobuko Kayashima, and Hiromichi Morishita.

(ii) *Early Childhood Development Education and Care: The Future Is What We Build Today.* Mathias Urban, Alejandra Cardini, Jennifer Guevara, Lynette Okengo, and Rita Flórez Romero.

(iii) *Developing National Agendas in Order to Achieve Gender Equality in Education (SDG 4).* Natasha Ridge, Susan Kippels, Alejandra Cardini, and Joannes Paulus Yimbesalu.

(iv) *Measuring Transformational Pedagogies across G20 Countries to Achieve Breakthrough Learning: The Case for Collaboration.* David Istance, Anthony Mackay, and Rebecca Winthrop.

(v) *Teacher Professional Skills: Key Strategies to Advance in Better Learning Opportunities in Latin America.* Javier D. González, Dante C. Castillo, Claudia Costin, and Alejandra Cardini.

Task Force 7: *The Future of Work and Education for the Digital Age*

(i) *The Need to Promote Digital Financial Literacy for the Digital Age.* Peter J. Morgan, Bihong Huang, and Long Q. Trinh.

(ii) *Lifelong Learning and Education Policies to Capture Digital Gains.* Cyn-Young Park.

(iii) *Rethinking Pathways to Employment: Technical and Vocational Training for the Digital Age.* Romina Bandura and Paul Grainger.

(iv) *Bridging the Gap between Digital Skills and Employability for Economically Vulnerable Populations.* Angela C. Lyons, Alessia Zucchetti, Josephine Kass-Hanna, and Cristóbal Cobo.

**Other education-related T20 Policy Briefs produced for 2019**

(i) *Fostering Human Dimension of the Digital Education.* Ilya Kiriya.

(ii) *Leaving No One Behind: Measuring the Multidimensionality of Digital Literacy in the Age of AI and Other Transformative Technologies.* Angela C. Lyons, Josephine Kass-Hanna, Alessia Zucchetti, and Cristóbal Cobo.

(iii) *The Reskilling Effort to Bring the Fourth Industrial Revolution to Latin America.* Ramiro Albrieu and Martin Rapetti.

**Education-related T20 Policy Briefs produced in 2018**

These policy briefs are available here: https://t20argentina.org/policy-briefs/?q&category=252&autor.

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(ii) *Redesigning Education Landscapes for the Future of Work: Third-Space Literacies and Alternative Learning Models.* Cristóbal Cobo, Alessia Zucchetti, and Axel Rivas.

(iii) *Bridging the Education-Workforce Divide: Strategies to Meet Ever-Changing Needs and Mitigate Future Inequalities*. Claudia Costin and Allan Michel Jales Coutinho.

(iv) *Financing Quality and Equitable Education in LATAM.* Javier Gonzalez, Santiago Cueto, Alejandra Cardini, and Barbara Flores.

(v) *Transforming Education Financing for Inclusive, Equitable and Quality Learning Outcomes for the 2030/SDG4 Agenda*. Kazuhiro Yoshida, Yasushi Hirosato, and Shinichiro Tanaka.

(vi) *Issues and Options for Financing Post-Compulsory Education.* Mick Fletcher and Paul Grainger.

(vii) *The Means for Achieving Greater and Better Literacy: An Exponential Education Model in Support of the 2030 Agenda*. Jorge Guillermo Barbosa Garzon, Lucía Acurio, Elena García, Álvaro Galvis, María Elena Chan, Consuelo del Val, Alessia Zucchetti, and Alejandro Llovet Abascal.

(viii) *A Social Ecosystem Model: A New Paradigm for Skills Development?* Paul Grainger and Ken Spours.

(ix) *Evaluating Options for Funding and Financing Post-Compulsory Education*. Mick Fletcher and Paul Grainger.

(x) *Can Education and Skills Development Be More Aligned Locally Reflecting Local Work Patterns and Business Growth?* Pauline Tambling.

# About the T20

The T20 is one of the G20's engagement groups, where representatives of different civil society stakeholders take their demands and proposals to G20 countries. It gathers think tanks and leading experts from around the world to produce concrete policy recommendations. During 2019, the T20 is co-chaired by the Asian Development Bank Institute (ADBI), the International Institute for Monetary Affairs (IIMA), and the Japan Institute for International Affairs (JIIA).

More information here: https://t20japan.org.

# Transforming Education towards Equitable Quality Education to Achieve the SDGs

**Shinichiro Tanaka**
Japan International Cooperation Agency (JICA)

**Shimpei Taguchi**
JICA

**Kazuhiro Yoshida**
Hiroshima University

**Alejandra Cardini**
Centro de Implementación de Políticas Públicas para la Equidad y el Crecimiento

**Nobuko Kayashima**
JICA

**Hiromichi Morishita**
JICA

## Abstract

Schooling systems face some limitations in providing quality education for all. The gap between the dominant and the marginalized in access to education is getting wider, and accessing education does not guarantee real learning. Furthermore, in this rapidly changing world, delivering quality education does not only mean raising cognitive knowledge but also equipping learners with socioemotional skills. Many researchers find that the development of socioemotional skills requires care in early childhood development. Science, technology, engineering, and mathematics (STEM) education is also vital, considering that the Sustainable Development Goals (SDGs) will never be achieved without taking full advantage of advanced technology.

## Challenge

In the era of the Millennium Development Goals (MDGs), we saw significant progress in access to education. Globally, gross enrolment rates were 89% at the primary level and 66% at the lower secondary level, respectively, in 2015 (UNESCO UIS). However, there are still 264 million primary and secondary age children and youth not in school (UNESCO GEM 2017). In addition, UNHCR (2016) reports that 3.7 million out of 6 million refugee children are out-of-school.



Furthermore, even if children attend school, their learning is far from satisfactory. Many children cannot read a simple sentence or manipulate simple calculations in mathematics even after some years of schooling (learning crisis).[1] Thus, in the present era of the SDGs, immediate action is needed to raise the quality of education, while reaching all those children in difficult situations.

The era of the SDGs also marks a rapid transformation in society, politics, and economy accelerated by new technologies and globalization. However, the common vision of education policy remains mostly unchanged: education must provide the opportunity for all people to gain the knowledge and skills that are necessary for them to have a quality life, become responsible citizens, and actively participate in and contribute to society. The changing nature of society necessitates changes in what education delivers and how this is done, where global citizenship, interpersonal relationships, and respect for the natural environment become more valuable OECD (2018a, 2018b). Schooling systems should support "skills" being expanded from a traditional cognitive perspective (acquisition and use of academic skills) to the inclusion of non-cognitive "socioemotional skills."

Socioemotional skills can be gradually developed from early childhood. Thus, attention on early childhood development (ECD) has been increasing recently. Nevertheless, only 42% of children in low-income countries have access to some sort of organized learning one year before the official primary entry age, while this reaches 93% in high-income countries (UNESCO GEM 2018). Quite often, ECD is an opportunity limited to richer families to prepare their children for primary school as a part of basic education. That is, ECD is not regarded as an opportunity for all young children to acquire the necessary skills, including socioemotional skills.

[1] The "learning crisis" gained global attention in the course of developing the SDGs, and now it has become the most dominant agenda (UNESCO 2014, World Bank 2018, UNICEF 2018).

Advanced technology is imperative for achieving the SDGs. The quality of STEM education, however, differs greatly among and within countries, as evidenced in international comparative studies, such as PISA and TIMSS. This means that fewer children in low-income countries get a chance to become an engineer, a scientist, or a doctor. Thus, the advancement of technologies may not benefit people worldwide equitably.

*G20 educational policy makers are challenged to transform our schooling systems. Leaving these challenges unresolved poses a risk for current and future generations, as they will find complex difficulties in realizing and enjoying sustainable development.*

## Proposal

In this policy brief, four possible transformations are proposed. First, we will discuss the remaining issues relating to access to education and the growing concern over its quality. Second, to further enhance the quality of education, the proposal to strengthen non-cognitive skills, especially socioemotional skills, is explored. Third, based on the fact that socioemotional skills need attention in the early years, a way to establish a quality ECD system is proposed. Lastly, this brief proposes to strengthen STEM education to utilize technology as a mean of achieving SDGs.



### 1. Reach the excluded and provide quality learning that is aligned to their life needs

Global enrolment indicators are generally improving. However, the number of out-of-school children worldwide has not been decreasing in recent years, and it is estimated there are still 264 million children out of school (UNESCO GEM 2017). In emergencies such as conflicts and natural disasters, educational provision is crucial, but often resources are too restrained to prioritize such events. For instance, in Syria, the access rate to primary and lower secondary education was 94% in 2009, but due to conflict, this has declined to 60%, leaving 2.1 million children and adolescents without access to education. In the case of natural disasters, Nepal experienced a series of earthquakes in 2015 and its schooling system was devastated, leaving 34,500 of 55,000 classrooms assessed as unsafe for use, endangering over a million children (UNESCO GEM 2015).

Furthermore, there are several groups of children who are marginalized due to their gender, ethnicity, and/or disabilities. Public education systems are most often designed to meet the needs of the most dominant group in society, generally the ethnic majority in a particular country. UNICEF (2015) found that children from marginalized social groups are two to three times more likely to be out of school in Bolivia, Ecuador, India, and the Lao People's Democratic Republic. In addition, children with disabilities are less likely to enroll in school than their peers without disabilities. There is a study that shows that a child with a disability is more than 50% less likely to attend school than their able peers in Malawi (UNICEF 2015).

To tackle these challenges, any possible policy intervention should be aligned with its context (where the educational transformations take place). There is no panacea that can be applied to all contexts. This is particularly true when remedial policies are meant for children in difficult circumstances or marginalized situations. The reasons why children do not attend school are usually quite contextually or individually unique. *G20 governments should fully examine their own contexts to look for good practices around the world. They are encouraged to adjust their policy interventions in ways that allow authorized discretion to front-line practitioners (teachers and local education officers, etc.), addressing the unique and diversified needs and lives of the learners.*

To tailor policy interventions in order to reach to the excluded and marginalized children in an education system, advanced technologies can play a significant role. For instance, UNICEF, collaborating with Microsoft, is developing what they call a "learning passport," a digital platform that will facilitate learning opportunities for children and young people affected by conflicts and natural disasters. In Bangladesh, a Japanese non-profit organization, e-Education, has introduced video-recorded lessons and provides them to rural parts of the country. These lessons support students in rural areas in accessing to high-quality lessons, opening a way for those students to enter top national universities in Bangladesh. In addition, utilizing advanced technologies invites more private sector actors to join hands. There are also many private companies trying to utilize new technologies to provide quality education to the rural parts of developing countries. *G20 governments should encourage, support, and invest in such private, governmental, and non-governmental innovations to accelerate the process to achieve SDG4 – the provision of inclusive and equitable quality education for all.*



Issues of out-of-school children are often concerned with social, cultural, and political backgrounds, as seen in the cases of girls' education and education for refugees. This is why all stakeholders should be involved in each step of policy intervention: planning, implementation, and evaluation. For instance, the Japan International Cooperation Agency (JICA) is implementing the project "school for all," which facilitates the involvement of parents in school management in many sub-Saharan African countries. With parental involvement, schools start to use their budgets more wisely and effectively and teachers' absenteeism decreases. Further, by having community members facilitate supplementary classes after formal school hours, students' cognitive knowledge, reading and calculation skills are drastically improved. As seen in this good practice, the involvement of stakeholders as outsiders of traditional schooling systems can catalyze educational transformation. This in turn will have positive effects on the community as a whole. As such, *G20 governments should reform school governance in a way to invite and involve local communities on board and turn them from silent bystanders into proactive collaborators who jointly pursue the achievement of SDG4 together with schools.*

## 2. Education systems need to nurture non-cognitive skills (socioemotional skills) in addition to traditional cognitive skills, such as literacy and numeracy

It is widely recognized that not only cognitive skills, such as literacy and numeracy, but also non-cognitive skills, or socioemotional skills, matter for children's success in the future. For instance, the OECD has pointed out that socioemotional skills have "a strong impact on social outcomes and the subjective well-being" of children, and also "cognitive and social and emotional skills cross-fertilize" (OECD 2015b).

In addition, the report mentions three important drivers of lifetime outcomes of children, namely perseverance, sociability, and self-esteem. These skills are, in fact, among the key factors that will determine children's future success.

G20 governments should consider how to foster the socioemotional skills of their youth in their respective contexts and to transform the education system to this end. In this respect, many countries' national curricula already mention something about fostering socioemotional skills. The real challenge is how to implement the policies.

Thus, G20 governments should ally with global partners to look for good practices around the world and make such information broadly available. *Caution must be stressed, however, due to the fact that socioemotional skills must function in very different social and cultural contexts. With this in mind, policy borrowing should entail a careful adaptation process to local contexts.*

Fostering socioemotional skills through education system is quite a new area of interest, and not much has been spoken about or demonstrated in a "scientific" way. As such, *G20 governments should promote research on education systems and practices that foster socioemotional skills. Areas of research may include which non-cognitive areas we should focus on at school and how effectively we can foster such skills while responding to the changing nature of societies.*

We should note that SDG4.7 mentions the skills and attitudes needed to promote sustainable development, such as awareness of global citizenship and the appreciation of cultural diversity. *G20 governments should promote education for sustainable development (ESD) and Global Citizenship Education (GCED) practices because fostering socioemotional skills through education powerfully contributes to achieving SDG4.7, which has the fundamental role of achieving the entire set of SDGs by building the capacity of people.*



## 3. Include vulnerable groups in quality ECD

ECD is undoubtedly important for children's success in their subsequent schooling systems and in their future lives. Nevertheless, why does access to ECD stay low at about 40% (UNESCO, GEM 2018) in developing countries? This is because ECD is still seen as a luxury. G20 governments should consider transforming ECD from being a private luxury for richer people to an enabler for all children, including vulnerable and marginalized groups. Strong foundations are necessary for all learning and skills development, both cognitive and non-cognitive, in addition to motivation to learn. All of these skills and attitudes should be imparted at early ages (WDR 2018).

Considering these situations, *G20 governments should first consider policy interventions to promote ECD for vulnerable groups.* As underscored by Urban et al. (2018) in the policy brief developed for T20 Argentina in 2018, early childhood development, education, and care programs are one of the most effective policy tools governments can employ to impact both individual and collective (national) well-being and educational achievement. Providing incentives to socio-economically vulnerable groups to send their children to ECD services is one of the possible policy interventions. By so doing, repeating early grades, and dropping out of primary school can be reduced, because these children are usually a high-risk group in terms of dropout due to insufficient preparedness for schooling.

The foregoing discussion on access to education and the quality of education remains valid in the discussions on ECD. The quality of ECD is influenced by its context, and thus greatly varies. There should be, however, guiding principles for the quality of ECD. One of the most prominent guiding principles is to recognize the value of the interaction among children and between children and teachers. Children learn through interaction how to communicate with others, how to give a hand to others, how to mitigate conflicts, and so on, and also learn through their interactions with teachers what their society values are and what is right and wrong. Therefore, the quality of ECD is highly associated with the abilities of teachers to create such opportunities for interaction. In Japan, this concept is called "learning through interaction/play" and is exercised in many kindergartens, which is carefully guided by the curriculum, and the significance of play within ECD has been advocated by international organizations worldwide (OECD 2015a). Thus, *G20 governments should examine how this concept of "learning through interaction/play" may apply in each country's context and consider increasing the quality of ECD in addition to access to ECD for all.*

ECD deals with young children between the ages of zero and six, and especially between four and six. We should be aware that ECD has multiple dimensions, including care, welfare, and education. These should not be treated separately, and policy interventions should be designed to generate synergies across them. For instance, in 2018, WHO, UNICEF, the World Bank, and many other international organizations developed a Nurturing Care Framework for ECD, which states the importance of a whole-of-government and whole-of-society approach that looks for mutually accountable partnerships between relevant sectors—health, nutrition, education, social welfare, child protection, and environmental health. Following this movement, *G20 governments should consider combining various ECD interventions to produce synergies among those interventions.*



## 4. Further accelerate STEM education to transform the world into Society 5.0

We live in what we call Society 4.0, where the Internet of Things (IoT) has just started to change industrial structure, and automation is being realized by AI and big data analysis. However, we still have not fully integrated IoT into our society and not fully utilized it in a way that it makes all of our lives better, more equitable, and sustainable, leaving no one behind. Thus, further transformation is needed to establish a more sustainable society by creating a system which integrates cyberspace into physical space (the real world) in a way that human well-being is put at the heart of the transformation. To realize this next generation of society, the importance of STEM education is growing, because it lays the foundation for all the innovation.

To advance STEM at the level of higher education, a solid background is needed, and thus mathematics and science education during the preceding stages of education is imperative and should get much more attention as evidenced in many developing countries. For instance, there remain many developing countries where many of the students in upper primary school or even in middle school still use their fingers to manipulate very simple math calculations, or do not have a correct understanding of the meaning of measurement units. *Therefore, G20 governments should immediately make policy interventions for STEM, particularly for basic level mathematics and science.*

In addition, creativity, reasoning skills, and logical thinking are also imperative for success in STEM, and thus *G20 governments should also foster those skills by changing the nature of mathematics and science education in a way that cultivates the curiosity of children, motivates them toward choosing STEM subjects, and allows them to explore the many possibilities in this field.* Many reports mention this fact, but they often do not suggest actual ways to change classroom practices. One good way, for instance in mathematics, is to challenge children to think more deeply by giving them provocative questions and, in science, to introduce experiments/experimental learning that shows children actual objects instead of pictures on the wall. This means that we have to change classroom practices by changing teaching practices.

There also seems to be a preconception that STEM is for male students. However, we should encourage girls as well as boys to pursue STEM subjects, and there are several good practical policies in place around the world to achieve this (UNESCO 2017). In the United Kingdom, at the secondary school level, the program called "Discover!" is an informal learning intervention designed to stimulate the imagination and interest of girls. It offers participants the chance to act as scientists and encourages them to explore new career opportunities. In Ghana (UNESCO 2017), the first Science, Technology and Mathematics Education (STME) Clinic was established by the Ghanaian Education Service in 1987 to help improve girls' enrolment and achievement in related subjects in secondary and higher education institutions. These clinics help to get rid of the negative perceptions girls might have about women scientists by having them as role models. Learning from those good practices, *G20 governments should encourage girls' education in STEM around the world.*



## Conclusion

Human beings are born to be learners: to know the unknown, and to be able to do the unable-to-do are our natural joys. Education is a basic human need and a right. It facilitates the enhancement of human security and human capital too. To truly realize such universal values of education, we should transform how it is delivered, so that we can stop the social exclusion that begins with exclusion from education. Our shared mission among politicians, education policy makers, and practitioners, including international partners, is to allow no exclusions and to invite everyone to the quality learning.

