Education in the Asia-Pacific Region:
Issues, Concerns and Prospects 58

Sungsup Ra
Shanti Jagannathan
Rupert Maclean *Editors*

Powering a Learning Society During an Age of Disruption

Foreword by Nobel Laureate Joseph Stiglitz

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Series Editors' Introduction

This edited volume by Sungsup Ra, Shanti Jagannathan, and Rupert Maclean, *Powering a Learning Society During an Age of Disruption*, is the latest book to be published in the long-standing Springer Book Series "Education in the Asia-Pacific Region: Issues, Concerns and Prospects." The first volume in this Springer series was published in 2002, with this book by Sungsup Ra et al. being the 58th volume to be published to date.

Powering a Learning Society During an Age of Disruption critically discusses the roles and benefits of encouraging and actively promoting effective lifelong learning societies during a time of all-pervasive change. This change is occurring within individual countries, at the regional level, and worldwide.

With digitalization, increasing life expectancy, and the impact of the coronavirus disease (COVID-19) pandemic, creating a learning society to promote active lifelong learning has become more important than ever.

The major areas of change examined, all of which have important implications for the patterns, content, and modalities of education and training, include (but are not limited to) the COVID-19 pandemic; the fourth industrial revolution and its implications; and technological change including the internet, artificial intelligence, and robotics. Each of these major changes is creating disruptions that throw into question the foundations and taken-for-granted assumptions upon which education and training are based.

In the view of many of the authors of the articles represented in this collection, each of whom is opinion leader in their respective areas of expertise, this may well require the "re-engineering of education and training" to adequately accommodate such fundamental change.

The 21 chapters that comprise this cutting-edge volume are divided into six main parts. After an introductory section that provides an overview of the contents of the book, and a conceptual framework for examining a learning society during an age of disruption, the volume moves on to examining learnability and the learning crisis, future-proofing postbasic education, communities as learning platforms, learning societies and Industry 4.0, and technological solutions to build a learning society.

In terms of the Springer Book Series in which this volume is published, the various topics dealt with in the series are wide-ranging and varied in coverage,

with an emphasis on cutting-edge developments, best practices, and education and/or training innovations for development. Topics examined in the series include environmental education and education for sustainable development; the interaction between technology and education; the reform of primary, secondary, and teacher education; innovative approaches to education assessment; alternative education; most effective ways to achieve quality and highly relevant education for all; active ageing through active learning; case studies of education and schooling systems in various countries in the region; cross country and cross-cultural studies of education and schooling; and the sociology of teachers as an occupational group, to mention just a few. More information about this book series is available at http://www.springer.com/series/5888.

All volumes in this series aim to meet the interests and priorities of a diverse education audience including researchers, policy makers, and practitioners, tertiary students, teachers at all levels within education and training systems, and members of the public who are interested in better understanding cutting-edge developments in education, schooling, and training in Asia and the Pacific.

The reason why this book series has been devoted exclusively to examining aspects of education and schooling in Asia and the Pacific is that this is a particularly challenging region renowned for its size, diversity, and complexity, whether it be geographical, socioeconomic, cultural, political, or developmental. Education and schooling in countries throughout the region impact every aspect of people's lives, including employment, labor force considerations, education and training, cultural orientation, and attitudes and values. Asia and the Pacific is home to some 63% of the world's population of 7.7 billion. Countries with the largest populations (the People's Republic of China, 1.439 billion; India, 1.380 billion) and the most rapidly growing megacities are to be found in the region, as are countries with relatively small populations (Bhutan, 772,000; Niue, 1,700).

Levels of economic and sociopolitical development vary widely, with some of the richest countries and some of the poorest countries on earth. Asia contains the largest number of poor of any region in the world, the incidence of those living below the poverty line remaining as high as 40% in some countries in Asia. At the same time, many countries in Asia are experiencing a period of great economic growth and social development. However, inclusive growth remains elusive, as does growth that is sustainable and does not destroy the quality of the environment. The growing prominence of Asian economies and corporations, together with globalization and technological innovation, are leading to long-term changes in trade, business, and labor markets, to the sociology of populations within and between countries. There is a rebalancing of power, centered on Asia and the Pacific, with the Asian Development Bank declaring that the 21st century will be "the century of Asia and the Pacific."

We believe this book series makes a useful contribution to knowledge and expertise sharing about education, schooling, and training in Asia and the Pacific. Readers of this or other volumes in the series who have an idea for writing their own book or editing a book on any aspect of education and/or schooling that is relevant to the region are enthusiastically encouraged to approach the series editors either directly or through Springer to publish their own volume in the series, since we are always

willing to assist prospective authors in shaping their manuscripts in ways that would make them suitable for publication in this series.

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Foreword

This book, *Powering a Learning Society During an Age of Disruption*, represents a major step forward in the reorientation of development thinking—a process that began a quarter century ago. This new approach recognizes that development is about more than closing the gap in resources that separate developed and developing countries, but closing the gap in knowledge as well; and, more than that, the ability to learn and respond to the inevitable shocks and disruptions that confront the economy and society. The last 2 decades are telling, with the 11 September 2001 terrorist attacks on the United States and the global war on terrorism that they unleashed; the 2008 global financial crisis; the attacks on the international rule of law and protectionist policies that imposed uncertainties on globalization; and finally, the coronavirus disease or COVID-19 pandemic.

The doctrines of development that have prevailed until recently were based largely on a static view of the world that reflected a curious cognitive dissonance, since development is about change. What my colleague Bruce Greenwald and I emphasized in our 2014 book, *Creating a Learning Society*, was that this view was not only incomplete, it could provide very bad guidance for policy.[1] What was seemingly efficient in a static world with no change was dynamically inefficient. Many of the policies that had become standard fare under the Washington Consensus and neoliberalism were counterproductive in the long run because they impaired the ability of economies to learn, and even more importantly, to learn how to learn.

There has, of course, been a long tradition in economics, though one somewhat out of the mainstream, which emphasizes the importance of infant industries, and the role government may need to play in nurturing them. But our work took this one step further, reflected in the title of our early paper, "Helping Infant Economies Grow: Foundations of Trade Policies for Developing Countries."[2] Trade policy is but one instrument among many in creating the learning society that is at the foundation

[1] *Creating a Learning Society: A New Approach to Growth, Development, and Social Progress*, New York: Columbia University Press, 2014. Reader's Edition published 2015.

[2] Helping infant economies grow: Foundations of trade policies for developing countries. *American Economic Review: AEA Papers and Proceedings* 96 (2): 141–146, May 2006.

of development. Every aspect of economic policy needs to be scrutinized from the perspective of how it affects societal learning.

Every aspect of society needs to be viewed through the learning lens, too—not only the learning of individuals (though that is crucial), but organizational and institutional learning as well. Such learning enables organizations and the individuals within them to adapt to the ever-changing global environment. And there is much to learn from those organizations and governments that have tried to create learning cultures: for instance, the experiences of organizations and governments in the European Union trying to create a culture of learning in the workplace, and attempts to build learning communities and learning cities in Asia, which are described in this volume.

While every aspect of economic policy touches on learning, some do so more than others, and in some areas, viewing policy through the learning lens entails profound changes. This is especially the case for trade, investment, and industrial policy, partly because it is in these arenas that the neoliberal Washington Consensus policies seemed most out of sync with creating a learning society. The only way one could "learn" how to be a modern industrial society is through learning by doing—one could not read a textbook and follow the prescriptions provided there; one had to experience it. This provided a justification for limiting imports and providing subsidies and other forms of support, to begin at least a nascent industrial sector. Learning and institutional externalities benefit the whole economy. The entire economy, for instance, gains from the development of the financial and educational sectors that are necessary for a well-functioning industrial sector. The simplistic economic model underlying neoliberalism and the Washington Consensus not only ignored learning and knowledge, but also the pervasive externalities (not just environmental, but also macroeconomic and learning) that are central to a modern interdependent economy. These externalities provide part of the rationale for government involvement in the economy: collective action is necessary for efficient outcomes and a successful developmental transition, let alone for equitable outcomes. What is at stake is more than adaptation, but learning how to promote economic and societal change that enhances societal well-being.

While every aspect of economic policy needs to be seen through the lens of learning, perhaps nowhere is this more important than in education, as this book demonstrates, not just for formal and informal education, but in technical and vocational education and training as well. We see this in the experiences described in this book of continued basic education in an Indian village and postgraduate online courses that aim to upskill workers who lost jobs during the pandemic. Curiously, our learning institutions are seemingly among the hardest to reform. Entrenched interests are no less important in this part of the economy than in others. With no ensured path to success, it is easy to garner support for resistance to change. And yet, at no time has the imperative and opportunity of thinking through a redesign of the educational system, broadly understood, been more important than today. For more than a quarter century we have paid lip service to "lifelong learning," but with the fast pace of change and the ever-present disruptions, lifelong learning has become a necessity, not a luxury. Formal education systems need to focus on learning to learn to enable this lifetime learning.

Advances in technology have enhanced the capacities of societies to support lifelong learning, but no society has fully availed itself of these new opportunities. For developing countries, this is especially important. They now have, in effect, libraries at their disposal that are beyond the best that were available in the advanced countries a few decades ago. The challenge is how to employ this wealth of knowledge. Likewise, students in these countries can get access to the best teachers around the world. If we manage this process of learning to learn, there could be a revolution in learning and the potential for unleashing one of the most important positive aspects of globalization: the globalization of knowledge.

Lifelong learning has become more important for a number of reasons. The pace of change has increased, including that induced by the marked disruptions as I noted earlier. Several chapters in this volume talk about an innovative workplace as the "new normal." There are many forces that have led to organizational flux, with increased movements of individuals across organizations within society. While there are many benefits to increased labor market mobility and flexibility, they come with a cost—a decreased incentive of firms to provide training to their employees, putting more burden on individuals and society more broadly. And finally, increased longevity means that during an individual's working life it is likely that there will be marked changes in responsibilities and opportunities.

Fifty years ago, Asia showed the world that development was possible: the East Asia miracle transformed the lives of hundreds of millions of people and has almost eradicated poverty from a part of the world in which it seemed endemic. The potential for export-led manufacturing economies that were the basis of that miracle is diminishing, as manufacturing becomes a smaller and smaller share of global gross domestic product and employment.[3] There will have to be a structural transformation to a knowledge-based, services sector, green economy. This will not be a short-run disruption like COVID-19, but a longer-term one, one that the region will have to deal with over the coming decades. It will be important for the Asian Development Bank to provide resources and guidance to navigate this transition. And nothing could be more important in doing so than to help the countries in the region create dynamic learning societies.

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[3] J. E. Stiglitz, From manufacturing-led export growth to a twenty-first-century inclusive growth strategy: Explaining the demise of a successful growth model and what to do about it. WIDER Working Paper 2018/176. Helsinki: UNU-WIDER, accessible at https://www.wider.unu.edu/publication/manufacturing-led-export-growth-twenty-first-century-inclusive-growth-strategy.

Preface

We are undergoing an age of disruption prompted by the fourth industrial revolution that brings together increased automation, robotics, and artificial intelligence, but also by accelerating climate change and recently, by a global health disruptor, the coronavirus disease (COVID-19) pandemic. The onus of dealing with these unprecedented disruptions, and growing uncertainties lie with current and future generations of students, learners, and workers. Addressing these challenges can be encapsulated into one action: developing a learning society, where people learn *how* to learn, not just *what* to learn, to cope with disruptions and turn them into opportunities.

This volume, *Powering a Learning Society During an Age of Disruption*, brings together think pieces on the role and functioning of a learning society from policy makers, academia, industry experts, representatives of nongovernment organizations, professional organizations in education and training, and international development organizations. Intended for a global audience, this volume showcases the experiences of select member economies of the Asian Development Bank (ADB), such as India, Indonesia, and the Republic of Korea, as well as the policies and directions of regions outside Asia and the Pacific, such as the European Union.

The contributors have identified the stakes and the strategies to build a learning society out of learning cities, learning communities, and learning regions. This is demonstrated in Singapore where university curricula were retooled, not only to accommodate graduates for higher education courses but to future-proof its current crop of students; in the Philippines, where a nongovernment organization is supporting the education department by training teachers; and in the European Union, where the new European Skills Agenda identifies skills as fundamental for sustainable competitiveness, social fairness, and resilience.

Formal learning institutions like schools and universities should not be the lone frontier in building an ecosystem of skills and competencies. Enterprises, local and regional authorities, research institutions, apprenticeships, and most importantly, local communities starting from the family, need to contribute to create and support this web of societal learning.

From "work–life balance," the world now finds itself having to grapple with the "work–learn" balance. What will learning institutions and workplaces do when schools and society get back to the "new normal" post-COVID-19? Countries can

be effective in "building back better," and in responding to future disruptors only if the foundations of citizens' ability to learn are strong.

This book is the work of many minds over many months. The research team was jointly led by Sungsup Ra, Director of the Human and Social Development Division, South Asia Department concurrently Chair of Education Sector Group of ADB; Shanti Jagannathan, Principal Education Specialist, Education Sector Group, Sustainable Development and Climate Change Department, ADB; and Rupert Maclean, Adjunct Professor in the School of Education at RMIT University, Melbourne, Australia, and Adjunct Professor of International Education at the University of Tasmania, Tasmania, Australia. Thought leaders from different spheres and organizations have addressed contemporary issues and prospects for a learning society and we are deeply grateful to each one of them for their contributions. They bring great insights from a variety of settings and offer inspiration on how a future learning society could be from their own work and sphere of influence. Alfredo P. Garcia, Senior Operations Assistant, ADB, rendered invaluable support and coordinated the production and publication of the volume. ADB Consultants Cherry Lynn Zafaralla edited the volume and Joe Mark Ganaban performed graphics layout—both were instrumental in the quality delivery of this publication. Unika Shrestha, Social Sector Economist, ADB provided valuable inputs on academic references.

If there is one thing COVID-19 has proven, it is the interconnectedness of different actors of society, the underlying resilience to disruption, the ability to transform challenge into opportunity, and agility to respond to crises adaptively. This is a pivotal moment to revolutionize the role and function of a learning society embedding them across all organizations including ADB. It is my hope that this volume contributes to further advance the discourse on the topic and triggers concrete actions to reimagine education and learning post-COVID-19.

Kenichi Yokoyama
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Part I
Introduction

Chapter 1
Overview



Sungsup Ra, Shanti Jagannathan, and Rupert Maclean

Abbreviations

ADB	Asian Development Bank
COVID-19	coronavirus disease
UIL	UNESCO Institute for Lifelong Learning

1.1 Introduction

The concept of *learning society* has been in circulation, in one form or another, for decades, supported by a wide range of stakeholders, including the international community. A learning society adopts a life cycle approach to knowledge. The learning society philosophy considers learning as a continuum that takes place well beyond the early stages of school, secondary, and postsecondary education, and in formal and informal settings outside institutions. Learning can thus take place

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anytime and anywhere through many channels of the economy and society. Yet, new dimensions keep emerging, and there is an active discourse on how to engage and empower key partners to promote a *culture of learning* that supports and motivates individuals and organizations to learn on a community-wide and society-wide basis.

Joseph Stiglitz and Bruce Greenwald have argued that creating a learning society should be one of the major objectives of economic policy (Stiglitz and Greenwald 2014). If a learning society is created, a more productive economy will emerge and standards of living will increase. They explore the concept of going beyond learning by doing to learning to learn by learning and the transformation from a learning economy to creating a learning society.

There are two domains for learning: *learning for life* (mainly referring to learning in support of people becoming well-functioning, effective members of a family and wider communities); and *learning for work* (referring to skills development for employability). Both are important aspects of a learning society and involve a need for dynamic change over time as societies and economies adapt to and meet emerging challenges. For example, with regard to skills development for employability and learning for work, emerging labor markets of the future require re-imagining skills development and training (Ra et al. 2019).

Learning is a different concept from that of education (Field 2005). A key aspect is people's engagement in a wider social context, which is an important distinction between the two. Learning—the acquisition of knowledge, skills, attitudes, and values—is a natural everyday process that occurs throughout life (Faris 2005, p. 26). Learning covers activities for people of all ages (children, young people, adults, older people) in all life-wide contexts (workplaces and businesses, schools, families, and broader communities).

Education and human capital development, and advances in educational attainment, have been at the heart of the process of growth and socioeconomic development. Hanushek and Woessmann (2015) show that cross-country differences in long-run growth rates can be explained by differences in cognitive skills, as measured by standardized test scores in mathematics and science. In another study, Hanushek and Woessmann (2016) argued that the development status of countries in Latin America and Asia could be almost completely explained by differences in the test scores of schoolchildren. Further, this relationship between cognitive skills and economic growth is significantly greater among low-income countries than high-income ones.

The benefits of learning go far beyond increases in per capita gross domestic product. Learning is associated with a wide range of benefits—from better health to better governance. Learning helps people achieve their full potential as citizens, leaders, workers, and entrepreneurs.

1.2 Structure of the Book

This book is a compendium of articles from leading experts who discuss, from different vantage points, the importance of *powering a learning society during an age of disruption.* The publication seeks to capture important issues and trends, and to provide directions for how learning societies and lifelong learning can be best promoted.

The book identifies and analyzes trends and future directions with particular reference to selected examples from the Asia and Pacific region. The United Nations (UN) describes this region as exceedingly diverse, ranging from small island developing states to large global economies (UN 2019; UN Population Division 2019). The book spotlights examples from member countries of the Asian Development Bank (ADB).

The chapters take stock of major global trends and developments and how they provide a new impetus to re-imagining the role of learning societies. It also provides some case studies of the situation in specific countries. They examine and take into account unprecedented disruptions caused by the coronavirus disease (COVID-19) pandemic, and address key response mechanisms that would enable education systems to "build back better" and envision a "new normal" in education and training. The chapters outline new directions for learning societies resulting from experiences generated by COVID-19 and other major disrupters. While showcasing opportunities and potential gains, the chapters also capture significant barriers that must be overcome to achieve the vision of a new normal.

The book contains think pieces from experienced, leading academics and practitioners. It brings together a range of stakeholders—heads of professional organizations, private sector representatives, business leaders, leaders in civil society promoting education in society, university leaders, education companies, equity investors, leaders of large government-led skills initiatives and representatives of international development organizations—to weigh in on future directions for learning societies. These experts have contributed articles that can help chart possible paradigm shifts to increase returns from education and training in future learning societies. These articles are written as think pieces to stimulate change and development rather than as academic pieces.

The 21 chapters are organized into six parts. In Part I: Introduction, the first chapter provides an overview of key issues and sets the overall context for the subsequent chapters. It addresses the concerns, and prospects for education and training and the challenges faced by countries for effective policy and practice to foster learning societies. Chapter 2 discusses the conceptual framework for the approach adopted in this volume by elaborating on the meaning of "learning society", along with key issues and concerns in the current age of disruption, with particular reference to the COVID-19 health pandemic.

Approaches to developing learnability during an age of disruption, and issues concerning the learning crisis, are examined in Part II: Learnability and the Learning Crisis. The four chapters in this part examine possible ways of effectively addressing

the syndrome of the learning deficit with regard to basic and 21st century skills (Chapter 3); and the importance of adopting robust approaches to assessment for improving student learning, by reassessing various global approaches to student assessment, especially in light of the ongoing COVID-19 pandemic (Chapter 4). This is followed by Chapter 5, which provides an overview on disrupted and ruptured school-centered education systems, the so-called new normal in light of the pandemic, and the importance of lifelong learning and learning societies when seeking to achieve a utopian learning society. Chapter 6 makes an assessment of what works best as an effective approach to teacher quality and effectiveness, by providing a case study of achieving resilience and growth through the initiatives of a nonprofit organization, Teach for the Philippines, whose objective is to provide all Filipino children with access to inclusive, relevant, and excellent education.

Part III: Future-Proofing Postbasic Education explores how to strengthen and upgrade learning societies and lifelong learning to effectively develop specialist foundation skills in postbasic education. A case study is provided in Chapter 7 of a university's response in Singapore for future-proofing its graduates, and careers to achieve resilience and growth. Chapter 8, provides insights from the European Union concerning intensifying skills development for new-age economic development. Another case study is presented in Chapter 9 on how quality assurance for online learning, at scale, is being aimed for at the Institute of Cyber Education in Indonesia, which has contributed to increasing higher education participation rates. Meanwhile, the increasing reliance on technology that has fostered certification and accreditation innovations in technical and vocational education and training through increased online learning is examined in Chapter 10.

Part IV: Communities as Learning Platforms explores how communities can and do play an important role in promoting a learning society. Topics examined in this section are the convergence of education and city planning to promote playful learning landscapes, by merging architectural design and placemaking with the science of learning to address inequity in learning (Chapter 11); effective approaches to advancing learning cities through lifelong learning and the creation of a learning society (Chapter 12); lessons from India concerning the role of citizen reports and communities in improving children's learning in support of learning for all (Chapter 13); and roles of the public and private sectors in Singapore in developing a learning society that helps individuals acquire new skills and offers opportunities for upskilling and reskilling to support growing sectors of the economy (Chapter 14).

Strengthening and upgrading effective workplace learning is important as countries promote learning societies and lifelong learning, particularly in order to address emerging demands in light of the fourth industrial revolution or Industry 4.0. Part V: Learning Societies and Industry 4.0 examines how a learning society could meet the needs of Industry 4.0. Chapter 15 proposes new directions for apprenticeships to support and promote a learning society and lifelong learning. Chapter 16 discusses effective ways of facilitating data-driven workforce planning for productivity increases in support of learning societies, using the rail sector as an example. Chapter 17 explores the experience of the Skillman Network in

promoting workplace-based training in the European Union. Chapter 18 rounds up this part by propounding insights from the Republic of Korea on how to strike a suitable work and learning balance post-COVID-19.

Part VI: Technology Solutions to Build a Learning Society concludes the book by examining technology-based solutions to transform and support learning societies. The concept of a modern learning society as exemplified in Coursera's post-pandemic workforce recovery initiatives is presented in Chapter 19, wherein the need to promote reskilling to rebuild and support workforce recovery, in partnership with governments and workforce intermediaries across the globe, can provide access to no-cost digital upskilling to displaced workers. Chapter 20 emphasizes the important role of the private sector and technology for future-ready education and training, while Chapter 21 explains how data and digital technologies can benefit and help transform education systems.

1.3 Roles of a Learning Society

An effective learning society seeks to enhance and promote *learning for all*, contributing to individual and community development and social cohesion, lifelong learning, irrespective of age, gender, race, and socioeconomic or work status, through multiple modalities. Diverse actors need to play a part in promoting a learning society: public sector, private sector and nongovernment organizations, and local communities and interest groups, all of which provide genuine, effective opportunities for enhanced learning, creativity, and innovation.

Assuring quality and relevance in education, along with promoting lifelong learning opportunities for all, are key global education goals in the 2030 Sustainable Development Agenda (United Nations Educational, Scientific and Cultural Organization [UNESCO] 2015). In a learning society, individuals, as well as organizations and institutions, adopt a learning approach to respond to the emerging needs of societies and economies.

In times of rapid change, unpredictability, and disruptive technologies, there is an even stronger need to strengthen a true "learning society approach" that is adaptive and flexible. Technology is not only changing landscapes concerning the organization of economic activities and business operations; it is also influencing the very nature and style by which education and training are provided, particularly keeping in mind the learning style of the millennials (or the digital natives, as they are often referred to).

To be adaptive to the future, learning societies need to enable skills to navigate the dynamics of the fourth industrial revolution, the rise of online learning, the emergence of new technical domains, and the aging of societies that requires people to stay active in the workforce much longer than before. Recent challenges posed by COVID-19 have also revealed the importance of agility and multiple channels for providing education and training for learning continuity. As economies return to more regular operations after COVID-19 has been controlled, the expectation is that there

will be a "new normal" with transformative features that are resilient to possible future shocks. The role of parents, communities, civil service organizations, and local bodies has thus, once again, emerged as an important requirement in providing learning continuity.

1.3.1 Framework for "Learning to Learn"

A learning society ensures that learning can take place in all areas of the society and economy, with learning links supporting and reinforcing each other.

When people learn *how* to learn, not just *what* to learn, they are better able to identify their own learning needs and direct their own learning pathways. They become personally empowered. To adopt *learning to learn*, they need to be able to find and appraise information and to think critically to solve problems. Individuals possessing these learning competencies are the key building blocks of learning societies.

The school system is crucial to providing a firm and reliable foundation for learning to learn and in nurturing young people to develop learning competencies that can adapt to different circumstances and styles. Unfortunately however, many traditional school systems still do not currently teach and nurture "learning to learn" skills. This needs to be corrected since this foundation at the school level enables students to make progress as "learning individuals" through higher tiers of learning, and to become self-driven and independent learners. Some will progress to tertiary education, where they develop further skills; some will pursue vocational skills for specific occupations; and some will go on to research and teaching in other communities to help drive positive change in society. When people enter the workforce—whether this be the formal or informal sectors—the worksite offers another avenue for continued learning. Learning can and should take place in homes and in communities throughout life. A strong in-built culture of learning makes organizations "learning institutions" that continually adapt and improve.

Learnability, or learning to learn, is a critical feature of ensuring that learners in schools, training institutions, universities and the broader society become capable of keeping pace with change, adapting to emerging needs of the economy and society, and navigating their lives in the most productive manner.

Measuring and monitoring learning in different settings and systems that can effectively provide the materials and support to lifelong learning are key to the success of a learning society.

1.3.2 The Learning Society in an Age of Disruption

Because of the far-reaching impact of COVID-19 on countries in Asia and the Pacific, ADB has prepared a guidance note that reimagines education and training after

COVID-19 (ADB 2021). The guidance note presents an initial set of issues and suggestions to assist, in particular, ADB member countries in coping with COVID-19 disruptions, and shaping new pathways for education.

ADB is currently an alliance of 68 members, 49 from within Asia and the Pacific and 19 outside this region, comprising 5 billion (66%) of the world's population.[1] The large and diverse Asia and Pacific region is adapting to global economic changes, including changes associated with the fourth industrial revolution, and now COVID-19 (Charungkaittikul 2020).

There is no doubt that the long-term impact of COVID-19, on top of other disruptions, will be dramatic. Magnuson (2020) notes the future will be much more precarious if we do not focus on building systems for lifelong learning that safeguard quality and inclusiveness. There seems to be a hunger for international dialogue within and between communities about learning societies, learning cities, and learning communities, and their response to COVID-19. The UNESCO cities of Wyndham and Melton in Victoria, Australia, for example, in partnership with a number of other learning cities, held a successful online Global Learning Festival[2] in September 2020, to celebrate learning and to bring their citizens some joy and connection in these trying times during the COVID-19 health pandemic.

In an age of disruption, it is timely to revisit the characteristics of a learning society (see Box 1.1).

Box 1.1 What Is a Learning Society?

A learning society effectively mobilizes its resources in every sector to

- promote inclusive learning from basic to higher education,
- revitalize learning in families and communities,
- facilitate learning for and in the workplace,
- extend the use of modern learning technologies,
- enhance quality and excellence in learning, and
- foster a culture of learning throughout life.

In so doing, it will create and reinforce individual empowerment and social cohesion, economic and cultural prosperity, and sustainable development.

Source UNESCO Institute for Lifelong Learning. 2013. Key features of learning cities. http://uil.unesco.org/lifelong-learning/learning-cities/key-features-learning-cities. Accessed 3 February 2020.

Lifelong learning is embedded in the integration of learning and living. Field (2005) argues that people's social relationships play an important part in their capacity to learn. Lifelong learning is not just another phase of adult education. The move toward a learning society recognizes the interconnectedness of formal,

[1] For full details on developing member countries of ADB, see ADB. How we're organized. https://www.adb.org/who-we-are/organization.

[2] Global Learning Festival. 2020.www.globallearningfestival.com.

nonformal, and informal learning. As with the formal curriculum of schools, universities, technical and vocational education and training institutions, and community education agencies, there is a vital need to form effective partnerships with actors in the public, private, corporate business, and voluntary sectors in order to adapt and be responsive to change. Indeed, such partnerships that work toward common goals, especially on complex issues such as climate change, can have transformative educational and social outcomes (Rathzel and Uzzell 2009; Wheeler et al. 2018).

In line with *Education 2030: Incheon Declaration and Framework for Action* (UNESCO 2015), at the heart of a learning society are the principles of inclusion and equity, that is, equal access to all levels of education and learning opportunities for the vulnerable. This includes persons with disabilities, minorities, indigenous people, and children, youth, and adults in vulnerable situations. Indeed, learning should be inclusive, relevant, of high quality, and offer a variety of modalities (formal, nonformal, and informal), which together meet a wide range of learning needs. This includes pathways to vocational and higher education, quality assurance, the use of learning technologies, social and other forms of media, and the building and celebration of a learning culture.

1.4 Key Messages of the Book

As UNESCO UIL (2015) stresses, the measurement, evaluation, and planning of learning society approaches, whether this is at the neighborhood, designated community, city, or regional level is imperative.

Figure 1.1 illustrates, in summary diagrammatical form, the main features of learning societies, and the interrelationship between various dimensions in an age of disruption, as presented and discussed in this book. A learning society occurs within the overall context of political systems (formal educational institutions, informal and community training infrastructure); health systems (social determinants of health); governance systems (gender equality, ethnic equality, indigenous knowledge); digital systems (online and blended learning, social media, job placement platforms, digital media, democratizing digital learning with inclusive opportunities); and environmental sustainability (education for sustainable development and climate change, food security and well-being).

From an exploration of the key issues concerning economic, social, environmental, and health-related disruptors in a learning society, what are the key messages of this book?

Following are the important messages that emerge from the various chapters in this book:

(i) ***In an "age of major disruption", an effective learning society can help economies, societies, and individuals to successfully navigate transformational changes and build resilience and greater productivity.***

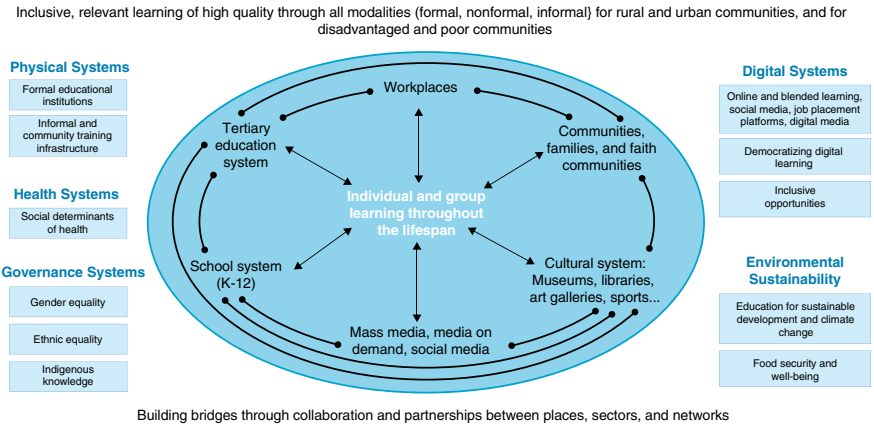


Fig. 1.1 A learning society in an age of disruption (*A learning society is one where inclusive, relevant learning of a high quality occurs through all modalities—formal, nonformal, and informal—for all communities, both rural and urban, including for disadvantaged and poor communities*). *Note* K-12 = kindergarten to grade 12, *Source* UNESCO Institute for Lifelong Learning. 2013. Key features of learning cities. http://uil.unesco.org/lifelong-learning/learning-cities/key-features-learning-cities. Accessed 3 February 2020

The disruptions may arise from various sources such as Industry 4.0 with its widespread technological changes; climate change and climate-related global events; and global health pandemics such as COVID-19. On the one hand, these disruptions can greatly impact education and training. On the other hand, a learning society can help to amplify the positive impact of disruptions and mitigate the negative impact.