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# Early Childhood Development Education and Care: The Future Is What We Build Today

**Mathias Urban**
Early Childhood Research Centre, Dublin City University

**Alejandra Cardini**
Centro de Implementación de Políticas Públicas para la Equidad y el Crecimiento

**Jennifer Guevara**
Centro de Implementación de Políticas Públicas para la Equidad y el Crecimiento

**Lynette Okengo**
African Early Childhood Network

**Rita Flórez Romero**
Universidad Nacional de Colombia

## Abstract

Early childhood development, education, and care (ECD/ECEC) has become a priority for governments and international bodies. ECD/ECEC is explicitly included in the Sustainable Development Goals (SDG 4, 4.2), underlining the global consensus. In 2018, the Group of Twenty (G20) acknowledged the key role of ECD and, in their Leaders' Declaration, announced a G20 ECD initiative. Access to high-quality, early childhood development, education, and care programs is unequal among and within countries, and this remains a major cause for concern. However, in the context of local and global sustainability, a new focus on the purpose of ECD/ECEC should become a complementing priority of the G20 process.

## Challenge

ECD/ECEC has become a policy priority for governments and international bodies. There is a broad consensus between policy makers, ECD/ECEC professionals, scholars, and advocates on the importance of ECD/ECEC as effective means to ensure individual and collective well-being and achievement, and to addressing wider societal issues including social cohesion, equality and inclusion, and persistent inter-generational cycles of poverty. Having ECD/ECEC explicitly included in the SDGs (SDG 4, target 4.2)[1] underlines the global consensus. Moreover, the G20 acknowledges the key role of ECD and in the 2018 Leaders' Declaration announced a G20 ECD initiative.[2]



At the global and local levels, an emerging "systemic turn" (Urban) has brought about a broad consensus that policy frameworks should address early childhood from a holistic perspective. Examples include the integrated policy framework "De Cero a Siempre" in Colombia and the Irish "whole-of-government strategy for babies, young children, and their families." Adopting whole-systems approaches to developing ECD/ECEC policy and practice ("Competent Systems") is key to providing quality ECD/ECEC for all children (Okengo 2011; Urban et al. 2011, 2012).

The ECD/ECEC policy brief adopted by T20 in 2018, *It Takes More Than a Village. Effective Early Childhood Development, Education and Care Services Require Competent Systems* (Urban et al. 2018), outlines concrete policy recommendations that should be taken by G20 governments collectively and individually.

However, there has been little attention to questions of the purpose and content of ECD/ECEC in the context of sustainability. "Yesterday's solutions" continue to be supported by policy makers and donors alike:

- Focus on deficiencies rather than the capabilities of children, families, and communities.

[1] ECD/ECEC is included in Goal 4: "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all"; specifically mentioned in target 4.2: "By 2030, ensure that all girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education."

[2] The T20 Communique handed to former G20 leaders includes ECD/ECEC as a priority in its proposal 4, based on the promotion of equal opportunities for quality education.

- Focus on (externally) predetermined models and outcomes rather than culturally and locally appropriate approaches.
- Focus on decontextualized and "borrowed" education practices and approaches (e.g., Reggio, Montessori, HighScope, Project Zero, etc.) rather than culturally appropriate and locally developed sustainable solutions.
- Focus on narrowly defined "early learning" curricula (literacy and numeracy), extending from countries in the global north to the global south; backed up and promoted by the democratically unaccountable: soft power: of international organizations, including the Organisation for Economic Co-operation and Development (OECD) and increasingly extended to and imposed on countries in the global south, e.g., Africa.
- Focus on narrow and unsustainable notions of "development"—at the individual, collective, country, and global levels—that originate in supremacist and colonialist thinking.
- Naïve extrapolation of today's socioeconomic contexts into the future, including the assumption that, for instance, "digital," and AI, are both the main challenges and the solutions to development and education.

# Proposal



## ECD/ECEC for Sustainable Development

### Background and context

Undeniably, every child has the right to access and meaningfully participate in high-quality, early childhood development, education, and care programs. Pre-primary education is, in fact, considered an important part of a holistic and robust educational system (United Nations, 2017: 24). Participation in "pre-primary or primary education in the year prior to the official entrance age to primary school" (ibid) has increased to around 9 out of 10 children in Europe, Latin America, the Caribbean and North America; the rate in the least developed countries remains much lower (4 out of 10).

However, effective early childhood ECD/ECEC does not start one year before compulsory school age. Children learn and make significant experiences from birth, long before they enter schooling. Early learning is embedded in children's holistic development, which comprises physical, emotional, cognitive, social, cultural, and spiritual aspects from birth.

In fact, ECD/ECEC practices, despite being of global concern, are inevitably local (Urban 2014). Caring for, teaching and bringing up young children comprises physical, emotional, cognitive, social, cultural, and spiritual aspects from birth (Cardini et al. 2017). This means ECD/ECEC needs to be shaped through democratic debate of all stakeholders within countries, and at all levels of government (Urban 2008, 2009).

Countries in both the global north and south are increasingly adopting policy frameworks that address early childhood from a holistic perspective. Examples include the integrated policy framework "De Cero a Siempre" in Colombia (Instituto Colombiano de Bienestar Familiar, 2015; Republic of Colombia, 2013) and the Irish "whole-of-government strategy for babies, young children, and their families" (Department for Children and Youth Affairs 2018). Adopting whole-systems approaches to developing ECD/ECEC policy and practice ("competent systems") is key to providing quality ECD/ECEC for all children (Okengo 2011; Urban et al. 2011, 2012).

Based on the policy brief, *It Takes More Than a Village. Effective Early Childhood Development, Education and Care Services Require Competent Systems* (Urban, Cardini, and Flórez Romero 2018), policy recommendations adopted by the T20 summit 2018 spell out concrete actions to be considered by G20 governments at three interconnected levels:

- *At the national level*, make systemic approaches sustainable by providing leadership, resources, and support
- *At the G20 (international) level*, initiate and support cross-country learning with and from forward-looking systemic ECD/ECEC initiatives in countries in the global south and north
- *At the level of monitoring, evaluation, and research*, adopt whole-system approaches and all-stakeholder participation (including participation of children, families, and communities)



The majority of the initiatives have focused on increasing access to, and participation in, ECD/ECEC programs (as spelled out in SDG 4). In most regions there have been increases in access to ECEC/ECD programs (UNESCO 2014) Worldwide, half of all three to six-year-olds have access to ECD/ECEC programs (World Bank 2017).

However, access to high quality early childhood development, education, and care programs remains unequal. In the global South, just one in five children have access to ECD/ECEC (World Bank 2017). Furthermore, younger children from low-income families and children in rural communities have significantly less access to ECD/ECEC programs compared to their peers in more affluent and urban areas (Cardini et al. 2018).

Increased access and enrolment figures alone are not a sufficient measure for meaningful participation in high-quality programs that are effective in making a positive difference in children's lives. Even when more children access ECD/ECEC services, they enter and participate in very diverse and unequal programs. Quality of services, as experienced by children, families, and communities, varies widely and often continues to be inadequate.

Despite some encouraging developments (e.g., the emerging "systemic turn" (Urban et al. 2018) in most countries, fragmentation at all levels of the ECD/ECEC system remains a major challenge. For historical reasons, policies for the care and education of young children have often developed separately. This remains the de facto governance situation in most countries (Bennett 2008).

Hence, ECEC services are structured in different ways, and they embody diverse understandings of children, aims, and approaches (Kaga, Bennett, and Moss 2010). This effectively prevents integrated service provision, inter-professional cooperation, integrated policy generation, and systemic evaluation of processes and outcomes.

However, ECEC/ECD services are, by nature, multisectoral and hybrid. Given the sectorial tradition of social policies, countries face difficulties in achieving coordinated and coherent approaches to ECEC (Cunill-Grau, Repetto, and Bronzo 2015).

## Re-conceptualize ECD/ECEC in the context of existential global crises and develop a roadmap to integrated early childhood development, education, and care for sustainable development

The policy measures proposed in this brief address these shortcomings and build on the emerging broad international consensus on the importance of providing access to, and meaningful participation in, high quality early childhood development, education and care programs and services for all children from birth.

This consensus extends to all countries, in the global south as well as in the global north. It reflects the fact that critical issues facing young children and their families are no longer easily situated in naively defined "developed" versus "developing" country contexts. For instance, experiences of forced displacement, malnutrition, marginalization, and poverty are, unfortunately, shared by an increasing number of children in the poorest as well as the most affluent countries, with well-documented negative effects on their immediate and future life chances and individual and collective developmental and educational achievement.



This "blurring of boundaries between the centre and the periphery" (Braidotti 2011) is taking place despite the fact that marked differences continue to exist between countries, and within countries, in terms of children's access to ECD/ECEC. While country-level figures on access to ECD/ECEC show stark differences between, for instance, countries in Europe and Latin America (*high*) and sub-Saharan Africa (*low*), they tend to mask disparities *within* countries.

Children from vulnerable communities, children growing up in rural contexts, children suffering from forced (internal) displacement, and children with special educational needs often have significantly less access to appropriate ECD/ECEC programs compared to children from more privileged, affluent, or dominant communities.

A particular target group in a number of African countries are children whose communities are affected by HIV/AIDS, growing up without parents or in the care of grandparents or community members.

Taking this context into account, G20 governments can and should take concrete action in line with the 2018 Leaders' Declaration to initiate, orient and resource a major early childhood development, education and care initiative.

The approach to the initiative should be three-pronged:

(i) Continued and increased commitment to increasing access to, and meaningful participation in ECD/ECEC programs and services of high quality, in order to address unequal access within and between countries and regions

(ii) Commitment to "whole-systems" approaches to developing, improving, resourcing, and governing early childhood programs in order to achieve the sustainability of programs and services

(iii) Reconceptualize early childhood development, education, and care across G20 countries as societal, democratic realization of early childhood as a common good and collective responsibility, and contribution to achieving sustainability on a global scale, i.e., in the context of the 2030 Sustainable Development Goals

Strengthening the emerging international consensus on the need to take whole-systems approaches to policy and practice (competent systems) is arguably the most effective strategy to overcome the persistent, wasteful, and ineffective fragmentation of services and persistent silo-mentality at the levels of administration and governance.

Reclaiming early childhood as a public or common good entails recognizing the key responsibility governments have in relation to effective and sustainable ECD/ECEC provision. This is notwithstanding the indispensable role of a multitude of actors, including civil society actors and local communities in service and program development and delivery. However, reclaiming government responsibility also requires strategies and concrete action to reduce the influence of large-scale, for-profit provision, privatization, and the corporatization of program and service provision. Such a renewed public responsibility also addresses the democratically unaccountable exertion of "soft power" by actors as varied as international philanthropy or the Organisation for Economic Co-operation and Development (OECD).



A concrete step to be initiated by G20 governments should be the phasing out of all public funding for services and programs that aim at returning a profit over an agreed time frame of five years.

Reclaiming public responsibility for ECD/ECEC in the context of local and global sustainability requires re-conceptualization not only of structures and governance of ECD/ECEC, but of the purpose, aims, and content of early childhood programs. Realizing the existential crisis facing humanity on a finite planet, the task is to initiate public, democratic debate leading to program review in the light of critical questions on content, values, and ethics to complement the necessary continued focus on access and participation.

In the context of a global sustainability framework, realizing SDG 4 (education) is an important orientation. It will be crucial, however, to align all areas of education, including ECD/ECEC, with the entire range of 17 SDGs.

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# Developing National Agendas in Order to Achieve Gender Equality in Education (SDG 4)

**Natasha Ridge**
Sheikh Saud bin Saqr Al Qasimi Foundation for Policy Research[1]

**Susan Kippels**
Sheikh Saud bin Saqr Al Qasimi Foundation for Policy Research

**Alejandra Cardini**
Centro de Implementación de Políticas Públicas para la Equidad y el Crecimiento

**Joannes Paulus Yimbesalu**
Women's Economic Imperative

[1] The Al Qasimi Foundation would also like to acknowledge and thank Callum Printsmith for his contribution to this policy brief.

## Abstract

Approaches to addressing gender inequality in education are generally based on a one-size-fits-all model that has predominantly focused on girls' education. However, there are growing gender disparities in education impacting boys in regions such as the Caribbean and Middle East. It is, therefore, necessary to take a more holistic look at gender and target those children who are most at risk of being unable to access "equitable quality education" (UN 2018: 1). This brief calls for the establishment of baseline data and targeted interventions to benefit the most marginalized girls and boys in order to achieve gender equality in education.

*"Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all"*
– Sustainable Development Goal 4 (UN 2018: 1)

## Challenge

Significant progress has been made in global education over the past 2 decades, in part due to the adoption of the Millennium Development Goals (MDGs) in 2000, which provided a universal framework for tackling educational inequality (United Nations 2015a). Since 2000, key advances have been made toward achieving universal primary education and halving the number of out-of-school children (UNDP 2018). However, there are still key areas in the education sector, in particular relating to gender, that require continued attention.

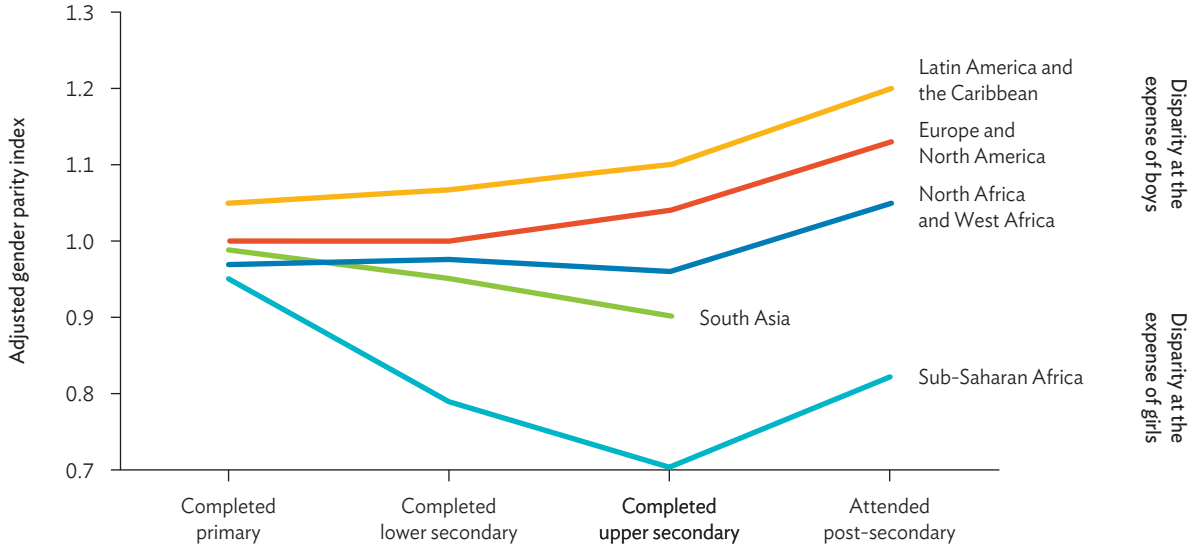


While the gender gap in primary and secondary education is closing at the global level, a wide gap remains in tertiary education where only 4% of countries have attained parity (GEM Report Team 2018b). The 2018 Gender Review, written by the GEM Report Team found that "66% of countries have achieved gender parity in primary education, 45% in lower secondary [,] and 25% in upper secondary" (p. 11). These figures, however, mask gender differences occurring at the regional levels, in addition to not capturing patterns in gender inequality that exist within the most marginalized groups.

Gender parity statistics vary greatly throughout regions and countries. While sub-Saharan Africa and South Asia are still experiencing large inequalities in relation to girls' education, other regions, such as North Africa, West Africa, the Caribbean, Latin America, Europe, and North America, are currently experiencing gender inequality in relation to boys (see Figure 1).[1]

[1] For example, in sub-Saharan Africa between 2010 and 2015, 86 females completed lower secondary education for every 100 males, while in Latin America and the Caribbean, 93 males completed the level for every 100 females (GEM Report Team 2018b).

**Figure 1:** Adjusted Gender Parity Index for Selected Education Indicators in Selected Regions, 2010–2016




Note: Values for North Africa and West Asia refer only to low- and middle-income countries in the region. The analysis is based on household survey data.

Source: Global Education Monitoring Report Team (2018a).



Research disaggregating the distribution of gender parity statistics has also shown that the per capita income of a country is also a determining factor (GEM Report Team 2018b). Among low-income countries that have not attained gender parity in education, gender disparity is at the expense of girls, while in upper middle- and high-income countries it is at the expense of boys (GEM Report Team 2018b; Psaki, McCarthy, and Mensch 2017).[2]

Despite significant differences in patterns of gender equality, global agendas often overlook local, regional, and national realities. As such, countries need to develop context-based approaches to achieving gender parity and formulate educational priorities that address specific national (or even subnational) contexts. These need to focus not only on disadvantaged women and girls but also on disadvantaged men and boys where needed (see Ridge 2012). A more nuanced approach to understanding gender disparities with respect to education would benefit the entire sector, as a one-size-fits-all approach risks leaving certain populations neglected and in decline.

Governments should seek first to understand and map education patterns in gender inequality, then look at the underlying structural factors, such as poverty, race, cultural norms, and geography. Following this, they can develop bespoke education initiatives for specific populations, in specific places, to achieve gender equality in Sustainable Development Goal 4 (SDG 4).

[2] In low-income countries, from 2010–2015, 66 females completed upper secondary education for every 100 males, in contrast to upper middle- and high-income countries, where 91 males completed this level for every 100 females (GEM Report Team 2018a).

# Proposal

Ensuring gender equality around the world remains crucial, and there is an opportunity for G20 member states to take action to address this in the education sector. With modest but strategic investment, the G20 member states can support the development and implementation of the first holistic gender policy frameworks to support more equitable education systems. While there is no exact formula for how to ensure gender equality in education, the hope is that G20 member states consider addressing gender disparities in education by working upwards from the local to the national to the global level.

## National-Level Recommendations

G20 member states can begin by understanding the specific issues related to gender and education in their own countries. Similar to recommendations at the global level, all countries need to have access to research to better understand their own educational contexts. Only once areas of need are identified and understood can targeted interventions be implemented. As gender equality issues are not confined only to education, there is also a need for multisectoral collaboration in terms of research and policy implementation. Governments, education institutions, businesses, philanthropic actors, think tanks, civil society organizations, youth, and others need to work together if gender equality is to be achieved in and through education. Our recommendations are outlined in more detail below.



### ■ Recommendation 1.1: Establish a national research fund to examine issues related to gender in education

Governments have a responsibility to understand the various education landscapes in their own countries, and in order to do so, funds should be allocated to non-partisan research. At the country level, research should focus on mapping and understanding gender disparities, examining barriers, and identifying promising solutions to eliminate gender disparities in education.

Research first needs to map educational issues related to gender in order to better understand what and where the most pressing issues are and determine if these issues are linked to associated underlying structural factors, such as poverty, race, and/or geography. Next, research needs to identify what barriers to success in education exist for marginalized girls or boys. Finally, national-level research should also identify existing promising programs and policies in the local context as well as examine other countries that have been successful in reducing the gender gap in education.

### ■ Recommendation 1.2: Formulate and implement targeted policies to address particular gender issues

Using the research, appropriate gender policies should then be designed and formulated to fit country-specific needs. These policies may include addressing issues related to a range of areas, including infrastructure, teacher training and recruitment, curriculum design and development, or parental involvement (see Table 1). For example, policies linked to infrastructure may include developing water and sanitation systems in schools, as girls have been found be absent from school due to inadequate access to toilets (Birdthistle, Dickson, Freeman, and Javidi 2011). Similarly, schools can be spaces where

boys are exposed to and unprotected from violence (Barker et al. 2012), and as such teachers could be trained on how to identify, respond to, and prevent such issues (Antonowicz 2010). Child labor also represents a barrier to education for poor girls and boys, and governments could design policies to increase school enrollment and attendance, potentially through initiatives around educating parents on the benefits of education and by introducing legal frameworks to prevent child labor (Sakamoto 2006; UNICEF 2006).

**Table 1:** Areas of Educational Policy That May Reduce the Gender Gap

| Focus Area | Example |
|---|---|
| Infrastructure | • Provide schools with access to safe drinking water and gender-specific sanitary facilities (e.g., toilets) that offer privacy for students<br>▸ Found to decrease school absenteeism, especially for girls in developing countries (Birdthistle et al. 2011; Jasper, Le, and Bartram 2012)<br>• Ensure that schools in the hardest-to-reach communities are easily accessible<br>▸ Particularly important for girls as they are more vulnerable to physical and sexual violence while making long commutes to school (UNICEF 2004) |
| Teacher training | • Provide targeted teacher training to eliminate gender bias (GEM Report Team 2018b; Swedish International Development Cooperation Agency [SIDA] 2017)<br>• Train teachers on how to identify, respond to, and prevent issues afflicting (or affecting) specific genders<br>▸ In schools, boys are most exposed to school-based violence (Barker et al. 2012) |
| Educator recruitment | • Ensure gender equity in the teaching profession<br>▸ For example, attract more males to be primary teachers (McGrath and Sinclair 2013)<br>▸ For example, recruit more female instructors to teach in science, technology, engineering, and mathematics (STEM) subjects, where appropriate (Bettinger and Long 2005) |
| Curriculum design and development | • Ensure that curricula are gender-equitable<br>▸ Both girls and boys should be presented positively within curricula to prevent and combat gender stereotypes (Global Partnership for Education 2016; SIDA 2017).<br>▸ Curricula should encourage both boys and girls to pursue STEM subjects<br>• Provide all children with the same national curriculum regardless of gender<br>▸ Found to prevent children of one gender from being channeled into "lower status" subjects and reduce pre-existing teacher prejudices (Akpakwu and Bua 2014) |
| Parental involvement | • Enact policies designed to encourage quality parental involvement of both fathers and mothers (Guo et al. 2018; NASUWT 2014; Sosu and Ellis 2014)<br>▸ Father involvement reinforces the importance of education and, subsequently, children's engagement in education, particularly for boys (Kadar-Satat, Szaboki, and Byerly 2017)<br>▸ Parents' level of education and their concern for their children's well-being are associated with child labor rates (Sakamoto 2006) |
| Extracurricular activities and awareness campaigns | • Provide activities outside of school, targeted at reducing gender gaps<br>▸ For example, mentorship programs<br>• Implement awareness initiatives tailored to gender issues<br>▸ For example, launch campaigns to promote the value of education in areas with high dropout rates for girls or boys (UNICEF 2005) |
| Cultural values and societal norms | • Develop policies to address cultural norms and harmful practices that keep boys or girls out of school<br>▸ For example, address issues such as early marriage, teenage pregnancy, female genital mutilation, and breast ironing that negatively impact girls' education (Banda and Agyapong 2016) |

Gender-specific programs may also be implemented to support the girls or boys most in need. For example, several Balkan countries introduced the Young Men Initiative (YMI), which targets vocational secondary schools and disengaged boys within them in an effort to redefine manhood and promote healthier masculinities (Namy et al. 2015). Through using educational workshops, residential retreats, and a social marketing campaign, YMI has provided additional support for boys in education outside of the traditional school environment. Research on YMI suggests that boys who participated in the initiative showed increased gender-equitable attitudes, exhibited reduced levels of violence, and a strengthened sense of civic engagement (Namy et al. 2015). Policy makers should share such success stories, in addition to the lessons learned.

### ■ Recommendation 1.3: Encourage multisectoral collaboration

Gender inequality will not be eliminated without broad support from both within and outside of the education sector. Thus, there should be concerted efforts to collaborate across government entities, as well as with education institutions, think tanks, businesses, philanthropic organizations, social welfare organizations, civil society, and other relevant bodies when appropriate. For example, as education has a direct link to the labor market, it makes sense to partner with entities such as ministries of labor to explore the linkages (or lack thereof) between education and the labor market as they relate to challenges for women and men.

### ■ Recommendation 1.4: Implement targeted polices to close gender gaps in STEM fields and in reading



G20 countries must pay close attention to STEM education and reading outcomes in their countries as there are often marked gender disparities related to participation and achievement in these subjects. At the global level, girls are less likely to study STEM subjects or subsequently enroll or take up career paths in related fields (Chavatzia 2017; UNESCO 2018). However, in the case of reading, boys consistently underperform in comparison to girls. In the 2015 Programme for International Student Assessment, in every country, boys scored less than girls on average in reading (OECD 2016). Domestic narratives and policies around girls pursing STEM and boys' achievement in reading need to better communicate the importance of the ability to be able to, create, think, use, and develop innovative solutions to address local and global challenges. At the global level, G20 countries can also commit to supporting international agendas, such as the Incheon Declaration and Framework for Action (UNESCO 2016) and the Addis Ababa Action Agenda (United Nations 2015b), both of which call for equality and increased investments in STEM education in order to ensure those entering the workforce are equipped with the skillsets required for jobs of the future.

## Global-Level Recommendations

Globally, education policies need to be designed to better support gender equality in education. While there has been a shift in the global agenda for gender education equality with the advent of the SDGs—namely in moving away from a narrower focus on girls' education to a broader appreciation for gender equality more holistically—there is still more to be done to ensure that all girls and boys receive the support they need. Although there should be a sustained effort to target the systematic marginalization of women and girls, there must also be an appreciation of the issues facing men and boys.

The two recommendations outlined below focus on ensuring equitable approaches to education; firstly, through forming a global coalition to understand and actively implement relevant policies targeting gender disparities in education and secondly, through mobilizing and pooling resources for the most vulnerable.

## Recommendation 2.1: Establish a Global Coalition for Gender Equality in Education

The G20 is in a unique position to establish a Global Coalition for Gender Equality in Education. Three key aims of this body would be to: (i) support research on gender disparities in education, (ii) hold governments accountable for gender equality in education, and (iii) convene key actors to share the latest findings in research and practice.

To start, the coalition would commission research related to developing gender and education indicators, mapping the gender landscape, tracking progress made toward achieving SDG 4 as it relates to gender, and identifying future research and policy areas. Although there is enough data available to report on gender issues in education, the ability to track gender equality is limited. Researchers have found that for many of the global indicators, additional methodological work is needed, and the SDG 4 monitoring framework should be broader (see GEM Report Team 2018b). Thus, research into existing and new indicators could strengthen the monitoring framework. Expanded areas of focus could include values and attitudes, teaching and learning practices, and laws and policies (GEM Report Team 2018b; Unterhalter et al. 2015).



Research commissioned by the coalition should also examine existing and emerging issues in gender in education as they relate to SDG 4. This should explore cross-cutting issues related to barriers in education for girls and boys, identifying overlapping issues and those that are gender-specific. The coalition would be responsible for making findings widely available to inform policy makers, academics, and other stakeholders.

Secondly, the Global Coalition for Gender Equality in Education would assist governments with upholding their obligations to the Education 2030 Framework for Action, the international community's roadmap towards achieving SDG 4 (GEM Report Team 2018b). In addition, the coalition would encourage G20 member states to initiate new international treaties on gender in education and create associated formal mechanisms to hold governments accountable. It would also encourage G20 member states to support their counterparts struggling to enact and enforce relevant policies, which may include countries affected by conflicts or natural disasters.

Finally, a third core mandate of the coalition would be to facilitate the convening of policy makers, academics, practitioners, and other stakeholders in order to exchange information through targeted events and platforms. Some possible avenues to facilitate such exchanges could include symposia, meetings adjacent to pre-existing events, and/or an online sharing portal. Such facilitation would support a sharing of best practices and the adoption of strategic gender education policies at the state, regional, and global levels.

### Recommendation 2.2: Increase funding for initiatives in education to address gender needs within vulnerable populations, including refugees

G20 member states can collectively increase support for the most vulnerable populations in education, as these groups are not only in the greatest need but gender issues in education can also be particularly pronounced for them. If policy makers are to advance SDG 4's aim of leaving no one behind, then they should invest more heavily in quality education for those who are most vulnerable, including and especially in countries with refugee populations. For example, in 2011 in Pakistan, the national primary net enrollment rate was 71%; however, for Afghan refugees it was less than half, at 29% (GEM Report Team 2018c). Within that subgroup, 39% of Afghan refugee boys were enrolled in comparison to only 18% of Afghan refugee girls (GEM Report Team 2018c). While in 2017, $450 million was given in global humanitarian funding to education, this amount was only 2.1% of total humanitarian aid and fell short of the 4% target (GEM Report Team 2018c). G20 member states can make a united effort to improve provisions and increase funding,[3] as many refugee host countries cannot provide the necessary educational provision alone.

Those from low socioeconomic status backgrounds constitute another vulnerable group, and the intersection of poverty and gender deserves greater attention from policy makers. Gendered labor expectations can pull boys with a low economic status out of school and push them into unskilled labor jobs where secondary school completion is not a requirement, and differences have also been found in terms of academic achievement levels of girls and boys when they come from the poorest segments of the population (David, Albert, and Vizmanos 2018; GEM Report Team 2018b; Ridge, Kippels, and Chung 2017). Governments can prioritize financing education for such populations. If there is a heightened global effort to invest in the education of vulnerable populations, this would boost development and economic growth at national and international levels (GEM Report Team 2018c).



## Conclusion

Significant advances have been made in education over the past 2 decades as near universal primary education has been achieved and education is now accessible to many sections of society that were previously excluded, including girls. Moving forward, policy makers must recognize and understand existing gender issues in education in their specific contexts and correspondingly implement evidence-based policies to establish more equitable, quality education systems. Only after this will they develop societies where everyone can be an active and productive citizen.

[3] Two avenues for supporting populations in need include the International Finance Facility for Education (IFFEd) and Education Cannot Wait (ECW).

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# Measuring Transformational Pedagogies across G20 Countries to Achieve Breakthrough Learning: The Case for Collaboration

**David Istance**
Center for Universal Education at the Brookings Institution

**Anthony Mackay**
National Center on Education and the Economy

**Rebecca Winthrop**
Center for Universal Education at the Brookings Institution

## Abstract

Given the urgent need to transform traditional teaching and learning practices in order to prepare students with the breadth of skills needed for the future, it is urgent that G20 countries collaborate quickly to develop a breakthrough set of measures to track pedagogical transformation. Currently, no country has the data or assessments it needs to track if these pedagogical changes are happening and whether students are mastering the desired skills. International and national education assessments use metrics that only partially indicate whether a country is headed in the right direction. We recommend the G20 establish a Task Force made up of leading thinkers from the G20 and around the globe to develop these shared measures.

## Challenge

A range of global comparative assessments, from the Program for International Student Assessment (PISA) to the Programme for the International Assessment of Adult Competencies (PIAAC), to Trends in International Mathematics and Science Study (TIMSS), and Progress in International Reading Literacy Study (PIRLS), have underscored enormous gaps in the performance of students among education systems. Without major policy changes, these gaps will only widen. Projections show that by 2030, more than half of the world's children will not be on track to achieve basic secondary level skills from literacy and numeracy to critical thinking and problem-solving.[1] And by some estimates, if we continue with the current approaches, it could take students from poor families up to 100 years to catch up to the learning levels of students from wealthy families. At the same time, the changing nature of the world of work and the advent of artificial intelligence and related technologies means that what will be required to succeed tomorrow may be very different from what is needed today. Beyond basic skills, students need skills for the 21st century, such as critical thinking, collaborative problem-solving, empathy, and flexibility to respond to a changing world.



All countries, high and low performing, face two equally urgent tasks: accelerating or maintaining their performance to enable their students to compete globally now while simultaneously attempting to anticipate the skills that will be needed in the future.

Countries within the G20 urgently need to rapidly accelerate progress or leapfrog in order to prepare their students for a global economy and an uncertain future dominated by technology. The key to leapfrogging as outlined in *Leapfrogging Inequality: Remaking Education to Help Young People Thrive* (Winthrop et al. 2018) is a major transformation in teaching and learning from lecture-based to more playful learning approaches, where "learning is driven by student needs and inquiry is meaningfully connected to students' lives and fosters experimentation and social interaction."

This is much broader than a curriculum revision: a holistic transformation in teaching and learning that reconsiders how, when, and where students learn will be necessary. Transforming *how* students are taught must be a central part of the transformation. After all, many 21st century skills are best developed not by introducing separate curricular subjects (e.g., a creativity class or critical thinking class) but by transforming how current subjects are taught (e.g., using experiential, collaborative projects as a way of teaching science concepts).

[1] *The Learning Generation: Investing in Education for A Changing World.* https://report.educationcommission.org/report/.

Despite the evidence that transformational pedagogies make an impact,[2] currently, no country has the data or assessments it needs to track whether these pedagogical changes are happening and whether students are mastering the desired skills. This is because international and national education assessments use metrics that only partially indicate whether a country is headed in the right direction of transformational learning. These assessments primarily track two sets of data: performance data (based on student test scores) and education system statistics (enrollment, personnel, funding levels). *No matter how in-depth these assessment programs are, they do not go nearly far enough to illuminate whether innovative, dynamic teaching practices are being employed and to what degree of success.*

This information is crucial if education systems are to truly leapfrog towards all children developing broad competencies and skills.

## Proposal

Given the enormous disruption to traditional teaching and learning practices that is necessary to prepare students for the future, it is urgent that G20 countries collaborate quickly to develop a breakthrough set of measures to track teaching and learning transformation. These measures must be holistic—spanning the learning interactions between student and teacher, the education system that enables the conditions for learning, and the macrosystem of economy and society that drives education—as well as forward-looking: usable to education decision-makers so they can simultaneously improve their education systems incrementally while planning for the uncertainty of the future.



The process should collaborate and complement existing international assessment programs and should build on the array of existing work that has been done to measure what success looks like today for student performance, for classroom environments, and for education systems. For example, a number of leading global organizations, such as the Brookings Institution, the Center on International Education Benchmarking, Yidan, and the OECD have proposed different frameworks for benchmarking the process of transformation of education systems towards the goal of helping children develop a broad set of capabilities and skills. All of these approaches are aligned in terms of the broad vision for success and general policy approach to transforming teaching and learning to reach that success.

All G20 countries will need some way of measuring transformational pedagogies, and it would be inefficient for countries to tackle this task on their own. Instead, significant cross-border sharing and collaboration will be necessary to develop a unified set of measures that are applicable across countries. It is the authors' belief that the G20 is the perfect vehicle for this collaboration. Such a pressing and far-reaching task will require the best minds from government, education, nongovernment organizations, and the broader society. The G20 is the perfect convener to gather the relevant groups as well as emphasize the need for the new measures.

We, therefore, recommend the G20 establish a Task Force made up of leading thinkers from the G20 and leading experts from around the globe to develop these shared measures.

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[2] See Organisation for Economic Co-operation and Development's (OECD) Innovative Learning Environments project. http://www.oecd.org/education/ceri/innovativelearningenvironments.htm.

The shared measures would complement existing education data—both performance data, such as standardized exams and education system statistics including student participation and enrollment—and provide insight into the educational processes that we know from the OECD's research are strongly linked with the pedagogical changes that develop breadth of skills.

The Task Force would address four questions, which would guide the proposed phases of work:

(i) What existing data is currently regularly collected and can be used for this initiative?

(ii) What are the gaps in data and how can that data be gathered?

(iii) What are the most salient measures for countries to track if their shift toward pedagogical transformation is moving in the right direction?

(iv) What approach should be used to collect, report, and share this data?

Throughout the process, the Task Force would survey key stakeholders to provide input into the work. Collaboration with existing assessment programs will be a top priority in order to build on the data collection efforts already underway. Broader input will be needed to inform the development of the research and ensure buy-in for the recommendations. To this end, extensive consultations with governments, the private sector, civil society, and other education actors will be undertaken. The specific phases of the Task Force are detailed below:



## Phase I: Identify the existing data

The Task Force would be charged with surveying existing frameworks, tools, and research. For example, the OECD collects data on teacher collaboration as part of the TALIS survey that could be a starting point for the proposed breakthrough measures.[3] The Task Force would provide guidance for G20 countries about the multiple and complementary purposes of existing data and develop guidance and protocols about which sets of data are useful for what purposes.