(ii) ***There is a need to re-examine and reevaluate the structure, characteristics, content, and modalities of education and training.*** From kindergarten to grade 12, all the way to postsecondary levels, training and education can be made more agile, responsive, and inclusive in fundamental ways. Institutions need to renew their commitment to achieve a learning society for all, and to promote lifelong learning for all.

(iii) ***"Re-engineering education for change" is required.*** Rather than just tinkering with or making minor adjustments to existing systems of education and training, the re-engineering concept places education and educators at the leading edge of the development process whereby systems and processes need become more nimble and agile to serve changing societies and economies.

(iv) ***Constructing an effective learning society should be considered in the context of solving societal challenges.*** These challenges include environmental degradation, the need for greening of economies and societies, combating climate change, reducing major inequalities, and providing opportunities to all to acquire skills and quality jobs for decent living.

(v) ***Resources outside schools and educational institutions need to be harnessed for a sustainable learning society.*** COVID-19 has highlighted that a less rigid curriculum, and flexible teaching practices and assessment systems are crucial to move with the changing times. Learning opportunities in the home–neighborhood–community continuum need to be strengthened.

(vi) ***Education and training institutions need to collaborate and consult with other stakeholders for a successful learning society.*** These stakeholders include parents, employers, civic authorities, and other agencies. Pursuit of networks of excellence in education training uplifts the quality of human capital and also helps to build talent of the highest order in important sectors and themes.

(vii) ***Governments need to promote a culture of learning where continuous and lifelong learning are promoted.*** In the context of rapid changes and uncertainty of future markets and societies, it will be even more critical to promote learning how to learn. Learnability or "learning agility" to develop and build new skills will be a crucial attribute in a learning society.

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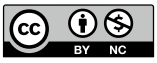
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Chapter 2
Conceptualizing the Meaning, Theory, and Practice of Learning Societies During an Age of Disruption



Rupert Maclean and Leone Wheeler

Abbreviations

ADB	Asian Development Bank
ALE	adult learning education
COVID-19	coronavirus disease
GDP	gross domestic product
GNLC	Global Network of Learning Cities
OECD	Organisation for Economic Co-operation and Development
SMEs	small and medium-sized enterprises
TVET	technical and vocational education and training
UIL	UNESCO Institute for Lifelong Learning
UNESCO	United Nations Educational, Scientific and Cultural Organization
WEF	World Economic Forum

2.1 Introduction

The concept "learning society" can be traced back to ancient Greece in the West, and to Confucius in the East (Longworth and Osborne 2010; Yiannouka 2020). There

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has been a modern re-emergence and renewed interest and focus on the learning society since the later part of the twentieth century, based on changing notions of learning, which go beyond the conventional distinction between the formal sectors of education and continuing education, to embrace lifelong learning and learning throughout life (Longworth and Osborne 2010).

Two key reports commissioned by the United Nations Educational, Scientific and Cultural Organization (UNESCO) have been important catalysts for renewed thinking on the meaning of learning society in modern times. The first is *Learning to Be: The World of Education Today and Tomorrow* (Faure et al. 1972). Known as the Faure Report, it proposed that lifelong education is a "master concept" at the heart of learning societies (Elfert 2015). The second report, *Learning: The Treasure Within* (Delors et al. 1996), commonly known as the Delors Report, highlighted the importance of learning throughout life through its "four pillars of learning."

Both reports continue to influence education scholars, policy makers, and practitioners to this day. For example, Robbie Guevara, who is President of the International Council of Adult Education, and a Board Member of the Global Campaign for Education representing Asia and the Pacific, applied a learning society framework to the coronavirus disease (COVID-19) pandemic (Guevara 2020). He reworked the Delors Report's four pillars of learning and added a fifth pillar, "learning to transform oneself and society" previously developed by UNESCO in 2015 as part of the Education for Sustainable Development (Samantekt 2015).

2.1.1 Learnability and Lifelong Learning

The enhanced Delors framework demonstrates the importance of learnability of the individual or *learning to learn*—the skills that can be applied to the collective (i.e., the workplace and education systems); the family; the community; the importance of civil society; and caring for our world. Previously, the Delors framework was applied by various researchers to employability, work, and skills in the twenty-first century while others have applied it to learning communities, learning cities, and learning societies (Maclean and Ordonez 2007, Faris 2008, Kearns 2015, Wheeler et al. 2013). The Delors framework speaks of the "next normal" instead of the "new normal" since going into the future, we will be in a constant state of change and adaptability.

Learnability is a critical feature of ensuring that learners in schools, training institutions, universities, and other settings become capable of keeping pace with change, adapting to emerging needs of the economy and society, and navigating their lives in a productive manner. Longevity is an important aspect of a learning society since people are living longer and remaining as productive members of the labor force much longer. There is therefore an increasing need for them to be effective participants in lifelong learning for a longer period, for them to be fully contributing members to a learning society.

This learnability can be applied to knowledge, skills, attitudes, and values required to cope with a health pandemic such as COVID-19. It could also be applied for other risks such as climate change.

There is a growing recognition of the importance of the concept of lifelong learning to support economic, social, environmental, and healthy futures for people and places. In this time of pandemic crisis, conflicts, and widening inequality gaps, international organizations such as the Asian Development Bank (ADB), International Labour Organization, Organisation for Economic Co-operation and Development (OECD), and UNESCO are placing an increasing emphasis on the importance of the concept of a learning society and lifelong learning. In the case of UNESCO, through its *Future of Education: Learning to Become* project, it is building on the ideas of key reports such as Faure et al. (1972) and Delors et al. (1996), and imagining a more just society, one where every person has the capacity to imagine a "good and fulfilling life" (UNESCO 2020). Indeed, a recent policy briefing on education in the time of COVID-19 by the Secretary-General of the United Nations (UN), António Guterres, makes it clear that it is imperative for national and international communities to come together to ensure that education is at the forefront of recovery agendas (UN 2020). It is vital to protect investment in education otherwise countries are likely to face a "generational catastrophe" that could undermine decades of progress, waste untold human potential, and worsen entrenched inequalities (UN 2020). While this UN policy briefing focuses on the formal education system, it is vital also to consider the learning society ecosystem that surrounds the individual learner.

2.1.2 Learning Cities, Learning Communities, and Learning Regions

The terms *learning cities*, *learning communities,* and *learning regions* are now commonly used and are models within a larger notion of a learning society (Longworth and Osborne 2010). Driven by formation of the UNESCO Global Network of Learning Cities (GNLC) in 2013, and the PASCAL International Observatory's Learning City Network, the Learning Cities movement has achieved great traction. There are now 230 member cities from 64 countries that are part of the GNLC,[1] including 72 cities from the broader Asia and Pacific region, the majority (50) being from the Republic of Korea; nine cities in the People's Republic of China; three each in Australia and Thailand; two each in Japan and Viet Nam; and one each in Indonesia, Malaysia, and the Philippines. Thailand is currently considering establishing "learning cities for a post-COVID-19 era" in 20 provinces (Omas 2020).

[1]See UIL. *Members of the UNESCO Global Network of Learning Cities.* https://uil.unesco.org/sites/default/files/doc/lifelong-learning/cities/list-of-members-unesco-gnlc-uil.pdf. The cities as of 2020 are listed at Pascal International Observatory. The UNESCO Global Network of Learning Cities welcomes 55 new member cities from 27 countries. http://pascalobservatory.org/pascalnow/pascal-activities/news/unesco-global-network-learning-cities-welcomes-55-new-member-cities.

While the learning cities development is important work, and partnerships and networks have been built that have proven to be particularly critical for international dialogue in this time of COVID-19, more remains to be done. As Kearns (2015) notes, this approach must be extended to rural areas in Africa, Asia, and elsewhere, including exploring the potential of the learning region concept in fostering innovative forms of partnership in rural and regional areas. Citizens in rural areas should have access to inclusive, high-quality learning opportunities that meet their future needs. The UNESCO Institute for Lifelong Learning (UIL) recognizes that the principles and values identified as key features of learning cities (UNESCO UIL 2015) are also applicable to those people living in rural and remote areas, in disadvantaged and poor neighborhoods and communities, as well as in small towns and villages under the umbrella of a learning society.

2.1.3 The Learning Society

In the past, place-based models founded on lifelong learning and the learning society have been harnessed to address a myriad of economic and social challenges, such as urbanization, demographic shifts, climate change, unemployment, migration, financial crises, threats to peace and security, and globalization. The Republic of Korea, Japan, and Singapore are examples of countries in the broader Asia and Pacific region that have applied the learning society approach to meet such challenges at the national level (Yang and Yorozu 2015).

In its 2020 meeting, the World Economic Forum (WEF 2020b) noted the massive economic and social realignment occurring due to globalization, and global risks such as climate change. The WEF also noted the economic and technological disruptions on work from rapidly changing information technology, as well as the effects of the fourth industrial revolution (Industry 4.0) and artificial intelligence (AI), which contribute to high unemployment and skills deficits. Societal trends such as involuntary migration, the ever-widening gap between rich and poor, and situations of conflict are continuing to impact the way people live, the way they learn, and how they are employed (Wood 2020).

The health emergency brought about by the COVID-19 pandemic has unleashed an unprecedented global crisis that is having a profound effect on societies and communities in multiple ways for which few are prepared (Magnuson 2020). Communities are living with disruption as a part of daily life and having to adapt quickly. The current health pandemic is a clear example of a disruption within a concentrated timeframe, is interconnected, and on a global scale, marked by the following short-term consequences:

(i) overstretched health systems,
(ii) weakened populations,
(iii) rising death rates,
(iv) rising unemployment rate,

(v) impact on school systems and a consequent rise in the number of young people not in education or training, and
(vi) businesses and small and medium-sized enterprises (SMEs) having to limit trading or close.

In addition, there is the disproportionate effect on the poor, who generally live in more densely populated areas where, because of overcrowding, it is more difficult for them to follow recommendations for self-isolation and social distancing. The virus is impacting densely populated urban areas much more than rural areas.

2.2 The Age of Disruption: Powering the Learning Society

There are a multitude of challenges facing communities, the future of work, the sustainability of communities, and ultimately the planet. The economy, rapidly changing technology, the environment, climate change, conflict and terrorism, and now a pandemic are all major disruptors (Harari 2015; OECD 2020a; World Bank 2020a; WEF 2020a). These interlocking crises in climate, ecological, economic, social (including health and geopolitical areas of conflict), have highlighted both the vulnerability and resilience of our societies to such shocks (GIM 2020). The disruption of the job market, growing social and economic inequality, climate change, and the pandemic loom large.

2.2.1 The Fourth Industrial Revolution or Industry 4.0

The OECD surmises that Industry 4.0 is the "next production revolution" and will be the convergence of many new technologies including human–machine integration (supported by system integration and the Internet of Things), autonomous machines (supported by AI and cloud computing), and additive manufacturing cum 3D printing (supported by simulations and Big Data) (Envirotrec 2018). Developed economies are now well advanced in developing national strategies and programs for these technological and scientific innovations. As Bruno et al. (2019, p. 7) note, "The disruptions caused by the formation of Industry 4.0 in the next 10–15 years will completely change the structure of the global economy."

The WEF (2018, p. 12) reports that the world of work is undergoing dramatic change as automation (particularly robotics), AI, and other new technologies develop at an unprecedented rate. This is significantly impacting industry as well as the jobs, tasks, and skills required. Indeed, the future "employment landscape" will dramatically change because of the increasing rate of computerization and AI (Bruun and Duka 2018). It is not just routine tasks that will be impacted. Increasingly, computers are handling more complex and variable data, which means that jobs that were thought to be "uncomputerizable" are being affected; for example, in diagnostic

tasks in health care; and impartial decision making in fraud detection, deciphering, and contract or patent law research. Bruun and Duka (2018, p. 1) report that based on current estimates and research, "robotic labor will increasingly substitute human labor *en masse* across most sectors of the economy."

Traditionally the world of work has provided social and economic foundations for stability and social advancement for most families and communities (Marope et al. 2015). Work and employment provide social status and standing in communities for many people, particularly in Western society. More importantly, people use their income to meet their basic needs (affordable housing in healthy environments, good food, and high-quality health care). Human beings, as social beings, are then able to contribute to the broader society.

Job insecurity, high levels of informal employment, and long-term unemployment have an adverse effect on an individual's health and well-being. Moreover, at the macro level there is a strong correlation between high levels of stable employment in a society and better individual and public health (Prainsack and Buyx 2018). The dignity of work brings social cohesion and contributes a sense of social identity for the individual while a loss of work and income for an individual can bring a loss of personal identity and a meaning in their life, and fracture social cohesion.

Bruun and Duka (2018) pose two key questions about the impact of AI on employment: "How will our society be able to accommodate the displacement of a large percentage of its workforce within a generation or two?"; and "how will these shifts affect social cohesion?" (Prainsack and Buyx 2018, p. 5). Without intervention, these developments are likely to lead to "ever-more fractured, divided societies" (Prainsack and Buyx 2018, p. 287). This is exacerbated by the COVID-19 pandemic. It is therefore more urgent than ever to rethink elements and principles of what should be a good standard of work and living for all. This has implications for the content of, and approaches to, education and school, and for the characteristics of a learning society.

2.2.2 The Environment and Climate Change

Climate change is another major disruption that will also affect jobs, livelihoods, and the way people live particularly in Asia and the Pacific. This in turn will impact on education and schooling.

Climate change is happening harder and faster than predicted. The last 5 years are the warmest on record and natural disasters are happening more frequently and more intensely. Biodiversity loss and the rate of extinction is alarming (WEF 2020a). The UN Secretary-General Guterres has highlighted that so far, the world's efforts to stop climate change has been "utterly inadequate" and is warning that we are nearing the "point of no return" (Parra and Jordans 2019).

Just before the onset of the global health pandemic, respondents to the WEF's Global Risks Perception, listed climate change and related environment issues as among the top five risks in terms of likely future scenarios (WEF 2020a). Rising sea

levels, more frequent forest fires, glacial ice melts, and disappearance of coral reefs and species extinctions "is our reality right now, it will get worse, but it's already very, very, bad" (McKibben 2020, p. 4).

The results of the WEF Global Risks survey provide a useful guide to the disruptive forces that our communities and countries are dealing with, including economic, environmental, geopolitical, technological, and societal concerns.

In terms of climate change, according to the World Bank, the broader East Asia and Pacific region is the largest contributor to greenhouse gas emissions, accounting for one-third of the world's carbon dioxide emissions and 60% of its coal consumption. Curbing emissions in the region is critical to advancing the global climate change agenda (World Bank 2020c). While there is a fall in greenhouse gas emissions and pollution in major cities suffering the worst effects of COVID-19, these changes have been chaotic and unplanned mainly due to the disruption to industrial production and energy use (Lombrana and Warren 2020). The concern is that the comeback of economic activity might quickly wipe out any positive impact on the environment that has occurred due to reduced economic activity because of the health pandemic.

Currently, the world is particularly focused on the risk of COVID-19. This pandemic is testing resilience, but as nations around the world give attention to recovery, it is to be hoped that they will not lose sight of climate risk, because climate change planning is for the long term. Downplaying it in the short to medium term is not a viable option. As McKibben (2020) puts it, physics does not compromise and will not wait.

2.2.3 Education and Learning

In terms of formal learning, closing schools and tertiary institutions, including technical and vocational education and training (TVET) institutes, and adult learning education (ALE) institutions, have been part of the mitigation strategy for almost all countries in the world. Students have adapted to digitized and online learning as well as a modified form of face-to-face learning as restrictions ease. However, there is a concern that online and digitized learning will not compensate for the learning lost when schools and education institutions return to "normal" times, and that there are inequalities in terms of which learners get access to the internet (Magnuson 2020). For example, in Southeast Asia there is a significant digital divide in terms of access to and use of internet devices. Countries such as Singapore have 80% digital internet penetration whereas Indonesia has 56% and Viet Nam 38% in 2019 (Jalli 2020).

The rollercoaster of closure and opening, and the semi-opening of schools and tertiary institutions, will have long-term consequences for individuals, communities, and societies. As Magnuson (2020) notes, it will be the most vulnerable who are affected the most, such as, for example, students from poor and marginalized households. In the short term, the impact may well be that some students will not be able to read and write. This has long-term consequences for lifelong learning, especially for those young people who drop out of school, or suffer a decline in

learning, who will "face lower lifetime productivity and earnings" (World Bank 2020b; OECD 2020a). Gillard (2020), the Director of Global Education Partnerships, stresses that a lifetime of poorer learning outcomes and lower future earnings is a great risk, particularly for millions of children in developing countries including in Asia and the Pacific.

In a recent policy briefing on education and COVID-19, the UN Secretary General Guterres sounded an alarm, saying that we must all take action to try and prevent this learning crisis from becoming a generational catastrophe that could waste untold human potential, undermine decades of progress, and exacerbate entrenched inequalities (UN 2020). Disruption to TVET skills and training; for example, a reduction in apprenticeships in industries such as tourism, hospitality, aviation, and leisure services, where demand is at an historic low, will hamper the eventual recovery of economies and could well lead to skills shortages in some areas (OECD 2020b).

The Asian Development Bank has prepared a guidance note on education in Asia and the Pacific, post COVID-19 (ADB 2021). The note examines approaches to coping with COVID-19 disruptions with regard to kindergarten to grade 12 (or K-12) school education, TVET and disruptions to job markets, and higher education. It also outlines possible scenarios for re-imagining education and training after COVID-19. The guidance note presents an initial set of issues and suggestions to initiate a discussion on transformational changes in education as a result of the challenges that have had to be confronted due to the global COVID-19 health pandemic, with particular reference to countries in Asia and the Pacific.

The difficult problems faced in this age of disruption may seem insurmountable, especially when viewed through the lens of a global health pandemic during a period of lockdown. However, as McKibben (2020) says reassuringly, society has faced "problems from hell" before and worked out successful solutions. The World Bank (2020b, p. 7) proposes that societies now have a real opportunity "to build back better, and they should seize it." In addition, the UN Secretary-General has highlighted the opportunity to reimagine education and build systems that are more forward-looking, inclusive, flexible, and resilient (UN 2020). The changes brought about by the pandemic provides an opportunity to build on those systems for lifelong learning that safeguard quality and inclusiveness.

2.3 The COVID-19 Era: Auguring Prospects for the Biggest Revolution in Learning

2.3.1 COVID-19

The COVID-19 health emergency has and is having a profound effect on communities and societies, including the vast and diverse Asia and Pacific region (World Bank 2020c). Lockdowns and travel restrictions, which have been constraining the movement of people at the local, regional, national, and international levels, are

impacting labor markets and the supply of goods and services (UN-Habitat 2020). The depth and duration of the pandemic is uncertain, while "pandemic fatigue" is occurring as communities prepare for what is often referred to as the "new normal".

In a recent webinar, Guevara (2020) stressed that the COVID-19 pandemic has exposed the interconnectedness of multiple crises, making visible existing health, economic and educational inequalities in the Southeast Asian region.

In terms of economic growth, countries that rely heavily on tourism are particularly vulnerable (Cambodia, Thailand) as are countries that carry high levels of debt (the People's Republic of China, Malaysia, Thailand, Viet Nam). Commentators note that the current uncertainty is likely to cause a prolonged recession and hamper recovery. The economic impact of the virus in the Asia and Pacific region is only beginning to be felt, while the effects will last for years to come (Massola 2020; Oxford Economics 2020; World Bank 2020a).

2.3.2 Re-imagining Lifelong Learning

Education policy makers and researchers, and other informed commentators, are referring to the COVID-19 pandemic as being a catalyst for the biggest revolution in education, a once in a lifetime opportunity for re-imagining education and schooling, and the notion of learning societies (OECD 2020a; Lim-Lange 2020; UN 2020). Lifelong learning systems such as learning communities, learning cities, and learning regions (under the umbrella of a learning society) are an important part of this revolution. There is also a growing body of knowledge on how to develop and sustain a learning city. This does not depend on a one-size-fits-all model but is shaped by a city's location and political orientation (Boshier 2018). The model can also be adjusted to accommodate the specific characteristics of rural and regional communities.

Charungkaittikul (2020) notes that the importance of lifelong learning and learning societies has been widely recognized for a considerable time in Asia and the Pacific. Her analysis of the lifelong learning policy and practices of selected countries within the region provide growing convincing evidence that policy makers and national experts recognize the vital importance of lifelong learning to develop sustainable futures. She specifically refers to countries such as Australia, the Republic of Korea, Singapore, and Thailand—all of which have made significant progress to incorporate lifelong learning as part of their education systems, with the specific measures adopted varying from country to country. Charungkaittikul refers to the importance of skills recognition in Australia, the National Lifelong Learning Promotion Plan in the Republic of Korea, alternative education in Myanmar, and teacher development programs through e-learning in the Philippines. In addition, there is a potential network of "learning cities for a post-COVID-19 era" project in Thailand, which the Office of Non-Formal and Informal Education is considering in 20 provinces that have the highest number of people affected by the health pandemic (Omas 2020). As pointed out by Charungkaittikul,

> There is a clear, shared recognition across Asia-Pacific countries that the need and demand for lifelong learning will continue to grow, as will the importance of terms such as learning society, learning region, learning cities, and learning communities. While specific policy priorities to support lifelong learning are likely to depend on the context, there is a growing consensus about the importance of developing learning societies. (Charungkaittikul 2020, p. 117)

2.3.3 Transforming the Formal Education System

The formal education system is having to transform rapidly because of COVID-19, and countries in Asia and the Pacific are leading the way. For example, Tam and Al-Azar (2020), in a WEF blog, highlight positive trends that could result in future transformations, which include the following:

(i) ***The blooming of innovations.*** In some countries with strong 5G digital networks, policy makers and practitioners are taking real advantage of new modes of learning. For example, in the People's Republic of China, some 120 million Chinese students have been sitting in front of their television sets, learning through national broadcasts. Students in Hong Kong, China have been learning on digital apps since February 2020 (Lim-Lange 2020).

(ii) ***Public–private partnerships can grow in importance.*** The World Bank cites examples from the People's Republic of China, where stakeholders from different sectors (media, industry professionals, and government) have come together to provide an array of educational assets (such as videos, book chapters, assessment tools) that can be used by students. While the initiatives so far are limited in scope, the pandemic could pave the way for much larger-scale, cross-industry coalitions to be formed around a common educational goal.

There is an opportunity provided by the response to the crisis to innovate and build education systems that are stronger and more equitable than they were before. As a result of the health pandemic, "Many actors—parents, teachers, mass media, government and others—will have changed their perception about their role in the education process" (World Bank 2020b, p. 32). For example, parents will have a better understanding of the need to work jointly with schools to foster the education of their children. The innovations developed in response to the health pandemic have shown what is possible when countries focus on the most effective and equitable approaches to close learning gaps for all children.

Societies have a real opportunity to "build back better" and to use the most effective crisis recovery strategies as a basis for long-term improvements. Hence, they should seize the opportunity (World Bank 2020b). On the other hand, a real threat is that the digital divide could widen as a result of the health pandemic, and this is a major issue that needs to be decisively and constructively addressed (Tam and Al-Azar 2020). Although this is not inevitable, it must be borne in mind that currently, only 60% of the world's population is online and access is very uneven across the countries of Asia (Jalli 2020).

2.4 Conclusions

Throughout Asia and the Pacific, an increasing emphasis is occurring regarding the importance of learning societies. But how are such learning societies best configured and powered in an age of disruption?

(i) ***Create a framework articulating principles and values of lifelong learning.*** One way is to create a framework that provides underlying principles and values for the best way societies can be organized, based on the well-documented view that learning is an important catalyst for change and improvement. Key principles and values include attention to policy development; more responsive governance with adaptive institutional structures; multi-stakeholder partnerships and collaboration, rather than a tendency for just the private sector to be a key actor; and civil engagement as a key element, especially building bridges between different sectors of society. It is also important to have a recognition of how this concept will need to be continually adapted in place-based contexts. In a continually changing environment, measurement and evaluation should focus on learning and adaption, not just evaluation.

(ii) ***Enable lifelong learning to tackle key factors of disruption globally.*** There will be increasing disruption from those factors identified by the WEF (2020a) as important matters that countries will need to deal with, e.g., climate change and the environment; economic change (especially due to the ramifications of Industry 4.0); technological developments; possible future health pandemics; and geopolitical change (including that involving the need for conflict resolution).

(iii) ***Align with the UN Sustainable Development Goals.*** Any framework developed must also align with the UN Sustainable Development Goals and with Quality Education and Sustainable Cities and Communities. UN-Habitat (2017) highlights the importance of the linkages between urban, peri-urban, and rural areas; and of adopting an integrated planning approach at regional and national levels, inclusive of rural and regional communities.

(iv) ***Reimagine formal education to further stimulate lifelong learning.*** Learning society practitioners stress the importance of building a culture of learning within a community, whether this be at the neighborhood level, within a larger geographic area, or online. As well as re-imagining formal education, the involvement of people from vulnerable and disadvantaged groups is vital. The ways that countries throughout Asia and the Pacific have responded to the COVID-19 pandemic provides many examples of how these communities have been able to be very responsive in working with the most vulnerable.

(v) ***Asian economies should foster a learning society.*** There is a growing consensus on the importance and need to continue developing learning societies in Asia. In Asia and the Pacific, the Republic of Korea provides an advanced model that could be adopted by others, such as its National Lifelong Learning Policy, which translates to plans in at least 46 cities with practical

outcomes in neighborhoods, and the vision of a learning center within 10 min of where people live.

(vi) ***Enable lifelong learning to become resilient to all types of shocks and disruptions.*** The questions posed by Bruun and Duka (2018) about whether societies will be able to accommodate disruptions and the displacement of the workforce due to AI, and how the major shifts of technological change affect social cohesion, apply to all areas of disruption. Now is an opportune time to consider how best to provide a good standard of living for all, and this starts by considering how the principles and values of learning societies can be most effectively applied to address major disruptions in order to build the next normal.

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Part II
Learnability and the Learning Crisis

Chapter 3
Addressing the Learning Crisis: Basic Skills and 21st Century Skills



Moses Oketch

Abbreviations

COVID-19	coronavirus disease
LLMICs	low- and lower-middle-income countries
OECD	Organisation for Economic Co-operation and Development
PISA	Programme for International Student Assessment
RCT	randomized controlled trial
RISE	Research on Improving Systems of Education

3.1 Introduction

Student performance needs to be improved substantially, particularly in low- and lower-middle-income countries (LLMICs),[1] which have seen gains in enrollment in recent years, in order to achieve basic skill requirements. There is also ample evidence that shows that improving student performance may have a high economic and social payoff (Carnoy et al. 2015).

[1]For fiscal year (FY) 2021, low-income economies are defined as those with a gross national income (GNI) per capita, calculated using the World Bank Atlas method, of $1,035 or less in 2019; lower-middle-income economies are those with a GNI per capita between $1,036 and $4,045. *Source* World Bank. World Bank Country and Lending Groups. https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups.

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There is a growing body of empirical data and evidence that can begin to help policy analysts and policy makers in LLMICs decide which strategies are most likely to raise learning achievement and ensure that education systems can meet the demand for the skills needed today. Even in the more economically advanced countries, where evidence shows that learning levels are typically very low by standards of the Organisation for Economic Co-operation and Development (OECD), data is now available that makes the scale of the global learning crisis much easier to understand in a wide range of contexts. Learning rather than schooling has now become front and center and is an issue for both developed and developing countries. Estimates by OECD (2015, p. 38) show that more that 70% of students do not acquire basic skills by age 14–15 years in Ghana, Honduras, and South Africa. In this category of countries, the best performing country is Slovak Republic where less than 30% are categorized as not acquiring these skills by ages 14–15. In the more economically advanced countries, many countries, including Ukraine, United Kingdom, and the United States have more than 20% of their students not acquiring basic skills by ages 14–15. The best performing countries in this category are Estonia; Hong Kong, China; and the Republic of Korea, where students who have not acquired basic skills by ages 14–15 comprise less than 10% (Fig. 3.1).

3.2 Defining Basic Skills

Rossiter et al. (2018) argue that there is no single definition of basic skills, while international reports refer to "basic skills like literacy and numeracy" (World Bank 2018). Others have shown that failure to learn to read is associated with falling behind or dropping out of school altogether (Abadzi 2006). Others refer to "transferable skills" in addition to or in combination with literacy and numeracy (DFID 2018). In economics terms, basic skills refer to ability to compete in the economy of the future, wherein workers need strong basic skills and foundations for adaptability, creativity, and lifelong learning (World Bank 2018, xii), including adaptability, creativity, and lifelong learning. Rossiter et al. (2018, p. 14) argue that "another approach to defining basic skills emphasizes the social foundations to participate fully in society (a right, by virtue of being a member)"—which is a broader definition of basic skills. Educational assessment, as used for example, in the acquisition of at least Level 1 skills in the OECD Programme for International Student Assessment (PISA; see examples in Box 3.1), is another commonly used reference to basic skills (Rossiter et al. 2018, p. 14).