## Phase II: Identify the gaps in the data

After completing the above exercise, the Task Force would identify the gaps in data and what would be required to obtain the data. For example, an existing gap we are aware of is the lack of assessments designed to systematically measures pedagogical change from lecture-based to interactive, engaged and student-driven. The Task Force's work is likely to uncover additional gaps.

## Phase III: Identify new measures

The Task Force would work to determine the specific measures that would give countries actionable data on how they are performing on their path to pedagogical transformation. From existing research, we expect that these measures could include:

- the extent to which teachers are collaborating;
- the existence of structures for continuous school and systemwide improvement;

[3] OECD's Teaching and Learning International Survey. http://www.oecd.org/education/talis/.

- widespread and thoughtful use of technology as part of pedagogy;
- to what extent teaching and learning are aligned to 21st century skills;
- whether teaching and learning are taking place in a wide range of contexts including outside the school building and day;
- are systems using a diverse array of metrics to assess student performance that captures their abilities across academic knowledge, skills development, and other 21st century competencies;
- partnerships between schooling and sectors outside education; and
- a policy environment conducive to adapting rapidly to meet the demands of the future.

An essential part of identifying new measures will be to identify the possible methods for collecting data on them. The Task Force will consider a wide range of options, including approaches that use more continuous data collection methods, are a "lighter touch" than those used by current international assessment regimes, and that do not result in internationally comparable league tables.

### Phase IV: Develop approaches to collect, report, and share

Based on the above work, the Task Force would identify approaches to collect and share data among G20 countries. A likely outcome would be the identification of a select group of countries where it would be useful to pilot the new measures. The Task Force would provide guidance on implementation, data collection and rollout in participating jurisdictions.



In closing, having a set of unified measures across countries will enable jurisdictions to compare themselves on common holistic measures that span the linkages between education and the economy and the society of the future. Given the slow pace of change across many education systems towards helping all students cultivate full breadth of competencies and skills they need, there is a need to try new approaches that can help leapfrog progress. With the uncertainty facing countries as they try to prepare students for a world that is constantly evolving, the time has never been more urgent.

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# Teacher Professional Skills: Key Strategies to Advance in Better Learning Opportunities in Latin America

**Javier D. González**
Laboratorio de Investigación e Innovación en Educacion para America Latina y el Caribe

**Dante C. Castillo**
Laboratorio de Investigación e Innovación en Educación para America Latina y el Caribe

**Claudia Costin**
Center for Excellence and Innovation of Education Policies

**Alejandra Cardini**
Centro de Implementación de Políticas Públicas para la Equidad y el Crecimiento

## Abstract

It is widely recognized that teaching is a key driver to improve students' learning. The Sustainable Development Goal (SDG) 4 recognizes the importance of teachers and the urgency of having organized systems of pre- and in-service training. This policy brief offers policy recommendations related to initial training improvement, introducing highly effective teaching practices, rethinking the use of information and computer technology (ICT), and adopting a renewed collaborative approach for teacher professional development from a Latin American perspective. This is particularly relevant in the context of the 2030 agenda which recognizes teacher shortages across the world (UNESCO 2016) and the need to address the learning crisis (TALIS 2014).

## Challenge

Latin America, as other developing regions, requires a new wave of policies to address the institutional, economic, and cultural barriers to improve the teaching profession. Findings provided by the Inter-American Development Bank (2018) in their publication "Profession: Teachers in Latin America: how was teaching prestige lost and how to recover it?", shows that the teaching profession is one of the least socially valued in the region. Amid several problems, teachers' salaries in many Latin American countries have not increased as much as in other areas, although access to teacher training programs is almost guaranteed for anyone.



Although policy solutions are presented here as a set of differentiated recommendations, this policy brief stands on the idea that particular policies and practices must be comprehended in a framework that explains the knowledge, practice, and professional engagement required across teachers' careers. This means that beyond specific practices, policies regarding teachers' professional development must find a common ground in terms of knowing students and how they learn; the content and how to teach it; the plan and implementation of effective teaching and learning; the creation and maintenance of supportive and safe learning environments; assessment, feedback provision, and reporting on student learning; engagement with professional learning, colleagues, parents and/or carers, and the community.

In relation to this common framework, one of the main challenges to be tackled is the creation of systems that, on the one hand, attract high-performing students to the teaching profession, recognizing the social value that teachers play in a rapidly changing world and that, on the other hand, ensure the quality and pertinence of pre- and in-service teacher training, focusing on the most effective teaching practices. This implies establishing high-quality standards to assess pre- and in-service teacher training programs, finding the optimum balance between subject matter knowledge, teacher dispositions, and their pedagogical and professional skills. Along with that, it is critical to make use of the advantages that ICTs offer to reach large numbers of teachers that need to develop new critical skills; all of these challenges require adjusting the national institutional frameworks to advance the professionalization of the teaching career.

# Proposal

Teacher policies require institutional frameworks with a comprehensive perspective over particular solutions. In this regard, the following recommendations are understood as an interrelated cluster of solutions where training, collaboration, effective practices, and the use of ICTs must be jointly addressed by public policies. In terms of Darling-Hammond et al. (2017), teacher professional development should be envisioned in a wider systemic view related to curriculum, resources, a shared vision, and assessment, among others.

## Introducing Highly Effective Teaching Practices

The "what works" literature has identified a set of highly effective teaching practices. These practices can be thought of as fundamental capabilities that teachers should master if they want to be effective in unleashing the potential of their students. These skills should also orient national frameworks to organize not only training programs, but also the national agencies in charge of providing teacher professional development.

Several initiatives across the world have made progress in identifying the most effective teaching practices to transform the teaching and learning experience to increase academic performance, educational equity, and inclusion.[1] These practices should be promoted with the objective of finding the optimum balance between subject-matter knowledge, teacher dispositions, and pedagogical and professional skills. These skills, understood as critical competencies for the teaching practice, have been identified as very cost-effective, which should induce policy makers to make the best use of them. The skills teachers need to develop to become effective should include at least these four:[2]

*Provide effective feedback*: This skill implies giving information (oral or written) to the learner regarding her/his outcomes in relation with the learning objectives. In this sense, feedback should be a compulsory task for the teacher when performing formative assessment. The teacher must help to align the student's efforts and actions to the goal that has been set. Global evidence shows that students that receive proper feedback from their teachers learn over 65% more—in a given academic year—than their peers who do not receive feedback.

*Foster metacognition processes*: Teachers should help students think about their own learning process more explicitly. To achieve this, teachers must provide students with specific strategies for designing, planning, and evaluating their own learning. Teachers require intensive training and practice to master this competence because it involves working with students' motivation, disposition, and level of development. Academic evidence shows that students trained in metacognition techniques learn over 55% more—in a given academic year—than their peers who do not master metacognition skills.



[1] EEF. https://educationendowmentfoundation.org.uk/evidence-summaries/teaching-learning-toolkit; SUMMA. https://www.summaedu.org/plataforma-de-practicas-educativas-efectivas/; University of Michigan, Teaching Works Initiative. http://www.teachingworks.org/work-of-teaching/high-leverage-practices.

[2] Contextualized information for Latin America about this strategies is available in https://www.summaedu.org/effective-education-practices-platform/. This platform has been developed in partnership with the Education Endowment Foundation.

*Cultivate dynamics of collaborative learning*: Most traditional classrooms lack collaborative learning experiences. Teachers should be able to create working groups so students can have in-depth interactions and learn from each other on collective tasks. Several didactic strategies can be put in place; however, they share the basic feature of having a common collective task to which every student must contribute and perform multiple activities such as designing, organizing, communicating, deciding, and evaluating. Comparative evidence shows that students that learn collaboratively perform over 40% more—in a given school year—than their peers who learn in a traditional manner.

*Nurture processes of socio-emotional learning*: This skill entails improving students' interaction with others in order to have positive relationships, manage their emotions, and take responsible decisions with respect to peers, teachers, family, and community. This competence demands teachers to pay attention to emotions and social relationships, rather than focusing exclusively on the academic or cognitive elements of learning. Evidence shows that students with better socio-emotional skills learn over 30% more—in a given academic year—than their peers who do not properly acquire these skills.

## Setting Higher Standards for Pre-Service Education

Countries such as Chile, which have made consistent improvements in learning outcomes for children have implemented rigorous national standards for teachers that inform the curriculum of pre-service teacher training programs. These programs intend to ensure that aspiring teachers master not only content knowledge (what), but also pedagogical knowledge (how). The latter involves helping aspiring teachers develop effective practices, such as the ones listed in the previous section of this brief. In order to do this, pre-service programs offer residency-style internships in partnership with the public school system, where aspiring teachers will eventually pursue their careers.



Beside informing teacher training curricula, national standards for the teaching profession may also inform certification processes for pre-service programs put in place by education ministries. Ideally, programs that do not meet these standards should be shut down by regulating agencies, increasing the likelihood that all graduating students are adequately prepared to enter the profession. An important lesson we can learn from the Chilean experience is to implement these reforms gradually, in order to minimize political opposition from powerful stakeholders, beginning by making certification voluntary for a short period, then mandatory, and finally making it high stakes (by shutting down non-compliant programs).

A common consequence of the low social status of the teaching profession in many Latin American countries is that the least qualified students are the ones seeking teacher training programs. Attracting the most qualified is not an easy task. Countries such as Chile and Peru have raised the admission standards into teacher programs by requiring a national minimum grade on entrance exams. This needs to be done gradually and in tandem with other measures such as scholarships for pre-service programs and higher teachers' salaries.

In summary, there are important measures for elevating the status and quality of future teachers, thereby raising the quality of the system as a whole. These are: establishing national standards for the teaching profession; ensuring pre-service programs are practice-based and that they have a strong school residency component; implementing a certification process for teacher training programs; and raising the admission standards for students into these programs.

## Leveraging Professional Development through ICT

Improving initial teacher training will only increase the quality of education systems in the long term, but current students in public schools cannot wait that long. To improve the quality of teachers who are currently in public school classrooms, it is necessary to increase the effectiveness of professional development strategies. The Teaching and Learning International Survey (TALIS) defines professional development as the activities that aim to develop an individual's skills, knowledge, expertise, and other characteristics as a teacher. As previously mentioned, these activities should be oriented to develop those fundamental teacher competencies that are more likely to improve learning.

"Collective teacher efficacy," whereby teachers believe their collective work can have a positive impact on students and are able to confirm this belief with evidence of student learning, has been strongly linked to student achievement and needs to be incorporated as a goal of professional development (Eells 2011; Hattie 2015). Collective teacher efficacy is achieved through strong collaborative cultures, shared decision-making and by focusing on students' assessments, collective lesson-planning and observations, feedback and reflection for continuous improvement (Brinson and Steiner 2007; Fullan and Quinn 2016). Understanding teaching as a collective undertaking shifts the focus of professional development from teachers to schools. Goals change from improving individual capacity to fostering a culture of collaboration in which school leaders, teachers and students are all learning from each other and growing continuously.

In Latin America, UNESCO's Third Regional Comparative and Explanatory Study (TERCE) shows that only 26.7% of teachers participated in a professional development activity of at least 60 hours and associated with the school subjects taught, during the 2 years prior to the survey. This accounts for a low participation of teachers in these training activities (TERCE 2013). Many of these activities might be delivered through ICT technologies. Some initiatives across the globe are advancing in this area.[3] There is still a debate about how to provide effective teacher professional development at scale, while ensuring key principles such as quality, equity and cost-effectiveness (Lim et al. 2018).

ICTs provide an effective and efficient platform to train a large number of teachers in those new competencies. In order to achieve this, previous research has identified a group of key principles to deliver effective teacher training (TPD@scale Coalition Secretariat 2019; Avalos 2011). Among them, digital technologies need to be focused on pedagogy rather than technology itself; this means that multiple modes of delivery (offline/online/blended) are more likely to be effective.

[3] Digital Learning for Development (http://dl4d.org/), TPD@scale coalition (https://tpdatscalecoalition.org/), Alianza para la Digitalización educativa en Latino América (ADELA).

In this sense, a critical factor is to develop high quality materials to be adapted locally and provide incentives for teacher participation. To increase the chances of having an impact, collaborative networks should be formed with national government, local authorities, governmental agencies dedicated to teacher training, universities and nongovernment organizations. This approach seeks to make training programs scalable and sustainable.

## Ensuring Policy Coherence

One of the greatest challenges to improve learning outcomes in Latin America, as in other developing regions, is guaranteeing continuity of successful policies. Continuity is essential to reach SDG 4. A promising means of ensuring continuity is to adopt Fullan and Quinn's coherence framework for promoting a whole system change (2016). This framework comprises four components: (i) focusing direction (having a set of clear goals and strategies), (ii) cultivating collaborative cultures (capacity building and collaboration vertically and horizontally within and across systems), (iii) deepening learning (new pedagogical partnerships with technology as the accelerator), and (iv) securing accountability (internally responsible and externally accountable). According to this framework, leadership needs to connect these four components through all levels of the system, within classrooms, schools, districts, and systems. Effective leaders "use the group to change the group by building deep collaborative work horizontally and vertically across their organizations" (Fullan and Quinn, p. 47).



Professional development efforts by school systems which apply this framework will have a greater chance of improving students' learning in a sustainable way. By ensuring broad and meaningful participation in improvement efforts, collaborative processes are a promising antidote to the discontinuity that often hinders reform efforts.

Moving forward, the greatest challenge for Latin American countries might be to ensure that teachers work as agents of "deep learning"; this is truly transformational education—one that places the learner as someone who can make a positive impact in his own community and the world, as Paulo Freire envisioned (Freire 1974; Fullan et al. 2018).

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# The Need to Promote Digital Financial Literacy for the Digital Age

**Peter J. Morgan**
Asian Development Bank Institute

**Bihong Huang**
Asian Development Bank Institute

**Long Q. Trinh**
Asian Development Bank Institute

# Abstract

Digital financial literacy (DFL) is likely to become an increasingly important aspect of education for the Digital Age. The development of the "gig" economy means that individuals will become more responsible for their own financial planning, including for retirement. Consumers will need to have increasing financial sophistication to make effective use of financial technology (fintech) products and avoid fraud and costly mistakes. The Group of 20 (G20) countries need to agree on a standardized definition of digital financial literacy, design tools to assess it, and develop strategies and programs to promote digital financial education, including special programs for vulnerable groups.


# Challenge

Digital financial literacy (DFL) is likely to become an increasingly important aspect of education for the Digital Age. The development of the "gig"[1] economy means that individuals will become more responsible for their own financial planning. Individuals will need to better manage their own retirement savings and pensions, due to the trend of switching to defined-contribution from defined-benefit pension plans. Consumers will need to have a higher level of financial sophistication to make effective use of financial technology (fintech) products and services and avoid fraud and costly mistakes. These developments point to the need to develop digital financial education programs to improve digital financial literacy, with a focus on skills likely to be critical for those participating in the Digital Economy.



# Proposal

The Group of 20 (G20) countries need to cooperate to develop consistent definitions of digital financial literacy, to design and implement tools to assess it, and develop strategies and programs to promote digital financial education as well as special programs for vulnerable groups, including the elderly, the less educated, owners of small and medium-sized enterprises (SMEs) and startup firms, women, etc.

## Increasing Recognition of the Importance of Digital Financial Literacy

Fintech, i.e., using software, applications, and digital platforms to deliver financial services to consumers and businesses through digital devices such as smartphones, has become recognized as a promising tool to promote financial inclusion, i.e., access of excluded households and small firms to financial products and services. In 2010, the G20 endorsed the Financial Inclusion Action Plan (FIAP) and established the Global Partnership for Financial Inclusion (GPFI) to coordinate and implement it.

[1] The gig economy is a free market system in which temporary positions are common and organizations contract with independent workers for short-term engagements. These systems are frequently implemented on internet-based platforms (https://whatis.techtarget.com/definition/gig-economy).

The FIAP was updated at the 2014 G20 Leaders' Summit in Brisbane and, acknowledging the importance of fintech, includes a commitment to implement the G20 Principles for Innovative Financial Inclusion under a shared vision of universal access (BIS and WBG 2016).

However, improved access to financial services via fintech requires higher levels of digital financial literacy to make effective use of them and to avoid miss-selling, fraud, hacking attacks, unauthorized use of data, discriminatory treatment, and behavioral issues, such as excessive borrowing. Digital financial literacy is likely to become an increasingly important aspect of education for the Digital Age. The development of the 'gig' economy means that individuals will become more responsible for their own financial planning. Individuals will need to manage their own retirement savings and pensions more, due the trend of switching to defined-contribution from defined-benefit pension plans. Also, the decentralized nature of fintech implies that consumers will need to have increasing financial sophistication to process financial information. This points to the need for nations to include digital financial education in their national financial education strategies.

To be sure, financial literacy has become recognized as an important requirement for effective financial inclusion, along with consumer protection, and has gained an important position in the policy agenda of many countries (OECD/INFE 2015a). At the Los Cabos summit in 2012, G20 leaders endorsed the High-Level Principles on National Strategies for Financial Education proposed by the Organisation for Economic Co-operation and the International Network on Financial Education (OECD/INFE), thereby acknowledging the importance of coordinated policy approaches to financial education (G20 2012). In 2016, G20 leaders focused on digital financial literacy more closely and endorsed the High-level Principles for Digital Financial Inclusion, which include Principle 6 on "Strengthen Digital and Financial Literacy and Awareness" (GPFI 2016). However, most national financial education strategies do not address digital financial literacy specifically, but instead focus on basic financial concepts. Moreover, the G20 has not yet developed guidelines for digital financial literacy or digital financial education. We consider this to be an important gap that needs to be filled. Also, digital technology can make financial services borderless, which would allow people to easily access financial products and services in other countries. This shows the importance of global coordination not only in regulating fintech, but also in improving the digital financial literacy of the public.



## Definition of Digital Financial Literacy

Similar to digital literacy and financial literacy, digital financial literacy is a multidimensional concept.[2] While some previous literature (e.g., OECD 2017) has described various aspects of digital financial literacy, there is still no standardized definition. We propose four dimensions of digital financial literacy, including knowledge of digital financial products and services, awareness of digital financial risks, knowledge of digital financial risk control, and knowledge of consumer rights and redress procedures.

[2] Digital financial literacy straddles the concepts of digital literacy and financial literacy but has its unique aspects due to the nature of the products and risks involved. For a proposal to define digital literacy, see the earlier policy brief by Chetty et al. (2017). One definition of financial literacy, together with survey questions to measure it, can be found in OECD/INFE (2018).

The first dimension is *knowledge of digital financial products and services*, which captures the basic understanding of digital financial products and services. Individuals should be aware of the existence of nontraditional financial products and services provided through digital means such as the internet and mobile phones. These services generally fall into four major categories, although there are overlaps:

- Payments: Electronic money, mobile phone wallets, crypto assets, remittance services;
- Asset management: Internet banking, online brokers, robo-advisors, crypto asset trading, personal financial management, mobile trading;
- Alternative finance: Crowdfunding, peer-to-peer (P2P) lending, online balance sheet lending, invoice and supply chain finance, etc.; and
- Others: Internet-based insurance services, etc.

In addition to being aware of digital financial services (DFS), people should be able to compare the advantages and disadvantages of each available DFS. Such knowledge would help them to understand the basic functions of different types of DFS (i.e., either for personal or business purposes).

The second dimension of digital financial literacy is *awareness of digital financial risks*. Individuals and firms need to understand the additional risks that they may incur when using DFS, which are more diverse but sometimes harder to spot than those associated with traditional financial products and services. DFS users should be aware of the existence of online fraud and cyber security risks. There is a multitude of potential risks facing DFS users, such as:



- Phishing: When a hacker pretends to be an institution in order to get the user to divulge personal data, like usernames or passwords, via e-mails or social networks;
- Pharming: When a virus redirects the user to a false page, causing them to divulge personal information;
- Spyware: When malicious software inserts itself into the user's PC or mobile phone and transmits personal data; and
- SIM card swap: When someone poses as the user and obtains the user's SIM card, thereby obtaining private data.

DFS users should also be aware that their digital footprint,[3] including information they provide to DFS providers, may also be a source of risk, even if it does not result directly in a loss, including:

- Profiling: Users may be excluded from access to certain services based on their online data and activities.
- Hacking: Thieves may steal personal data from their online activities such as social networks.

[3] A digital footprint is a trail of data one creates while using the Internet, including websites visited, e-mails sent, and information submitted to online services. This can include both active (intentionally submitted) and passive (unknowingly submitted) footprints (https://techterms.com/definition/digital_footprint).

Due to easy access to credit enabled by fintech, DFS consumers could also face potential problems of overborrowing or excessively high interest rates. Such risk can trigger unexpected and large losses when the DFS providers are not regulated or only weakly regulated. Overborrowing may also harm their credit rating. Finally, unequal access to DFS could exacerbate gaps between the rich and the poor.

DFS users should fully understand terms and conditions stipulated in contracts they digitally sign with DFS providers. They should also be aware of (risky) implications of digital contracts. They should understand that DFS providers may use their personal information for other purposes such as calculating their credit demands, advertising and credit evaluation. In terms of financial risks, easiness of access to finance may also lead to overborrowing.

The third dimension of digital financial literacy is *digital financial risk control*, which is related to DFS users' understanding of how to protect themselves from risks arising from such use. They should know how to use computer programs and mobile apps to avoid spamming, phishing, etc. They should also know how to protect their personal identification number (PIN) and other personal information when using financial services provided through digital means.[4]

The fourth dimension is *knowledge of consumer rights and redress procedures*, in cases where DFS users fall victim to the above-mentioned risks. DFS users should understand their rights and know where they can go and how to obtain redress if they fall victim to fraud or other loss. They should also understand their rights regarding their personal data, and how they can obtain redress against unauthorized use.



## Develop and Implement Tools to Measure Digital Financial Literacy

The OECD/INFE recommends that dedicated national surveys or coordinated international studies be used to collect high-quality, comparable data on levels of financial literacy (OECD/INFE 2019). Internationally standardized surveys of general financial literacy have been developed by the OECD/INFE (2018), the World Bank (2018) and others. However, these surveys do not include the aspects of DFL described in the previous section. We recommend that a standardized set of questions be developed to cover these dimensions, and that they be included in these questionnaires. The augmented surveys should be carried out as soon as is practicable to acquire baseline literacy on the state of DFL in individual countries.

The data so acquired should be analyzed to identify aspects of DFL that may cause particularly significant issues, especially to the vulnerable groups in greatest need of DFL. Furthermore, it should be used to analyze the financial behavior of the population or specific subgroups in relevant areas, such as accessing and using DFS for the purpose of saving, borrowing, investing and acquiring insurance.

[4] This overlaps with digital literacy.

## Develop Digital Financial Education Strategies and Programs

The OECD/INFE also recommends that countries establish and implement national strategies to ensure a coordinated approach to financial education (OECD/INFE 2019), including the following aspects:

- recognizing the importance of financial education—through legislation where appropriate—at the national level;
- involving cooperation with relevant stakeholders and identifying a national leader or coordinating body and/or council;
- establishing a roadmap to support the achievement of specific and predetermined objectives;
- providing guidance on individual programs to be implemented under the national strategy in order to efficiently and appropriately contribute to the overall strategy; and
- incorporating monitoring and evaluation processes to assess the progress of the strategy and amend it accordingly.

All of these aspects should be applied to the development and implementation of national strategies and programs for digital financial education as well. The OECD and other relevant organizations should incorporate such recommendations into their guidelines for national financial education policies, such as OECD (2012). Within the context of such national strategies, the G20 should also support the development of recommendations for regulating financial service providers such as fintech companies, including requiring them to fully disclose the product information and relevant risks to the general public in an appropriate way.



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# Lifelong Learning and Education Policies to Capture Digital Gains

**Cyn-Young Park**
Asian Development Bank

## Abstract

Rapid technological innovations are transforming the world of work. In many Group of 20 (G20) countries, employment is shifting towards jobs that require high-level cognitive and socio-emotional skills, while highly routine jobs are being automated or offshored to varying degrees. Today's skills will not match tomorrow's jobs but newly acquired skills may quickly become obsolete. As the concept of future jobs and careers becomes increasingly fluid, more emphasis will be on lifelong learning to keep up with changes in technology and maintain flexibility in skills. This brief discusses policy options for lifelong learning, target groups, and education in information and communication technology.

## Challenges

Rapid technological innovations are creating new opportunities for businesses and workers while greater interaction between humans and machines will raise productivity. New technologies are also generating skills gaps and digital divides, in that, as new technology increases demand for high skills in complex jobs, it may reduce labor demand or "deskill" workers in low-skill and routine jobs.

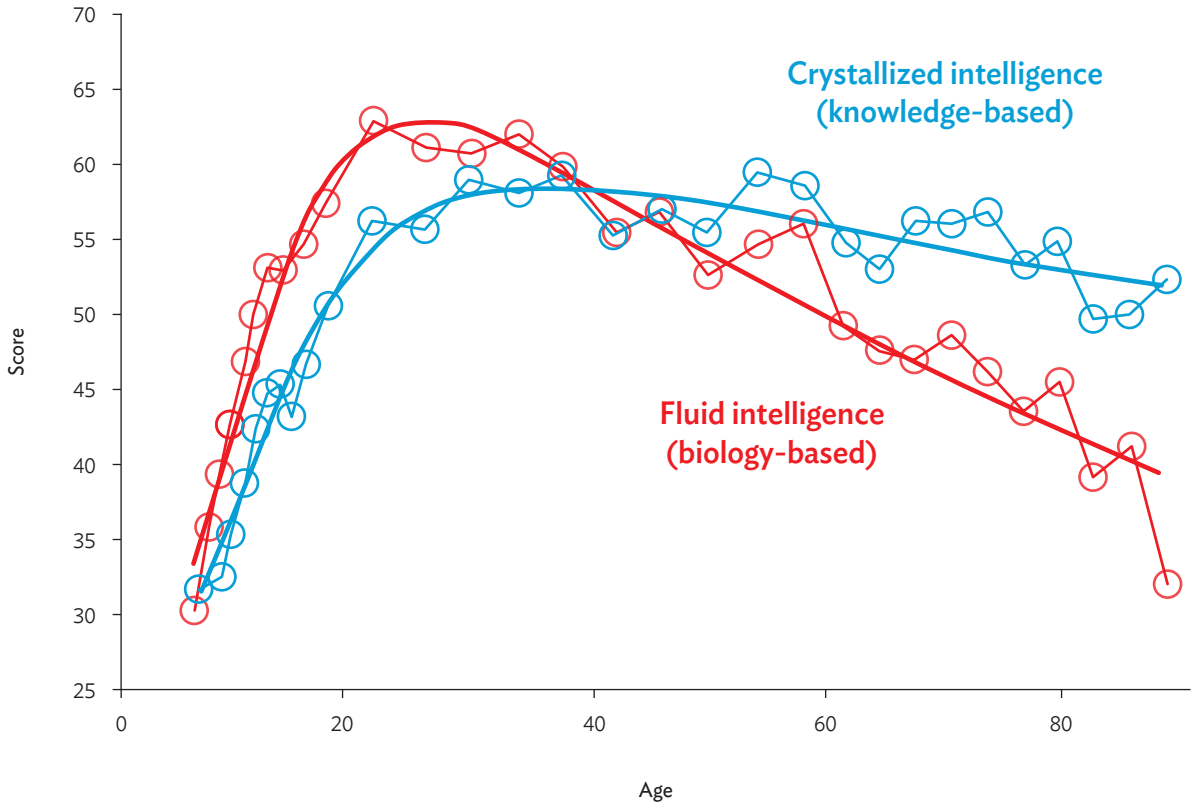
The emerging digital age leads to a major rethinking of education and skills training. The challenges are mainly threefold.



First, human capital will depreciate at a much faster rate as new technologies transform work and the needed skills. The age-productivity profile is shown to have an inverted-U shape, as productivity starts to decline after peaking at specific ages (Figure 1). Technologies will likely increase the pace of skills depreciation and therefore lead to a faster decline of productivity after the peak (Bartel and Sicherman 1993; Lovasz and Rigó 2013). Combined with increased life expectancy, workers will face a longer period of lowered productivity in the later stage of their careers. Along with changing demographics, an increasing number of seniors above the conventional retirement age of 65 are still employed in Organisation for Economic Co-operation and Development (OECD) countries (Figure 2). The average labor force participation of OECD seniors aged 65–69 increased from 20% in 2006 to 26% in 2016 and from 12% to 15% for seniors aged 70–75.

Second, new technologies have tendencies to polarize jobs. While technology can free workers from arduous labor, technology or automation processes can also render that labor superfluous, ultimately alienating workers and stunting their development. Traditional education and training have largely focused on cognitive abilities and skills. But middle-skilled, routine jobs face the highest risk of replacement by automation and new technologies. Rather than basic cognitive skills, humans will need to acquire soft and noncognitive skills, such as creativity, emotional intelligence, and complex human interactions. There will be also significant reallocation of jobs in coming years, creating more desperate need for job-training programs.

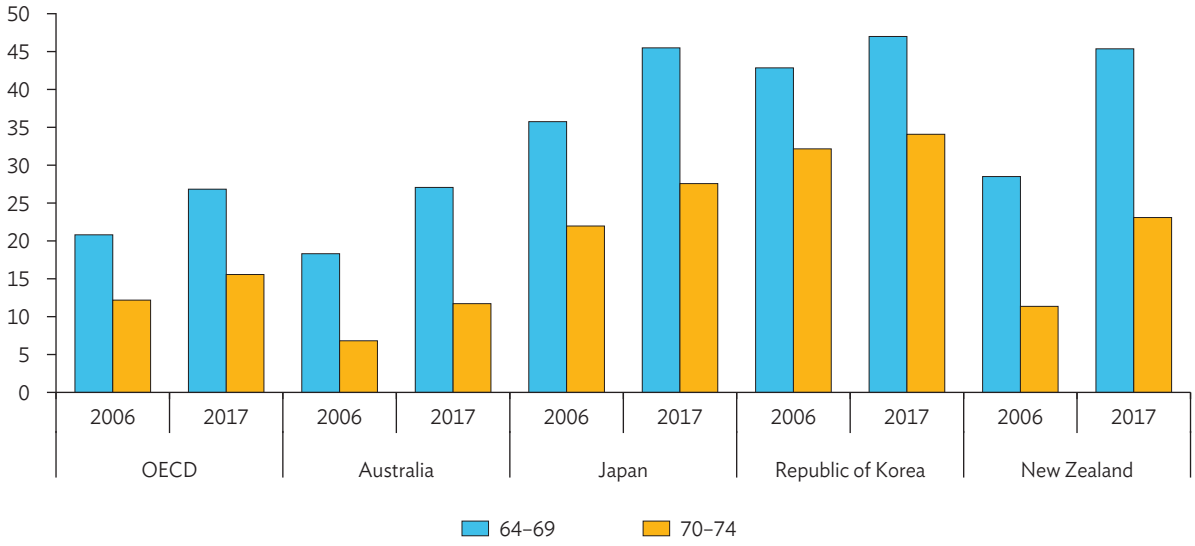
**Figure 1:** Productivity by Age at the Individual Level (Psychometric Tests)




Source: Chomik et al. (2018).



**Figure 2:** Labor Force Participation of Senior Workers in OECD Countries, 2006 and 2017



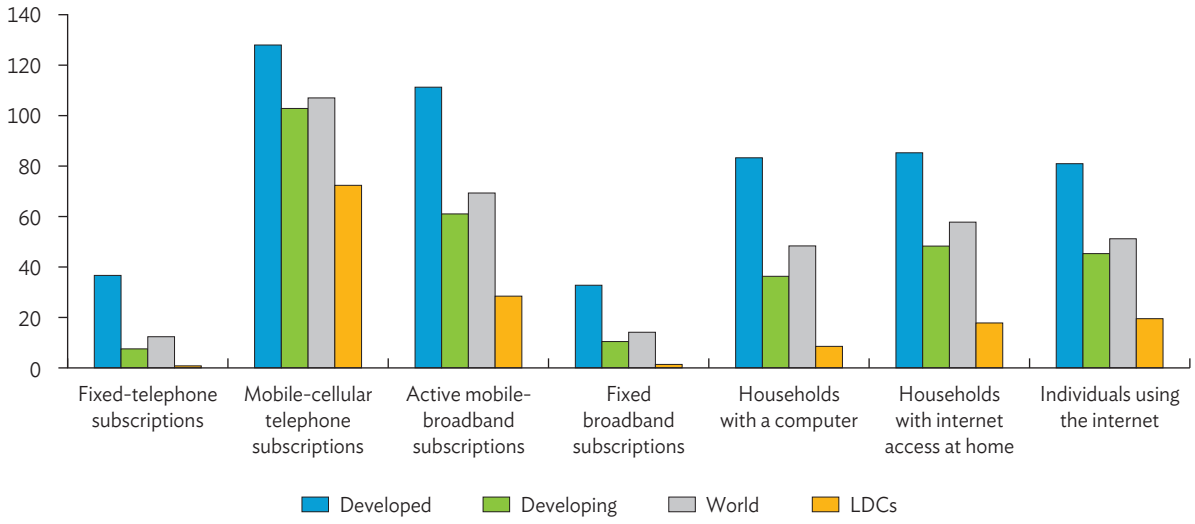

OECD = Organisation for Economic Co-operation and Development.

Note: Labor force participation rates for ages 70–74 for Australia refer to 2006 and 2016 data.

Source: OECD.Stat. Labor Force Statistics by Sex and Age Indicators. https://stats.oecd.org/Index.aspx?DataSetCode=LFS_SEXAGE_I_R (accessed 25 February 2019).

Third, while digital technologies offer vast economic potential, the value of digitization can only materialize when businesses and people have access to it. Key ICT indicators show a considerable digital divide by income level (Figure 3). The digital divide is also pronounced within most communities, disproportionately more concentrated in rural, low income, elderly, illiterate, and female. However, access to the technology alone is not enough; even where a large majority of the population has access, digital literacy and skills needed to capture economic gains are often limited and vary across segments of society.

**Figure 3:** **Key ICT Indicators by Income Group, 2018** (per 100 people)




ICT = information and communication technology, LDCs = least developed countries.

Notes: Aggregates are based on the International Telecommunication Union regions and the United Nations M49 developed/developing country classification.

Source: ITU. Global and Regional ICT Data. https://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx (accessed 25 February 2019).



# Proposals

1. **Adopt a holistic approach toward lifelong learning that encompasses all stages of life, from preschool to post-retirement, and all forms of learning, including formal, nonformal, and informal education**

The skill base of the population (including education, digital skills, and ability to learn and relearn) becomes crucial for technology adoption and spread of digital jobs. The right skill mix for future jobs would include strong general cognitive skills, including literacy and numeracy, basic information and communication technology (ICT) skills, analytical skills, and a range of complementary skills like creativity, problem-solving, and critical thinking. Interpersonal and communication skills, as well as emotional skills, such as self-awareness and the ability to manage stress and change, are also increasingly important. Yet the workforce readiness varies in the adoption of new technologies and digital jobs.

As labor markets and demand for skills evolve, a comprehensive, people-centered, and rights-based approach to lifelong learning should help workers adjust to change, preventing the high social costs of the complex and disruptive changes ahead and maximizing their positive effects.

- **Formal education:** Formal education systems need to be transformed to provide learning for the changed nature of work and workplace. Policy makers working with education providers (traditional and nontraditional) could do more to improve basic science, technology, engineering, and mathematics (STEM) skills through the school systems, put a new emphasis on creativity as well as critical and systems thinking, and foster adaptive and lifelong learning.
- **Nonformal education:** Policy makers need to create incentives for the private sector to drive and invest in human capital development and training. The workers in increasingly ICT intensive job environments that have lower ICT skills will benefit from employers and communities willing to invest in training and upskilling. Companies need to assume a more active role in education and training, including providing better information about needs to learners and the education and training ecosystem, and providing better learning opportunities themselves. Through tax benefits and other incentives, policy makers can encourage companies to invest in human capital, including job creation, learning and capability building, and wage growth.