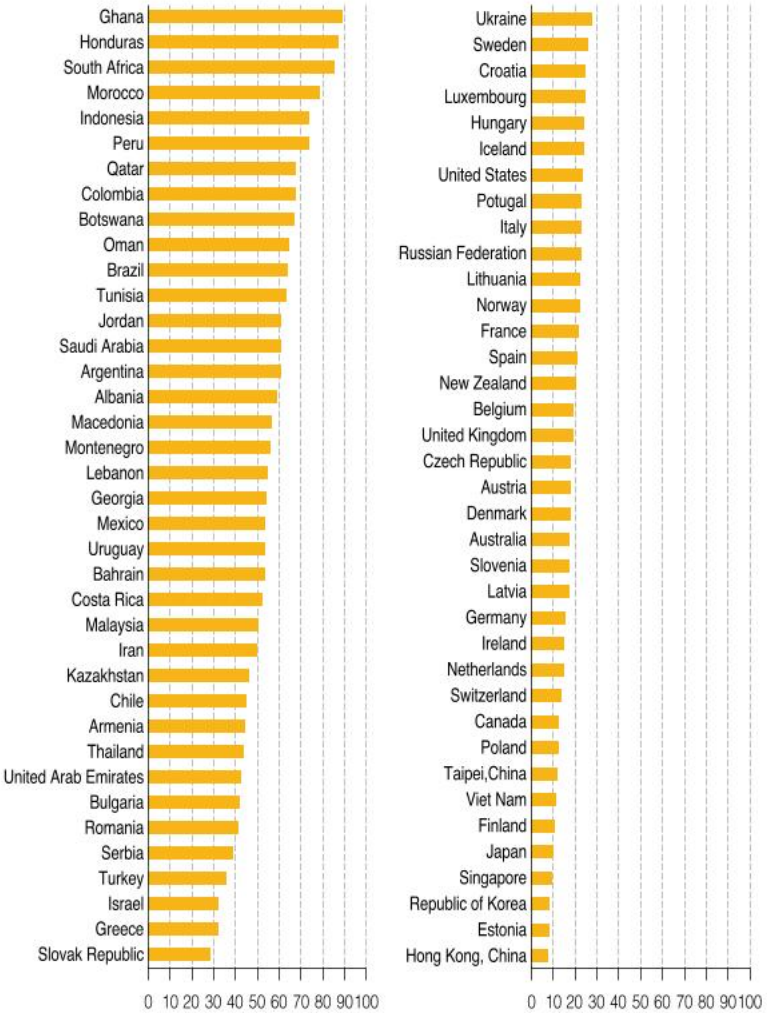


Fig. 3.1 Estimates of students not acquiring basic skills by age 14–15 (%) (*Student performance particularly in low- and lower-middle-income countries needs to be improved substantially, to achieve basic skill requirements*). *Source* Organisation for Economic Co-operation and Development. 2015. *Universal basic skills: What countries stand to gain.* Paris: OECD Publishing

Box 3.1 PISA Proficiency Scale Description for Mathematics and Reading

PISA mathematics level 1	PISA reading level 1
At Level 1, students can answer questions involving familiar contexts where all relevant information is present and the questions are clearly defined. They are able to identify information and to carry out routine procedures according to instructions in explicit situations. They can perform actions that are almost always obvious and follow immediately from the given stimuli.	Tasks at this level require the reader to locate one or more independent pieces of explicitly stated information; to recognise the main theme or the author's purpose in a text about a familiar topic, or to make a simple connection between information in the text and common, everyday knowledge. Typically the required information in the text is prominent and there is little, if any, competing information. The reader is explicitly directed to consider relevant factors in the task and in the text.

PISA = Programme for International Student Assessment
Note PISA Reading Level 1 is split into Level 1a (slightly higher) and Level 1b (slightly lower). This box shows the statement for Level 1a
Source Rossiter, J. et al. 2018. *Delivering on every child's right to basic skills: Summative report.* Oxford: Young Lives

Using one or more of the above definitions of basic skills has led researchers such as Rossiter et al. (2018) to conclude that the majority of children in LLMICs are off-track in learning to master these basic skills. The severity of this problem is illuminated by the UIS (2017) presentation on global distribution of primary school-age population who are not achieving the minimum proficiency in reading, where sub-Saharan Africa is the worst performing region with about 87% not achieving proficiency. This is followed closely by Central and South Asia where approximately 81% are not achieving proficiency in reading (Fig. 3.2).

Furthermore, there is a strong association between basic skills and economic growth rates across countries as illustrated by Hanushek and Woessmann (2015) in Fig. 3.3.

Majority of children in low-income countries attend school.[2] Nearly 90% of primary-school-aged children globally are enrolled in school, and in LLMICs, as a whole, far more than half complete primary school (Crouch 2020, p. 1). However, access is still unequal and school quality is generally low on the measures available. There is great variation in learning outcomes among countries at similar levels of income: in some cases, there are lower levels of student achievement in countries with greater expenditure in education and higher level of income, compared to countries with lower income and lower education expenditure. For example, the 2015 PISA results show exceptional performance for Viet Nam, a lower-middle-income country

[2]See UNESCO Institute for Statistics. http://data.uis.unesco.org/.

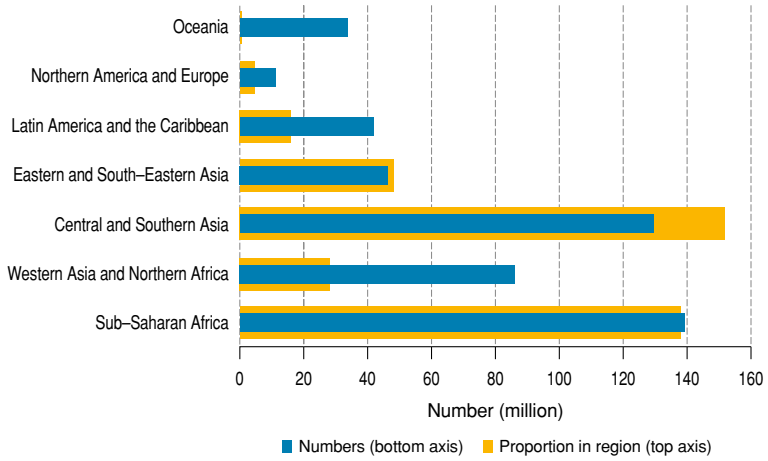


Fig. 3.2 Global distribution of primary school-age population not achieving minimum proficiency levels in reading (*Reading, which is one of the basic skills, is severely lacking in majority of children in low- and lower-middle-income countries*). *Source* UIS. 2017. *Delivering on every child's right to basic skills: Summative report*. Eds. J. Rossiter, M. Woodhead, C. Rolleston, and R. Moore, 15. Oxford: Young Lives

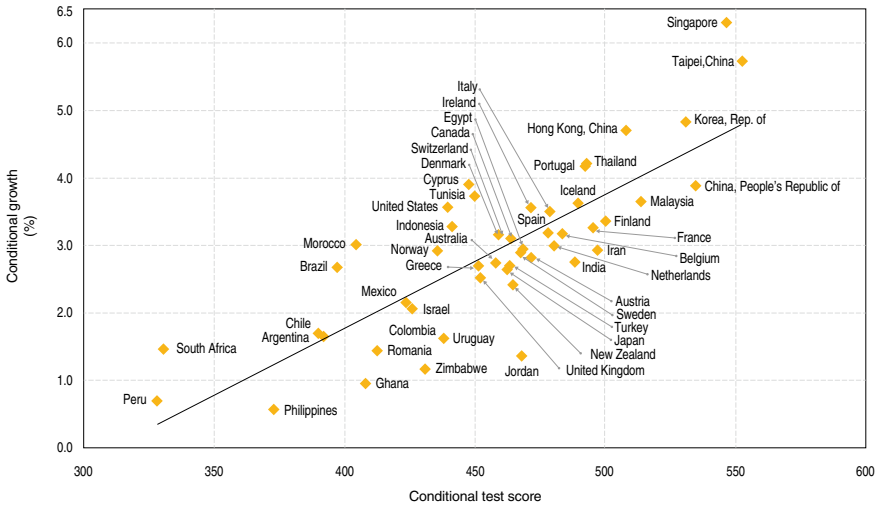


Fig. 3.3 Collective skills and economic growth rates across economies (*There is a strong association between basic skills and economic growth*). *Source* Hanushek, E.A., and L. Woessmann. 2015. *Universal basic skills: What countries stand to gain*. Paris: OECD Publishing. https://doi.org/10.1787/9789264234833-en

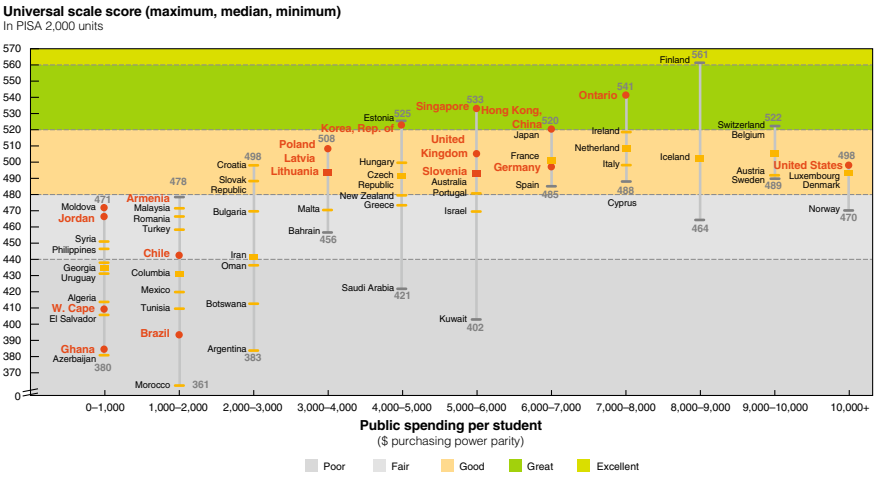


Fig. 3.4 Public spending per student (*Not all education systems are equal. In some cases, there are lower levels of student achievement in countries with greater expenditure in education and higher level of income [see Peru in the figure], compared to countries with lower income and lower education expenditure [see Viet Nam]*). *Source* McKinsey&Company. 2010. Exhibit 3: Systems with similar spend have widely ranging levels of performance

with a history of recent conflict, whereas the results for Peru, a considerably wealthier country, are near the bottom of the ranking (Fig. 3.4). In the Southern and East Africa Consortium for Monitoring Educational Quality countries, Kenya, which is a lower-middle-income country, outperforms both Botswana and South Africa, which are middle-income countries that spend a lot more on education than Kenya. Such evidence suggests that increasing per pupil expenditure alone is not the solution to the learning crisis. Student learning is a complex process and is subject to factors within and outside school, and some of these factors are outside the control of the school authorities (Carnoy et al. 2015).

Evidence from a large body of literature across many countries is robust on the impact of children's backgrounds and teacher quality on learning. Among these is the Research on Improving Systems of Education (RISE) Programme, a global research endeavor that seeks to understand how education systems in developing countries can overcome the learning crisis.[3] RISE is helping increase attention on the importance of macro drivers of system performance that contribute to student learning. Large differences between systems demand much greater attention to the macro level, and to the interrelationships between macro-level systemic factors and the micro and meso levels of pupil, class, teacher, and school (Oketch et al. 2020).

While it is obvious in one sense that the quality of an education system cannot exceed the quality of its teachers, teachers with similar characteristics in one setting may "produce" outcomes quite different from those in another, as has been shown in several studies of private versus public schooling. Further, macro-level factors

[3]See Research on Improving Systems of Education Programme. https://riseprogramme.org/.

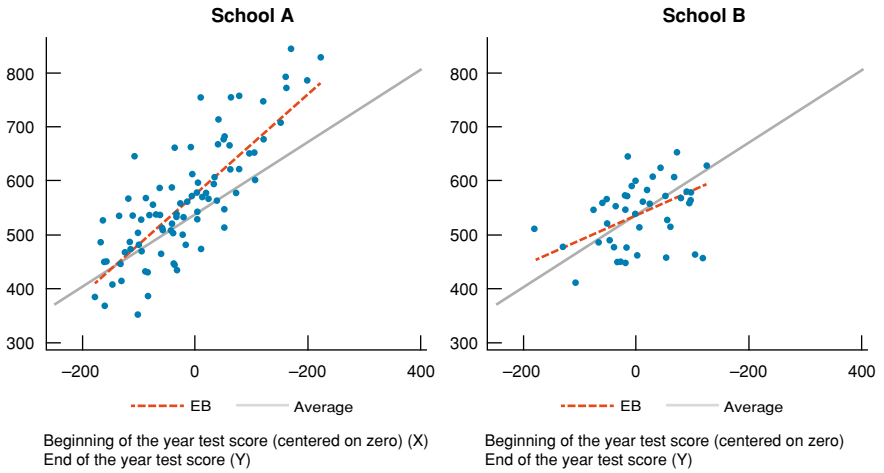


Fig. 3.5 Learning gains in two schools—beginning and end-of-year test scores (*This figure is an illustration of two schools purposively selected for having different groups of pupils and different patterns of learning progress. It suggests that research focused on the dynamics of systemic change at all levels—national, regional, classroom—is required to establish potentially successful reform pathways, and to understand the blockages that make learning more relevant for the development of basic skills*). *Note* Based on Ethiopia School Survey data. *Source* Oketch, M., C. Rolleston, and J. Rossiter. 2020. Teacher value-added using Young Lives Ethiopia school survey data—Diagnosing the learning crisis: potential applications of value-added analysis. RISE Insight Series. No. 2020/016. https://doi.org/10.35489/BSG-RISE-RI_2020/014

frequently resist reduction to simple proxy indicators. Measures such as per-pupil spending, teacher–pupil ratios, etc., explain relatively little of the differences between systems. Historical and political factors may explain somewhat more (Carnoy et al. 2015), but these are less well understood and less readily quantified. Moreover, as can be seen in Fig. 3.5, diagnoses of systemic failure are not solutions in themselves, as illustrated in a comparison of two schools in Ethiopia's context (see Oketch et al. 2020, p. 3).

According to Oketch et al. (2020), some schools can show substantial progress for students with above average prior achievement, and limited progress for students with below average prior achievement. Other schools can show a more homogenous group of students (in terms of prior achievement), with more progress among those with below average prior achievement—perhaps at the cost of high early achievers' progress. In this context, schools with substantial progress for students with above average prior achievement would be considered to show a greater than average value-added (effectiveness) than schools with more progress among those with below average prior achievement. However, considered more carefully, both categories of schools generate effectiveness by improving learning among different groups of pupils—one category of schools raises the bar for the brightest pupils, while another category of schools adds value more evenly across the range of prior learning levels (Oketch et al. 2020, p. 3). Diagnoses of systemic failure may not be able to reveal this

heterogenous classroom context that are common in low- and lower-middle-income countries.

Furthermore, this situation illustrated in Oketch et al. (2020) suggests that research focused on the dynamics of systemic change at all levels—national, regional, classroom—is required to establish potentially successful reform pathways and to understand the blockages that make learning more relevant for the development of basic skills. The search for uniformities, sometimes evident in international comparisons such as those in the education monitoring reports of the United Nations Educational, Scientific and Cultural Organization (UNESCO), may not be the approach to this kind of research. Nevertheless, understanding the structural changes that accompany successful reforms and describing them comprehensively should be considered an important step in addressing system performance and learning, and infusing new notions of how to significantly raise student achievement. Methodologically, Big Data can be pulled into the education sector to inform granular, real-time data and insights, which in turn inform differentiated policies and actions.

3.3 System Diagnostics

Comparative education systems analysis is required to provide better evidence on both the efficiency and effectiveness of education systems. RISE explains that examining an education system holistically—or systems thinking—allows one to see what components are not working together to produce learning.[4] This forms the starting point for establishing summary performance indicators at the system level for learning outcomes that can serve basic skills requirements. Differences in performance depend both on differences in inputs and outcomes, while the key to improving performance within a limited resource envelope is in improving the efficiency and effectiveness with which inputs are employed.

The development of system metrics is an important part of this area of research. For example, simple measures such as cost-effectiveness indicators (e.g., dollars per increment in pupil test scores) are rarely available, but these are what can greatly help to compare countries that spend over $10,000 per student with those that spend $1,000 or less, as seen from the PISA test based on the computation by Mourshed et al. (2010). A more effective analysis of learning outcomes can be the contribution that each teacher makes to improving learning based on the composition of the class that they teach, as illustrated in Oketch et al. (2020).

However, measures of performance, efficiency, and effectiveness do not provide explanations for how and why an education system *is where it is* or *what works* to improve learning outcomes or address the learning crisis. The development of system diagnostic tools is key for understanding the reasons for differences in (summary) system performance. These tools set out to identify strengths and weaknesses in

[4]See Research on Improving Systems of Education. Systems thinking. https://riseprogramme.org/systems-thinking.

systems. Weak links in education systems are especially important owing to the interdependence of components within a system. As pointed out by Crouch (2020, pp. 1–2), "One reason education systems struggle to address the learning crisis is that the quality of the sub-systems (curricular design and lesson plans, textbook design, assessment tools, and teacher coaching and support) is often low, and in some cases missing altogether. Just as importantly, though, the coherence among these 'core' sub-systems is often missing."

Still, while system diagnostics provide a fuller understanding of the sources of good or poor performance at the present, they do not provide a way forward with respect to specific reforms needed (or likely to be effective). For example, if poor school accountability is identified as a weak link that explains high levels of teacher absenteeism (a potential cause of low learning progress in LLMICs), the question of *how to improve* teacher attendance remains open.

Pilot studies using randomized controlled trials (RCTs) offer some insight at a small scale on potential mechanisms of change, but if the "blockage" lies at the macro level or system level, for example in terms of industrial relations with teachers' unions, there is a danger of oversimplification or reduction when using experimental evidence. This is the well-known problem of external validity of RCT designs. With respect to macro-level questions, such as reform of the curriculum, alternative solutions such as decentralizing curricular decisions or centralizing them could equally improve or worsen system performance, depending on the institutional and political-economic context. A fundamental question then is how do successful systems manage to be successful, particularly when there are specific "country effects" that cannot be explained by differences in pupils' socioeconomic background and variables used to measure teacher quality or classroom conditions (Carnoy et al. 2015). According to Crouch (2020, p. 2), "In the context of these coherence and support challenges, there are several promising examples of how national and sub-national governments in low- and middle-income countries have aligned their sub-systems. These governments are either seeing rapid improvements in learning outcomes or are sustaining learning levels that are better than their peers."

Crouch (2020, p. 1) proposes the following as tips considered to lead to system improvement:

(i) Focus on just a very few achievable indicators, and place foundational learning at the forefront for a country emphasizing learning.
(ii) Use data to drive both initial "wake-up" and stock taking, but also to help the teaching process along.
(iii) Emphasize teaching by teachers who are already in place.
(iv) Provide strong motivation through support that works.
(v) Use tight management so there is some degree of centralism and prescriptiveness as to pedagogy and other inputs, but after having iterated and adapted to context.

3.4 Addressing the Learning Crisis

3.4.1 Reform Pathways

The effectiveness of education reforms to address a learning crisis and align with basic skills with respect to individual dimensions of the education system, such as curricula or teacher training, is limited to a large extent by the next weakest link in the system. For example, improving textbooks may yield improvements in learning, but these improvements will depend upon teachers' knowledge and training being adequate to employ the new books effectively and on regular assessment of pupils' learning feeding back into teaching and learning. Many of these links are *processes* rather than more readily measurable inputs (Carnoy et al. 2015).

Reform pathways are more than mechanisms for change of individual features of a system (e.g., high teacher absenteeism as above) but also reflect the chain of linkages required for sustainable system reform. Reform pathways describe routes from the present status quo to improved system performance, based on a holistic approach that results from thorough diagnosis of weaknesses and strengths plus a full understanding of the interdependence between mechanisms of change. This is related to what the RISE research is attempting to accomplish by seeing system coherence as analogous to that of a car with a motor, transmission, axles, and wheels; and that "the pieces have to all work together as sometimes fixing one piece at a time won't make any difference" (Pritchett 2018, p. 1). In turn, this requires an understanding of the why questions that relate to the status quo—what are the reasons why the reforms that may be considered necessary for learning quality for basic skills have not been undertaken or have not succeeded? How are education standards that produce higher achievement developed?

3.4.2 Blockages and Catalysts for Reform to Address the Learning Crisis

The question to ask here includes under what circumstances are effective reforms for improving learning undertaken? What stands in the way of effective reforms?

These questions relate largely to the political economy of education systems, an area that is gaining better recognition today than it did before. This is an area where research is required at the national level to understand decision-making processes and their influences, while synthesis across countries to provide a framework for understanding political economies of education is also an important area of research work. Here, again, the RISE Programme offers some insights in a blog written by Lant Pritchett: "A key part of the RISE agenda is to focus on getting to systems of basic education that are coherent around learning" (Pritchett 2018, p. 1). The RISE Programme is divided into three parts: (i) a *symptomatic* description of existing conditions—what is known about the current levels and recent progress

in enrollments, learning, and the standard descriptions of available inputs (e.g., class sizes, teacher labor force, etc.); (ii) analytic *diagnostic* of key elements of the education system; and (iii) what are the system changes required, their impact and why (or why not) those changes are likely to produce impacts. This ultimately leads to policy influence.

3.5 Policy Influence

Providing evidence for informed policy change in education requires not only technical analyses of performance, diagnostic tools for understanding reasons for low performance, and identification of mechanisms of change. It also requires an understanding of the political economy of such change so as to link mechanisms to the systems in which they are most likely to be effective. Any evidence that is brought up, and how this evidence is utilized, are important to understand why some education systems are simply better than others in producing learning gains both inside and outside of school. Consolidating research from different kinds of studies can help with evidence that leads to figuring out how to bring together vertical strands of work that the international community is doing in education. For example, the early grade reading work led by Piper et al. (2014) in East Africa, which is similar to the vertical work in health on malaria, HIV/AIDS, etc., are being "horizontalized" or integrated by health authorities so that these successful programs can inform standard practice. This also helps to link evidence on specific subjects over the past few years into systems work related to improving learning outcomes that are relevant for basic skills (see also Crouch 2020).

These arguments suggest that in order to address the learning crisis, it may be necessary to consider a wide range of options including the following:

(i) more rigorous examination of natural variation in systems than has been done up to now;
(ii) use of more systematic, perhaps RCTs or other rigorous methods of evaluation of subsystems of countries, such as provinces or counties, as noted by Crouch (2020);
(iii) research on why effective systems use more of a systematic bureaucratic learning approach than a rigorous experimentation approach (because it is not clear that the best systems became that way by doing a lot of randomized or pilot studies); and
(iv) study on why effective systems also use a lot of measurement mixed with tatonnement processes and accountability, which gradually ratchet up performance and spread lessons learned in what one could call an evolutionary rather than designed manner (Crouch 2020).

This is not to deny the importance of knowledge derived from RCT studies and other similar pilot approaches. But it is to say that, when it comes to systems knowledge, rather than micro school practices and pedagogical norms, we need

something beyond RCTs and the like, although as rigorous (Oketch 2019). This is similar to the description by Pritchett (2018, p. 1) on the RISE systems approach, in which he notes the focus of RISE on the *coherence* of accountability systems (similar to the notion of the alignment of actors).

OECD (2015) suggests that economic growth of a country is somewhat strongly dependent on investment in education, a classic human capital theory argument. The idea is that improving the population's collective skills level is necessary for a country's path to economic growth (Hanushek and Woessmann 2015). Collective is the key phrase here, such that systems that only produce basic skills for a few children cannot be thought of as developing these collective skills. This is the learning crisis scenario in most LLMICs that have witnessed unprecedented growth in enrollment in recent decades, itself a great story. The question is how to achieve this collective skills level fast, in systems that are already far behind and experiencing a learning crisis. Crouch and Gustafsson (2018) find that the fastest way of increasing these collective skills is to move up from the bottom, analogous to illustration of schools in Oketch et al. (2020, p. 3), which add value more evenly across the range of prior learning levels. This is prioritizing the lowest performers as the fastest path to higher average skills (Crouch and Gustafsson 2018). OECD (2015) notes that replicating best performance in as many countries is the likely pathway to achieving the basic skills by 2030. The ultimate question however, is how can this replication be done successfully in many varied contexts?

3.6 Conclusions

The world is struggling with interconnected crises that amplify and will most likely extend existing learning crises in education in LLMICs. Such is the scenario in the wake of the COVID-19, which will have significant impacts on achievements in basic skills. Drastic measures will be required to build back better from a crisis within a crisis situation in education; otherwise, there will be a significant human capital loss in the next generation. Building back better or building back equitably and powering learning societies in the age of disruption will require doubling of efforts to increase attention on the importance of macro level drivers of system performance that contribute to student learning. Building back better makes this call for coherent systems accountability approach even more urgent.

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Chapter 4
Improving Learning: Reconsidering Student Assessment Globally



Amit Kaushik

Abbreviations

ACER	Australian Council for Educational Research
AD	anno domini
CLA	citizen-led assessments
GPE	Global Partnership for Education
PIRLS	Progress in International Reading Literacy Study
PISA	Programme for International Student Assessment
SDGs	Sustainable Development Goals
TIMSS	Trends in International Mathematics and Science Study
UIS	UNESCO Institute of Statistics

4.1 Introduction

Assessment of learning is as old as learning itself. It began with the very first teacher who imparted information, ideas, and wisdom to the next generation, and continues to this day, for as every teacher knows, keeping track of what students have learned is an essential part of the teaching–learning process. Without assessment—formal or informal, structured or unstructured—the learning process is only half complete.

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For instance, in ancient India, students lived in the *ashram* (hermitage or monastery) with the *guru* and pursued *vidya* or knowledge. At the end of their *ashram* life, when the *guru* believed that students had imbibed all that he had to offer, students were expected to engage in a debate with other wise men. This debate was the final assessment and was often wide-ranging and comprehensive, with an emphasis on what students knew, testing the depth of their knowledge, and their ability to communicate what they had learned. Only when they were deemed to have displayed a mastery over their learning were the students admitted to the realm of the educated.

During the ancient Tang Dynasty (618–907 AD) and Song Dynasty (960–1279 AD) in what is now the People's Republic of China, reforms in the education system led to the creation of the world's first written examination system to select civil servants based on merit (Elman 2013). Most postcolonial countries in Africa and South Asia can trace their present-day learning assessment systems to these reforms, which were adopted in Europe in the eighteenth and nineteenth centuries. The Europeans used these at first to screen candidates for admission into the civil service, and then increasingly to identify "merit" in schools and universities. The emphasis that this form of assessment placed on candidates' abilities to remember arcane bits of language or philosophy to determine their suitability for a career as a civil servant was reflected in school and college assessments that assessed student performance largely on the basis of their ability to memorize.

The two approaches described above illustrate in many ways the debate that has been witnessed in recent years about the best approach to assessing student learning. What learning will assessment measure? What form should assessment take? Should the emphasis of assessment be on recall or competency? Should we undertake assessment *of* learning, assessment *for* learning, or assessment *as* learning? What should be assessed—breadth of knowledge or depth, application or recall? Who should do the assessment—the teacher or someone else? Or both?

Learning assessment has also acquired renewed salience at a time when educational institutions everywhere are adjusting to the disruption caused by the coronavirus disease 2019 (COVID-19) pandemic. How can we ensure that students continue to learn during these challenging times? What measures of assessment might work best when education systems themselves have been overwhelmed? And in keeping with the theme of this book, how can assessment help power learning in an age of disruption?

Education systems all over the world have grappled with similar questions for decades. Writing in the *Herald* in 1930, ACER's first Executive Officer, K. S. Cunningham, noted that "…since the establishment of mass education it has been assumed that it is necessary to instruct children in large groups, that is, to have them at the same stage in any given subject at any given time. The result has been the raising to a high level of perfection of the class lesson as the main, if not the sole, means of instruction" (Cunningham 1930, p. 27). Even at that time then, there was a recognition that not all students learn at the same pace, and that it is important to be able to establish their progress individually. Over the years, we have arrived at the view in ACER that the fundamental purpose of assessment is to determine where

a learner is in their individual path of learning at the time of assessment (Masters 2013), which helps to establish where students are in their unique learning journey and identify what they know and can do. When considered in this fashion, assessment can be of several different types, all of which help understand the progress made by learners in their varied and individual learning journeys.

4.2 Understanding Assessment

Let us begin by establishing a common understanding of assessment. As most teachers and practitioners know, learning assessments can be of several types, such as classroom-based formative assessments, end-of-term summative examinations, exit certification assessments, tertiary education entrance tests, diagnostic exercises in the form of large-scale assessments.

The word "assessment" itself comes from the Latin *assidere*, meaning "to sit beside". In its most literal form then, assessment implies being by the side of a learner, supporting them as they learn. Usually, one would expect to see this in the classroom, i.e., between the student and the teacher. The first form of assessment then, is one that is done *with* the student, not *to*, and is intended to support them: it is ongoing and formative in nature. The results of such assessment feed into the teaching–learning process, indicating both to the teacher and learner what a student knows and can do, as well as areas that need further work. The purpose of such assessment is clearly to improve learning.

Separately from ongoing assessment is assessment that takes place at periodic intervals to measure what a student has learned, most often against expected norms or standards—this is summative in nature. These assessments or examinations could be quarterly, midterm, or annual, and their purpose is to judge overall success in terms of student learning as measured by achievement of prescribed curricular standards. In general, such assessments carry high stakes for the student by their very nature, since failure to meet expected norms in such assessments usually carries consequences, such as for example, detention in the same grade. Periodic assessments of this nature also perform the role of certifying the achievement of key stages, as for instance, the matriculation examination, or the high school leaving examination.

Assessments that judge student learning can also be used for another purpose: gatekeeping. Entrance examinations are often used to identify candidates considered more hardworking or suitable for admission to higher courses of education or work opportunities. Again, such assessments are high stakes assessments for the students, since failure to meet the expected norm or cutoff can lead to loss of opportunity.

Aside from school-based measures, assessments may also be undertaken at national, regional, or international levels to provide a diagnostic evaluation of education systems to policy makers, planners, and other stakeholders. These assessments provide important information about the functioning of the system and help support evidence-based policy making to bring about improvements. Ideally, diagnostic assessments of this nature should be low stakes for participating students

as their outcomes do not usually impact individuals. Ironically however, these assessments can become high stakes for teachers and administrators if the outcomes are used to judge the latter on the success of their students or systems.

The first standardized international learning assessment can be traced to the 12-country comparative study undertaken in 1959 under the aegis of the United Nations Educational, Scientific and Cultural Organization (UNESCO) Institute for Education, Hamburg. Led by Arthur Foshay, this pilot study combined an empirical approach with comparative education methodology to understand school achievement in those countries (Foshay et al. 1962), and eventually led to the development of the periodic Trends in International Mathematics and Science Study (TIMSS) and Progress in International Reading Literacy Study (PIRLS) now conducted by the International Association for the Evaluation of Educational Achievement. Today, TIMSS, PIRLS, and the Programme for International Student Assessment (PISA) of the Organisation for Economic Co-operation and Development are among the best-known international learning assessments.

Since 2000, over 90 countries have participated in PISA, which measures how well students can apply what they learn in school to real-life situations through an assessment of the abilities of 15-year-olds in reading, mathematics, and science. Undertaken every 3 years, PISA has become a high-profile assessment, with countries tailoring their education strategies to include measures that help improve their overall ranking. For participating countries, the outcome of PISA is an important indicator of system performance and the assessment has become a significant influence in national policy making (Breakspear 2012). The assessment has also led to policy reform in education, by providing countries an opportunity to justify such reform domestically based on international evidence (Grek 2009), thus demonstrating the impact of global actors on primary and secondary school education (Ninomiya and Urabe 2011). Most important, it has been suggested that there are significant economic gains for countries that can improve cognitive skills for their students (Hanushek and Woessmann 2010).