**2. Target groups most affected by skills displacement[1]**



**Aging workers:** Age-friendly policies will become increasingly important. Older workers are disproportionately impacted by the adoption of ICT in maintaining or getting a job that requires ICT skills. But older workers are less likely to have access to skills development than younger workers and are less likely to engage with learning if the opportunities are available to them (Meyers et al. 2010). This is because either the returns are considered too low given their remaining working careers or because the type of training delivery (e.g., in a classroom) is not attractive (OECD 2006).

Ensuring the participation of mature workers in training may be best addressed by continuing to provide them with opportunities for rich work and further development to sustain their capacities and interest in contributing to work and workplaces as well as ensuring that they have good training opportunities earlier in their careers (Dymock et al. 2012).

**Low-skilled, own-account workers and small and medium-sized enterprises (SMEs), and women:** Workers in SMEs and own-account workers, such as the self-employed, are under-represented in training. Women make up a disproportionally large share in these groups as well. Greater participation of such groups can be achieved by redesigning tax systems to encourage adult learning and by providing financial support to alleviate the costs of learning. It could also mean improving systems for career guidance and opportunities for the recognition of skills acquired through informal and nonformal learning. For small firms, targeted initiatives to encourage skill needs assessment and training provision are also important measures to reach low-skilled and own-account workers.

[1] From OECD and ILO (2018).

In most OECD countries, low-skilled adults are less likely to participate in training, and employers and worker representatives have a key role to play in mobilizing them. Where training programs target low-skilled workers, low-skilled learners achieve the most significant outcomes, with over two-thirds of learners with no previous qualification moving to a higher qualification level (Stuart et al. 2016). The validation or recognition of nonformal and informal learning improves skill matching in the labor market by strengthening the signaling power of skills and making it easier for employers to identify which skills jobseekers already have. It also provides an incentive for individuals to further invest in learning by allowing them to capitalize on the skills they already have. This process of recognition of prior learning is particularly important in countries with high levels of under-qualification, where workers possess skills required for the job but lack a qualification to prove this.

**Youth:** The International Labour Organization's (ILO) 2017 youth and future of work survey found that young workers are aware of the need for training as jobs change due to the impact of technology (ILO 2017). However, as much of the responsibility for equipping youth with relevant skills lies with national education and training systems, these systems will need to strengthen the programs and services offered to ensure that initial education and training provide relevant and high-quality skills to smooth the school-to-work transition of young people. This engagement should also be broadened to offer interdisciplinary training that allows students to develop core work skills and knowledge through experiential learning, such as through quality apprenticeships and other forms of work-based learning.



Programs will increasingly need to cover a range of subjects beyond narrow occupational classifications to deliver more fluid transdisciplinary skill sets, such as those defined as 21st-century skills (Brewer and Comyn 2015). However, research by the ILO and UNESCO suggests that many technical and vocational education and training and skills systems may not as yet sufficiently support the development of these generic or so-called "soft skills" (UNESCO 2015; ILO 2015). This reinforces the need to ensure that initial education and training for young people delivers relevant skills to a high standard.

### 3. Invest in early childhood for the digital age

Evidence is accumulating of the positive effect of early childhood education. The rate of return to early childhood education is highest for educating children aged 0–5 according to scientific research. Early investments are potentially more valuable than those made later in adulthood (Heckman 2011; Heckman et al. 2013, 2014, 2016, 2018). Early childhood education also makes cognitive skills acquired by investments in human capital, even in the later stages of life, more productive. Therefore, early childhood investment can be very cost-effective.

Digital literacy and coding are important new areas, which early childhood education needs to incorporate more actively. While building basic digital literacy, technology can be used as a tool to build skills in other areas, including reading and writing, motor skills, and socio-emotional skills.

Integrating ICT in early childhood education is particularly important to narrow the digital divide in society. Parents of low-income families are less likely to afford ICT devices and applications and are often not very familiar with the technologies themselves. Low-income families often do not own a computer or have Internet access. A US study finds that only about one-third of lower-income parents have downloaded educational software for their children, whereas three-quarters of higher-income parents have done so.

Improving the quality of teachers should be a priority in education policy. The results of earlier studies also indicate that school resources beyond some minimum levels are not effective, but teacher quality matters (Angrist and Lavy 1999; Rivkin, Hanushek, and Kain 2005). As digital technologies become increasingly integrated into early childhood education, the role of teachers for children of low-income families will become even more important. Early childhood education providers need to work closely with families to support the learning of young children, with a particular focus on supporting parents of low-income children. To ensure that all families are prepared to support children, early childhood providers can supplement devices and software owned by the family and open up opportunities for parental participation through digital means. In addition, teachers can model effective technology use to ensure that parents are equipped to provide support in the home. A teacher's ability to properly facilitate technology use has also been shown to be an important determinant in whether technology leads to positive impacts on learning.

Educational expenditures should be spent wisely, particularly targeting improvement in teacher quality. This can be accomplished by maintaining high standards of curriculum design and teacher performance and recognizing the significance of retraining and regularly assessing educators.

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# Rethinking Pathways to Employment: Technical and Vocational Training for the Digital Age

**Romina Bandura**
Center for Strategic and International Studies

**Paul Grainger**
University College London

## Abstract

Technical and vocational education and training (TVET) generally suffers from low status and is regarded as inferior to academic study. Moreover, TVET institutions, which were established to be authoritative in knowledge and skills, need to adapt to an environment where the knowledge flow is reversed, with skills increasingly being generated within economic activities. Technology is also changing the kind of skills required by employers. A new relationship between educator and employer must be established for effective, high profile TVET and work-based learning programs. We propose a B20–L20–T20 collaboration and a Group of 20 (G20) database on TVET to promote best practices.

## Challenge

Our world of work is going through a rapid transformation. Globalization, demographic shifts (aging in developed economies alongside growing youth bulges in South Asia, Middle East, and Africa) and technological changes brought about the Fourth Industrial Revolution (4IR) (Schwab 2016) are having profound effects on the global labor market. These disruptions raise issues around the types of skills and learning required for the future of work.



Technology is changing the skills requirements of occupations, affecting both new entrants to the labor market and older workers. Unfortunately, current education systems are not adequately preparing the workforce for these changes, tending to fail both young and old. There is a disconnect both in terms of curriculums and requisite skills in occupations and between education outcomes and employers' needs.

Globally, many youths are unemployed or disengaged from the labor market. According to the International Labor Organization (ILO), 64 million youth are unemployed worldwide (ILO 2019). More strikingly, 20% of young people are not in education, training, or employment—they are disengaged. At the same time, millions of jobs remain unfilled. In part, this is brought about by youth not possessing relevant work experience, having underdeveloped or inadequate skills, and lacking career guidance. A 2013 McKinsey study reported that 39% of employers surveyed cited skills shortage as the main driver for the vacancies (Barton, Farrel, and Mourshed 2013). This paradox—high youth unemployment alongside widespread vacancies—requires rethinking the role that education systems, and specifically TVET and other types of work-based learning, can play in bridging this divide.

Sadly, there is a residual view in most countries that an academic track is the only pathway to a good career, while TVET—in both traditional occupations (i.e., construction and manufacturing) and emerging occupations (i.e., information technology, hospitality, and management) remains stigmatized as inferior. Yet TVET graduates with the requisite knowledge and skills can command high salaries, particularly in developed economies, a fact that is given insufficient emphasis when advising young people about their career possibilities (BLS 2019; OECD 2018a). These salaries are far higher than TVET institutions can pay their instructors, causing a potential shortfall in teachers. One solution would be to create mechanisms and systems whereby highly skilled employees can contribute to the learning process, benefitting not only TVET institutions but also creating opportunities for TVET innovations.

Such partnerships could represent two-way flows—from workplaces into educational settings and through joint working for knowledge and skills to flow back into workplaces. Such a two-way street could both help raise the standing of TVET systems and the quality of work-based learning.

Given this confluence of challenges, the G20 could have an important role in examining pathways to employment and the role that TVET can play both for those entering workforce and older workers that need to reskill. TVET systems must increase their partnership with employers to ensure appropriate forms of learning and access to world-class skills to promote new and continuing employment suitable for a high-skill economy and newly emerging forms of employment. The G20 can be instrumental in this regard.

# Proposal

## Promoting best practices on TVET across G20 countries by understanding the actual situation of self-employed individuals working via platforms

This proposal is for two interconnected policy actions.

- **Policy action 1:** The first is that the G20 establish a T20–B20–L20 collaboration to promote TVET and work-based learning within the G20. This group could collaborate with networks such as UNESCO–UNEVOC, the Global Apprenticeship Network (GAN), and the European Apprenticeship Network to increase understanding of the nature of TVET learning and share best practices of TVET within G20 countries.
- **Policy action 2:** To support and empower the group established under Action 1, a second policy action is needed to create a G20 database or tool to promote and inform about TVET requirements and labor market outcomes. This database could complement other efforts, for example, the OECD Skills for Jobs database (2019), with a greater focus on future looking trends in employment. It would:
  - examine labor market outcomes of general education, TVET and academic university provision;
  - explore the education and skills requirements for different occupations; and
  - calculate comparative cost/benefit of academic education versus TVET.



## Policy action 1: T20–B20–L20 collaboration to promote TVET and work-based learning within the G20

The B20 has recently noted *"Employability has to be a key component of education systems in order to avoid skills mismatches on the labor market. In this sense, close cooperation between businesses and relevant government agencies and institutions is key to ensure that the curricula of training systems are in line with labor market needs"* (B20 2018). In this regard, TVET and other types of work-based learning can be pivotal to close this gap.

Promoting work-based learning and TVET can be effective in easing the school-to-work transition and providing young people with skills that more closely aligned to employers' needs (Box 1). As the OECD (2018b) and UNESCO (2016) note, work-based learning is an avenue to reskill vulnerable groups and upskill older workers, but it is vital that it is not restricted to, or identified with, under-performing groups. Work-based learning is important not only for manual or low-skilled occupations but plays a significant role in the new middle- and high-level skilled occupations.

**Box 1: What Is Work-Based Learning and TVET?**

Work-based learning and TVET are interrelated concepts. Essentially, work-based learning is part of a TVET system, but it can also take place outside of it.

- According to the OECD (2018b), **work-based learning** *"encompasses a range of formal and informal arrangements, including apprenticeships, informal learning on the job, internships and work placements of various types that form part of school-based vocational qualifications."*
- According to UNESCO (2019), **technical and vocational education and training (TVET)** comprises *"education, training and skills development relating to a wide range of occupational fields, production, services, and livelihoods. TVET, as part of lifelong learning, can take place at secondary, post-secondary and tertiary levels and includes work-based learning and continuing training and professional development which may lead to qualifications. TVET also includes a wide range of skills development opportunities attuned to national and local contexts. Learning to learn, the development of literacy and numeracy skills, transversal skills and citizenship skills are integral components of TVET."*



In general, from the upper secondary phase onward, technical instruction of some kind, or TVET, has been introduced in most G20 countries with a view to enhancing employment potential. However, across these nations, there is no consensus as to the nature of TVET, its structure, content, or the type of institutions in which it is delivered. Far too often TVET appears only within organizations characterized as low status or remedial.

The first strand of this proposal is important because too many policy makers and other stakeholders do not fully understand the nature of vocational learning. There is a fundamental difference in how learning takes place in an academic setting and the style of learning that underpins high-quality vocational training, which is driven to supply practical and job-specific skills. Too often, TVET systems are supply driven, that is, they are dictated by government officials' understanding of the labor market instead of relying on private sector demands. Linking the business sector in TVET is crucial. Another challenge is that policy makers and other stakeholders view TVET as a second-best choice to a university degree or as a remedial intervention for vulnerable groups or dropouts. A T20–B20–L20 collaboration can overcome some of these barriers by bringing in the business community and showcasing best practices in TVET that countries can emulate (Table 1). Furthermore, evaluations of TVET systems are scant. G20 countries need to build more capacity in monitoring and evaluation of TVET systems. The results of such evaluations will help us understand what works and can inform TVET design.

**Table 1:** Select Challenges of TVET Systems

| Challenge | Solution |
|---|---|
| • TVET carries low status internationally, is stigmatized as second best, and has no prestige. | • Universities need to embrace TVET more fully, accepting TVET students and developing TVET programs. G20 countries can share approaches to high-quality TVET. |
| • TVET is frequently regarded as "remedial." | • TVET must be made more challenging. The skills taught should go beyond the technical or occupation-specific, so people are not siloed into one track. One way is to promote pathways to other occupations or into a university track. G20 can share best practices for this approach. |
| • There is a lack of information on occupation requirements, labor market outcomes, and costs of an academic track (university) versus TVET.<br>• There is scant information on impact evaluations on TVET systems. | • G20 can promote more information to labor market entrants by developing a user-friendly data tool.<br>• Capacity building should be strengthened among G20 countries on TVET design and improving monitoring and evaluation of TVET systems. |
| • Developing countries have big informal sectors (e.g., agriculture, retail) that are not organized and have more difficulty in identifying key representatives on the employer side to work with. | • Community groups and informal organizations should be more involved in the TVET system. |
| • For SMEs, it is harder to finance and train workers undergoing TVET and apprenticeships. | • There is a need for more focused support from governments and larger formal employers for SMEs.<br>• Technology can be employed to deliver TVET to more people, particularly as virtual platforms become globally available. |

SMEs = small- and medium-sized enterprises, TVET = technical and vocational education and training.

Sources: ADB (2014), Barton, Farrel, and Mourshed (2013), Maurer (2015), Ra, Chin, and Liu (2015).



Recent studies are clear that good TVET takes a new approach to learning whereby the *"relationship between theory and practice is inverted in technical education when compared to academic study, with practice necessarily preceding theory"* (Doel 2018). This "learning by doing" is accompanied by a wholly different approach to assessment, which is ongoing and therefore impacts the way that learners are profiled and certificated. When creating a garment, for example, there are no correct answers. Provided certain fundamentals are met, the garment is evaluated according to a whole range of criteria: practicality, fashion, culture, warmth, durability, cost, etc. This is a continuous process of evaluation whereby the garment, or any artifact or service is reviewed and modified during the process of the design phase, and improvements introduced.

A further condition of excellent TVET is the need for a clear line of sight between the learning environment and the work environment (CAVTL 2013). This line of sight was most likely to be engendered by a two-way street of continuous engagement between the education institution (and its teachers) and the industries in which students are being prepared for employment. Furthermore, teaching is more effective when delivered by dual professionals—those highly skilled in both their employment domain and in the art of teaching. Some ways that employers and educators can be brought together are through the secondment of teachers into employment, providing financial incentives to those working in industry to lure them into teaching, setting up apprenticeships or other forms of work-based learning, and designing strategic partnerships between education institutions and employers to share staff and resources.

With under-developed TVET systems, many countries will face significant challenges in designing, financing, and implementing new forms of work-based learning. The G20 could have a significant impact in disseminating the distinctive features of high-quality TVET amongst its members and promoting good practices, particularly to overcome the bias that "vocational" learning is remedial or of low status. Across G20 countries, there is a need to understand the challenges and opportunities of different TVET systems (and other forms of work-based learning) and to learn about best practices to overcome those challenges. A joint T20–B20–L20 partnership could lead this effort.

## Policy action 2: A G20 TVET database or tool to help inform on TVET requirements and labor market outcomes

The second strand of this proposal is the creation of a G20 tool on TVET that can provide more tangible information on the skills requirements for each occupation, costs of education, and labor markets outcomes on TVET across countries. Governments, educational institutions, and citizens need to understand that technological shifts are impacting how people learn, what skills will be required in each occupation, the costs to acquire such skills, and what labor outcomes one can expect (e.g., vacancies, wages, job characteristics). Currently, this information is not readily accessible to many. As mentioned, sharing more information across G20 countries on TVET and other forms of work-based learning can help inform good TVET design across governments and support citizens as they consider different careers if they are given relevant data. Policy Action 2 complements and supports Policy Action 1 in the sharing of knowledge and best practices of TVET across G20 countries.



The economic shifts brought about by the 4IR will have implications on employment and the type of skills required for the digital age. The 4IR will bring new ways of working, such as the "platform economy," and will create new jobs, as economies respond to the impact of developing technologies (Evans and Schmalensee 2016). The evolution of new forms of work is likely to accelerate, but not uniformly. The relationship between technological innovations and their implications for the future organization of work and demand for skills cannot be reduced to the view that automation and robotization are inevitable and human work will be replaced by technology (Autor 2015). New technologies can result in the creation of new jobs and new skills, but many cannot be predicted yet.

What is observable in contemporary economies is first and foremost the need to revisit skills: the skills that were underpinned by a single qualification are no longer sufficient. Moreover, employees do not have to gather together to be productive. Factories can be replaced by smaller units; an individual can have a global reach once they have access to the internet. Both smaller units of production and extended reach require enhanced networking skills, such as well-developed interpersonal skills that are effective over a virtual medium. Barber (2016) argues that vocational learning will become much more collaborative as students debate and elaborate each other's ideas in online environments. As routine cognitive tasks are increasingly automated, it is the qualities that make us distinctively human—empathy, storytelling, and connecting—that will be in ever greater demand. Colvin (2014) suggests that graduates of the future might be better off studying literature and so developing skills such as reading, social nuance, and understanding someone else's perspective. There is thus a need for a wholesale reconsideration of the design of TVET courses, supported by evidence from the proposed G20 collaboration.

Historically, it has been the case that the different ways of working co-exist alongside, rather than replace, one another. Not everyone will be an artificial intelligence (AI) specialist but can become adequately competent to be able to use and apply the technologies critically. Employees will need to feel comfortable working in AI environments supporting a continuing role for creative human intervention, rather than "technological scientists." A well-designed TVET system should therefore both promote social skills and high-level technical skills. The types of skills taught in vocational training need to broaden: from narrow technical skills associated to a specific occupation to a wider set, such as socioeconomic skills that can prepare workers to navigate an ever-changing labor market (OECD 2018b; Barber, Fernadez-Coto, and Ripani 2016). Communication between employers and TVET providers needs to be enhanced to ensure the supply of such skills.

TVET should move beyond its "modernist" industrial image and in the future support interaction and creativity which can be assistive to the digital world. In this way, advanced TVET might come to assert a status equivalent to the highest levels of academic study. TVET systems therefore need to be flexible and adaptive to the new labor environment. The G20 could play a pivotal role in identifying and disseminating examples of high quality, forward-thinking TVET. In this regard, a G20 database (or tool) that can provide information on skills, cost of education and outcomes of TVET, and other learning paths can be useful not only for G20 policy makers but for educators, employers, and families as they then embark on the complex but fascinating journey to employment.