As an unintended consequence though, PISA and other international assessments have also become high stakes assessments for many participating countries anxious to demonstrate the progress they have made as they seek to improve their rankings in the educational sweepstakes. Some scholars have argued that the increased emphasis on PISA outcomes may well be leading to changes in curricula and pedagogy in participating countries whose impact will only be known several years later (Gorur 2016).

Finally, the last 2 decades have seen the rise of citizen-led assessments (CLA) organized by nongovernment organizations, which attempt to provide a dipstick view of the state of learning at a given point in time. Beginning with the Annual Status of Education Report first published by the NGO Pratham in 2005 in India (Pratham Resource Centre 2005), CLAs are now found in many countries including Kenya, Mexico, Pakistan, Tanzania, and Uganda. While the methodologies followed by early surveys varied, many CLAs today use methods and techniques that compare with global best practice and may in some cases be more reliable than available national surveys.

Additionally, CLAs have one significant advantage over other national and international assessments: the surveys are conducted in the homes of respondents, which results in the collection of learning data even for children who are out of school, and greater involvement of parents and the community. Given the still high number of children out of school, particularly in developing countries, it is appropriate that data from such surveys are also taken into account when monitoring progress globally (Schwantner et al. 2018).

Each of these types of assessment serves a unique purpose and takes a different form; nevertheless, they all fundamentally perform the function of providing information about learning at a given point in time to various stakeholders at different levels. Thus, while classroom assessments enable teachers to teach better, large-scale assessments support evidence-based policy making. Used appropriately, the data from each kind of assessment enables improved learning.

4.3 Global Variations

Globally, assessment capacities began to improve after the 1990s when 155 countries adopted the World Declaration on Education for All in Jomtien, Thailand, which shifted the focus of the discourse from inputs to outcomes, by declaring the need to focus on learning outcomes instead of only enrollment (Greaney and Kellaghan 2008). The adoption of the Sustainable Development Goals (SDGs) in 2015 has provided renewed importance to learning assessment, with SDG 4.1 stipulating that the target is to ensure by 2030 that "…all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes" (United Nations 2015). The emphasis on the achievement of specific learning outcomes stipulated in the SDGs carries with it the implicit need for quality assessment to monitor progress toward achieving the goal.

The challenge however, is that countries differ in terms of their levels of educational development and in how they design and use learning assessment. In South Asia for instance, which accounts for the highest number of out-of-school children in the world, technical and managerial capacity for assessment is nascent and institutional systems delicate, a situation that has been exacerbated by the COVID-19 pandemic. As a result, decisions about assessment are often made by those who may not always have technical knowledge or an understanding of its objectives or benefits, which can adversely affect the quality of the assessment undertaken. Very often, adequately trained human resources are not available or may not be able to give their full attention to assessment. In certain cases, merely undertaking the assessment may be viewed as the end objective in itself, rather than acting on the outcome of such assessment. Assessment in such countries still tends to be considered something that should be undertaken after teaching has been completed, rather than an integral part of the teaching–learning process that should be continuous and ongoing.

Most countries in South Asia have traditionally relied on their own national assessments to provide data on student learning, with limited participation in

international or regional surveys, although this may now be gradually changing. India participated in PISA in 2009 and will do so again in 2022. Bhutan participated in PISA for Development in 2018, while Pakistan and Sri Lanka are considering future participation in TIMSS or PIRLS.

Other regions of the world have made more progress, with countries developing relatively advanced institutional abilities, allowing them to move beyond their own borders to consider learning achievement at a regional level. The South East Asia Primary Learning Metrics is a regional survey that assesses outcomes of students in grade 5 in six Southeast Asian countries and provides inputs into education policy making in the concerned countries. In Latin America, the Regional Comparative and Explanatory Study[1] evaluates students in grades 3 and 6 in reading, writing, mathematics, and sciences across 18 countries in the region. In the Pacific, the Pacific Islands Literacy and Numeracy Assessment helps assess basic numeracy and literacy skills of children from 15 countries.

4.4 Learning to Learn

Most forms of assessment, whether in the classroom or through an international survey, privilege existing institutional structures of learning, namely the school and its stakeholders, since that is the way society has traditionally viewed learning (Elmore 2019). However, as educators have increasingly recognized, learning takes place in diverse settings, both inside and outside the school environment, and COVID-19 has emphatically reinforced this understanding. Today's workplace prizes the so-called 21st century skills of collaboration, creativity, communication, and critical thinking far more than a simple recall of facts and figures (World Economic Forum 2015). This means the nature of assessment also needs to undergo a change.

Recalling that assessment is a means to an end, i.e., improving learning, it seems fair to say that the future of assessment globally is linked to the future of learning. Developments over the last several years have made it clear that a significant number of countries is moving away from traditional, rote-based learning systems toward learning that encourages the development of 21st century or transversal skills (UNESCO 2014). Care et al. (2017) observed that public education systems in 113 countries across the world had defined education as being more than equipping students with academic or technical skills for work, although not many were necessarily clear about how those skills were to be integrated into national curricula. Not surprisingly, there is also tension between existing structures of education systems and the desire to develop these skills (Care et al. 2017).

While schools and curricula remain highly structured, the truth is that learning is a deeply individual experience and one that takes place in a variety of environments. Neuroscience tells us that the human brain continues to develop over one's life

[1]Laboratorio Latinoamericano de Evaluacion de la Calidad de la Educacion-Estudo Regional Comparativo e Explicativo.

span and that learning occurs in several ways in different natural, social, and institutional environments (Elmore 2019). It is not reasonable therefore, to assume that learners acquire all their skills, curricular and co-curricular, only within the school environment. Indeed, if the COVID-19 pandemic has conclusively demonstrated anything, it is that physical attendance in school is no longer a prerequisite for learning beyond say, the foundational learning stage or the first 3 years of primary school. In turn, this implies that students need to be prepared to learn, unlearn, and relearn as they progress through various stages of lifelong learning. That being so, assessment should enable "learning to learn" rather than merely testing recall of specific subjects or facts.

The biggest change this requires is for assessment to be viewed as an integral part of good pedagogy, rather than something that gets tacked on at the end of the teaching cycle. Recollecting the view of assessment as fundamentally the process of establishing and understanding where individual learners have reached in their learning at a given point in time (Masters 2013), we can consider learning itself in a different light. In a forward-thinking way, by establishing what a learner knows and can do, assessment informs next steps since it enables both the teacher and taught to identify and address areas that need additional support. This remains true whether the assessment is an international or national survey, or in the classroom: the purpose of assessment remains essentially to support making decisions that lead to an improvement of learning.

Equally importantly, this approach is underpinned by the fundamental belief that learning is a process occurring over many years and can potentially be lifelong (Masters 2013). In turn, this implies that every student can make progress given enough time and adequate opportunity. The Fig. 4.1 describes a virtuous assessment

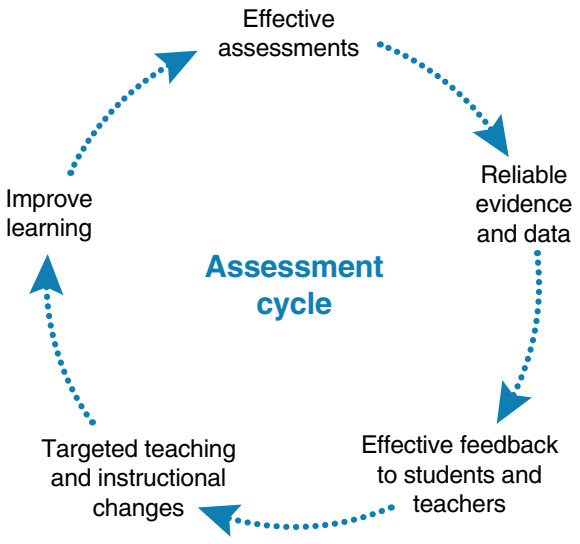


Fig. 4.1 The assessment cycle (*Every student can make progress given enough time and adequate opportunity*). *Source* Author's representation

cycle that is based on this approach. Regardless of the nature of assessment, when carried out correctly it should support improved learning.

Note that it is not the act of assessment itself that will lead to improved learning, but the actions that follow based on its outcomes, i.e., the steps that are taken subsequently to address the status of learning made visible by the assessment. All too often, one observes that in the case of many education systems, the assessment event becomes the end in itself with data from the exercise not being used to inform policy and corrective action. In one South Asian country for example, a national assessment of secondary schools was undertaken in 2017 but was never reported, and the development project supporting the assessment wound up before the reports could be released. In another, data from a national assessment of grades 3 and 5 remained unused for 2 years before funding was made available for its analysis and reporting. Using the data emerging from an assessment is critical to improving learning; merely undertaking an assessment is not the end goal. Additionally, such assessment data should ideally be used in conjunction with other available data about the student to arrive at the best judgment of their progress.

It is interesting to observe that this process remains true throughout an active learning life, whether the learner is in school, at the workplace, or elsewhere. Regardless of where learning takes place, an accurate appreciation of progress made over time and the current state of an individual's learning provides important clues to the next steps that need to be taken. Externally administered assessment may not always be required—an independent learner would be capable of self-assessment to arrive at a realistic understanding of their growth, identifying areas for further learning on that basis. Thus, assessment need not be viewed as something that must always be purely formal in nature. As the nature of learning changes throughout the learner's life, so must the form taken by assessment.

4.5 Future Possibilities

4.5.1 Increased Use of Technology

The COVID-19 pandemic has severely disrupted education systems worldwide and caused countries to find newer and innovative solutions for the delivery of learning to students. It has also forced a reappraisal of the way assessments are undertaken, both in school and outside. More than anything else, it has shown us that education systems need to be resilient and responsive to disruptive challenges, for surely COVID-19 will not be the last challenge they face. Increasingly, countries are switching to technology-based solutions to undertake assessments, even though access to such technology may not be easily available to all. The role of technology in learning assessment has been increasing over the last several years but the pandemic has demonstrated that it is only likely to assume more importance in the future. Given the ability of technology to create and manage increasingly high levels of complexity,

one would expect to see it being more widely used, leading among other things, to greater personalization of assessments, adaptive assessments that draw on a built-in knowledge base to provide learning support, and the use of artificial intelligence to take on some of the tasks that are presently performed manually. Increased use of technology—whether online or offline, for individual classroom-based assessments or large-scale ones—will also help provide increasingly reliable and valid data upon which to base decisions that help to improve learning. However, it would be even more important to remember that the process of designing assessments to provide data on which valid and reliable conclusions can be reached remains important—a badly designed assessment delivered using good technology would still be a badly designed assessment.

It is likely that many of the technology-based solutions adopted as a result of COVID-19 will remain with us as we navigate the pandemic over the next few years; this will impact the manner in which assessment is carried out too. Having said that, it is important to enter a caveat here: the availability of technology and technology-based solutions even in the so-called developed countries is not equitable, and it is certainly less so in developing ones. A recent study from India showed that although schools tried to deliver online learning during the pandemic, more than four-fifths of students in the government's central schools (arguably better provisioned and run than most state schools) had to use mobile phones to access to online resources, while only about 10% had access to laptops (National Council for Educational Research and Training 2020). Countries will therefore need to review the current availability and distribution of technological aids for learning and assessment, and prioritize faster adoption. From focusing on access to physical educational infrastructure, administrators and policy makers will now need to plan for virtual access by investing in devices, computers, and broadband capabilities. At the same time, we must continue to remind ourselves that technology is not a magic bullet that can solve all problems; therefore, realistic expectations about its impact should be based on the characteristics of individual education systems.

4.5.2 Strengthening and Reforming Learning Assessment

There is general agreement that the world has been facing a learning crisis for some time now. In a 2018 report, the World Bank noted that even after several years in school, millions of children cannot read, write, or do basic mathematics, referring to this as a learning crisis that is increasing social and economic gaps instead of helping to reduce them (World Bank 2018). In the interest of equitable learning (already interrupted by COVID-19, which is likely to cause further learning losses), the development of robust assessment systems has become even more important. While some form of learning assessment is usually in place in most countries, it will become critical for assessment reform to be undertaken in ways that allows some common agreement on basic elements.

The Global Partnership for Education (GPE) recently made the strengthening of learning assessment systems a strategic priority so as to bring about improved and more equitable learning outcomes (Global Partnership for Education 2016). As part of this initiative, GPE has worked with ACER to develop the Analysis of National Learning Assessment Systems tool kit to provide a resource for countries to systematically gather and analyze information about their national learning assessment systems to bring about reform and improvement (Australian Council for Educational Research 2019). One would expect to see similar tools being made available to countries seeking reorganization of learning assessment.

An important consideration for many countries at this time will be the development of appropriate capacities to implement reliable assessments, whether in the classroom or at scale, especially as they seek to accelerate economic and social development. In the short run, this is likely to be prioritized as governments seek to understand and address educational gaps between different segments of domestic society, leading to a strengthening of classroom and provincial or national assessments.

It has been argued that assessment reform is driven by four factors: (i) demand for better data for decision making, (ii) advances in our understanding of human learning, (iii) recognition of the need to develop assessments that prepare students for life in the twenty-first century, and (iv) improvements in technology (Masters 2013). To these, I would venture to add a fifth: an improved appreciation by policy makers and practitioners, particularly in developing countries, of the role assessment data plays in supporting sound educational policy, which causes a demand for better data in the first instance. Increasing capacity in education systems to generate and use assessment data for policy making will also lead to greater efforts to develop stronger learning assessment systems in more and more countries.

As the nature of teaching and learning changes, thanks in part to COVID-19 but also as a result of natural progress, one would also expect to see the nature of assessment change to reflect that reality. Instead of more conventional assessments with students sitting together in a hall and undertaking a pen and paper assessment or one on a computer, assessments of the future could be based on other criteria, such as evaluation of project work done by a student or a group of students to demonstrate their skills of creativity and collaboration. Indeed, in some schools and countries, this is already happening although in most cases the school leaving examinations remain unchanged.

4.5.3 Assessing 21st Century Skills

Given the emphasis on creation of modern knowledge societies, the world of work is becoming more complex and more dependent on the successful use of technology. This requires students to acquire a high degree of facility with skills that can be transferred easily from one role to the next, especially in a world where many of the roles that future generations might play are yet to be defined. As countries start to build such skills into their education systems, they will also need to consider the best way in

which to verify the attainment of these skills, yet this task is not a simple one inasmuch as these skills do not lend themselves to easy assessment. Additionally, assessments aimed at evaluating transversal skills are not easily adaptable to education systems that primarily use learning assessments for summative or certification purposes (Care et al. 2018), as is the case in much of South Asia and elsewhere.

Different regions of the world have taken multiple approaches to the issue of assessing transversal skills. For instance, in Europe, the Assessment of Transversal Skills 2020 project involves 17 partners from 11 European Union countries and explores new approaches to developing and assessing such skills (Cyprus Pedagogical Institute 2020). Australia, which began discussing "general capabilities" in the 1990s, tends to treat the assessment of such competencies as integral to the assessment of subject knowledge and skills (Weldon 2019). The Philippines has begun work on reviewing and integrating 21st century skills into curriculum, pedagogy, and assessment with the development of a Strategic Road Map (Scoular 2020). Across Asia, several countries have included transversal competencies in their educational frameworks, but many report operational-systemic challenges to implementing such assessments (Care and Luo 2016), with the actual availability of formal assessment tools being limited (Care et al. 2019). Clearly then, developing effective and meaningful assessments for such skills will acquire priority in the years to come.

4.5.4 Citizen-Led Assessments

One would also expect household- or community-based population surveys to become more prevalent, particularly in countries where assessment capacity is still being built. Whether undertaken by governments, development agencies, or nongovernment organizations, such surveys have the advantage of not being school-based and therefore more inclusive since they cover even children who may not be enrolled in school.

Citizen-led assessments, as they become increasingly more technically sophisticated and widespread, will also be an important source of information about student learning. The PAL Network, a south–south partnership of organizations leading CLAs across three continents, recently released the International Common Assessment of Numeracy or ICAN, an open-source and robust assessment tool in 11 languages that offers international comparability of results. The technical sophistication of ICAN and the equivalence of translations means that children across the concerned countries undertake a common assessment, so that their progress can be compared (Schwantner and Walker 2020). It is not unreasonable to expect that similar, equally robust assessment tools will continue to become available as we move forward.

4.6 Conclusions

Learning assessment plays a critical role in helping to improve learning under different conditions and in varying situations, as an integral part not just of the teaching–learning process, but also of the larger policy environment. While the objective of each type of assessment may differ, its fundamental purpose remains that of helping to determine progress made by each learner in their individual learning path so as to be able to guide and support further development (Masters 2013). Most importantly, *utilizing* the data emerging from an assessment is critical to its success. The effort of undertaking an assessment is lost when the results of that assessment are not acted upon, whether in the classroom or in policy making.

The disruption caused by COVID-19 is likely to hasten the already rapid deployment of technology-based solutions to assist learning assessment, but it will be important to ensure equitable access to such solutions. However, notwithstanding the technology used, the design of assessment systems, whether in the classroom or for the country, will continue to require care and proficiency to elicit useful data.

The emphasis on transversal competencies or 21st century skills witnessed in the last few years also means that new methods of assessment will need to be designed and deployed, with attendant capacity created at various levels of the education system. Although many countries have identified these skills as desirable and included them in their curricular and pedagogical frameworks, there is as yet limited availability of tools that can provide reliable information about such competencies.

The development of CLAs has introduced a new dimension into the traditional understanding of assessment and its role in learning, and has helped generate previously unavailable data by covering out-of-school children. As they become increasingly technically sophisticated, such assessments can provide significant insights into student learning, especially at a time when previously followed models of education have been disrupted, with students learning in a variety of diverse environments.

The challenge of developing suitable capacities for learning assessment is one that will need to be addressed, particularly in countries that are also simultaneously dealing with issues of access, equity, and retention in a situation of resource scarcity. As countries progress toward becoming knowledge societies, developing the technical and managerial skills required for various kinds of reliable assessments will assume greater importance. Some attempts have been made at reaching a consensus on the best way to undertake and use learning assessments globally, such as the Learning Metrics Task Force (UNESCO Institute for Statistics and Center for Universal Education Brookings Institution 2014) convened by the UNESCO Institute of Statistics, or the ongoing Global Alliance to Monitor Learning.[2] However, given the vastly varied capacities available across countries, it is unclear at this stage if such agreement can or even should be reached. What is clear though, is that this is an area that will continue to require support and development if we are to address the pre-existing learning crisis and the one thrust upon us by COVID-19.

[2] *Source* Global Alliance to Monitor Learning. http://gaml.uis.unesco.org/.

Even as international learning surveys have provided a picture of learning across countries, as assessment capacities develop, the priority in most countries remains understanding the relative status of domestic groups so that greater support may be provided to those being left behind, leading to an emphasis on classroom and national-level assessments. In the medium term, it seems quite likely that there will be more diversification rather than less, with an emphasis on strengthening regional or even national assessments, all the way down to the classroom level to empower teachers to improve learning. Whatever direction future developments take however, one is likely to witness greater emphasis on building capacities for more accurate learning assessment to provide support at different levels for improving learning.

In an ideal scenario, learning assessment should be the business of everyone—teachers, students, parents, and the larger community, in the quest for creating "learning societies". Reliable learning assessment can help develop a culture of learning that supports lifelong learning, well beyond the formal years of education. The COVID-19 pandemic has conclusively demonstrated that learning is not confined within the four walls of an educational institution, and that it is possible to continue to learn in a variety of situations and in challenging circumstances. Notwithstanding where learning takes place however, it remains important to have in place robust assessment systems that allow measurement and monitoring of progress made by learners individually and as a group. Developing these systems and the associated skills will remain critical to supporting and improving learning, particularly in an age of disruption.

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Chapter 5
Disrupted, Ruptured, and in Between: Ruins of Schooling and Utopian Learning Society



Dae Joong Kang

Abbreviations

GIE	Gyeonggi Institute of Education
KERIS	Korea Education and Research Information Service
OECD	Organisation for Economic Co-operation and Development
UNESCO	United Nations Educational, Scientific and Cultural Organization

5.1 Introduction

Education is one of the areas most affected by the coronavirus disease (COVID-19) pandemic. Schools and universities worldwide closed for a time, and almost all students had to stay at home. Distance teaching and learning suddenly became the new normal. Many countries adopted flexible learning strategies using various information and communication technologies after schools shut down (Reimers and Schleicher 2020; United Nations 2020; Wagner and Warren 2020). In the past, we have seen many policy documents that advocate education reform with new technology. In many cases, the reform measures were only partially implemented and, for a long time, remained largely on paper. The COVID-19 pandemic made technology-enhanced education a reality within just a year, especially in technologically savvy countries like the Republic of Korea, for which this was a first in its history.

My two daughters, one in elementary school and another in middle school, started their "new normal" school days by opening their laptops at home and logging into

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their school's learning management system. Although they own personal laptops, they never used them for school assignments before the pandemic. The process was somewhat chaotic. They had to use a synchronous video-chatting application, watch video clips and slides that their teachers uploaded or relayed, and leave a message on a board instead of interacting directly with their classmates. My two daughters had to learn how to adapt to this technology-assisted educational environment at home. As a university professor, I also taught all courses with Zoom and Moodle-based learning management systems. Using this advanced technology was the only viable option to continue teaching and learning since COVID-19 kept us away from face-to-face interaction. Though it is very tough to effectively implement distance teaching and learning in a country with more than 8 million students, the Ministry of Education took this opportunity to shift its entire education system toward technology-assisted blended learning.

COVID-19 has significantly disrupted traditional learning, teaching, and working in the education field (Crawford et al. 2020; Lopes and McKay 2020; United Nations 2020). Being forced to replace traditional face-to-face physical classroom teaching with online and distance learning on an unprecedented scale has significant implications for schooling and education in the future. Is this the real beginning of a new era in education that is challenging the centuries-old traditional school system? Can this new normal be the better normal in education? Before the pandemic, the concept of the learning society had been circulating for more than 50 years as the future of education reform. Learning is considered a lifelong endeavor beyond the early stage of formal schooling, and as a life-wide phenomenon both in and out of school.

Technological development is vital to this change in education. There has been a strong consensus that the learning society is the guiding concept to imagine and concretize the new education system. Would the COVID-19 pandemic turn out to be the watershed moment in history to realize the much-hyped learning society? It seems the challenges caused by COVID-19 will finally bring about educational change as predicted, with the fruition of the concept of a learning society.

In this paper, I sum up how the education system in the Republic of Korea and around the world was disrupted by COVID-19, and how countries responded to the pandemic. I will remind the reader that the school-centered education system has been ruptured by new socioeconomic demands and technological developments even before the pandemic, giving birth to the discourse of lifelong learning and the learning society. In conclusion, I will discuss ways to take advantage of the pandemic to move toward the era of the learning society.

5.2 Disrupted

COVID-19 caused extraordinary worldwide disruption in education. In mid-April 2020, 1.58 billion children and young people in more than 190 countries stopped attending school—approximately 94% of the entire student population worldwide

(United Nations 2020). Not many people expected this huge-scale disruption when COVID-19 was first reported in the People's Republic of China. Although children and adolescents' mortality rate from COVID-19 was not high, clearly the current education system was most vulnerable to virus transmission.

In the Republic of Korea, the government did not expect a whole school system lockdown when the first COVID-19 case was reported on 20 January 2020. The Ministry of Education first focused on quarantining the returning college students from the People's Republic of China, specifically from Wuhan, the epicenter of the virus at the time. However, when COVID-19 spread in Daegu by the end of February 2020, things suddenly changed. The start date of the schoolyear, 2 March, was postponed for a week at first. It was postponed again to 23 March, then to 6 April. Schools finally opened on 9 April but online. It was the first time in the history of the Republic of Korea that schools opened online in April. When COVID-19 was contained in May and June, students could finally go to school, though only a third to two-thirds of the student were allowed each day. Thus, online learning continued. Colleges and universities also postponed the start of the semester and maintained online distance learning throughout the semester.

Around the world, school shutdowns and rapid transitions to online learning revealed poor digital conditions. Access to digital devices and high-speed internet is unequal from household to household and country to country. Among those who took the 2018 Programme for International Student Assessment (PISA) test in Latin America and the Caribbean region, only 61% had access to a computer at home (ECLAC-UNESCO 2020). Only 36% of the residents of lower- and middle-income countries have access to the internet (Vegas 2020). Even the wealthier and technologically advanced countries were no exception. In Europe, 6.9% of the children cannot access the internet (Lancker and Parolin 2020). All the 46 members of the Organisation for Economic Co-operation and Development (OECD) and partner countries had closed their schools from 7 to 19 weeks by the end of June 2020. This meant that most of the countries that participated in the OECD's 2018 PISA were not ready for online learning and teaching (Schleicher 2020).

Many countries struggled to cope with the disruption caused by COVID-19. Building a smart school that fits the digital learning environment was an essential policy direction in the Republic of Korea even before the COVID-19 crisis. However, an elementary schoolteacher recalled in an interview, "A year ago I couldn't help but laugh when the Ministry of Education talked about using artificial intelligence in schools." The teacher continued that until February 2020 there was no Wi-Fi in classrooms. Commercial e-mail services such as Gmail or Microsoft Outlook were banned in school. No one could use a cloud service in school at all. The school attended by the "ARMY", the fans who support the world-class K-pop group BTS through social media networks, did not even have Wi-Fi.[1]

The German situation was not so different from that of the Republic of Korea. In a survey on the early career teachers' adaptation to online teaching, König

[1]Personal communication. This interview was conducted for a Korean book entitled *COVID-19 Awakens Korean Education* (2020, Knowledge Smith).

et al. (2020) found that even the native digital generation of teachers are not well equipped with the necessary digital skills. It is because "many schools lag behind the expected information and communication technology (ICT) transformation process in educational systems" (König et al. 2020, p. 618). The COVID-19 pandemic was a game-changer in this regard. As another Korean teacher described the situation, "COVID-19 grabs schools by the collar and drags it toward digital technology".[2]

Still, it was tough to adapt to the challenging situation. According to a joint survey of the United Nations Educational, Scientific and Cultural Organization (UNESCO), United Nations Children's Fund, and World Bank on COVID-19 response from April to mid-June 2020, only about half of the surveyed countries provided teachers with additional training on distance learning. Among primary school teachers, 81% had the minimum required qualifications, and among secondary school teachers, 86%, according to data published by the UNESCO Institute for Statistics, International Task Force on Teachers, and the Global Education Monitoring Report (UN News 2020).

The Republic of Korea is one of the most successful countries to cope with the disruption. Online and distance education very quickly became the new normal. A survey by the Korea Education and Research Information Service (KERIS)[3] in Kye et al. (2020); and a survey by the Gyeonggi Institute of Education (GIE)[4] in Baek and Jung (2020), show some critical aspects of the educational response to the pandemic in the country. According to the KERIS survey, (i) 66% of the teachers considered themselves to be ready for distance teaching; (ii) only 14.8% of the teachers used real-time online teaching that allows synchronous interaction with students; and (iii) 78.4% of the teachers used asynchronous methods to give out learning materials and assignments. This was also observed in the GIE survey. On the question on how the teachers are conducting online classes, 33.6% of them assigned work and gave feedback, 31.7% created their own videos of lessons, and 29.2% used pre-produced videos. Only 5.5% conducted real-time interactive lessons. The fact that a relatively small number of teachers used the real-time teaching method shows that online teaching during the COVID-19 crisis focused on knowledge transfer. The advantages of online classes, such as personalized instruction or various interaction techniques, have not been much utilized.

The KERIS survey shows only that half of the parents were satisfied with distance education. Among primary school parents, 54% were satisfied, and 48% for secondary school parents. About 80% of primary school parents responded that they helped with their children's learning while only about 42% of secondary school parents did. This reflects how elementary school parents place a high priority on helping their children at home. The academic achievement gap among students seems

[2]Footnote 1.

[3]The KERIS survey was conducted nationwide from 29 July to 1 August 2020, right after the first semester. A total of 857,389 people participated in the survey including 51,021 teachers; 213,012 primary school students; 212,434 secondary school students; 213,012 primary school parents; and 167,910 secondary school parents.

[4]The GIE survey was conducted on 11–16 June 2020 with 28,445 teachers; 433,591 parents; and 200,085 students in Gyeonggi-do, the largest province in the Republic of Korea.

to have widened, as indicated by 79% of the teachers in the KERIS survey who attribute differences in the students' capability for self-directed learning (64.92%), parental support (13.86%), and difficulties in communication between the teacher and the student (11.6%) as possible reasons. At a focus group interview with teachers in the GIE survey, a high school teacher talked about the results of the schoolwide semester final examination.

> We did not have the normal distribution of the student's scores. Instead, the final exam result showed a reverse pattern: U-shaped. Analyses showed that students who are good at self-directed learning repeat learning with the materials uploaded by the teacher; thus, they learn thoroughly.… There are almost no students who scored between the 40 s and the 70 s [out of 100 points; above 60 is considered a passing score] while the number of students with scores in the 20 s increased significantly. (Baek and Jung 2020, p. 37)

As most countries focused on the urgent matter of containing the virus to prevent a health care system failure and boost businesses and the economy, the long-term consequences of school closures seemed to be a less urgent issue. However, it is a serious agenda in the long run. Above all, it is certain that school closures will have a long-term impact on students' mental health and psychological stability (Lee 2020; Radwan et al. 2020). The disruption of schooling has a lifetime impact on personal income and causes a decline in gross domestic product. Hanushek and Woessmann (2020) predicted that the learning loss caused by the school closures in the first half of 2020 might result in "something on the order of 3% lower career earnings" (Hanushek and Woessmann 2020, p. 6) for the typical current student. This economic loss is undoubtedly more significant for low-achieving students who lack the spontaneous motivation to learn, and for students from disadvantaged households who do not have enough direct support from their family members.

It was predicted that schools had returned to 2019 performance levels soon after September 2020. However, that did not happen. The long-term effects of school closures will accumulate until schools return to their pre-epidemic state. The pandemic exacerbates the existing inequality (Blundell et al. 2020; Lancker and Parolin 2020). Hanushek and Woessmann argue, "the future impact of past and future learning losses need to be considered when it comes to the design of mixed in-person and home learning and when classes are potentially cancelled again locally or regionally due to newly occurring infections" (Hanushek and Woessmann 2020, p. 12).