## Conclusion

Education systems are not adequately preparing the workforce for the current demands of the labor market. Strong population growth in developing countries will bring added pressures to supply schooling and decent jobs for millions of new entrants. The UN predicts that there will be 3.3 billion people under the age of 25 by 2030, most living in Asia and Africa. Africa will double its population by 2050 and 60 percent of its citizens will be under the age of 25 (UN DESA 2017). This represents a demographic opportunity that could be wasted if economies do not create meaningful jobs and educate new generations appropriately for the future of work (Bandura and Hammond 2018). In this regard, TVET should not be overlooked as a legitimate pathway to employment. The G20 cannot pass up on this opportunity to influence the global education agenda and promote strong TVET systems within and across its members. This will require building strong coalitions among governments, the business community, and education institutions.

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# Bridging the Gap Between Digital Skills and Employability for Vulnerable Populations

**Angela C. Lyons**
University of Illinois at Urbana-Champaign

**Alessia Zucchetti**
Center for Research – Ceibal Foundation

**Josephine Kass-Hanna**
Saint Joseph University of Beirut

**Cristóbal Cobo**
Center for Research – Ceibal Foundation

## Abstract

While digital technologies are spreading rapidly, mismatches in desired digital skills between education and industry pose an ongoing challenge for the future of work. Some segments of the population are ill-prepared to fill jobs that will require at least a basic set of digital skills. With rapid technological advancement, traditional and emerging learning deficits can put them at greater socio-economic risk by exacerbating inequalities and unemployment. This brief provides recommendations to bridge the digital skills divide and foster the employability of those vulnerable populations, which can lead ultimately to larger macroeconomic outcomes such as poverty reduction, income growth, and economic empowerment.

## Challenge

The fourth industrial revolution is raising challenges for the future of work, as digitalization, automation, robotics and artificial intelligence (AI) generate opportunities for the economy and society (Bughin et al. 2018; Frey and Osborne 2017; McKinsey Global Institute 2018; OECD 2018a). While routine and manual tasks are being automated, new types of jobs are being created. The World Economic Forum predicts a net loss of 5 million jobs in 15 developed and emerging markets by 2020 (WEF 2016a; 2016b). Virtually, all sectors and geographical regions will be affected, with a growing number of workers needing reskilling an upskilling. Those in low-skilled jobs in such industries as agriculture, textiles, and manufacturing will be particularly vulnerable. According to some estimates, as many as two thirds of all jobs, mostly in developing countries, could be at risk (WEF 2016a). Shortages and mismatches in desired digital skills also pose an ongoing challenge worldwide. It is estimated that 9 out of 10 jobs will require digital skills in the future (United Nations 2018). Presently, however, less than one half of adults possess such skills (OECD 2016), while half of the world's population still does not have access to the Internet (International Telecommunication Union 2018; Hernandez and Roberts 2018).



As vulnerable populations are more likely to be excluded from the digital economy and, therefore, from the workforce, digital literacy approaches should specifically address their needs. As highlighted by Chetty et al. (2017), "impoverished communities with limited capabilities have fewer opportunities to gain the skills needed to advance within the rapidly transforming digital economy." Even when Information and Communication Technologies (ICT) and connectivity are made available and affordable, these segments face numerous challenges in accessing and using digital technologies.

Failing to create targeted measures for addressing the needs of vulnerable populations will widen the skills gap over time as rapid technological change continues. Bridging the divide between education and employment has been found to result in significant "digital dividends" for disadvantaged populations (Bolstad et al. 2012; Chetty et al. 2017). This includes increases in human and social capital accumulation, productivity, employability, and earnings potential (OECD, 2015). The ultimate result can be poverty reduction, income growth, and the creation of a pathway to long-run economic empowerment and financial independence, leading to more dynamic and inclusive economies worldwide (World Bank 2016).

Countries, intergovernmental organizations, and nongovernment organizations (NGOs) have been promoting digital skills development for at least the last two decades. However, to date, limited attention has been given to identifying practical solutions for those populations most at risk of being left behind.[1] Targeted actions are required to manage the current transition and build a future workforce where all members of society have equitable opportunities to acquire the digital skills needed to be competitive in the digital age.

## Proposal

The Group of 20 (G20) has been among those actively engaged in bridging the divide between skills, training and employability. The 2010 G20 Training Strategy highlighted the early vision and the anticipated needs and challenges that the labor market was likely to face (ILO 2010). More recently, under the G20 German presidency, high-level policy discussions focused on the role of digital skills and digital inclusion in promoting occupational and social participation (IMF 2017; Kirton and Warren 2018). Under the Argentina presidency, there was the inclusion of *"Education"* as one of the main strategic areas, as well as the creation of the T20 Task Force on *The Future of Work and Education for the Digital Age*. The work conducted last year by the Task Force highlighted the strong interdependence between technology-driven transformations and the critical role that formal, informal and non-formal education need to play in preparing students and employers for a dynamic and constantly changing labor market. The advantages of all these efforts can be multiplied through policies targeting vulnerable populations.



As a next step, *the G20 should focus on addressing the digital skills divide and challenges facing vulnerable populations, as well as their relation to the future of work.* To this end, the following set of specific recommendations are provided, using a *"glocal"* approach that focuses on combining global strategies for digital skills acquisition with local socioeconomic community needs. This includes, but is not limited to:

### 1. A multilevel educational approach to bridging the digital divide for vulnerable populations

**1.1 Reforming existing education systems to better prepare vulnerable students:** Some schools do not provide digital training, and if training is available, it may not be compulsory (Chetty et al 2017). The G20 needs to assist member states in extending basic, intermediate, and advanced digital skills beyond schools to create a wider range of educational pathways to acquiring these skills for vulnerable and disadvantaged populations across member states. These groups may be children and youth, but also adult learners such as the poor, the less educated, the unemployed, women, the elderly, the disabled, migrants and refugees, those in rural areas, or any group ill-prepared to participate in a digital environment.

[1] The United Nations E-Government Surveys show that governments around the world have only recently started to include vulnerable populations as part of their efforts to address the changes in job markets and the need to reskill and upskill the global workforce (United Nations 2012, 2014, 2018). On request of the G20 German presidency, the OECD conducted an assessment of member states' digitalization policies for disadvantaged groups. While these efforts provided an initial framework towards adopting practical digital solutions for vulnerable populations, the work was preliminary in nature (OECD 2018b).

To this end, the G20 can establish a task force to draft a digital skills development strategy such as that proposed by ITU (2018). This strategy would identify the digital skills development goals at the primary and secondary levels, as well as at the tertiary level for technical and vocational education and training (TVET) programs, and colleges and universities. The G20 would then be able to promote the adoption of capacity building and TVET for vulnerable populations in those areas and professions where there will be high demand, directly linking education to skills training and to the labor market. Education and training can, and must, play a key role in bridging the digital skills divide by addressing the specific skills needs for vulnerable populations.

**1.2 Endorsing and supporting a life-long learning framework (from "cradle to grave"):** The G20 can assist in mapping out the specific socio-technical knowledge and skills needed to reach a wide range of demographic and socioeconomic subpopulations at formative stages in their lives (Lyons, Kass-Hanna, Zucchetti, and Cobo 2019). To this end, ensuring *equity in learning* and creating opportunities to upskill and retool throughout one's lifetime need to be the priority (Bolstad et al. 2012).

**1.3 Enabling and promoting internship and apprenticeship programs:** These opportunities will help students to have earlier exposure to career pathways and critical employment sectors that are using digital skills. Such efforts may be particularly helpful in highlighting to students the direct benefits between education and employability, reducing school dropout rates, grade repetition, and improving student performance. Scholarships and other forms of government funding can increase the effectiveness of these programs by supporting student engagement and creating financial incentives for participation and program completion. Programs should be designed and implemented in direct partnership with public and private sector institutions and employers to help them plan for future skills, address future workforce needs, introduce new employment practices, shift work cultures, and train and integrate vulnerable populations into the work environment. Digital skills training can also be combined with entrepreneurial and business skills, introducing participants to the basics of online and digital work environments. Onsite workplace training programs targeting low-skilled workers and aimed at upgrading their competences are also needed.



**1.4 Facilitating the creation of alternative and non-formal educational models for digital training:** These educational models can also be an effective means to help bridge the gap between schooling and employability, and provide a framework for skilling, reskilling, and upskilling vulnerable workers. Such efforts are particularly important for providing workers with market-related digital skills that can meet the evolving needs of employers within various industries in the public and private sectors (Cobo, Zucchetti, and Rivas 2018). To this end, training programs should be adapted to the various needs of workers of different socioeconomic backgrounds and skills levels, so that no one is left behind.

**1.5 Offering more individualized and flexible learning opportunities:** Beyond traditional degree-based education, non-degree TVET programs can be offered both online and in person. The G20 can encourage learning and certification models that facilitate the upskilling and reskilling of the workforce, especially the most vulnerable who often face barriers in obtaining a traditional educational degree. TVET programs could offer credentialing in digital skills that would be widely recognized and accepted by employers in a variety of fields and industries. Over a lifetime of learning, individuals could assemble, or "stack up," a series of formal and non-formal credentials (such as certificates, licenses, badges, apprenticeships, etc.) to build up digital skills qualifications which would facilitate employability or even employment mobility.

Opportunities to better harness the power of technology driven learning environments also need to be examined. Digital learning platforms such as e-learning programs, online training and course offerings, and interactive self-learning websites allow for faster, wider, and more efficient dissemination of digital literacy and transfer of skills. They also tend to have greater reach due to their scalability, sustainability, and affordability, especially for vulnerable populations where costs and a general lack of infrastructure are still prohibitive factors to skills development (Hernandez and Roberts 2018; Taylor 2017). Other low-cost and accessible alternatives gaining attention are makerspaces (Bertot et al. 2014; Bertot et al. 2015).[2] These learning models create an inventing-type environment where people can gain hands-on experience in technical areas like coding, machine learning, and robotics while also developing soft skills such as problem solving, critical thinking, creativity and innovation, entrepreneurship, and leadership.

## 2. Creating instructional resources with digital content for underrepresented populations

**2.1 Promoting the creation of personalized and targeted educational content focused on the specific needs of vulnerable communities:** Developing content that is adapted to different needs and capabilities is essential to facilitating the learning process and enhancing learners' interest and motivation in using digital technologies. Promoting the development of teaching resources and instructional materials that include digital content has been at the center of international discussions regarding ICT and Internet-related policies for several years (ITU 2018). This includes the work of the United Nations Internet Governance Forum (IGF) and its Best Practice Forum for Local Content.[3]



The development of digitally relevant resources and platforms at the local level and for specialized target populations remains essential to fostering Internet use and digital technologies adoption among the most vulnerable. Most educators, however, still find it difficult to identify educational curricula and other resources that include digitally enriched content (ITU 2018). Educational systems are often faced with having to develop curricula materials, courses, and programs where none currently exist. Or, they have to adapt or rebuild existing programs if content is seriously lacking. There is the added challenge that schools located in poorer communities still do not have the resources to purchase even the most basic digital infrastructure such as computers, printers, software, internet connectivity, etc.

Educational systems can form public–private partnerships in the design phase to ensure the development of relevant digital skills resources. With guidance from key stakeholders and expert communities (e.g., the IT industry and digital education companies), the G20 can also provide guidelines and recommendations about the specific educational curricula and programs that are needed to address the digital divides to increase equity and inclusiveness. Guidance on teaching methods for effectively incorporating new digital content into the classroom in an interesting, holistic and future-oriented manner for diverse leaners can, and should, also be included.

[2] http://www.makerspaceforeducation.com/makerspace.html.

[3] http://www.intgovforum.org/multilingual/content/bpf-local-content-0.

**2.2 Moving away from a one-size fits all digital education strategy:** This is particularly important as localized content is culturally sensitive, especially to gender and race/ethnicity issues (Antonio and Tuffley 2014; Lyons, Grable, and Zeng 2019; Lyons and Kass-Hanna 2019; Mishra 2017; Mariscal et al. 2019; Robinson et al. 2015). Moreover, language barriers remain a relevant challenge, considering that most digital content is in English, including programming and coding (Internet World Stats 2018). Thus, the development of digital content and instruction in the learner's native language can offer a key pathway to overcoming language barriers. Also, women and minority groups should have equal access to and usage of digital education and training opportunities, especially since they are expected to be hardest hit by the digital revolution (Hernandez and Roberts 2018; WEF 2016a). This is particularly critical since women and minorities remain underrepresented in STEM. G20 member states can launch national campaigns and multi-stakeholder initiatives and offer incentives that encourage more women and minorities to pursue educational degrees and careers in the STEM fields.

## 3. Delivering digital content to vulnerable populations

**3.1 Developing robust pedagogical competencies among instructors:** Even when content is available, most educators are not necessarily equipped with the digital expertise, experience, and confidence in how to effectively integrate digital skills into their teaching and learning activities, especially when it comes to meeting the needs of vulnerable populations. Instructors need to be able to collaborate with other partners in the community who can provide specific kinds of expertise, knowledge or access to hands-on, real-world learning opportunities that they may not be able to access. Member states can incentivize private and public organizations (e.g., IT and tech companies, small businesses, start-ups, research parks) through tax incentives and/or other public policies to develop and implement digital skills trainings to assist educators in retooling and upskilling disadvantaged populations. At the top of formal training programs, this might include summer courses, workshops, apprenticeships, job shadowing, and short-time employment opportunities for the educators themselves.



**3.2 Creating the educational environment to insure inclusivity of all citizens:** Future-oriented learning approaches need to be shaped by an education system that is built around the learner, rather than the learner being required to fit with the system (Bolstad et al. 2012). Moreover, this future-focused education system should be one that shifts from providing learners with knowledge to store up for later use in their lives, to focus on equipping them to "work" with knowledge and to use it in new contexts and creative ways. Teachers' main job should not be limited to transmitting knowledge, but to helping their students effectively use their knowledge to engage with digital technologies through direct and autonomous application.

Some examples of success have been in the field of gamification where the principles of gaming are being incorporated into the classroom to bring the "power of play" to engage, inspire, and immerse students in learning while simultaneously fostering higher-order cognitive and socioemotional skills (World Bank 2016). Educational experts have found that game-based learning can be an effective means to building digital and non-digital skills in the classroom. Other best practices have incorporated computational thinking and coding into schools via the use of data hackathons, programming bootcamps, after-school programs and tech clubs.

**3.3 Taking advantage of existing online training and platforms:** Efforts can be made to promote the adoption of online interactive training and education platforms that build data science skills via courses, skills tracks, career tracks, and also hackathons and bootcamps. Using these types of platforms (e.g., code.org, DataCamp.com), students and adult learners can network with employers and apply for jobs that match their specific data skills. There can even be platforms for instructors who want to integrate digital content and activities into existing curricula and lesson plans. *Pursuit* is one such successful model that specifically targets at-risk populations. Located in the United States, this NGO recruits individuals from low-income, underserved communities, teaches them programming over an intensive 10-month or 36-month bootcamp, and then helps them find employment and build meaningful careers in software development.[4]

## 4. Harnessing the power of public–private collaboration

**4.1 Facilitating more active engagement and coordination between education and the private and public sectors:** Broader consensus and support needs to be built around the digital skills needed of vulnerable populations. Schools play a critical role in digital skills development—imparting digital knowledge and providing the learning pathways in which knowledge and skills can be applied. Yet, there are many other key stakeholders within the digital skills ecosystem that need to be included in this process, especially when it comes to addressing the skill needs of those most at-risk. These stakeholders include employers, other private sector entities, the government sector, civil society organizations such as NGOs, TVET institutions, public libraries, community and technology centers, other non-formal providers of digital skills and lifelong learning, and many others.



Successful models of stakeholder engagement often include the creation of organizational bodies such as coalitions and councils, task forces, cooperative alliances, and digital skills forums. An organizational body such as this can be established to move forward under a clear and focused digital skills framework to accelerate the digital skills development of critical populations. Activities may include: (1) assessing digital skills needs, (2) reviewing current policies and programs, (3) establishing digital skill goals, and tracking progress towards meeting them and reducing digital skills gaps for the most vulnerable, (4) identifying and monitoring workforce needs and new technological developments, and (5) maintaining connection and relevance through participating in regional and global campaigns and fostering new partnerships.

One successful model of engagement has been the European Commission's Digital Skills and Jobs Coalition Initiative, which is part of the EU's New Skills Agenda for Europe (European Commission 2016, 2017a, 2017b).[5] The Coalition invites all types of organizations in the EU to become members, as long as they are committed to advancing the objectives and principles outlined in the Coalition's charter with regards to the EU's digital skills strategy. This initiative has compiled a repository of Europe's best digital skills projects, which is searchable by target group and keyword to assist organizations in finding projects that best meet their needs. Collaborations such as these are needed at every level (from local to international), and attention must be given to specifically addressing the needs of the most vulnerable groups.

[4] https://www.pursuit.org/.

[5] https://ec.europa.eu/digital-single-market/en/digital-skills-jobs-coalition.

**4.2 Creating an international community to develop a more coordinated digital skills strategy:** A collaborative body can be established with the specific aim to advance digital literacy, training, reskilling, and upskilling of underrepresented populations. Similar to the EU's coalition, this collaborative body can inventory existing best practices, policies, strategies, and programs globally that support the development of digital skills for at-risk groups. Through this platform, the G20 member states can also build teams and cross-cutting partnerships to address more localized or regional issues, while also facilitating the exchange of ideas and best practices and allowing participants to provide guidance and technical assistance to each other. This is also likely to include a sharing of digital literacy metrics, digital content, curricula and learning pedagogies, training materials, online learning platforms and offline training programs to upskill both students and instructors. Smaller communities of practice can be created around the needs of specific target populations that may have more specialized needs such as migrants and refugees who also have general education and health needs (Alam and Imran 2015; Lyons and Kass-Hanna 2019; O'Mara and Harris 2016; UNESCO 2018).