5.3 Ruptured

In a landmark UNESCO report, *Learning to Be*, Faure et al. (1972) report that "[F]or the first time in history, education is now engaged in preparing (people) for a type of society that does not yet exist. The change can be easily explained if the relative stability of past societies is compared with the accelerated development of the contemporary world. At a time when the mission of education should be to train 'unknown children for an unknown world', the force of circumstances demands that

educationists do some hard thinking, and that in so doing they shape the future" (Faure et al. 1972, p. 13).

Compared to the Spanish flu in the 1920s, we can continue many activities during the COVID-19 pandemic thanks to new technologies that were nonexistent a century ago. The digital transformation of contemporary society is at the heart of this technological development. At the same time, technological development is a source of instability in education, as the Faure et al. (1972) report succinctly points out. The ongoing fourth industrial revolution or Industry 4.0, along with artificial intelligence technology, is not an exception. Development in technology brings about a profound challenge in education. I would like to specifically dwell on two facets of such a challenge.

5.3.1 An Institutionalized Education System Is Not Enough

The Faure report carefully examines the changes the world would be faced with in the latter half of the twentieth century. It points out that the pace of the development of new technologies creates challenging conditions for the education system. The report exemplifies the decreasing time gap between discovering a scientific principle and applying it on a large scale. There was a difference of 112 years between discovering the principle of photography in 1727 and its practical application in 1839. Compare this with the scientific discovery of the solar cell in 1953 and its actual production today of only 2 years. The same goes for advances in the speed of human travel. From walking speed for hundreds of thousands of years, humans by the end of the nineteenth century could travel at a speed of 140 km per hour thanks to automobiles. In the mid-twentieth century, jets made it possible to move ten times faster than a car. In the early 1970s, astronauts traveled at a speed of 40,000 km per hour.

Therefore, the Faure report argues that it is impossible to train humans for the fast-changing world with only the institutionalized education system. Merely expanding school education is not enough to prepare for the future. The report recommends 21 principles for educational reform, the first of which is "Every individual must be in a position to keep learning throughout his life. The idea of lifelong education is the keystone of the learning society" (Faure et al. 1972, p. 181). It highlights the idea of the learning society up front.

In 1996, UNESCO put forward lifelong learning instead of lifelong education with the report *Learning: The Treasure Within* (Delors et al. 1996). Since then, 25 out of 28 UNESCO documents and/or publications include "lifelong learning" in their titles (Lee and Jan 2018, p. 378). Lifelong learning became a slogan of the new era. The Delors Report stresses the four types of learnings to prepare for the twenty-first century: (i) learning to know, (ii) learning to do, (iii) learning to be, and (iv) learning to live together.

Alheit and Dausien (2002) diagnose that lifelong learning since the 1990s has served as a signifier for restructuring the education system. They identify changes in the concept of work in a postindustrial society, changes in the role of knowledge in

an information society, functional limitations of existing educational institutions, risk society, and reflective modernity as comprising the background of lifelong learning. Lifelong learning is the keystone for deciphering the wider social change and educational policy response. Lifelong learning is the driving force to restructure the school-centered education system. In addition to formal learning in schools, lifelong learning encompasses nonformal learning and informal learning.

Lifelong learning has been much criticized because it promotes the commercialization of knowledge while depreciating the value of public education. However, lifelong learning has certainly expanded our understanding of learning as something that happens in much broader areas of life than in a formal school setting. The concept of lifelong learning makes "nonformal, informal, and self-directed learning… visible as legitimate sites for learning" (Merriam and Baumgartner 2020, p. 77).

5.3.2 The First and Second Education Revolutions

Collins and Halverson (2018) call the transition from school-centered education to lifelong learning as the second educational revolution. They divide the education system into three distinct eras: (i) the apprenticeship era, (ii) the universal schooling era, and (iii) the new era of education for lifelong learning. The first educational revolution was the transition from apprenticeship to universal schooling. While the first educational revolution was made possible by Industry 4.0, technological development plays a vital role in the second educational revolution. They present eight dimensions of the two educational revolutions. Each dimension shows how the school-centered education system is ruptured in the societal transition to lifelong learning:

(i) First, responsibility for education is shifting from parents to the state, then back to parents and individuals. Education is customized to individual interests, needs, and abilities using ICT in the lifelong learning era.
(ii) Second, what people expect of education has shifted from social reproduction, to success of all, then to individual choice.
(iii) Third, the content has changed from practical skills to academic knowledge, then to learning how to learn.
(iv) Fourth, pedagogy has also changed from apprenticeship to didacticism, then to interaction. In lifelong learning, individualized interactions between instructors and learners and between learners and learners are essential.
(v) Fifth, assessing educational outcomes has shifted from observation to standardized tests, then to embedded assessment. As computer-assisted learning increases in the era of lifelong learning, the learner's achievement level is immediately confirmed and prescribed accordingly.
(vi) Sixth, the location of education has moved from home to school, and now to anywhere. The school's monopoly on education is crumbling in the era

of lifelong learning. The knowledge and information necessary for learning can now be obtained anywhere due to the rapid development of ICT.

(vii) Seventh, the character of educational culture has also changed from adult to peer, then to mixed-age. With the advent of lifelong learning, anyone can learn anytime and anywhere, forming an educational culture of groups consisting of varied ages and generations.

(viii) Eighth, the educational relationship has changed from a personal bond with familiar figures such as parents, relatives, or villagers to authoritative figures such as teachers, then to computer-mediated interaction. As computer-aided education increases, educational relationships among those who share interests and needs are getting based on cooperation that is not face-to-face (Collins and Halverson 2018, pp. 85–96).

As the first educational revolution did not wholly remove apprenticeship, schools will also not disappear in the transition to the lifelong learning era. However, schools cannot but change intrinsically. It is possible that a yet-unknown system will emerge sooner or later. This will undoubtedly depend on digital technology. Governance over the education system will also change as learning ubiquitously spreads throughout life and society. The concept of the school district shows the current state of educational governance. A new one will be different, as the discourse of lifelong learning no longer equates education with schooling.

5.4 Conclusions

Every crisis makes existing problems worse while bringing up new challenges. The reports by the United Nations and Save the Children on COVID-19's impact on education point out that school education was already facing very formidable problems even before the pandemic (United Nations 2020; Wagner and Warren 2020). More than 258 million children were out of school, which is about one in six school-age population worldwide. Due to the pandemic, 8.5 million more students are expected to drop out.

The new challenge is to figure out how to take advantage of the crisis response toward realization of the learning society. The COVID-19 pandemic is a significant catalyst for people to think about what a learning society looks like. The widespread use of digital technology made the new normal in education possible despite some problems. In countries with advanced economies and technologies, digital transformation in education is occurring very quickly. A variety of local facilities and resources, not schools, were used for learning, such as "village learning circles" (Zacharia 2020) in India; and the "community hubs initiative" in San Francisco (CBS SF 2020). These are examples of policy responses to the crisis.

Holford and Jarvis (2000) classify the learning society discourse into four main versions: (i) futuristic, (ii) reflexive, (iii) consumer, and (iv) government-planned. They see the first version, the futuristic society, as an ideal learning society that

is "a modern fulfillment of the Athenian ideal, made possible not by slavery but by modern machine" (Holford and Jarvis 2000, p. 644). It promotes the idea of extending public-funded education in every corner of the society beyond the school system to help everyone at every life stage gain access to learning to fulfill oneself. However, this version of the learning society is far from realization due to financial constraints.

At the moment, the learning society cannot but remain futuristic. The second version, the reflexive learning society, is where learning is treated as a kind of must-do thing to keep oneself abreast with the rapidly changing (post)modern world. The learning society in this version is not something for the future but what we have to deal with here and now in everyday life. The third version, the learning society as a consumer society, depicts the marketplace where information, knowledge, educational programs, and even traditional degrees can be consumed privately. Traditional schools and educational institutes are one of many providers in this widening market. Holford and Jarvis specify that the second and the third versions of the learning society are not designed by legislation, policy, or government financing, but that "it has simply arrived" (Holford and Jarvis 2000, p. 649). I consider these two versions of the learning society as spreading faster and wider due to the rapid technological development.

The fourth version of the learning society is where a government actively plans to stimulate and control learning in the society. Holford and Jarvis see this version as "the 'third way' to learning society" (Holford and Jarvis 2000, p. 649). The European Union has promoted this version of the learning society since the 1990s. Recently, the United Nations' Sustainable Development Goals (SDGs) have also embraced this type of learning society. The Incheon Declaration, an educational version of the SDGs, put up a slogan, Towards Inclusive and Equitable Quality Education and Lifelong Learning for All (UNESCO 2015). Many national governments around the globe take up this version as well. Every 5 years, the Ministry of Education of the Republic of Korea renews the Basic Lifelong Education Development Plan as required by the Lifelong Education Act to construct a learning society.

COVID-19 provides an opportunity to make creative and imaginative policy proposals, which can accelerate the realization of the learning society. Two years before the publication of the Faure report, Illich (1970) defined the components of a good education system. Though his idea carries important aspects of lifelong learning, it was probably considered utopian back then. In closing this chapter, I would like to invite the reader to contemplate on the words of Illich as we are in the middle of the second educational revolution toward the era of lifelong learning:

> A good educational system should have three purposes: it should provide all who want to learn with access to available resources at any time in their lives; empower all who want to share what they know to find those who want to learn it from them; and, finally, furnish all who want to present an issue to the public with the opportunity to make their challenge known. Such a system would require the application of constitutional guarantees to education. Learners should not be forced to submit to an obligatory curriculum, or to discrimination based on whether they possess a certificate or a diploma. Nor should the public be forced to support, through a regressive taxation, a huge professional apparatus of educators and buildings which in fact restricts the public's chances for learning to the services the profession is willing to

> put on the market. It should use modern technology to make free speech, free assembly, and a free press truly universal and, therefore, fully educational. (Illich 1970, p. 91)

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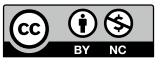
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Chapter 6
Approaches to Improving Teacher Quality and Effectiveness: What Works?



Clarissa Isabelle Liboro Delgado, Elizabeth Eder Zobel, and Margarita Liboro Delgado

Abbreviations

COVID-19	coronavirus disease
DepEd	Department of Education
HMO	health maintenance organization
ICT	information and communication technology
LAC	learning action cells
MIT	Massachusetts Institute of Technology
PISA	Programme for International Student Assessment
RCT	randomized control trial
SAS	Sa Aklat Sisikat Foundation, Inc
TaRL	Teaching at the Right Level
TFP	Teach for the Philippines

6.1 Who Are We?

Over the past 2 decades, Teach for the Philippines (TFP) has developed a multicomponent intervention strategy designed to improve public school teacher

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quality and effectiveness. TFP is a nongovernment organization established in 2012, following its work with the Sa Aklat Sisikat Foundation (SAS), which was formed in 1999. SAS started with a single-component grade 4 reading program that focused primarily on teacher training in functional literacy. The foundation later expanded its offering to include management training for school principals as part of efforts to foster enabling environments for teachers to implement progressive methodologies.

The SAS Foundation demonstrated a "statistically significant, positive impact" on students' functional literacy immediately, according to a 2009 randomized control trial (RCT) on the SAS reading program in Tarlac province conducted by the Abdul Latif Jameel Poverty Action Lab of the Massachusetts Institute of Technology (Linden et al. 2013). The survey affirmed that the reading program had lasting effects in many cases from 30 days to 1 year after the intervention. However, despite strong evidence supporting its effectiveness, SAS was not replicated nationally, as the public school system does not necessarily always adopt evidence-based strategies to increase learning outcomes. Moreover, because of the high turnover of education secretaries in the Philippines, the system's capacity to deliver a consistent reform agenda for generations of students is hindered. In the absence of a sustained national agenda, the system devolves its accountability to the simplest and easiest metric: access to education. In the process, it disregards the more urgent need to focus on student learning outcomes.

Achieving the long-term goals of improving the quality and relevance of an education agenda requires coherent policies sustained over considerable time. Given these circumstances, there was a need, in our view, to re-examine the program design of SAS. While the work of SAS had initially focused on increasing government teachers' capabilities, we understood the need to evolve from a single-component intervention to a multicomponent model that would deliver systemic change. "Multicomponent" is defined as including interventions that address both access to education as well as improved delivery in education services. It was with this purpose in mind that TFP was established.[1]

[1]To generate broader systemic changes, TFP works closely with policy makers, specifically the Department of Education (DepEd), under which the Philippine public school system falls. The DepEd secretary has broad authority to shape the public school system's reform agenda, which extends to the language of instruction, minimum required competencies, and curriculum design. Ideally, the education secretary serves concurrently with the administration in office for a 6-year term. Historically, however, the average term of a secretary of education in the Philippines is 9 months. In TFP's 21 years of involvement in public education, it has worked with 10 education secretaries (Delgado 2018). The notable exceptions to this are Armin Luistro (2010–2016), who served under President Benigno Aquino III, and the current Leonor Briones under President Rodrigo Roa Duterte (2016 to the present).

6.1.1 Core Programs

Teach for the Philippines offers a 2-year leadership development program aimed at developing young Filipinos passionate about nation building through education into teachers who can significantly improve student learning outcomes, as well as leaders who can spark positive changes in public school communities across the Philippines. The unique TFP model constitutes three core programs: Teacher Fellows, Teacher Leaders, and Ambassadors. Teacher Fellows and Teacher Leaders work inside the classroom, while the Ambassadors work with policy makers. This reinforces TFP's whole-system approach to quality learning that stresses the importance of engagement within and outside a classroom's four walls.

Both the Teacher Fellow and Teacher Leader programs introduce progressive pedagogy and inquiry-based teacher training methods to increase the quality of teaching. We select, train, and mentor both new teachers (Fellows) and tenured government teachers (Leaders) with years of experience. We work with both cohorts concurrently during the 2-year structured program. Each teacher receives 400–600 h of training and personalized coaching tailored to their own and their community's particular circumstances. While Teacher Fellows may not have the experience of Teacher Leaders, they bring new energy and fresh perspective to the school system.

The Ambassador Program invites Teacher Fellows who have completed the program to work directly with policy makers. This program was developed to give our teachers a pathway to channel their efforts toward system-wide changes. We train our Ambassadors in policy and program management at the Asian Institute of Management, then place these Ambassadors in existing vacancies throughout the local and national government. Through the Ambassador Program, young teachers are encouraged to share their recent experiences on the ground, which in turn help to inform education policy. By doing so, we also hope to narrow the gap that frequently exists between policy development and its successful implementation due to the failure to identify obstacles on the ground.

6.1.2 Living in Poverty Is Living with Chronic Stress

Initially, our teacher training curriculum focused mainly on the cognitive domain of learning. However, we soon recognized that the affective domain was equally significant. In 2013, we explored the primary impact of poverty and chronic socioemotional stress on learning outcomes, as well as its secondary effect on teachers. A growing body of research supports this intersectional view of student development and school health (Stafford-Brizard 2016). Struggling schools often expose the underlying effects of the conditions of recurring generational poverty. Often, this chronic stress or *trauma* does not allow children (or their parents) a sense of well-being and emotional regulation. Trauma adds to the regular stressors in education that can affect competent learning, i.e., how teachers teach and how

students learn. Understanding these circumstances, we instituted trauma management and psychosocial first aid as part of our teacher training curricula. Though more research is required, our internal evaluations indicate that our focus on trauma and the affective domain of learning has enhanced our students' cognitive learning.[2]

6.2 What Perspectives Do We Offer?

Teach for the Philippines embraces the idea that all our children can and should expect excellent education. We engage in global conversations around enhancing the quality of the education workforce and ensuring its effectiveness. Beyond focusing on learning outcomes, we also anchor our definition of "effectiveness" on the notions of equity and cultural contextualization.

6.2.1 Practitioner Perspective

The global education discourse stands to benefit from hearing *directly* from teachers, principals, and nongovernment organizations in order to develop a complete understanding of theory, policy, data, and their effects on the education of our future generations. Through global engagement, we often discover that other countries may be encountering challenges similar to those we face in the Philippines. This provides a platform on which to discuss and share solutions that are proving effective.

6.2.2 Indigenizing Education

As enriching as the global discourse may be, it must nevertheless be balanced by the contexts we face within the Philippines. It is vital to remain mindful of developing culturally responsive approaches and identifying hyperlocal solutions—to indigenize.[3] We recognize the imperative to identify and utilize our histories and cultures to create and drive an excellent and relevant education for future generations. Just as a one-size-fits-all solution does not work within an effective classroom, it should not apply when developing an education workforce that consistently improves learning outcomes. TFP engages in patient and repetitive

[2] In 2017, TFP ran an early-stage RCT to assess whether our trauma-informed teacher development curricula improved student outcomes. The RCT confirmed that the TFP curricula produce teachers who demonstrate statistically significant increases in numeracy and literacy outcomes in students (Linden et al. 2017). Given the scope of our teachers' involvement in community building, our next research focus is on the impact on learning of psychosocial and participatory community projects.

[3] "Indigenization" is a popular, postcolonial term in social work. It stems from the idea that the developing world suffered both political *and academic* colonialism.

cycles of action, reflection, and dialogue to find a solution that considers several factors, including the Filipinos' sociocultural biases and the precolonization and postcolonization history of education in the Philippines.

Through complementary skills training, TFP-trained teachers implement required community engagement projects within their 2-year affiliation with TFP. These socially oriented projects give teachers the flexibility and opportunity to integrate current social and cultural challenges within their communities to magnify the impact of their efforts.

6.3 Which Strategies Are Working?

The purpose of education is to prepare human beings who can successfully adapt to a future that is increasingly in flux. This holds especially true in times of massive and unexpected disruption, where the response to adversity is of key significance to future outcomes. Research suggests that teachers have the highest impact on student performance (Opper 2019); therefore, it would make sense to invest in our teachers.

We have identified five critical strategies to improve education workforce quality and effectiveness, namely, (i) expanding the definition of, while broadening the entry pathways, to the "education workforce"; (ii) increasing school-based coaching for teachers; (iii) reinforcing the importance of education workforce well-being; (iv) promoting participant ownership of data; and (v) involving teachers in discussions on education policy. These strategies apply to what may be described as "normal" situations as well as extraordinary circumstances, such as the current coronavirus disease (COVID-19) pandemic. While there is no denying the magnitude of disruption that COVID-19 has wrought upon society, the pandemic presents an opportunity to reevaluate and possibly redesign our education system for what lies ahead. In response, TFP has finetuned its strategies to address the immediate impact of COVID-19 on learning. We will continue to adjust these strategies to be relevant in a postpandemic world (see section IV below). Our five approaches contribute directly to the building of learning societies by making traditional education systems more inclusive of nontraditional actors. In the context of rapid changes and advancements, TFP's participants are essential to keep education relevant.

6.3.1 Expand the Definition of "Education Workforce"

In 2016, the World Bank performed a simple regression analysis throughout the Philippines and found that teachers' subject knowledge performance was *not necessarily associated with their education levels nor their length of experience in the classroom* (World Bank 2016b). And yet, to become a government teacher in the Philippines, one must complete 18 credits at an accredited teacher education institute and pass a professional licensure examination for teachers. Though some

argue that teacher licensure standards elevate a teachers' image and enhance respect for the teaching profession (Riney et al. 2006), around the world, the connection between succeeding in the licensure examinations and effective teaching is unclear (Schuls and Trivitt 2013, Allen 2010). In the Philippines, we should consider whether the traditional pathways into the profession of education are consequential to gaining a more skilled talent pool.

Teach for the Philippines believes that the Philippines needs to dedicate resources to developing alternative paths for nontraditional specialists to enter the field of education. Our Teacher Fellows program encourages young Filipino student leaders with education degrees *and* those who come from disciplines *outside education* to consider teaching in public schools. Through rigorous preservice training, we ensure that our Fellows secure the requisite credits and license to teach. Once classes begin, we assign each of them to an instructional coach for over 400 h of continuous in-service training. The research supports our experience, showing that trained teacher-coaches who pass on pedagogical skills are critical to improving student learning outcomes (Mukeredzi et al. 2015). Further, there is the case of Sierra Leone, where programs providing alternative pathways to qualification for unlicensed teachers and training them *in school* have been shown to improve student learning and aspirations (Crisp, Safford, and Wolfenden 2017). We can increase the quality of talent that we have in our schools by expanding the pathways into the profession of education.

6.3.2 Increase School-Based Coaching

Although school enrollment has increased significantly worldwide in recent decades, learning levels have remained stubbornly low. In the Philippines, poor learning outcomes persist even as teachers' and students' absenteeism levels remain low (World Bank 2016a). The situation is dire: the Philippines placed 79th out of 79 countries in the 2018 Programme for International Student Assessment survey (OECD 2019) and 58th of 58 in the most recent Trends in International Mathematics and Science Study (Mullis et al. 2020),[4] which shows that *students and teachers are going to school, but students are not learning.* One way to support the development and effectiveness of teachers is to provide them with structured coaching. Through TFP's coaches, TFP helps with individual competency-based student assessments and provides peer feedback, enabling teachers to clearly identify critical areas they need to improve on to meet students at their level.

[4]Even among peers in the region, the Philippines lags behind. Published in December 2020, the 2019 Southeast Asia Primary Learning Metrics (SEA-PLM) showed that only 29% of grade 5 Filipino students are at the level where they are able to "read a range of everyday texts, such as simple narratives and personal opinions, and begin to engage with their meaning" (SEAMEO and UNICEF 2020).

To achieve this, TFP uses the Teaching at the Right Level (TaRL)[5] methodology, which is based on (i) dividing children based on learning needs rather than age or grade; (ii) dedicating time to foundational skills rather than focusing mainly on the curriculum; and (iii) frequently assessing student performance, rather than relying only on end-of-year examinations (Banerjee et al. 2016). TFP's coaches help our teachers implement TaRL; however, teachers may access similar coaching strategies in *group settings* through professional learning communities like learning action cells.[6] There is the perception that recruitment and training of high-quality talent and individualized coaching for teachers are too challenging, too time-intensive, and too expensive for underserved communities. This must change. Education leaders need to reconsider their priorities. Based on our experience, school-based coaching should be one such priority.

6.3.3 Acknowledge the Importance of Teacher Well-Being

The well-being of individuals tasked with improving student learning outcomes is critical, and yet it is often overlooked. A teacher's stress levels influence those of their students and co-teachers and are thereby relevant to any conversation on a teacher's impact on learning (Cox, Solomon, and Parris 2018). At TFP, we focus on the educators' well-being, which forms an essential element in our trauma-based practice. We recognize that teachers cannot deliver learning from an empty emotional well. Likewise, administrators cannot support teachers from an empty well. Moreover, parents or guardians cannot nourish (their children or the school) from empty wells. TFP has a full-time specialist assigned to provide psychosocial support, resilience, and prosocial relationship training to our teachers. We have made additional investments by partnering with a professional network of counselors, psychotherapists, and psychiatrists. A focus on workforce well-being is critical in constructing the necessary socioemotional building blocks for our children.

6.3.4 Challenge the Framework of Evaluations and Promote Participant Ownership of Data

With the ongoing COVID-19 pandemic, we have the opportunity now, as never before, to rethink our framework for program evaluations. Evaluative work can and should answer critical questions about how historical and policy decisions have

[5]TaRL is an evidence-based educational approach that helps children develop basic reading and math skills.

[6]DepEd defines a learning action cell as a group of teachers engaged in collaborative learning sessions to solve challenges encountered in school, facilitated by the school head or moderator (Department of Education 2016).

affected populations, the effect of program strategy on underlying system drivers, and how entangled hyperlocal cultural contexts are in the structural conditions of our work (Center for Evaluation Innovation et al. 2017). *Let us build a data-driven post-COVID-19 future on equitable evaluation.* Aligning evaluation practices with an equity approach is critical if we hope to build back better our education systems. Evaluation teams must move beyond cultural diversity to diversity in disciplines, beliefs, and lived experiences. They must seek the cultural appropriateness and validity of their evaluation methods. The evaluation design must be capable of revealing system-level drivers of inequity in the present and historical context.

The degree to which communities have the power to shape and own how evaluations are conducted is crucial (Center for Evaluation Innovation et al. 2017). TFP is committed to multicultural validity and participant ownership.[7] We place equal value on stories (qualitative research) as we do on quantitative analysis. Qualitative research should be legitimized because its historical and cultural value adds critical context to the evaluation.

6.3.5 Involve Teachers in Discussions on Education Policy

The findings from our Ambassadors Program suggest that innovative disruptions to the current talent pipelines into government agencies are worth exploring. Policy makers benefit from incorporating insights from teachers and other school staff who have fresh experience on the ground. The TFP Ambassadors Program provides opportunities for former Teacher Fellows to work in government agencies as technical assistants. This, in turn, allows TFP Ambassadors to bridge the gap between policy design and the existing challenges to implementation on-the-ground. *Nihil de nobis, sine nobi*s. Nothing about us, without us.

Our TFP Ambassadors like Angela Rosal have assisted in drafting significant bills with the potential to impact the education of 110 million Filipinos. Drawing on her experience as a Teacher Fellow, Rosal, while working in the office of former Senator Bam Aquino, drafted the *Masustansyang Pagkain Para sa Batang Pilipino Act,* which requests and appropriates funds for a national feeding program targeted at malnourished children in all public daycares, kindergartens, and elementary schools. On 20 March 2018, the Act was passed into law (Republic Act No. 11037).

Our Ambassadors have also assisted in realigning national budget items in support of under-resourced rural communities. Over 6 years, five successive Ambassadors worked in Del Carmen, Siargao, a fifth-class municipality in Eastern Mindanao. In 2018, their combined efforts resulted in the fishing community being awarded 137

[7]Multicultural validity is the cultural accuracy of one's understanding and judgments, and their consequences across communities. Orienting TFP's evaluations to program stakeholders' needs rather than that of funding agencies requires that we include stakeholders in building a consensus on the results and consequent plans to improve.

million pesos (₱)[8] ($2.8M) from the national budget—the highest funded project for a local government unit in the Philippines. The municipal mayor of Del Carmen at the time, Alfredo Coro, said, "Our focus on education reforms has been acknowledged in the provincial, regional, and national levels since 2014, when we started seeing the outcomes of our initiatives and sustained the results over time."[9]

Since its inception, close to 70% of our Teacher Fellows have applied to the Ambassadors Program, of which 33% have pursued full-time employment in public service.[10] Their work has been regional and national, including the Cagayan de Oro City Education Road Map 2030 in Mindanao; the nationwide management and development of DepEd self-learning modules; professional development and career progression planning for teachers in the DepEd Central Office; and preparations for the national Programme for International Student Assessment Results (PISA) 2021 Field Trials. Offering teachers a seat at the decision-making table contributes relevant insights to the discussion and assists in the appropriate distribution of resources.

6.4 A Note on Coronavirus Disease Response

In the wake of the disruption to education due to COVID-19, most parts of the world have shifted to online learning, while some countries have adopted a hybrid of online and in-person instruction. However, a presidential order (Department of Education 2020) prohibits face-to-face instruction throughout the Philippines until a COVID-19 vaccine is available, and a certain level of herd immunity has been achieved. This has prompted DepEd to establish a two-option strategy to encourage learning continuity. Students who have access to the internet and information and communication technology (ICT) devices will receive instruction on digital platforms. Meanwhile, registered students who indicated that they do not have access to the internet or ICT devices will receive printed modules and distanced instruction through radio and television. There is an alarming disparity in the Philippines between those with access to the internet and those who do not. Only 55% of Filipinos have access to the internet, while only 26% of public schools have internet access (Jones 2019). At TFP, we are retraining our teachers for distance instruction. We also understand that it is essential to offer support for learning continuity at this time, and we have deployed our teachers to the communities to serve. Their proximity to the students and parents who may need support is critical. In May 2020, we successfully conducted

[8] $1 = ₱48.09 as of 6 January 2021. These are in support of two local government programs: a multispecies hatchery project of the Bureau of Fisheries and Aquatic Resources (a ₱40 million project or $830,000); and the Siargao Climate Field School for Farmers and Fisherfolks (₱97 million project or $2M).

[9] Personal communication.

[10] As of September 2020, Teacher Fellows continue full-time across the following offices: DepEd Central Office, DepEd, Biñan City; Commission on Higher Education; local governments of Cagayan de Oro, Lucena, Marikina, and Navotas; League of Cities of the Philippines; National Youth Commission; and Office of the Vice President.

our first All-Virtual and Summer Institute Teacher Training for first- and second-year teachers.

The responses of TFP to the limitations created by COVID-19 encompass the following:

(i) **Acute Response**

- Improving and ensuring connectivity across teams, which includes maximizing online productivity through tools such as Zoom Pro accounts
- Providing aid for graduating Teachers and Alumni Ambassadors stranded in their placement sites
- Implementing COVID-19 mitigating measures, including testing, purchase of personal protective equipment for all employees, private health maintenance organization coverage for deployed field personnel

(ii) **Strategic Response**

- Identifying problems correctly through rapid assessment community surveys
- Pivoting modes of delivery through the migration of all teacher training modules and delivery to virtual or remote delivery, focusing on synchronous and asynchronous modes, online and offline channels
- Commitment to measurement and replicating only what works
- Exploring access challenges

6.5 Conclusions

It is a sad reality that despite teachers' best efforts, students worldwide do not have equal access to quality education. Today, we face aggravating circumstances—an unprecedented health crisis that has taken a toll on past efforts and threatens to generate insurmountable inequities. The students who were already disadvantaged before COVID-19 are now even more crucially and cruelly impacted. Without immediate and long-lasting action, the most underserved children will continually fall further behind, compounded by other preexisting challenges such as poverty, gender, disability, geography, and ethnicity.

The COVID-19 crisis, nevertheless, comes with opportunities. It opens the door for us to challenge and reframe education systems to become more inclusive and equitable; it also underlines the increasing need to redefine future learning societies beyond the classroom structure and incorporate hybrid methods of education engagement. Equity in education in the Philippines is possible by broadening the pathways into the teaching profession, increasing school-based coaching, prioritizing the well-being of our education workforce, promoting participant data ownership, and ultimately, by allowing teachers to participate in policy decision-making processes.

Education reform is the result of the work of all stakeholders, and TFP is committed to being part of this shared effort.

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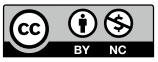
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Part III
Future-Proofing Postbasic Education

Chapter 7
Resilience and Growth: A University's Response for Future-Proofing Graduates and Careers



Miriam Jacqueline Green, Erik Johan Hertzman, and McRhon Banderlipe

Abbreviations

AYCL	all you can learn
CET	continuing education and training
CFG	Centre for Future-Ready Graduates
DYOM	design your own module
L3	Lifelong Learners program
NOC	NUS Overseas Colleges
NUS	National University of Singapore
R&G	Resiliency and Growth Initiative
SCALE	School of Continuing and Lifelong Education

7.1 Introduction

With a population of around 5.6 million, Singapore is affectionately referred to as the "little red dot" because of the way it is represented on many maps. Singapore became an independent country in 1965 and has an open and stable economy focused on manufacturing, trade, and business and financial services. Singapore's highly

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automated port is one of the busiest in the world. As a small nation integrated into and dependent on the international economy, Singapore has achieved remarkable success. Life expectancy, literacy, and gross domestic product (GDP) per capita are all among the highest in the world.[1] Without natural resources to drive economic growth, Singapore has stressed the need for education and human capital development since gaining independence. Singapore's education system produced 8,000 polytechnic and university graduates in 1985, rising to 25,800 in 2007.[2] By the early 2010s, investment in education had reached an average of 26.9% of total annual government expenditures, and in 2018 the gross tertiary education enrollment ratio stood at 88.9%.[3]

According to the Agency for Science, Technology and Research (2019), Singapore's transformation to a knowledge-based economy requires significant investments in expanding research, innovation, and enterprise activities—pillars that are essential to sustain the country's long-term economic growth. In 2018, national expenditure on research and development investments reached S$9.3 billion (US$6.8 billion[4]), impacting 49,704 jobs and inviting more collaboration among universities and research institutes, as well as the public and private sectors (National Research Foundation, Agency for Science, Technology and Research 2018).

Singapore has recognized the need for its workforce to be able to adapt and respond to the ways in which globalization and technology have changed the economy and work. Government, private industry, and educational institutions work together to secure the country's future. One of the ways Singapore has done this is through SkillsFuture. This framework helps to ensure that individuals are given opportunities to acquire the skills necessary for successful careers and career changes, and that industries have a steady pipeline of highly qualified talent.

7.2 The National University of Singapore

Started as a medical school in 1905, the National University of Singapore (NUS) is an active player in creating and harnessing knowledge to contribute to national development and progress. Singapore's open economy and multiracial society propelled NUS to embrace internationalization, and to adopt globalized curricula and

[1] Singapore's life expectancy in 2019 was 83.6 years, compared to Asia (73.6), Europe and North America (78.7), and high-income countries (81); see UN-DESA (2019) for details. The literacy rate is 97%, compared to 86.3% for the world. Mean years of schooling in Singapore has risen from 8.2 in 1999, to 9.7 in 2009, and to 11.2 years in 2019; refer to World Bank (2020). GDP per capita was over US$65,000 in 2019, slightly higher than that of the United States (Department of Statistics Singapore 2019).

[2] In 1980, only a quarter of Singaporeans aged 25–39 years had completed secondary education and above. This jumped to 96% by 2010 (Gopinathan 2015).

[3] Education expenditures during the same period averaged 3.0% of GDP; see UNESCO Institute of Statistics (2020).

[4] S$1 = US$0.73 as of 31 December 2018.

learning experiences that can compete with top-tier universities around the world. This has resulted in a number of important academic collaborations for NUS in recent years: the Duke–NUS Medical School in 2005, and Yale–NUS College in 2011.

Most importantly, these collaborations and networks have contributed to NUS' global acceptance and recognition. NUS currently ranks 1st in Asia and 11th globally in the 2021 QS World University Rankings.[5] Significantly, NUS graduates have gone on to become outstanding members of the political, legal, business, social and artistic communities in Singapore and beyond.[6]

7.2.1 The NUS Mission

The National University of Singapore strives to be a leading university, not only in Asia, but in the world (see Box 7.1). Its high-impact research advances the boundaries of knowledge and contributes to the betterment of society. Its transformative education encourages independent thinking and nurtures global citizens who will make a difference. NUS educates its students not just for today, but for the future.

Box 7.1 The National University of Singapore, Mission and Vision Statement

Vision: A leading global university shaping the future
Mission: To educate, inspire and transform
Values: innovation, resilience, excellence, respect, integrity

The National University of Singapore aspires to be a vital community of academics, researchers, staff, students and alumni working together in a spirit of innovation and enterprise for a better world.

Our singular focus on talent will be the cornerstone of a truly great university that is dedicated to quality education, influential research, and visionary enterprise, in service of country and society.

Source National University of Singapore. Vision, mission, values. http://www.nus.edu.sg/about.

[5] *Source* QS Top Universities. QS world university rankings 2021. https://www.topuniversities.com/university-rankings/world-university-rankings/2021. Accessed 9 November 2020.

[6] Following the July 2020 elections, NUS alumni now comprise half of Singapore's 14th Parliament (45 members) (NUS 2020a).

7.2.2 Holistic Education and Lifelong Learning to Prepare Students for the Future

The university prepares its students by promoting interdisciplinarity, inculcating critical thinking skills, encouraging experiential learning, and providing career guidance and support.

The university recognizes that education does not end with undergraduate study. In a world of rapidly evolving technology, shifting markets and global interconnectedness, learning must continue beyond one's early 20s—not only for the benefit of the individual learner, but so that collectively, people can address complex problems like climate change and global health, and understand and meet market demands. At NUS we are building a culture of lifelong learning.[7] Enrollment is now valid for 20 years from the point of undergraduate admission, making alumni automatically eligible for continuing education courses that have been curated from 17 NUS schools and faculties to keep their expertise relevant and current. Selected continuing education courses can be stacked into qualifications such as graduate diplomas, or even bachelor's or master's degrees. Short courses are available all through the year, and modular courses have intakes in August and January.

7.3 Future-Proofing Graduates

7.3.1 Preparing Undergraduates

7.3.1.1 General Education Requirements

During their first 2 years at NUS, every undergraduate must take a module in each of five "pillars" (Human Cultures, Thinking and Expression, Singapore Studies, Asking Questions, and Quantitative Reasoning), including a course in Computational Thinking. These inculcate higher-order qualities of the mind, going beyond practical know-how and skills for daily life. These requirements develop aspects of knowledge and abilities we expect of learned individuals, not just those required for specialization in a particular discipline or profession.

7.3.1.2 Interdisciplinary Studies

Singapore's former's Prime Minister Goh Chok Tong introduced the "Thinking Schools, Learning Nation" vision in 1997, with the objective of promoting a holistic

[7]NUS President Tan articulated how NUS is strengthening the lifelong learning initiatives (Tan 2020a).

learning ecosystem that includes students, teachers, parents, and industry.[8] This laid the foundation for an interdisciplinary approach to education. One of the things that came out of this was the Integrated Project Work initiative, which exposes primary school students to activities involving different disciplines such as science, mathematics, and the English language (Saravanan 2005, p. 2). This has fostered creativity and critical thinking among students.

Universities such as NUS play a key role in promoting and furthering interdisciplinary education so that learners carry this approach into their careers. In a thought piece published in *The Straits Times*, NUS President Tan Eng Chye observed that providing solutions for the complex, ill-defined, interconnected and "wicked" problems of today and the future "…requires integrating knowledge, skills and insights from different disciplines… We must now balance depth with breadth. Disciplinary rigor is still necessary, but will not be enough" (Tan 2020b).

Over the years, NUS has been inspired by an educational approach based on "*T-shaped*" competencies, the horizontal part representing breadth, and the vertical part the depth of knowledge in a specialized field; for example, entrepreneurial skills for breadth, coupled with advanced engineering expertise. However, graduates of the future need to be equipped with *multiple* abilities, so we now encourage our students to double the T, moving to "*Pi-shaped*" competencies. Given market demand, we urge students to combine a major in science, technology, engineering, or mathematics with a major in the humanities or social sciences. Training in two fields can occur in tandem, or in interdisciplinary fashion.

Starting in academic year (AY) 2021/22, students entering NUS may choose from 10 interdisciplinary degree programs.[9] Students in these programs will have two majors (*Pi-shaped* competencies), but rather than pursuing these in a traditional, parallel way, the new programs will focus on the integration of disciplines. Compared to a traditional double degree that provides deep understanding of two separate topics, the new cross-disciplinary approach will allow the students to also gain a clear understanding of the integration between the two topics. Possible pairings include economics and data science, and computing and project management. Students will take an equal number of courses in each of their two majors plus integrative projects involving both.

7.3.1.3 New Majors, Minors, and Specializations

To help prepare students for multiple career pathways and foster interdisciplinarity, NUS is expanding options for students to pursue double majors, second majors, and minors, and is creating more unrestricted elective space to explore broader interests. Recent additions to major options include a Bachelor of Science (BSc) in Data Science and Analytics, a BSc in Pharmaceutical Science, and a Bachelor of Landscape Architecture. New minors include Infrastructure Management and

[8] Saravanan (2005) detailed the curriculum review in Singapore schools to implement the vision.

[9] NUS (2020b) highlights the possible pairings of disciplines.

Table 7.1 National University of Singapore

	AY2017/18	AY2018/19	AY2019/20	AY2020/21
Double Major Programs	32	86	89	90
Minor Programs	63	94	108	105

The university offers some degree programs with overseas institutions
AY = academic year
Source Office of Research and Education Analytics, National University of Singapore

Finance, and Information Security. Specializations include Digitalization of Urban Infrastructure and Quantum Technologies. NUS also offers 70 joint, double, and concurrent degree programs with overseas institutions (Table 7.1).[10]

7.3.1.4 Self-Directed Learning

To empower students to take direct responsibility for their learning experience (an important part of lifelong learning), NUS offers courses under a concept titled Design Your Own Module (DYOM). Launched in August 2019, DYOMs can be either *edX* massive open online courses (MOOCs), or a group of at least 10 students who choose the subject and instructor for a module (instructors may come from industry). Between August 2019 and February 2020, 65 students took 92 *edX* MOOCs, and 27 groups designed and completed their own modules. DYOMs count as unrestricted electives and are graded on a "completed satisfactorily" or "completed unsatisfactorily" basis, which encourages students to step outside their field of study or comfort zone to explore other fields.[11]

7.3.1.5 Experiential Learning

Experiential learning is a critical part of preparing our undergraduates for the future. Hands-on experience clarifies a student's interests and talents, and creates valuable human and professional connections. NUS offers internships, study abroad, and opportunities to engage in entrepreneurship. More than 4,000 students participate in a global program annually; in AY2019/20 over 8,000 students had internships.

More NUS programs are making internships compulsory; however, more students *choose* to engage in an internship, even if not required. In the last 5 years, there has been a 135% increase in the number of students participating in compulsory internships. Over the same 5 years, there has been a 24% increase in the number

[10] Between AY2017/18 and AY2019/20, the proportion of *new students* entering NUS with double specializations rose from 9% to 21%, while the proportion of *enrolled students* who have double specializations rose from 15% to 29%. These figures are the most recent available and include students who graduated in AY2019/20 (source: NUS Office of Research and Education Analytics).

[11] NUS (2020c) outlines how students can participate in the DYOM initiative either by MOOCs, or supervised group work.

of students completing noncompulsory internships. The students have interned with multinational corporations like Google, AstraZeneca, ExxonMobil, and Visa; and with local employers such as DBS Bank and Grab (a Singaporean technology company with ride-sharing and delivery services).

Many NUS students choose to participate in a global learning experience. In AY2019/20, 2,205 NUS students studied at one of 300 partner universities in more than 40 countries. In the previous year, more than 5,500 NUS students had an international learning experience, whether study abroad or a shorter program or trip.

Finally, the university offers its students the chance to engage in and learn about entrepreneurship through the NUS Overseas Colleges (NOC) program. A unique take on study abroad, NOC offers a combination of full-time start-up internships and part-time academic study in entrepreneurial hubs such as Silicon Valley, Israel, Shanghai, and Toronto. More than 3,400 students and more than 1,300 companies have participated in NOC, with nearly 90% of alumni involved in innovation and enterprise at some point in their careers.

7.3.1.6 Career Guidance

The NUS Career Centre was restructured as the Centre for Future-Ready Graduates (CFG) in 2014. CFG applies a multidimensional, client-centric approach to help NUS students discover their passions, refine their skills, and demonstrate their value to employers. Beginning with the end in mind, CFG works with students from their first year to enhance their employability through a repertoire of career programs and industry-focused experiential opportunities. Students are encouraged to equip themselves with skills that are transferable across a broad range of job opportunities and to take a structured approach to explore multiple career pathways, develop people skills, build resilience, and gain relevant exposure. CFG has incorporated perspectives of employers in developing topics such as the future of jobs, employability skills, personal branding, and interview skills.

Each year, around 10,000 students participate in one of our career readiness programs or meet with a certified career advisor for personalized coaching.

Career readiness programs include the following:

(i) Career Catalyst, a credit-bearing module focusing on career planning, including self-marketing;
(ii) workshops on preparing for interviews and cultivating successful workplace traits;
(iii) the NUS Global Mentorship Program, which pairs students with internationally experienced industry professionals; and
(iv) Roots and Wings 2.0, a series of mini-modules offered in collaboration with the Department of Psychology, each of which teaches a soft skill such as resilience or collaboration.

Many CFG events give students opportunities to meet and network with potential employers. Annually, some 20,000 students connect with employers and alumni at various campus recruitment talks and career fairs.

We also use technology and web-based resources to prepare our students for their futures. New online resources such as the NUS *TalentConnect* job portal help students plan their careers and find jobs and internships. Students can upload their curriculum vitae into *TalentConnect*; these are compiled and shared with key employers.

In 2019, NUS launched *Career+*, an application that uses artificial intelligence to help students choose courses that will prepare them for their ideal jobs. The app informs students about possible careers for the academic degrees they are pursuing, recommends courses based on careers of interest, and suggests job opportunities based on the skills that students have acquired from courses they have already taken. *Career+* is also available to NUS alumni to identify NUS continuing education and training (CET) courses that will help them acquire and sharpen skills for advancing their careers.

7.3.2 Postgraduate: Enabling Continuing and Lifelong Learning

Over the past 5 years, NUS has accelerated its expansion of CET courses and its horizon for engaging with learners. As then acting Minister for Education Ong Ye Kung said at the launch of the NUS School of Continuing and Lifelong Education: "…the universities' role in education does not stop after graduation".[12]

7.3.2.1 School of Continuing and Lifelong Education

The School of Continuing and Lifelong Education (SCALE) was created to ensure a holistic approach and to unify professional development and CET efforts throughout the university. Establishing SCALE meant developing the structure to facilitate large-scale training delivery, following a three-pronged strategy to create a department that will provide the right products to benefit the right students in an operationally sustainable fashion.

SCALE's initial course offering started with the "NUS Lifelong Learners" (L3) initiative. NUS schools and departments were tasked to consider how alumni could stay relevant when their 20-year journey through the formal education system was over. NUS L3 began by offering access to select existing courses, such as individual courses in various master's programs. Three years later, and with a deeper understanding of market demand, SCALE extended course offerings to the public under the "CET 500" program. Together, the NUS L3 and CET 500 catalogs have

[12] See *The Straits Times* (2016).

grown from 534 courses at the beginning of AY2018/19 to 651 by the end of AY2019/20.

To ensure wider access to professional upgrading opportunities, SCALE is positioned to assist with training and education across broad-based and multidisciplinary subjects. Students with an interest in intermediate and advanced courses on specific subjects can then pursue deeper studies within designated schools. For example, SCALE has worked closely with industry partners and expanded to four fields of study, to meet the changing demands of national economic activity:[13]

(i) advanced manufacturing and engineering,
(ii) urban solutions and sustainability,
(iii) services and digital economy, and
(iv) health care and biomedical sciences.

Complementing the academic pathway, NUS offers an alternative nonacademic, noncredit-bearing track with the equivalents of Certificate of Competency, Professional Certificate, Advanced Certificate, and Professional Diploma.

Besides the technical proficiencies taught in these fields, CET also ensures the inculcation of skills such as business management, business agility, design thinking, and digital skills that make up the "ABCD" of the internet economy—artificial intelligence, blockchain, cloud technology, and data management.

The NUS alumni family's 312,000 members were the initial customers of NUS CET. For corporate customers, SCALE created "All-You-Can-Learn" (AYCL), a customizable training program for businesses to upskill and reskill their employees. AYCL allows partner organizations to send trainees to attend both academic and professional courses. Since the end of 2018, NUS has signed memoranda of agreement with nine clients under the AYCL program, ensuring at least 28,000 days of CET within 3 years for the staff of participating organizations.

In order to provide relevant and applicable courses, NUS works closely with employers, both within Singapore and internationally, as well as with industry associations and unions to identify skill gaps and design learning interventions. To help employers and education providers plan for the future, the Singapore Ministry of Trade and Industry has developed transformation maps for 23 industries in six strategic clusters.

7.3.2.2 Expansion of Master's Programs

In addition to the many options available to adult learners through CET programs, the university has also expanded its master's offerings. New offerings focus on upskilling and reskilling to provide growth and employment opportunities for our students.

Some of our programs permit sequential credentialing, so students can earn graduate certificates and diplomas, stacking credits that can lead to a master's. Students in the Master of Social Science (Communication) program receive a

[13] We aim to offer sequential credentialing in these four areas.

Table 7.2 Semester 1 2020 update of lifelong learning (including Resilience and Growth)

Type of course	Unique students	Enrollment
L3 modules	97	128
Professional Certificates	633	633
Executive Certificates	67	67
Total	797	828

Some master's programs, like Master of Science in Industry 4.0, offer specializations such as Additive Manufacturing, Data Mining and Interpretation, Deep Learning for Industry, Digital Supply Chain, and Internet of Things
L3 = Lifelong Learners program
Source Office of Research and Education Analytics, National University of Singapore

graduate certificate upon completion of 16 modular credits, a graduate diploma with 24 modular credits, and a master's with 40 modular credits (including a final project). This program also allows students to pause after completing the graduate certificate, and to return later to complete the master's.

Some of our new master's programs, like Master of Science (MSc) in Industry 4.0, offer specializations. Students can earn a graduate certificate in the specialization or go on for the full MSc. Specializations in MSc in Industry 4.0 include Additive Manufacturing, Data Mining and Interpretation, Deep Learning for Industry, Digital Supply Chain, and Internet of Things (see Table 7.2). Other new specializations for the master's degree programs include venture creation, data science and machine learning, forensic science, food science and human nutrition, pharmaceutical science and technology, computing, communication, economics, and petroleum projects and offshore technology. Several of these programs are offered as either full- or part-time courses.

Some specializations require completion of a consulting project, wherein a team of students work with a private, public, or nonprofit organization to create a specific industry application or solve a problem. Students are mentored by a faculty advisor and a company representative (the latter can support students with further industry connections).

Offering these new postgraduate programs is congruent with NUS' role in fulfilling Singapore's Smart Nation strategy.[14] NUS is home to the Smart Nation Research Cluster[15] established in 2016 to drive and implement strategic capabilities in data science, analytics and optimization, artificial intelligence, cybersecurity, and simulation and visualization. Furthermore, NUS has forged significant partnerships

[14]The Smart Nation Digital Government Office outlines this in a vision paper. See Smart Nation Singapore. Transforming Singapore through technology. https://www.smartnation.gov.sg/why-Smart-Nation/transforming-singapore.

[15]Further information can be found on National University of Singapore. Smart nation. http://nus.edu.sg/research/key-areas/smart-nation. See also details of the press release on Tan (2015).

with industry organizations to expand the depth and breadth of research and teaching. Some of these private sector partnerships and national-level initiatives include:

(i) AI Singapore,
(ii) Grab-NUS Artificial Intelligence Laboratory,
(iii) Lloyd's Register Foundation Institute for the Public Understanding of Risk,
(iv) NUS-Singtel Cyber Security Research and Development Laboratory, and
(v) Singapore Data Science Consortium.

7.4 Experiencing Disruption: Coronavirus Disease

Although Singapore reacted swiftly and decisively and has weathered the coronavirus disease pandemic admirably from a public health perspective, NUS, like other organizations and institutions, has been greatly affected by the crisis. We had to move to remote learning for most of spring 2020, and incorporate remote assessments. For fall 2020, all courses are offered online; only some courses are offered face-to-face under strict conditions. We are proud of the efforts expended to keep students, faculty, and staff safe.

7.4.1 The Resilience and Growth Initiative

For new graduates entering the job market in 2020, the negative economic impact has meant reduced employment opportunities. Working with government and industry, NUS launched the Resilience and Growth Initiative (R&G) to help our students and recent graduates overcome the immediate economic effects of the Coronavirus disease pandemic. R&G went from conceptualization to market in just 3 months, welcoming our first students into the initiative in September 2020.

The R&G includes the following:

(i) direct financial support, in the form of grants to our neediest NUS full-time undergraduate students (given on top of the existing regular financial aid that students receive);
(ii) an opportunity to join NUS by creating 200 full-time and 800 traineeship positions for our fresh and recent graduates[16];
(iii) increased access to continuing education through the provision of four free CET modules (stackable toward graduate or professional certifications) to all fresh graduates;
(iv) students who enroll in self-funded master's programs at NUS get 3-years interest-free fee deferment; and

[16]To date, we have established approximately 100 full-time positions at NUS for our fresh graduates and have admitted about 500 graduates to the traineeship program.

(v) funding for solutions where NUS will fund team projects that empower our graduates to have an impact on our people and our society in a postpandemic world.

The enrollment for L3 course for Semester 1 2020, including R&G students, is presented in Table 7.2.

For modular courses, R&G students represent about 30% of the total number of unique students enrolled (348) and modules taken (447). Professional certificates and executive certificates are new offerings. The enrollment is encouraging, especially with respect to the professional certificates, which are noncredit bearing. Executive certificates take more effort to complete (the duration for each is one semester).

7.4.2 Flexible Continuing Education and Training

The move to remote learning in the spring of 2020 expanded NUS' ability to provide online learning, especially synchronous distance classes. Building on our Learning Management System (LumiNUS) platform, NUS is designing and creating more asynchronous content for students and CET learners who are unable to attend scheduled lectures. This gives students increased opportunities for self-paced learning.

7.4.3 Supporting Singapore's Workforce

To help individuals and businesses weather the pandemic, Singapore's fourth stimulus budget (passed in May 2020) included funding for a package to create 40,000 jobs; 25,000 traineeships; and 30,000 skills training headcounts.[17] As part of this effort, NUS agreed to provide 6 months of skills training to help job seekers learn new and in-demand skills, and to facilitate their re-entry into the workforce as the economy picks up again.

Besides the training courses, NUS has worked to ensure that there are real jobs waiting for those who participate in the program. Work placements act as incentives and make jobseekers see real value in the courses, helping them persevere through challenging circumstances. NUS also extended its counselling services to provide personal support to program participants, and to help with motivation. Participants receive a training allowance from the government.

By keeping a watchful eye on the future and maintaining a willingness to innovate, NUS continues to respond to economic and employment shifts. Our flexibility also enabled us to respond to the pandemic rapidly and with less disruptions on learning.

[17] The Singapore national budget addition is estimated at S$2 billion (US$1.42 billion as of 26 May 2020) (*The Straits Times* 2020).

7.4.4 Re-imagining the Future

With a commitment to high-quality teaching, carefully designed curricula, and an emphasis on experiential learning, NUS is preparing its students for the rapidly changing workplace of today and tomorrow.

In AY2021/22, NUS will establish the NUS Colleges of Humanities and Sciences, a collaboration between our Faculty of Arts and Social Sciences, and the Faculty of Science. Students in the College will have flexibility in degree choices (Bachelor of Arts, Bachelor of Science or Bachelor of Social Sciences), and access to cross-disciplinary opportunities. They will also receive a strong foundation in reading, writing, critical thinking, and numeracy—skill sets that employers value. This shift from NUS' traditional discipline-centric approach to a flexible, broad-based education will enhance the educational quality, market relevance, and learning experience of our students. It will prepare our graduates to not only thrive in, but to shape the future.

7.5 Challenging Perceptions, Participation, and Stakeholders' Interactions

The interaction of the key actors in the lifelong learning agenda—target participant(s) at the *micro level*; the support of employers and presence of the learning program providers at the *meso level* (in this case, NUS); and the state at the *macro level* could affect the level and extent of an individual's participation in any learning program (Boeren 2017). As such, it is important to consider these relationships when designing and implementing innovative learning programs. We argue that Singapore's initiatives to promote lifelong learning demonstrate an attempt to break down the dominant barriers—a preference for merit- and degree-based credentials, lack of expanded and flexible approaches to learning, and a siloed environment and lack of interaction among disciplines. Although these challenges are similar to those faced by other universities, Singapore's lifelong learning activities were fueled with substantial funding from the government.

Also, NUS responded to these challenges by offering programs that permit interdisciplinary collaboration, more self-directed and experiential learning activities, and sequential credentialing to focus on teaching key skills students can immediately apply in their current and future workplaces. However, the preference for paper-based qualifications is still embedded in the cultural and social psyche of the citizens (Tan 2017). Macro and meso-level actors could do more to challenge these perceptions; in redefining the definitions of success of learning and providing more options for graduates to excel; and in working with individuals on how they can potentially contribute their talents and skills to meet the needs of society. In addition, continued engagements with families, voluntary associations, and organizations working in socio-cultural affairs could also help in building more inclusive learning

societies (Osborne et al. 2013). In time, we will learn whether these new approaches succeed.

Beyond the economic agenda and market-driven orientation of the programs, lifelong learning providers such as NUS should continually work to address how their role could also contribute to meeting sustainable development targets, and where our learners and graduates could help fill the void. Powering learning societies necessitates the collective participation of all the relevant actors in designing and offering meaningful programs that promote environmental sensitivity, inclusive participation, and social justice, among many other things.

The global pandemic amplified the need to continue the discourse on strengthening lifelong learning initiatives not just within our countries but also in our networks and regions. As a global university, NUS could tap on its comparative advantage to support lifelong learning initiatives for its regional neighbors in Southeast Asia. As research, teaching, and thought leadership forms part of the university's lifeblood, NUS' own lifelong learning journey could also uniquely contribute to similar institutions that are supporting the learning communities in Asia and the world. Since 2012, NUS has been offering the NUS Programme for Leadership in University Management (TF-PLUM) through the Temasek Foundation International. This program for university leaders from the People's Republic of China, India, and the Association of Southeast Asian Nations has created space for interaction and collaboration among regional universities.[18] Some of our graduates and learners are now looking forward to establishing their careers, businesses, and partnerships in these economies, presenting a larger opportunity for NUS to continuously make our lifelong learning programs responsive to the future career and personal aspirations of our students, and in influencing the region to continually embrace lifelong learning.

7.6 Conclusions

This chapter has demonstrated that meso-level institutions like NUS play a major role in future-proofing the workforce by offering interdisciplinary and multidisciplinary programs, learner-centered pedagogy and activities, as well as expanded lifelong learning opportunities among its graduates and the broader Singaporean society. In recent years, NUS has introduced many programs and initiatives to support both national-level and individual-level aspirations. We therefore hope this chapter generates more deep thinking and collective reflections among all the stakeholders in the education sector. As we search for more creative and innovative ways to promote and establish robust learning opportunities—in spite of many kinds of disruptions—we aspire to further support our citizens' capacity building and contribute to society with its ever-changing needs.

[18]Over 250 university leaders have benefitted from the TF-PLUM (see NUS. Thought leadership. http://nus.edu.sg/gro/about-us/thought-leadership. Accessed 11 November 2020).

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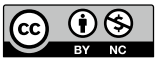
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Chapter 8
Intensifying Skills Development for New Age Economic Development: Insights from the European Union



Manuela Prina and Georgios Zisimos

Abbreviations

Cedefop	European Centre for the Development of Vocational Training
ETF	European Training Foundation
EU	European Union
UNIDO	United Nations Industrial Development Organization

8.1 The Role of Skills in European Union Policies

The world will remember 2020 as the year of the pandemic, the turning point where disruption impacted on all human beings—our way of living, of working, of studying. In Europe, it is also a year we will remember as a turning point, when it was able to deliver the new vision for the European Union (EU) in the midst of a challenging year. In 2020, the EU made a clear choice as regards skills: they are to be the backbone of the EU priorities and vision toward 2030, necessary to realize the so-called "twin transitions"—one, the vision of a green EU, and two, the ability of all actors and economic sectors to make the best use of digital and technological advancement (European Commission 2020c).

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In the Treaty of Rome of 1957,[1] the newly born EU made economic and social cohesion one of its pillars to support all member states, in particular by improving the living and working conditions across the Union; and by addressing disparities among member states and across subnational level regions within member states. However, only after almost 20 years after the treaty came into force, or in 1972, did the EU take steps to establish policies. Joint policies focusing on economic, social, and industrial development; and implementation of specific funds—either directed through member state authorities and regional administrators or through direct funding—were put in place to promote skills development needs across all of the EU. Through the European Structural and Investment Funds,[2] several policies are now being implemented in all member states, particularly in the areas of social inclusion and employment promotion, as well as services targeting employment and improvement of governance for the world of work. Together with the Funds, the EU is investing through specific programs that target areas of joint interest in the member states. Innovation and research[3] in particular have a key role in ensuring the continuous ability of the EU to anticipate, learn, and adjust its policies and actions for the benefit of society.

Meanwhile, it was only in 2000—or 48 years after the Treaty of Rome, and 38 years after the start of joint work in the area of social and economic cohesion, industrial development, and regional development—did the EU make its first joint statement with regard to education and training policies. Before that time, cooperation in the area of education and training was happening at the level of programs targeting higher education, and through the establishment in 1987 of the Erasmus+ program.[4]

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[1]Tutto sul Parlamento. Treaty of Rome (EEC). https://www.europarl.europa.eu/about-parliament/it/in-the-past/the-parliament-and-the-treaties/treaty-of-rome.

[2]The European Structural and Investment Funds consist of five funds and represent one of several instruments through which the EU channels funds to its member states. The Funds channel more than half of the EU's resources, and have the objective of supporting job creation toward a sustainable and healthy European economy and environment. The five funds are as follows: (i) European Regional Development Fund aimed at supporting the development of regions within the EU; (ii) European Social Fund, focusing in particular on employment-related projects and human capital development, including education and training for both youth and adults; (iii) Cohesion Fund, focusing on the EU member states where gross national income per inhabitant is less than 90% of the EU average, and supporting projects in the field of transport and environment in particular; (iv) European Agricultural Fund for Rural Development; and (v) European Maritime and fisheries fund. More information are available at European Commission. Funding programmes and open calls. https://ec.europa.eu/info/research-and-innovation/funding/funding-opportunities/funding-programmes-and-open-calls_en#esif.

[3]The budget of the EU for 2021–2027 pays particular attention to the need to invest in research and innovation via Horizon Europe, the European program that supports research and innovation, which in 2021–2027 alone has an allocated budget of 100 billion Euros (source: Horizon Europe European Commission. https://ec.europa.eu/info/horizon-europe_en. Accessed 24 November 2020.) .

[4]Created to support mobility of learners at university level across European Countries, the Erasmus+ (formerly Erasmus Program) is perhaps the most known program of the EU in the area of education and training. Today the program supports mobility not only of learners but also of teaching staff; supports cooperation among learning providers; and supports innovative practices, partnerships, and sector alliances. Erasmus+ is accessible not only to EU member states but to many other countries

The Erasmus+ is the EU's flagship mobility program for students across the EU. Today, Erasmus+ covers almost the entire world and covers not only mobility of students but also mobility of teachers and trainers, and cooperation across education and training providers.