# Conclusions

The current policy brief has aimed to address the digital skills divide affecting vulnerable populations, and its potential impact on the future of work. Despite the efforts to bridge the digital divide, major challenges remain across several dimensions such as connectivity deployment, promoting digital skills acquisition in formal education and non-formal education settings, and linking skills training to the labor market. Unless policies specifically address the digital divide affecting vulnerable populations, there is a high risk of increasing inequities and unemployment in the years to come, with relevant implications for societies at large. All stakeholders including governments, the private sector, academia and civil society, need to revisit strategic frameworks for digital inclusion to assess barriers that may still be creating digital exclusion for disadvantaged and vulnerable groups, especially as it pertains to barriers to digital knowledge, skills training, and potential employability. The G20 is the international organizing body that is best positioned to combine these efforts into a cohesive and integrated strategy for improving digital skills for citizens worldwide, and especially for those groups most vulnerable to the digital transformation.



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# About the Authors

**Romina Bandura**

Romina Bandura is a senior fellow with the Project on Prosperity and Development and the Project on United States Leadership in Development at the Center for Strategic and International Studies. Her current research focuses on the future of work in developing countries and the economic engagement of the United States in the developing world. She has conducted extensive research on enhancing the reach and impact of the multilateral development bank system. She holds an MPA in International Development from Harvard University's Kennedy School of Government and a BA in Economics from the Universidad Católica Argentina, Buenos Aires.

**Alejandra Cardini**

Alejandra Cardini is Director of the Education Programme at the Centre for the Implementation of Public Policies for Equity and Growth (CIPPEC) in Argentina. She also lectures on educational policy at the University of San Andrés and at the School of Politics and Government of Austral University. She worked for many years as a researcher and as ministerial advisor for Argentina's National Ministry of Education. She is a sociologist and holds a PhD in Education from the University of San Andrés and an MA in Educational Policies from the Institute of Education, United Kingdom.



**Dante C. Castillo**

Dante C. Castillo is Director of the innovation area at SUMMA and a PhD researcher at the Education Program of the Universidades Diego Portales and Alberto Hurtado, Chile. He has worked in social research at the Centre for Policy Analysis in the Universidad de Chile in the areas of education, labor, and citizenship; and as a research project officer at the admissions office in the University of Cambridge, United Kingdom, to investigate the use of contextual data in admission processes to higher education. He holds a degree in sociology from Universidad de Chile and a MSc in Culture and Society from the London School of Economics. His areas of interest are educational innovation and processes of circulation of scientific knowledge in education.

**Cristóbal Cobo**

Cristóbal Cobo Romaní is Director of the Center for Research, Ceibal Foundation, Uruguay, and associate researcher at the Oxford Internet Institute, University of Oxford, United Kingdom. He has served as an external evaluator for the Inter-American Development Bank, the National Science Foundation and MIT Press, and the International Development Research Centre, Canada. He was Professor and Director of Communication and New Technologies at the Latin American Faculty of Social Sciences, Mexico. He holds a PhD and MA in Communication Sciences from Universitat Autònoma de Barcelona, Spain.

**Claudia Costin**

Claudia Costin is Director of the Center for Excellence and Innovation of Education Policies, Getulio Vargas Foundation. She is a visiting professor at the Harvard Graduate School of Education and a member of the Global Commission for the Future of Work at the International Labor Organization. She was in the recent past Senior Director for Global Education at the World Bank, Secretary of Education of Rio de Janeiro and Federal Minister for Public Administration and State Reform. She has a master's degree in Economics and a PhD in Administration from the School of Business Administration of São Paulo at Getulio Vargas Foundation.

**Javier D. González**

Javier D. González is Director of SUMMA, Affiliated Lecturer at the University of Cambridge, and Advisory Board Member of UNESCO's Global Education Monitoring Report. He has been a senior consultant to UNESCO, the World Bank, and the Inter-American Development Bank; Cabinet Advisor on education and innovation policies at the Ministry of Finance of Chile; Executive Secretary of the Chilean Ministers Council for Advanced Human Capital Formation; Director of Research at CONICYT; and Researcher at the Ministry of Education. He holds a BA and MA in Economics (Universidad Católica de Chile), and a MPhil and PhD in Development Studies (University of Cambridge).

**Paul Grainger**



Paul is Co-director of the Centre for Education and Work, and Head of Innovation and Enterprise for the Department of Education, Practice and Society, at University College London. Previously, he was a lecturer and then Inspector for TVET, before becoming Principal of a Further Education College in Liverpool. His research concerns qualifications reform, the leadership of local skills systems, the complexities of regional training, skills and employment patterns, and how these influence regional economic prosperity, including the potential impact of the fourth industrial revolution on the future of work. Originally a historian, he has an MPhil in Medieval Rhetoric.

**Jennifer Guevara**

Jennifer Guevara is a postdoctoral fellow at the Early Childhood Research Centre at Dublin City University in Ireland, and Associate Researcher with the Education Programme at the Centre for the Implementation of Public Policies for Equity and Growth in Argentina. She works and publishes on questions related to early childhood education and care policies, systems, and workforce in Latin America. She holds a PhD in Education from Universidad de San Andrés, Argentina. She has been a doctoral and postdoctoral fellow of the National Scientific and Technical Research Council for Argentina and has recently been awarded a prestigious Rising Talent Fellowship by Dublin City University.

**Bihong Huang**

Bihong Huang is a Research Economist at the Asian Development Bank Institute (ADBI) in Tokyo. Her research interests include economic development, climate change and the environment, and inclusive and sustainable finance. She has led many research-based policy development projects at ADBI. Her work has focused on topics including East Asian economic integration; fintech and financial inclusion; finance and innovation; globalization and economic stability; globalization, climate change, and the environment; income inequality; and the middle-income trap. She has published three books and more than 20 papers in leading academic journals. She holds a PhD in economics from Nanyang Technological University in Singapore.

**David Istance**

David Istance is a Non-resident Senior Fellow at the Brookings Institution in Washington, DC; Visiting Professor at Strathclyde University, Scotland; and former Senior Analyst at the Organisation for Economic Co-operation and Development's (OECD) Centre for Educational Research and Innovation. His recent work has been primarily on innovation, education, and learning. Currently, he is engaged in a substantial study on learning innovation with the Brookings Institution. He retired from the OECD in 2017, where in the past 2 decades he led the projects Schooling for Tomorrow, Innovative Learning Environments, and Innovative Pedagogies for Powerful Learning. He has written numerous reports, chapters, and articles.



**Josephine Kass-Hanna**

Josephine Kass-Hanna is an Assistant Professor at the Faculty of Business Administration and Management at the Saint Joseph University of Beirut, Lebanon. Her research revolves around financial inclusion, financial and digital literacy, inequality, and the economic security of vulnerable populations. Prior to joining academia, she worked for 7 years as an auditor and consultant for small and medium-sized enterprises. She holds a PhD in Economics from the University of Perpignan, France.

**Nobuko Kayashima**

Nobuko Kayashima is Vice President of the Japan International Cooperation Agency (JICA) as well as Principal Research Fellow of JICA Research Institute. She joined JICA after graduating from Kyoto University in 1982 and plays a key role in the planning and operation of JICA's education cooperation programs. Prior to her current assignment, she served as Director/Deputy Director of JICA-RI, Senior Advisor for Education, Director General of the Human Development Department, and Chief Representative of JICA Bangladesh Office. She received her PhD in International Development from Nagoya University. Her current research interests include education cooperation, the internationalization of higher education, and university participation in official development assistance.

**Susan Kippels**

Susan Kippels is a Research Fellow at the Sheikh Saud bin Saqr Al Qasimi Foundation for Policy Research. She previously carried out research on nonformal education strategies as well as early learning in emergency contexts for UNICEF. Her current research interests at the Al Qasimi Foundation include philanthropy and education, gender in education in the Gulf, and migrant teachers. She holds a dual bachelor's degree in Economics and Arabic from the University of Notre Dame as well as a master's degree in International Education Policy from the Harvard Graduate School of Education.

**Angela Lyons**

Angela Lyons is an Associate Professor and the Director for the Center for Economic and Financial Education at the University of Illinois at Urbana-Champaign, United States. She is widely recognized as an international expert in household and behavioral economics, focusing on economic and financial inclusion, financial and digital literacy, poverty and wealth inequality, and the financial security of vulnerable populations. She has assisted over 40 countries in designing practical and sustainable models to improve the financial stability of communities worldwide. She holds a PhD in Economics from the University of Texas at Austin.

**Anthony Mackay**

Anthony Mackay is CEO and President of the National Center on Education and the Economy, based in Washington, DC, and formerly CEO of the Centre for Strategic Education in Australia. Anthony is Chair of the Australian Council for Educational Research; Deputy Chancellor of Swinburne University, Melbourne; Board Chair of the Song Room; Board Director of High Resolves; and a Senior Fellow at the Graduate School of Education, University of Melbourne. Anthony is an expert consultant to the OECD and UNESCO and Co-Chair, Global Education Leaders Partnership, among other positions, and is a past President of the International Congress for School Effectiveness and Improvement.



**Peter J. Morgan**

Peter J. Morgan is Senior Consulting Economist and Vice Chair for Research at the Asian Development Bank Institute (ADBI). Prior to joining ADBI in 2008, he had 23 years' experience in the financial sector in Asia, most recently serving as Chief Asia Economist for HSBC, responsible for macroeconomic analysis and forecasting for Asia. Before that, he served in Tokyo as Chief Japan Economist for HSBC, and earlier held similar positions at Merrill Lynch, Barclays de Zoete Wedd, and Jardine Fleming. He earned his MA and PhD degrees in Economics from Yale University. His research interests are in macroeconomic policy, financial sector development and regulation, financial inclusion, financial literacy, and financial education.

**Hiromichi Morishita**

Hiromichi Morishita is group director for basic education at the Japan International Cooperation Agency (JICA). After graduating from Keio University in 1994, he worked at Japan's Ministry of Education, Science, Sport and Culture before joining JICA in 2001. His expertise covers educational development in developing countries with emphasis on education administration and finance. He is also involved in development in Africa, serving as deputy director general of the Africa department and chief representative of JICA Burkina Faso. He holds an MS in International Project Management from Ecole Supérieure de Commerce de Paris, France.

**Lynette Okengo**

Lynette Okengo is an early childhood expert and the founding Director of the Africa Early Childhood Network (AfECN). Her professional experience spans policy and strategy development, program design, implementation support, research, and evaluation. A major focus of her work is high-level advocacy for increased prioritization and engagement of all key stakeholders, especially governments, in the holistic development of young children. Prior to her work with AfECN, she taught at the university level and served as a Senior Technical Advisor for various international organizations. She has authored and presented on young children's issues internationally and across Africa.

**Cyn-Young Park**

Cyn-Young Park is Director of the Regional Cooperation and Integration Division in the Economics Research and Regional Cooperation Department of the Asian Development Bank (ADB). In her current capacity, she manages a team of economists to examine policy issues and develop strategies and approaches related to regional cooperation and integration. During her career, she has been a main author and contributor to ADB's major publications, including *Asian Development Outlook* (ADB's flagship publication), *Asia Capital Markets Monitor, Asia Economic Monitor, Asia Bond Monitor, and ADB Country Diagnostic Study Series.* She has also participated in various global and regional forums, including the G20 Development Working Group, Association of Southeast Asian Nations (ASEAN), ASEAN+3, Asia-Pacific Economic Cooperation, and Asia-Europe Meeting. She has written and lectured extensively about the Asian economy and financial markets.

**Natasha Ridge**

Natasha Ridge is Executive Director of the Sheikh Saud bin Saqr Al Qasimi Foundation for Policy Research. Prior to this, she was the Acting Director of Research at the Dubai School of Government. She has a number of publications, including *Education and the Reverse Gender Divide in the Gulf States: Embracing the Global, Ignoring the Local*. She holds a Doctor of Education in International Education Policy from Columbia University and a master's in International and Community Development from Deakin University. She is a founding board member and former president of the Gulf Comparative Education Society.

**Rita Flórez Romero**

Rita Flórez-Romero is Professor in the Department of Human Communication of the Faculty of Medicine at the National University of Colombia. She directs the Cognition and Language in Childhood research group and coordinates the Communication and Early Education research line of the master's degree in education at the Institute of Research in Education of the Faculty of Human Sciences. The purpose of many of her investigations has been to offer recommendations to public policy at both the district (Bogotá DC) and national (Colombia) levels. For more than 20 years, she has cooperated with teachers and educational agents of all educational levels.

**Shimpei Taguchi**

Shimpei Taguchi is currently on sabbatical leave from the Japan International Cooperation Agency (JICA) and studies as a PhD student at the Graduate School of Economics at Keio University, Japan. During his time at JICA, he mainly worked in the education sector and was engaged in the formulation of various educational development projects and research projects. His areas of expertise include project formulation and evaluation, teacher training, and math and science education. He holds an MA in International Educational Administration and Policy Analysis from the Stanford Graduate School of Education.

**Shinichiro Tanaka**



Shinichiro Tanaka is a Senior Education Advisor to the Japan International Cooperation Agency (JICA). Prior to joining JICA, he worked at PADECO, a consulting firm based in Tokyo, and the World Bank. His expertise includes education administration and finance, school development, and community governance, and he has provided consultancy/advisories to schools, offices, ministries of education, and private firms in over 30 developing countries. Tanaka holds an MA in Education with distinction from the Institute of Education, University of London.

**Long Q. Trinh**

Long Q. Trinh is a project consultant at the Asian Development Bank Institute (ADBI), Tokyo. His current research interests include financial inclusion, financial development, small and medium-sized enterprise development, international trade, structural change, and economic growth. Before joining ADBI in July 2015, he worked as an economist at the Central Institute for Economic Management, Viet Nam's leading think tank, for more than 10 years. He received his PhD from the National Graduate Institute for Policy Studies in Tokyo.

**Mathias Urban**

Mathias Urban is Desmond Chair of Early Childhood Education, and Director of the Early Childhood Research Centre at Dublin City University, Ireland. He works and publishes widely on questions of diversity and equality, social justice, evaluation, and professionalism in working with young children, families, and communities in diverse sociocultural contexts. Before joining Dublin City University, he held the position of Froebel Professor of Early Childhood Studies at the University of Roehampton, London. He is Chair of Diversity in Early Childhood Education and Training and was President of the International Froebel Society during 2016–2018. He holds a PhD from Goethe University, Germany.

**Rebecca Winthrop**

Rebecca Winthrop is a Senior Fellow and Director of the Center for Universal Education at the Brookings Institution, where she works to promote quality and relevant education and advises governments, international institutions, foundations, and corporations on global education issues. Prior to joining Brookings in 2009, she served as head of education for the International Rescue Committee and was responsible for the organization's education work in over 20 conflict-affected countries. She has authored numerous articles, reports, and books, including most recently *Leapfrogging Inequality: Remaking Education to Help Young People Thrive*. She received her PhD and MA from Columbia University and a BA from Swarthmore College.

**Joannes Paulus Yimbesalu**

Joannes is a global education expert and activist with 8 years of experience working to ensure that every boy or girl in school gets 12 years of free quality education. He is currently pursuing his PhD in Health Economics and Policy with research emphasis on Early Childhood Development at Lancaster University, United Kingdom. He is a trained scientist and has lived and worked in Cameroon, the United States, Canada, and Niger working on youth-related health and developmental programs. Currently, he leads a new United Nations global partnership initiative called Generation Unlimited in Nigeria aimed at preparing young people to become productive and engaged citizens.

**Kazuhiro Yoshida**

Kazuhiro Yoshida is Professor and Director at the Center for the Study of International Cooperation in Education, Hiroshima University, Japan. His main research interest is in the education aid effectiveness and education reform in developing countries. He is currently co-chair and an Asia-Pacific regional member of the SDG-Education 2030 Steering Committee. He has extensive experience on education issues in developing countries as a researcher and practitioner, including at the Japan Bank for International Cooperation (now JICA) as director of the social development division and as a human resources economist at the World Bank. He holds a MPhil in Development Studies from the University of Sussex, United Kingdom.

**Alessia Zucchetti**

Alessia Zucchetti is the Research Coordinator of the Ceibal Foundation and the Coordinator of the Ethics Committee for the use of data in education, Uruguay. Her field of expertise is focused in ICT governance and Internet-related policies. She has served at the Directorate General Connect of the European Commission (Brussels, Belgium) within the Principal Adviser Office and the unit in ICT Innovation, as well as a Specialist in EU policies at the Europe Direct Center of Forlì in Italy. She holds a master's degree in Mass Media and Politics from the University of Bologna, Italy, and a BA in International Relations from Universidad de la República, Uruguay.

## Realizing Education for All in the Digital Age

Education is a key driver for sustainable and inclusive development. However, education now faces two broad challenges: to extend the availability of high-quality education to all in line with the Sustainable Development Goals and to equip people to deal with the rapid technological changes in the Digital Age that are affecting the demand for skills, the nature of work, and the global allocation of employment.

Under Japan's presidency of the Group of Twenty (G20), in order to guide G20 policy discussions, the Think20 (T20) has addressed a broad range of education issues under the direction of two of its task forces: *"2030 Agenda for Sustainable Development (Task Force 1)"* and *"The Future of Work and Education for the Digital Age (Task Force 7)."*

The education issues addressed by the two task forces are closely related. Accordingly, this book collects nine Policy Briefs drawn from the work of these two task forces. These Policy Briefs provide insightful recommendations and will help guide discussions among G20 countries and their partners to inspire global and national action.

### About the Asian Development Bank Institute

ADB Institute, located in Tokyo, is the think tank of the Asian Development Bank, an international financial institution. ADBI aims to be an innovative center of excellence for the creation of rigorous, evidence-based knowledge that can be implemented as new actionable policies by developing and emerging economies, so as to contribute to achieving a prosperous, inclusive, resilient, and sustainable Asia and the Pacific. It also contributes to ADB's overall mission and operational priorities in line with ADB's Strategy 2030. This vision will lead ADBI to continue to be a globally recognized think tank.

### About the Japan International Cooperation Agency Research Institute

The Japan International Cooperation Agency (JICA) Research Institute (JICA-RI) conducts policy-oriented, academically solid studies that address the important issues faced by developing countries. JICA-RI was established in October 2008 as the research arm of JICA, an organization that is responsible for Japan's bilateral development cooperation. JICA-RI hopes to develop research networks worldwide and create opportunities for dialogue between researchers and practitioners so that ground-breaking research can be conducted and its findings delivered to the international community.