It should be noted that although the Treaty of Rome made no provision for education, it did make a provision for vocational education and training (VET): "The Council shall, acting on a proposal from the Commission and after consulting the Economic and Social Committee lay down general principles for implementing a common vocational training policy capable of contributing to the harmonious development both of the national economies and of the common market" (Article 128, p. 104).

In 2000 in Lisbon, the EU's Head of States asked ministries of education across the Union to start a joint declaration of cooperation to improve education and training across the Union. Hence, in 2003, the European Council adopted the first joint declaration on education and training and established agreed targets to be achieved by 2010 as a first step, then renewing and expanding these by 2020.

In the Communication on Achieving the European Education Area by 2025 (European Commission 2020b), the EU vision and targets were established for 2030. Regarding VET, the ministers responsible for VET endorsed the Osnabrück Declaration on 30 November 2020, identifying four key priorities for 2021–2025 (Council of the European Union 2020). Apart from the Osnabrück Declaration, there is a plethora of recently enacted EU documents[5] in the field of education and training, including VET, which stress the role of this domain in economic and societal development, and in supporting the dual green and digital transition.

Skills development is hence part of the EU's policies and cooperation among member states across both economic and education and training dimensions. Both these elements have been present in the history of the EU as important factors shaping societies and citizens across the Union; however, skills development has been following two different tracks of implementation, in particular as regards specific actions addressing different age groups. For youth, the focus is on education and training policies; while for adults, the focus is on skills programs within the European Social and Cohesion Funds' related actions and programs.

With its recent policies through its new vision, the EU has clearly demonstrated the political willingness to ensure support for all citizens in transitioning toward a greener and digitally capable economy and society. The EU has achieved learning as a community and has set new priorities as a result of evidence, consultation, and political vision. It has also translated this learning into specific priorities and actions that embed learning ability and skills development needs across all sectors and dimensions of life of citizens, in both the economic and social milieu.

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including Asian ones for specific actions (See European Commission. Erasmus+ https://ec.europa.eu/programmes/erasmus-plus/about_en).

[5]These include the European Skills Agenda (European Commission 2020d), Proposal for a Council Recommendation on Vocational Education and Training, Digital Education and Action Plan (European Commission 2020e), and European Education Area.

From the theory of capacity development, as defined by the European Training Foundation (ETF), we can look at three dimensions or levels that allow for investments in skills to be productive and leading to societal changes (ETF 2014):

(i) the individual level, or the dimension through with most actions have been directed, and favoring individual learning and opportunities for employment;
(ii) the institutional level, where governance of the system is addressed in the ability to create an enabling environment for both skills creation and skills use in a specific sector or theme; and
(iii) the system level, where a clear vision and holistic investments take place, which are conducive to leading the achievement of societal value and public purpose.

8.2 Skills and the Road Ahead for the European Union

With the priorities outlined in 2019 by the EU Commission,[6] there has been a shift on how the EU is looking at skills. For the first time, skills appear as the pillar that underpins all priorities, policies, and actions; and will allow the Union to achieve its vision of becoming the first climate-neutral continent, empowering people through a new generation of technologies, attracting investments, and stimulating the creation of quality jobs, especially for young people and small businesses.

The European Skills Agenda launched in 2020 in the aftermath of the first wave of the coronavirus disease (COVID-19) represents a turning point in the approach of the EU to skills development, particularly as regards the role of skills in supporting the so-called "twin transitions": toward a greener economic era, as well as higher adoption of technology across all spheres of work and life (including access to public services) for all citizens. Although the European Skills Agenda seems to be a continuation of the EU Skills agenda launched in 2016, the new agenda is more coherent and incisive in terms of ambition and targets. It aims to forge alliances with stakeholders, develop tools for lifelong learning, support the provision of skills, and unlock private investments in the provision of skills.

Following several strategic communications, including the one establishing modalities to achieve a common EU education area by 2025, the European Skills Agenda sets out as its vision the integration around skills of first, the central role

[6]The priorities set by the European Commission for 2019–2024 are clustered under six chapters: (i) a European Green Deal, composing the core of the vision of the EU to create a green and sustainable society; (ii) a Europe fit for the digital age, ensuring at best the maximization of opportunities posted by digital and technological developments; (iii) an economy that works for people, confirming the focus of the EU pillar of social rights, inclusiveness, and lifelong learning; along with boosting jobs and youth employability programs; (iv) a stronger Europe in the world, with increased attention to development, cooperation, and external relations policies; (v) promoting the European way of life through renewed policies and actions, including a new pact on asylum and migration; and (vi) a new push for European democracy and foresight, with a greater investment in research and innovation (See European Commission. 6 Commission priorities for 2019–24. https://ec.europa.eu/info/strategy/priorities-2019-2024_en).

of lifelong learning; and second, the need to address skills requirements of all age groups, all sectors of the economy, and all regions of the EU. Apart from its focus on the EU internal market, the agenda also addresses the external dimension of these policies and aspirations, as it recognizes the importance of skills and investments in skills development beyond the EU borders. For the first time, what appears as internationalization of VET is seen as a bidirectional process that combines actions contributing to two drivers: the globalization of markets and labor force, and the intrinsic need of education and training systems to learn from each other and expand their circle of cooperation.

In a nutshell, the EU has made future transitions and a clear societal model (greener, inclusive, and fair) the basis for all of its policies and priorities for the next decade. This need has been backed up by additional funding, in particular for research and innovation, youth, skills development for all economic sectors, and a strong digital agenda.

The international dimension of these EU education and training developments is clearly outlined in many policy documents that recognize not only the need for cooperation among EU member states, but across the world. Vocational education and training, in particular, is being asked to contribute to response strategies for unprecedented incidents (see European Centre for the Development of Vocational Training [Cedefop] 2020, p. 3).

The trajectory of the EU policies and actions is based on a concept of continuous learning and policy adjustments, grounded on a strong evidence and monitoring culture, innovation and research investments, and a solid social and participatory dialogue that allows capture of and building on diversity to anticipate the multiple demands of society.

The merits of the European Skills Agenda, among the many priorities and actions outlined, are (i) the strong recognition of the role of skills in supporting the economic and social aspirations of the Union; (ii) the focus on all stages of life, modalities of skills development, and recognition of skills; and (iii) the strong responsibility reposed in all levels of governance, from international policy dialogue and steering, to sector dialogue and cooperation at the European, national, and local levels.

COVID-19 has strongly impacted the European Union, specifically at a time new priorities were being launched and new policies developed. The impact of COVID-19 on the economy has pushed the EU to further prioritize its focus on skills development as an essential investment for the future. In order to give a concrete response to emerging demands created by COVID-19, and because of the necessity to support citizens in the transition toward a greener and more digital society, the EU has added to the 2021–2027 long-term budget a temporary recovery instrument called nextgenerationEU. This recovery fund will not only support the necessary social measures during this time of crisis but will mainly be allocated to modernization through research and innovation, digital development and support, and skills development across all programs.

8.3 Instruments for Skills Development Toward a New Economic Age

There are both consolidated as well as new features that the EU has adopted to support the transition to a green and sustainable economy by 2030. In terms of continuation of consolidated successes, on one hand, we see the confirmation of the "policies, strategies–actions–funding scheme" implemented in the previous decades, providing specific access, i.e., funds and competent support, to funding opportunities, research and innovation, as well as targeted skills development support at the level of regions, sectors, and specific target groups of citizens across the Union. Several funds, including the European Pillar of Social Rights[7] reconfirm priorities of actions to support joint targets such as the reduction of youth unemployment and the support to transition measures. Several instruments in place since the 2000s have been reconfirmed, such as the European level policies and practices focused working groups, thereby allowing for technical steering and policy learning across member states. Other programs that constitute the backbone of cooperation in education and training among member states as well as countries outside the Union are also given renewed support.

Other actions, such as those targeting the New Industrial Strategy for Europe[8] and the European Digital Strategy,[9] allow for observation of the shift under the current EU Commission and leadership toward a more closely integrated vision of economic development and clear purpose led by the Union, marked by greening, sustainable competitiveness, social fairness, and resilience. These targets are to be reached through a more holistic and integrated attention to all levels of capabilities—from the individual to skills development for all, and to the institutional and organizational—including supporting new governance modes and modalities of work, services and access to them, and private sector efforts at transformation and transition. At the system level, this will be pursued through a stronger alignment across the Union.

Other new features include the stronger focus on cooperation, through what the European Skills Agenda calls "pact for skills" to be implemented at the sector level. Also included are several levels of governance from international to local; and more actors to develop virtuous cooperation and ecosystems for skills development, job creation, and economic transformation. Also important in the new approach is the revisited targeted of adult participation in training opportunities. This target has been maintained at 10–15% until 2020. It is now set to cover 50% of the adult population

[7]The European Pillar of Social rights outlines three priority areas for the EU: (i) equal opportunities and access to the labor market, (ii) fair working conditions, and (iii) social protection and inclusion. The full text can be found at European Commission. European pillar of social rights. See https://ec.europa.eu/info/strategy/priorities-2019-2024/economy-works-people/deeper-and-fairer-economic-and-monetary-union/european-pillar-social-rights_en.

[8]See European Commission (2020c) for the New Industrial Strategy for Europe.

[9]The European Digital Strategy is accessible at https://ec.europa.eu/digital-single-market/en/content/european-digital-strategy.

in Europe by 2025. The need for retraining, upskilling, and reskilling is meant to derive from the strong focus on transition toward a greener and more digital EU, and also in response to the impact of COVID-19 on societies, business models, and needs to confront the crisis and future recovery.

Finally, the European Skills Agenda has a greater focus on the external dimension of the EU policies; on dialogue with countries outside the EU; and cooperation in the areas of skills development, innovation, and social and economic cohesion. There is more openness across the programs and funding opportunities to countries outside the EU, as well as cooperation among EU actors and third countries. Support to mobility as well as measures to address migration are established, particularly through the new pact of asylum and migration[10] where both legal migration and labor mobility, as well as addressing the root causes of illegal migration, sees skills as one of the key assets for success of these policies and measures.

8.4 Impact of Coronavirus Disease: Crash Test and Reality Check

The COVID-19 outbreak hit the EU just as the newly established European Commission was ready to launch its policies and actions for its mandate. Throughout the emergency, the EU has confirmed its priorities and vision, making the impact of COVID-19 an accelerator to push forward several actions with an even stronger public purpose and sense of urgency as regards the need to immediately turn policies into action.

The EU has organized its COVID-19 response across several channels, in response to the immediate challenges posed by the health emergency and subsequent crisis. Much effort has been exerted to address employment and social cohesion, including support to young people, economic support to small businesses, and incentives for innovation and research. Moreover, for the longer term, the lessons learned from these times of disruption will be integrated into new societal and economic models.

Studies conducted by the (ETF 2020) and the United Nations Industrial Development Organization (UNIDO)[11] on the impact of COVID-19, particularly on socioeconomic needs and skills, outline that most public measures put in place for crisis management and recovery have failed to look at skills as an asset for support. Despite the recognition by economic actors, in particular industries and small and medium-sized businesses, on the urgent need for reskilling and upskilling, most companies were not informed about opportunities being offered by public players. The European Company Survey released in the fall of 2020 (Eurofound and Cedefop

[10] See European Commission (2020a) for The New Pact on Asylum and Migration.

[11] UNIDO Learning and Knowledge Development Facility. Global survey analysis: changing needs for skills development as a result of COVID-19. https://lkdfacility.org/resources/global-survey-analysis-changing-needs-for-skills-development-as-a-result-of-covid-19.

2020) reveals that companies in the EU offer training but fail to have a future-looking and holistic approach to skills development.

The outbreak of COVID-19 and its impact on all aspects of the socioeconomic life of individuals and organizations have accelerated the understanding of how several disruptions and potential transformations can be taken on board, and what gaps are there to move from vision, to implementation, to realization.

COVID-19 has further accelerated the need to support the EU's future transitions, and to support and guarantee cohesion and inclusion across all member countries in a time of crisis and recovery, in pursuit of the EU's new "greener, inclusive, and fair" societal model. COVID-19 is a reality check, a solid baseline to assess the ambitious EU agenda and vision for the future, and to gauge current capabilities at all levels of governance and all actors involved in realizing the EU vision.

At the level of education and training, the impact of COVID-19 has affirmed most of the priorities already addressed at the policy level, such as the need to focus on key competencies; the importance of investing on teachers and trainers; the growing inequalities with respect to the use of technologies, access to technology, and connectivity; and the crisis of learning across all countries of the world.

The gap between the highly purposeful and inspiring vision and policies put in place at the EU level met a strong crash test when confronted with the realities on the ground. There is a wide gap to be filled, both in the world of work and the world of education and training, to ensure that Europe can confidently move toward its targets by 2025 and the realization of its vision by 2030.

8.5 From International Policies to Local Implementation: The Case of Turin

One of the most important dimensions in skills development is the level of local governance. Regions, cities, municipalities are the epicenter of the cooperation and action that translate policies into facts.

Between 2019 and 2020, the ETF together with the International Training Centre of the International Labour Organization (ITCILO) joined forces with the City of Turin, which was hosting both institutions on the occasion of ETF's 25 years of operation, and ITCILO's 100 years. Turin was guiding a dialogue at the city level on the role of skills in supporting the vision of the city to become an innovation hub. The initiative, named Torino Skills City,[12] examined within a period of 6 months the following: (i) actors needed around the table to address skills demands to realize the economic vision of the city, (ii) identification of challenges facing the city in realizing its potential, and (iii) solutions built on global exchange with experts from the international arena.

[12] More information on the project is accessible at European Training Foundation. Torino Skills City: solutions to global challenges in the city. https://www.etf.europa.eu/en/news-and-events/news/torino-skills-city-solutions-global-challenges-city.

Being historically an industrial city, Turin was home to one of the most important districts in the automotive sector. Still retaining some of its industrial history, the city is now home to one of the innovation hubs of Italy, and has invested in the aerospace industrial cluster while having a strong presence in the agriculture and agri-food sectors. As part of its vision for the future, the Turin administration has reserved a prominent role for innovation testing and prototyping to attract investments, start-ups, and international companies to the city. This vision is shared by stakeholders working with the city administration under the Torino City Lab,[13] an initiative led by the deputy mayor for innovation.

Two leading universities in Turin, namely the Università degli Studi di Torino and the Politecnico di Torino, play a major role in the transformation of the city. They have absorbed much of the industrial know-how and developed research and innovation structures to become world-class knowledge hubs. As there had been limited reflection on skills development—which was the focus of the dialogue between Torino City Lab, ETF, and ITCILO—critical challenges have been identified by stakeholders upon analyzing the role of skills in achieving the vision for the future of Turin and the aspirations of Torino City Lab. These challenges reflect the gap that could be found at the local level, which needs to be addressed to ensure that the vision for a new economic era can be realized:

(i) ***Digital skills development.*** Stakeholders pointed to the need to invest on digital skills not only at the level of education and training of young people, but also of public administration and citizens, so as to correctly access and use digital services that will be developed in the future.

(ii) ***Cooperation among actors.*** One of the elements outlined as critical by stakeholders is the need to move away from working groups that are either sector- or age-specific, to working groups and policies that are transversal; which address a domain; and which allow for synergies, partnerships, and joint projects that bring together diverse competencies.

(iii) ***Steering a culture of innovation.*** Across both public and private sectors, the resistance to innovation and change has been identified as an area of concern needing resources and specific competencies. To increase the openness to innovation, funding and services that can support both education and training, as well as enterprises, to embrace opportunities for the future are needed.

(iv) ***Foresight***. A clear focus on "what is coming next" based on solid evidence and data was identified as a critical factor for success in setting up a clear strategy to achieve a shared vision. Likewise, a permanent observatory that allows for policy steering and collects inputs from all actors involved in the ecosystem is needed.

[13] Torino City Lab is a project of the City of Turin aimed at supporting the development of a virtuous ecosystem, enabling the attraction, creation, and impact of innovation for the city. Several actions take place under the umbrella of Torino City Lab, including cooperation in the area of education and training, research and innovation investments, and innovation for social impact. See Torino City Lab. https://www.torinocitylab.it/it/.

(v) ***Transitions guidance***. An important feature identified by city stakeholders stemmed from the discussion on inclusion and career guidance for young people. Continuous guidance from the city, learning from consolidated services provided to young people and to the unemployed, and expansion of the concept to serve other target users will support each citizen in the transition toward a new way of living and working. These abilities were deemed critical for the city to support the population through several transitions in their career and work environment.

(vi) ***Attracting and retaining talent.*** A shared need expressed by both private and public actors focused on attraction of talent. New competencies are needed at all levels in private companies and in public administration, and also among training and education providers. Likewise, there is need to focus on possible new forms of work, including those offered by distance cooperation and digital and smart working. This dimension poses new challenges and requires new legislative frameworks and international rules, to avoid an even more aggressive competition for talent across the EU and the world.

These lessons learned from the specific observation of a case study highlight the concrete challenges that can ensure successful implementation of policies given the diversity of needs, local realities, and sectoral developments.

The impact of COVID-19 has further widened the gap between policy setting and implementation, and raises an alarm as regards the need to take into account diverse needs and realities. Inclusion must be ensured as a part of both policy formulation and implementation, to allow strong ownership among local level stakeholders. A diffuse leadership approach is called for, where different organizations can take the lead in coordinating and steering specific chapters of a shared vision.

8.6 Skills and Challenges Ahead to Realize a New Economic Age

The EU vision, policies, and instruments put in place are a model not only for Europe but for the world as it tries to achieve at the global level the Sustainable Development Goals by 2030, where sustainability, social fairness, and resilience are key features shared by all countries that have adhered to the 2030 agenda.

First, as skills development has finally become a transversal pillar for the EU across all policy dimensions, the 2030 agenda cannot be achieved if the question "what skills are needed to achieve this specific goal" are not addressed and transformed into action. Cities will not be better if skills are not there to make them better; the seas and the environment will not be managed in a sustainable way; and cooperation among actors will not take place. It is through skills that we can achieve the change we want. Therefore, it is fundamental to ensure that skills development is not confined to a single dimension; rather, it should be the question that underpins all levels of change: individuals, organizations, societies.

Second, it is key to ensure a continuum across the vision statement, policies and strategies, funds, and actions. Missing out on any of these elements will have a negative impact on all.

Third, skills development cannot be seen solely as a role for the education and training systems. Skills development policies need to be perceived as an ecosystem: from problem statement, to solutions, to tools, and to actors involved. This is why the role of local governments, city, and regional stakeholders; and sector dialogue and skills pacts at the sector and local level, are key assets for success when looking at achieving a vision and accompanying any transition.

Fourth, we need to ensure that new demands in skills development and use of skills are considered, so that we can maintain a certain flexibility in policies to be able to cater to change. Some of these changes are the new forms of work, where the possibility of increasing the number of digital workers, and the possibility of economies integrating and hiring workforce "from a distance", will affect social fairness, labor legislations and rights, and skills development and usage across the world.

Fifth, we need to ensure that skills form part of each measure we design and put in place. Be it for the public or private sector; be it for education and training of youth, adults, or elderly, skills are key to achieve transformation, ensure social fairness and inclusion, and put in place the conditions to create the world of tomorrow, as well as use the opportunities that will arise.

Finally, the case of the City of Turin in Italy brings us to the importance of focusing on implementation and outlines several crash tests to be done when moving from a policy statement to realization of concrete change for all citizens. The need to ensure a holistic and cooperative approach to policy domains and actions must be complemented by a strong focus on innovation, communication, and diversity of engagement strategies so that all actors and all citizens could successfully become part of the desired change.

8.7 Conclusions

Facing change in societies is not a new story for human beings. The pace of change makes disruptions more frequent and thus demands quicker adaptations. The impact of innovation linked to technological advancement; the embedding of the digital world in all spheres of life and work; and the disruptions in how societies organize themselves, perceive problems, and face new and demanding challenges such as climate change or rising inequalities, bring new complexities to the table. Learning as a society and developing skills as individuals and organizations within a society, comprise part of the solution when we look at disruptions from both an individual as well as societal point of view. For society, it is key to have in place a learning cycle that allows to anticipate and mitigate risks, and maximize benefits from disruptions to transform them into opportunities. For an individual, it is key to learn throughout life,

to acquire skills, to develop and enhance own competencies, and to meet changing demands while cultivating one's own talent.

As we argue in this chapter, a learning society is not only about having isolated educated and skilled citizens. It takes multiple and complex interactions to grow an ecosystem that connects, supports, and makes the best out of individuals' learning. Formal learning institutions like schools and universities, enterprises, local and regional authorities, research institutions. and local communities need to contribute to create and support ecosystems of skills and competencies. Within the EU context, such ecosystems are the root source of innovation and development and can strengthen sustainable competitiveness while ensuring social fairness.

Will the world achieve its inspiring 2030 agenda and be able to recover from the impact of COVID-19?

This is a complex question that cannot be answered with a simple yes or no. Even if we take for granted that sooner or later, COVID-19 will be defeated, the question of recovery and catching up with the burning issues that societies had even before the pandemic still needs to be addressed.

The paper argues that in this process of recovery and reignition, the ability of countries, regions, or cities to respond will depend on the skills capacity of their citizens. Transition toward a greener and more sustainable societal model requires that societies adopt a learning model embracing all citizens of all ages, working status, and social conditions.

To respond to such a diverse and intensified provision of skills where upskilling and reskilling are equally important as skilling, a new approach is needed that blends together age, geographical, societal, and individual needs. This new age of economic development will reveal the value of networking for the development of more dynamic partnerships even between stakeholders who had traditionally worked in isolation. Striving for excellence as a process of continuous improvement will become the new norm for such partnerships to happen.

The EU through its history and its priorities for the future sets a model as regards learning societies. There are two ways the EU shall be considered as a lighthouse when looking at learning societies. First, since its early days, the EU has placed learning at the heart of its vision and policies, identifying needs and areas for cooperation among member states, and between the EU and external actors. The second is the vision of the EU for the future, reinforcing the investment on skills on the basis of anticipated needs and vision, and learning from its stakeholders to address needs that are at the basis to realize the transition toward a greener, fair, and resilient society. This vision is backed by an unprecedented investment in skills and innovation areas for EU member states, where the financial envelope for 2021–2027 has been increased through an additional investment called the "NextGenerationEU" (European Union 2020).

Funds for flagship programs of the EU focused on skills and excellence, mobility of learners and teachers, and cooperation in the area of education and training have doubled as compared to the amounts of the previous programming cycle of the EU. Despite uncertainties and proving the commitment of the EU to a global sustainable agenda, the budget for external actions and humanitarian aid has increased in the new

financial perspective. This follows the "New Consensus on Development" where the EU declares,

> Ensuring access to quality education for all is a prerequisite for youth employability and longlasting development. The EU and its Member States will support inclusive lifelong learning and equitable quality education, particularly during early childhood and primary years. They will also promote education at secondary and tertiary level, technical and vocational training, and work-based and adult learning, including in emergency and crisis situations. Special attention will be paid to education and training opportunities for girls and women. The EU and its Member States will intensify their efforts to ensure everyone has the knowledge, skills, capabilities and rights they need to enjoy a life in dignity, to be fully engaged in society as responsible and productive adults, and to contribute to the social, economic and environmental well-being of their communities. (Article 28 in European Commission 2017, p. 11)

The EU is an engine that has a declared interest to support skills development as a driver for change and growth, increasing its future budget allocations for external assistance and for youth and skills programs across all its priorities. The importance to society of learning, both in the ability to anticipate and manage change, as well as to ensure a continuous and accelerated learning process throughout systems, organizations, and individuals, is even greater than ever.

External partners of the EU, in Asia in particular, will be called upon for a reinforced cooperation with the EU in the field of skills development; adaptation of skills; and shared vision as regards greening, social fairness, and innovation. This will include renewed cooperation in the formal education domains, for example through the Asia Europe Meeting bringing together 51 countries from Europe and Asia to discuss cooperation in the area of education and training. It will also include renewed attention to labor rights and social demands in trade agreements, and renewed attention to upskilling and reskilling across economic sectors to contribute to a wider transition toward the realization of the 2030 Agenda, which the EU supports in full through its policies and investments in the world.

The decade ahead will test several EU policies, responses, funding instruments, and programs aimed at bringing transition and positive results for the 2030 agenda. The vision and political commitment are clearly there, and now is the time for implementation.

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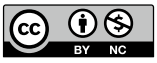
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Chapter 9
Quality Assurance in Online Learning at Scale at the Indonesia Cyber Education Institute



Paulina Pannen

Abbreviations

HEI	higher education institution
ICE Institute	Indonesia Cyber Education Institute
ICT	information and communication technology
MOOC	massive open online course
MORTHE	Ministry of Research, Technology and Higher Education
SPADA	Sistem Pembelajaran Daring
UNESCO	United Nations Educational, Scientific and Cultural Organization

9.1 Introduction

The rapid growth of information and communication technology (ICT) has led to the impressive growth of online higher education worldwide. In general, adoption and implementation of online education is aimed at enhancing the quality of teaching and learning to accommodate various learning styles of students, increase access to learning opportunities, increase the learning flexibilities for students to develop skills and competencies needed in the twenty-first century, and improve cost effectiveness of the institution. Online education provides an opportunity for anyone to learn anytime, anywhere; and to communicate and collaborate virtually across countries. Through the use of technology in online education, education is considered to

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be delivered more efficiently and at a lower cost. For many higher education institutions (HEIs), online education is beneficial to reach new student markets needing flexible learning opportunities, as well as to provide an opportunity for creating new innovative learning environments.

In the conventional setting, online education has been integrated into a blended learning mode that allows a mix of online and offline learning within a course, or within a curriculum. What was once a sporadic individual effort of a faculty member to improve learning through flexible and media-rich teaching and learning has been evolving into institution-wide, even country-wide programs from which students can obtain both credits and degrees (Pannen 2015). Although online education is considerably new and is a different practice of teaching and learning in HEIs, it is expected to deliver significant improvements, specifically increased access to quality higher education at reduced costs to meet the same goals, satisfy the same requirements, and achieve the same learning outcomes as conventional education.

The use of online learning has been amplified by the coronavirus disease (COVID-19) pandemic that requires people to apply social distancing and less-contact activities. Schools and HEIs have been closed. For Indonesia, learning was 70% conducted from home in 2020, with the remaining 30% allowed only for small group meetings, particularly for practices and practicum, while applying health protocols. Even in the red zone area, the Minister of Education and Culture has advised postponement of practices and practicum until the new semester in 2021.

The learning from home or "emergency remote learning" has been heavily reliant on the use of ICT, especially e-learning systems and virtual meeting mobile applications. Some HEIs had an advantage, having prepared their e-learning courses prior to the pandemic in preparation for the fourth industrial revolution or Industry 4.0. With the sudden shift to learning from home, the use of ICT for teaching and learning is now inevitable. This has in turn posed questions about the quality of learning from home, which may be more flexible for students but less controlled by lecturers. By its nature, the flexible and virtual mode of online education demands evidence of higher quality than that of conventional education (Protopsaltis and Baumi 2019). It is necessary for online education to prove its quality to be comparable to conventional education.

This paper discusses the development of online education in Indonesia and highlights the effort of the Government of Indonesia at quality assurance of online education, and quality education in a learning from home situation.

9.2 Development of Online Education in Indonesia

Higher education is at the forefront of Indonesia's policy to prepare the country for Industry 4.0. With a gross domestic product of $1,022,454 million as of 2019,[1]

[1] *Source* countryeconomy.com. Indonesia GDP—gross domestic product. https://countryeconomy.com/gdp/indonesia?year=2019.

Indonesia is the world's seventh largest economy in purchasing power parity terms, and has the world's fourth largest population of 272.1 million.[2] The government is determined to improve Indonesia's competitiveness in the world market, placing high priority on the development of science, technology, and innovation as demanded by Industry 4.0, and infusing humanist and inclusive goals into its tertiary education program. According to the Ministry of Research, Technology and Higher Education (MORTHE), the goal is to increase the gross tertiary enrollment from 34% (8 million students) to 50% (11.7 million) by 2024 (MORTHE 2019a). Currently, Indonesia has 4,583 HEIs with 34,189 study programs and 286,787 lecturers.[3] The government expects online education to play a significant role in the development of competent, skilled, and professional human resources to meet the needs of industry and the community in the twenty-first century, especially given the increasingly technology-savvy Indonesian population. The country's internet penetration in 2019 has reached 64%, while social media users comprise 59%, and mobile users 124% of the population of 272.1 million (2019).[4]

In this paper, online education is defined as education delivered or accessible via the use of ICT, including its connectivity, flexibility, and ability to promote varied interactions. Online education covers e-learning, distributed learning, networked learning, tele-learning, virtual learning, web-based education, distance education, technology-based education, massive open online courses (MOOC), blended learning, flipped learning, and also learning from home using ICT during the COVID-19 pandemic. The last falls under the broader category of technology-based education, which can be delivered in blended mode in a conventional face-to-face education setting, or in a distance education mode.

Technology-based education in Indonesian higher education has a long history and has been growing impressively. It started as a traditional correspondent course for teachers' education in the early 1950s. In 1984, the establishment of Universitas Terbuka introduced multimedia distance education marked by computer-based education, tele-education, internet-based education, and web-based education. At present, Indonesia is making efforts to apply blockchain technology for its online higher education (see Fig. 9.1).

By 2014, Indonesia was promoting online learning through Indonesian MOOCs called Sistem Pembelajaran Daring (SPADA Indonesia), consolidating individual faculty efforts in about 4,000 HEIs. SPADA Indonesia started with 30 online courses from six pioneer universities, shareable to more than 4,000 HEIs. The first batch of students was around 3,000 with a completion rate of 61% and average retention rate of 42% (Pannen 2015; Pannen and Riyanti 2017; Chaeruman 2018). Although SPADA Indonesia was less successful compared to the Hybrid Learning for Indonesian

[2] *Source* Worldometer. Indonesia population. https://www.worldometers.info/world-population/indonesia-population/.

[3] *Source* Pangkalan Data Perguruan Tinggi (Higher Education Database). https://pddikti.kemdikbud.go.id/.

[4] Andi.Link. Hootsuite (we are social): Indonesian digital report 2020. https://andi.link/hootsuite-we-are-social-indonesian-digital-report-2020/.

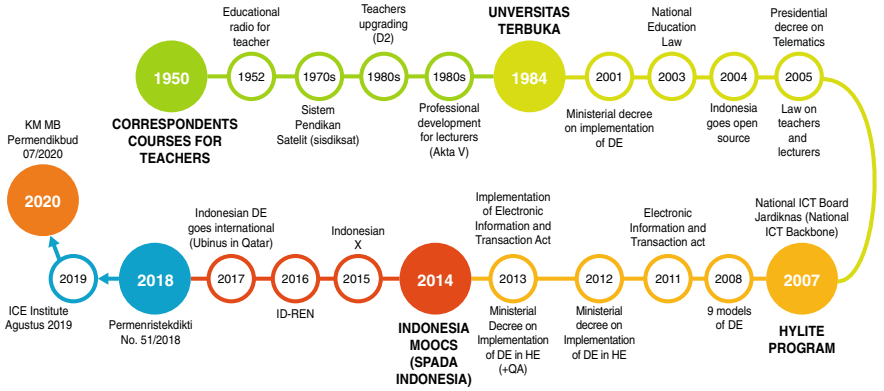


Fig. 9.1 Development of technology-based education in Indonesia (*Milestones in technology-based education in Indonesia*). *Source* Adapted from P. Pannen, and R.D. Riyanti. 2017. Digital and distance learning in higher education in Indonesia: Moving forward. Paper presented at the International Council for Open and Distance Education World Conference on Online Learning Teaching in a Digital Age—Re-thinking Teaching and Learning. 16–19 October 2017. Toronto

Teachers (HYLITE Program), which had a success rate of 90%, SPADA Indonesia was relatively more successful than the pilot test of Coursera, which logged 7% completion (Rivard 2013).

SPADA Indonesia has expanded its course collection since 2014. By the end of 2019, there were 279 open content, 221 open courses, and 400 online courses offered by 54 HEIs to 201 partners, involving 15,138 students. Since 2017, SPADA Indonesia has also been hosting a 1-year teachers professional course consisting of more than 600 modules from 53 study programs, involving 18,103 participants, conducted in 58 teacher colleges (Pannen 2019). SPADA Indonesia has also supported in-country student mobility by allowing students to do "one semester in other university", and offering joint courses among the seven HEIs in Indonesia on special topics such as disaster management, peatlands, and tropical diseases.

The government's initiative was soon followed by private sector initiatives. The Indonesia-X applies an EdX model for Indonesian online courses using instructional video from various distinguished Indonesian scholars. It is open and free to participate in, but exams and certification are fee-based. At one point, Indonesia-X had about 5,000 students taking a popular marketing course. Haruka Edu is another private player in the online education market in Indonesia.

In early 2020, a new policy was issued by the Minister of Education and Culture that allows HEIs to apply Kampus Merdeka—Merdeka Belajar (Freedom Campus—Freedom Learning). This allows undergraduate students to have three semesters of independent study to conduct several activities for credit transfer, including two semesters off-campus, and one semester cross-credit from other study programs and/or faculties within the HEI. The off-campus study covers internships, practices, community projects, teaching, research, entrepreneurship activities, humanity projects, and or independent projects, including online courses

from other HEIs or aggregators. The one semester cross-credit study has encouraged online courses to flourish, and is preferred by both students who prefer to learn from, and lecturers who prefer to teach, online study programs in other campuses.

While online education is developing rapidly in Indonesia, the program needs an enabling regulation and quality assurance system to scale up. In terms of regulations, the newest ministerial regulation on distance education of 2020 includes regulations on online education in a conventional university, a distance education university, and an unbundled university setting (fully online as well as blended learning). This opens opportunities for HEIs to offer online courses or online study programs. It has also led to the establishment of more online higher education institutions such as the University of Cyber Asia, which was launched in September 2020, offering fully online programs.

The new Regulation No. 7/2020 assumes that advancement of technology to include artificial intelligence will provide strong support for the development of online education in Indonesia. This new regulation virtually enables online education to exist with the transfer of credentials from other HEIs. During the pandemic, this policy allowed online courses to increase up to 70%. Parallel to this, the Government of Indonesia has issued a new policy to open up its market for cross-border education, especially to commercial presence of foreign HEIs in Indonesia, covering physical branch campus, or collaboration presence or virtual presence. It can be expected that more online education from foreign universities will soon be offered.

Indonesian HEIs also enter foreign markets. In 2017, Universitas Bina Nusantara opened its distance education center in Qatar, offering five study programs related to industrial engineering and information technology to more than 100 Indonesian workers. Meanwhile, Universitas Terbuka has representatives in 40 countries to cater to Indonesians abroad needing higher education. Thus far, two HEIs are offering single mode distance and online education, the Universitas Terbuka and University Cyber Asia. Further, there are 11 HEIs offering 58 distance education study programs, including 40 programs of Universitas Terbuka, 6 vocational programs from National Polytechnics of Electronics in Surabaya, and Health and Medical Polytechnics in Kupang and Samarinda.

Regulation No. 7/2020 also introduces a new framework for quality assurance to cover not only accreditation in institutions and/or study programs in the conventional and distance education settings, but also accreditation in courses and blocks in an online or unbundled university setting. As part of the scheme, a national quality assurance center was created by the Government of Indonesia to ensure quality of online education regardless of level (institution, study program, course, or block). Called the Indonesia Cyber Education Institute (ICE Institute), the center was designed to house all online courses and online education in Indonesia and ensure quality in the marketplace of online education in Indonesia. ICE Institute will focus mainly on online education and will complement the existing Badan Akreditasi Nasional Pendidikan Tinggi (National Accreditation Agency of Higher Education) or BAN-PT.

9.3 Quality Assurance in Online Education in Indonesia

In order to achieve the goals of access, quality, and relevance of tertiary education, Indonesia is promoting alternative and complementary education delivery vehicles of distance education through the use of online learning technology. It is believed that distance education will increase the participation rate in higher education and thus achieve equity, improve the overall quality of higher education, provide instant access to global Industry 4.0 knowledge and innovations, and promote lifelong learning and opportunities for reskilling and up-skilling of workers.

Nevertheless, one major issue in online education has been its quality. Stakeholders of HEIs have always compared online education to conventional education. Online education is not simply different ways of packaging instruction, nor modeling conventional classroom practice and focusing on the presentation and delivery of content, nor an electronic copy of traditional face-to-face education. The ultimate test of online education—in any form—will be learning effectiveness. Content can be easily duplicated in various formats, including e-learning, but may not have value. What is valuable is the interaction; the synergy; and the bonding of students, faculty members, tutors, resources, and the institutions through personal feedback and assessment, contextualized and personalized navigation through complex topics, encouragement, questioning by a faculty member and/or tutor to promote deeper thinking, and a context and infrastructure of learning (Allen and Seaman 2013). Theoretically, there is a minimum standard to be fulfilled as a guarantee that the online education process will be well implemented. This requirement typically defines levels of minimum acceptability for particular dimensions for the quality of institution, study program, or course.

In 2014, along with the inauguration of SPADA Indonesia, a team was appointed to implement quality assurance for all online courses under SPADA Indonesia. This was meant to control quality in every single online course to be offered through SPADA. The framework involves six domains of indicators: (i) instructional design, (ii) content, (iii) interaction and delivery process, (iv) assessment and evaluation, (v) system and technology, as well as (vi) human resources (Pannen 2019). Since online courses are offered by existing accredited institutions and study programs, they were not considered for evaluation anymore.

The quality control indicators were focused heavily on the proposed design of online learning experience, which is different in nature and process from conventional learning. Also, assessment is done on "system and technology" as intrinsic requirements, which constitute a high capital investment. Advocacy on sharing system was provided by the government to reduce initial costs in setting up distance education. Human resources are also being assessed for technology literacy and online pedagogy skill of instructors and tutors. The HEIs participating in SPADA were allowed to revise and improve their online courses so as to adhere to the intrinsic requirements (MORTHE 2019b). That marked the first time a course became an entity in quality assurance in higher education in Indonesia.

Although distance education in Indonesia higher education has been around for quite some time since 1984, the minimum requirement and accreditation tools for distance (online) education were completed only in 2019, especially for distance and online education study programs (MORTHE 2019b). Within the tools, the National Accreditation Agency has included indicators for blended and online course in conventional universities, and a separate instrument for distance (online) education. The accreditation conducted by the National Accreditation Agency is focused on an institution and study program to assess the quality of implementation. Meanwhile, quality assurance of online courses requires a more systematic integrated assessment mechanism conducted prior to implementation of the online courses.

Facilitated by Regulation No. 51/2018 and No. 7/2020, MORTHE has encouraged HEIs to start online courses. The number of proposals for online course as well as new online study programs have been increasing. These proposals are reviewed by Directorate General of Higher Education for provision of license to operate. Once it passes the review, the courses or study programs can be offered. It is assumed that good quality plans will lead to good implementation and good results.

9.4 Indonesia Cyber Education Institute

Quality assurance in online education is highly strategic for online education. Without standardized quality assurance, stakeholders evaluate effectiveness and ineffectiveness based on their own perception, which may be biased. Online education has allowed HEIs to provide different certificates and degree-awarding strategies using blockchain, micro credentialing, or digital credentialing. Thus, quality assurance of online courses is highly important to make a course transferrable across HEIs as well as across countries, as it will ensure quality and integrity in online course credentials earned in various higher education institutions.

The ICE Institute was established for the transformation of higher education in Indonesia in response to Industry 4.0 (MORTHE 2019c). The establishment of ICE Institute under the auspices of MORTHE is very timely, since there is growing interest in online education in public and private HEIs in Indonesia, as well as foreign HEIs coming to Indonesia virtually. The ICE Institute was inaugurated in August 2019, and is managed Universitas Terbuka. In its first stage, several HEIs are collaboratively building the marketplace based on common standards.

The architecture of ICE Institute is depicted in Fig. 9.2.

The function of ICE Institute is first, to curate online courses or online study programs in Indonesia, specifically the e-learning courses from Indonesian universities, as well as online courses from international universities and global MOOC platforms. As the online courses enter the online market, quality assurance is mandatory. ICE Institute will be able to carry over the curation process and supervise its compliance based on certain standards. In this process, curation is not merely looking for validity of the content and reviewing the design of online learning experience, but also examining the interoperability of each course within

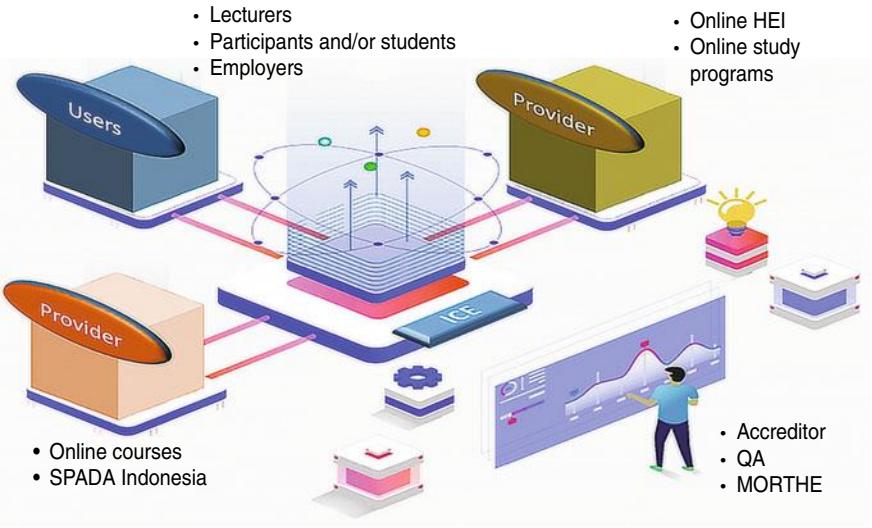


Fig. 9.2 Architecture of the Indonesia cyber education institute (*ICE Institute is expected to offer wider access to high-quality higher education, and to serve as a vehicle for credit transfer, degree programs, continuing professional development, and lifelong learning for all Indonesian people*). HEI = higher education institution, MORTHE = Ministry of Research, Technology and Higher Education, QA = quality assurance. *Source* Ministry of Research, Technology and Higher Education. 2019c. Arsitektur konseptual ICE Institute: proses – aplikasi – database – teknologi. Concept paper presented by Pannen, P. ICE Institute Development Team Chairman, to the Minister of Research, Technology and Higher Education. May 2019

the ICE Institute system and marketplace. Afterward, a registration number will be assigned as the unique identity for the marketplace of the ICE Institute.

Managing the marketplace of online education is the second function of ICE Institute. Employing blockchain for its services, the marketplace of the ICE Institute will have a number of galleries, i.e., the website of the HEIs, SPADA Indonesia, as well as international online course providers. Quality assurance in online courses in the marketplace will facilitate course and credit transfers, or recognition across institutions or countries.

In addition, ICE Institute is expected in the future to also house online course learning management platforms to assist HEIs that do not own platforms. By the very nature of its operation, ICE Institute owns big data on students taking online courses, which can be used for further analysis to improve online courses offerings as well as the ICE Institute's services. The blockchain technology will also allow the ICE Institute to provide a general ledger on students' records for each of their individual transactions in online education mode.

A study by Gullapalli and Ren (2019) confirms the need for quality assurance in online education systems up to the course or block level. Their study indicates that for 76% of recruiters, online education requires regional accreditation to be recognized as equal to conventional education. Mostly, recruiters value online

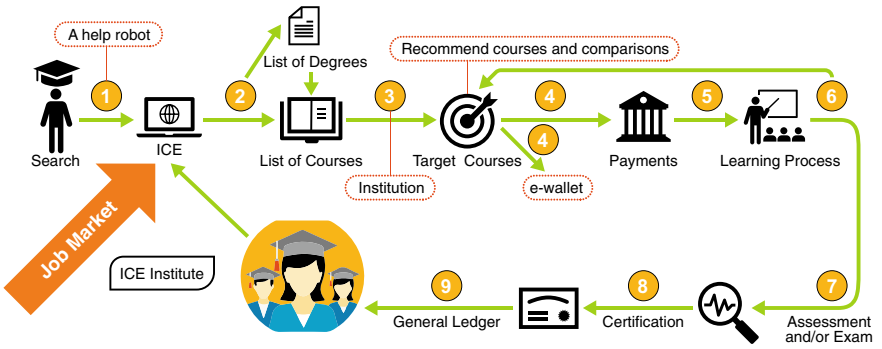


Fig. 9.3 Business process of the Indonesia Cyber Education Institute (*For the ICE Institute, quality assurance is needed in each step of the process*). *Source* Gullapalli, S., and P. Ren. 2019. ICE Institute and digital education in Indonesia. Presentation to the Ministry of Research, Technology and Higher Education by Darden School of Business, University of Virginia. 19 December 2019. Jakarta

courses from "well-known" or accredited HEIs (Fig. 9.3). Starting with the ICE-I website (appearance, chatbot, navigation, content), the intrinsic requirements for quality online courses consist of design and development of the learning journey, learning materials, delivery system, interaction and/or engagement strategy, and assessment and evaluation. The next considerations are quality of administration, including registration, payment, e-wallet, announcement and notification, general ledger, student record, linkages with other websites such as job market platform, etc. While the learning process and assessment or exam are to be assured by each participating HEI, the certification process and the value of the certificate have to be assured by the ICE Institute.

9.5 Quality Assurance of Online Education in Southeast Asia and Beyond

The development of online education in Indonesia has taken an almost similar course to that of other Southeast Asian countries, such as Malaysia, the Philippines, Thailand, and Viet Nam. The Association of Asian Open University has launched a MOOCs collection produced by its members, and the Asian University Network.

Thailand's online education was initiated in 2017 by the Thai Cyber University Project as the national MOOC platform in Thailand (Theeraroungchaisri and Khlaisang 2019). The main target groups of Thai MOOCs are employees, entrepreneurs, students, teachers, and others from the general public. In 2019, nine universities collaborated to develop Thai MOOC, resulting in a total of 300 courses; 2,470 learning hours; and more than 94,000 participants (Theeraroungchaisri and

Khlaisang 2019). The Thai MOOC introduces "credit bank" concept as application of blockchain in education to offer flexible lifelong learning opportunity for Thais.

In the Philippines, the University of the Philippines Open University or UPOU was established in 1995 applying fully online open distance learning. Since 2013, UPOU has promoted Massive Open Distance and E-Learning (MODEL) to provide more open and accessible education, and to reach out to more Filipinos not just in the Philippines but all over the world. UPOU offers certification based on completion of an online course to participants coming from local government, as well as businessmen, workers, and specific target groups, who enjoy flexibility in the offerings.

Meanwhile, in Malaysia, development of online education is exemplified by Taylor University, which started its first online course in the form of MOOC in 2013. This was followed by four universities i.e., Universiti Teknologi Malaysia, Universiti Teknologi MARA, Universiti Malaysia Sarawak, and Universiti Kebangsaan Malaysia. In 2014, the government declared Malaysia as the first country in the world to implement MOOCs for all public universities, and also the only country where MOOCs are implemented at a national scale through the local government (Rajendram 2014). Malaysian MOOCs are focused not only on academic courses, but also on nonformal and informal interests, and flexible courses for lifelong learning.

Today, each country seems to carry out its own initiatives in online education, mostly in the form of MOOCs or e-learning. In general, this movement in online education is based on the aim to offer educational opportunities to a wider audience in a more flexible manner and affordable cost. Most initiatives enjoy strong government's support, which require fulfillment of certain standards to serve majority of the public. The United Nations Educational, Scientific and Cultural Organization (UNESCO) reports that pushed by the COVID-19 pandemic, the campus-based universities in virtually every country worldwide is transitioning into online learning (UNESCO 2020a, b).

With such intensive practice of online education to reach wider audiences, providing a seamless opportunity for education in a very short time, sometimes without proper preparation, especially during this pandemic, places the quality of online education at risk. In this case, ICE Institute has the capability to provide guidance for quality online courses especially through the curation process, which will assist online education providers in conducting quality control and assurance. Further, with the online education movement, transfer of courses across institutions within a country or across countries may become a common practice, which can be facilitated through the online course marketplace. This marketplace for online education will be a primary tool for Asian countries to exchange quality courses within a micro credentials framework. Through collaboration, ICE Institute can become a hub to assist HEIs in Southeast Asia and beyond to widen their reach across institutions as well as countries.

9.6 Quality Assurance of Online Education During the Coronavirus Disease Pandemic

In an era of increased accountability, it is important to be able to demonstrate that online education adoption is sound, effective, and efficient. The COVID-19 pandemic has had significant consequences on higher education institutions. Conventional universities need to adjust to the disruption and carry out the whole learning experience from home, heavily using technology.

Since the spread of the pandemic, technology-based education or online education has gained high popularity in Indonesia. Belawati and Nizam (2020) confirm that Indonesian HEIs have undergone digital transformation through adoption of "online learning" after Indonesia enforced limited social movement. Within less than a month, 98% of 4,621 Indonesian HEIs have gone into online learning. In the capital city of Jakarta, about 65% of 325 HEIs reported directly deploying online learning for emergency remote learning. Prior to the pandemic, less than 10% of HEIs employed online learning for up to 30% of its curriculum. Such a sudden shift to online education, without proper preparation, lowers the expectation of the outcome of the emergency remote learning situation.

Within 2 months after the Government of Indonesia declared a lockdown due to the pandemic, around 60% of HEIs' efforts have been focused on preventive actions, such as issuance of policy for emergency remote learning; introduction of health and social protocols; deployment of masks, disinfectant, and hand sanitizers; and maintenance of communication. Changing teaching and learning activities, issuance of new policies regarding remote learning from home, as well as the postponement of practices or practicum came afterward. The emergence of COVID-19 left little room for HEIs to fully prepare the online courses, the system, the lecturers, and the students for an online learning mode. A study by Belawati (2020) suggests that HEIs took 25 days to move into online learning since the outbreak, with 76% of lecturers and 46% of students reported having experienced online learning. Belawati (2020) also indicates that the Google online learning platform was highly popular, followed by modular object-oriented dynamic learning environment or MOODLE, and Microsoft Teams or MS Teams. As for discussion, Zoom has been a popular platform. Meanwhile, majority of online learning materials are reported to be in the form of PowerPoint, MSWord, portable document format, and video, either as developed by the lecturers or taken from the internet. Although online and blended learning were perceived to be complicated at first, up to 75% of lecturers and 43% students reported willingness to continue online and blended learning in the future.

In the evolving new normal, less-contact teaching and learning in the form of online learning will become common practice in most HEIs, and may replace or be blended with the traditional classroom teaching and learning. Quality offering of the online learning experience is indispensable. While each HEI takes steps in quality assurance of its online courses, deploying ICE Institute's services in curating the online courses, offering of high-quality online courses through its marketplace, and employing ICE Institute's general ledger on student data will be a useful option for HEIs in Indonesia.

9.7 Conclusions

The current environment brought about by COVID-19 has shown the rapid growth of online education, which comes with some challenges, especially the issue of assuring quality of online courses. With students facing a lot of academic constraints in online education offered especially during the pandemic, only quality online courses can compensate the situation. Each online course must go through quality curation through a systematic and reliable mechanism to assure its design quality, its content, as well as its interoperability. Such mechanism must be made available within each country and applied by each HEI offering online courses. Spending time to wait for market evaluation toward the online courses is not advisable as learning experience as well as time for students will be jeopardized. Thus far, the mechanism for assuring quality of online courses is mostly integrated in the mechanism of quality assurance for a study program or a HEI, not as a separate or unbundled entity. The ICE Institute is one of the mechanisms that will curate specifically online courses in Indonesia prior to their offering, thus guaranteeing the quality of the courses.

The establishment of ICE Institute shows the vision and commitment of the Government of Indonesia in promoting the quality of online education in Indonesia. Moving into the future, ICE Institute needs to develop its blockchain technology that would allow the institute to offer more flexible and transferrable online courses, which are linked to the registration and verification credit system in HEIs, to the skills set database, and to the job market. The presence of ICE Institute may also create a new tertiary education and employment ecosystem that one, incorporates advanced AI-powered labor market information system between HEIs and industry; and two, uses AI-powered student career guidance for employability. Through rigorous quality assurance, online courses in the ICE Institute marketplace will be able to gain regional or even international accreditation to assure regional or global transferability and valuation. Assuring quality of online education takes a commitment and concerted efforts from many parties. The establishment of ICE Institute for online education in Indonesia is a remarkable first step in online education and needs to be further developed.

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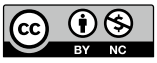
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Chapter 10
Certification and Accreditation Innovations in Technical and Vocational Education and Training



Dhruv Patel and Laura Brown

Abbreviations

COVID-19	coronavirus disease
TVET	technical and vocational education and training
UNESCO	United Nations Educational, Scientific and Cultural Organization
UK	United Kingdom

10.1 Introduction

Founded in 1996 in the United Kingdom (UK), Nisai is an early pioneer of online education, using 56 kilobits per second dial-up modems to enable teachers to deliver lessons using virtual classrooms. Things have come a long way over the last 20-plus years, yet there is still a lot of resistance and a lack of understanding when it comes to online learning, as shown in the coronavirus disease (COVID-19) pandemic. It is Nisai's mission to show that online does not mean lower quality, that online does not mean fewer opportunities, and that online does not mean one cannot access a full and varied curriculum.

Nisai has been working with its international partners to consider the need for formal certification and accreditation in the technical and vocational education and training (TVET) sector. This has allowed us to study systems currently in place, and to engage in discussions around the need for change in the TVET sector, to see how

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we can establish changes in our own practices. With the way the world has been affected by the global pandemic, and with many educational institutions having to close during this period of lockdown, the acceptance of online learning has allowed for steps to be taken. Hopefully, this is just the beginning of larger reforms.

10.2 Educational Disruption

The United Nations Educational, Scientific and Cultural Organization (UNESCO) concern is that nationwide closures are impacting over 60% of the world's student population. Several other countries have implemented localized closures, affecting millions of additional learners (UNESCO 2020). UNESCO has been able to track some of this impact, with the peak disruption being shown in April 2020 (see Table 10.1, Figs. 10.1 and 10. 2).

This same pattern will be reflected for those accessing technical and vocational education and training. We are seeing internationally that these closures are leaving significant skills gaps in international labor markets that will go on to impact the recovery of the economy for many years to come. These educational gaps would not be purely based on technical knowledge, but on development of many skills, including communication, leadership, etc. There have been several studies that look into skills regression throughout the summer break, and this will only be magnified during this extended period of lockdown. The majority of these, such as by speech pathologist Gosling (2012), Blanton (2015), and Oxford Learning (2020), are focused on the impact of this regression within a particular geographical or educational area. However, we need to extend this further to consider global implications of location and societal changes. An innovative approach to training and accreditation now is

Table 10.1 Learners affected by COVID-19 lockdowns

Date	Affected Learners	Share of Total Enrolled Learners (%)	Country-wide Closures
1 March 2020	299,145,521	17.1	6
1 April 2020	1,598,099,008	91.3	194
1 May 2020	1,287,401,633	73.5	181
1 June 2020	1,137,291,883	65	135
1 July 2020	1,067,674,228	61	109
1 August 2020	1,058,824,335	60.5	106

Figures correspond to number of learners enrolled at preprimary, primary, lower-secondary, and upper-secondary levels of education (ISCED levels 0–3); as well as at tertiary education levels (ISCED levels 5–8)

COVID-19 = coronavirus disease, ISCED = International Standard Classification of Education

Source Based on figures from UNESCO. Education: From disruption to recovery. https://en.unesco.org/covid19/educationresponse. Accessed 2 October 2020

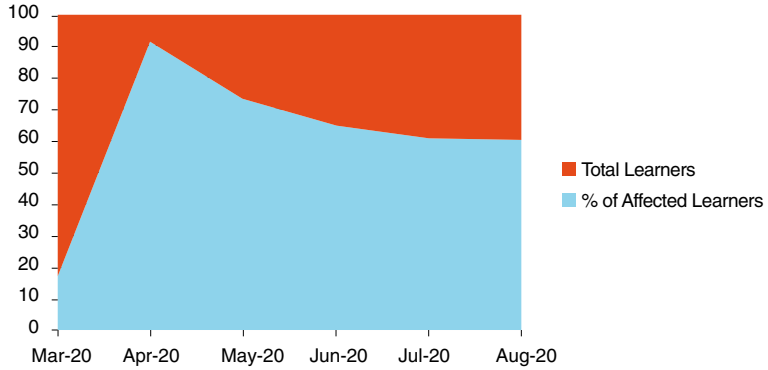


Fig. 10.1 Share of learners affected by COVID-19 (*Graphical representation of the percentage of all learners who were affected by school closures due to COVID-19 across preprimary, primary, lower-secondary, and upper-secondary levels of education [ISCED levels 0–3]; as well as at tertiary education levels [ISCED levels 5–8]*). COVID-19 = coronavirus disease. *Source* Based on figures from UNESCO. Education: From disruption to recovery. https://en.unesco.org/covid19/educationresponse. Accessed 2 October 2020

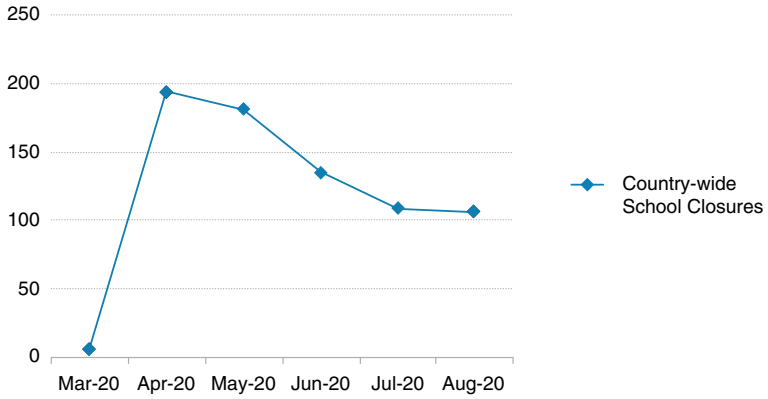


Fig. 10.2 Country-wide school closures due to COVID-19 (*Graphical representation of school closures around the world due to COVID-19. COVID-19 = coronavirus disease*). *Source* Based on figures from UNESCO. Education: From disruption to recovery. https://en.unesco.org/covid19/educationresponse. Accessed 2 October 2020

sure to benefit not only the individual learner, but also the local community and global society.

The numbers in Box 10.1 from Oxford Learning (2020) show what can be expected following a 2-month closure. Considering the impact of COVID-19 will be felt for many more months (see Box 10.1), many schools will have been closed, and further closures may still be put in place, by the time we return for a new academic year. The outcomes would be unthinkable; thus, we need to ensure that a more robust system

is in place to prepare for any future disruptions to the provision of education and training.

Box 10.1 Effects of a 2-Month Summer School Closure

- An equivalent of 1 month of learning is lost after summer vacation.
- 2.6 months of math skills are lost over the summer.
- 2 months of reading are lost over the summer.
- 6 weeks are spent relearning old material in the fall to make up for the summer learning loss.
- By the end of grade 6, students who have experienced summer learning loss over the years are on average 2 years behind their peers.
- Two-thirds of the income-based achievement gap is attributed to summer learning loss by the start of high school.

Source Oxford Learning 2020. Summer learning loss and how to prevent it. https://www.oxfordlearning.com/summer-learning-loss-and-how-to-prevent-it/. Accessed 2 October 2020.

These sobering facts highlight the very real problem that the world is currently facing: we have to move the provision to the population, rather than moving the population to the provision.

10.3 Inclusive Education

It is vital that learners are able to continue their progression and that peers are able to challenge each other to reach the next level of development. Stability and consistency within education and training will help learners understand their own role and what is expected of them, as well as allow them to build confidence in attempting to complete the required activities. Online learning can support this consistency, meaning that even at a distance, our young people are able to continue to grow and develop.

Online learning can help to provide the opportunity for extended study to some students who were not physically able to do this in the past. Some remote areas are limited in their development as there is no expertise within that region yet, no expert who can pass on their knowledge and experience. This means that within a local village, the same skills and trades are passed on from one generation to the next, without further improvement. This could lead to that village being left behind as the world continues to evolve and as further industrial, technological, or educational revolutions take place. By bringing the expert to this area remotely, the skills and passions of each individual can be supported.

Online learning will also allow for the expansion of TVET provision, providing further opportunities and growth for all involved. It also means that the delivery can

continue throughout troubled times, such as the current COVID-19 pandemic, and this will all ensure that our young people continue to be trained, are ready to enter the workplace, and are not further disadvantaged. Additional skills are also developed during this provision, with learners being responsible for their own progression. They have to be in control of their learning, making sure that they access their online classes, that they are completing work independently, without the teacher watching them do this. Learners are more autonomous and will be better prepared to self-motivate once they enter the workplace. These skills are beneficial to their long-term future, and so we need to look to online learning as a delivery platform that can suit all learners with all needs, not just in response to one crisis for a short period of time.

According to Meresman (2014, p. 8), "Involving parents and the community is an important principle of quality, both in and out of the classroom. It is even more relevant in the case of inclusive education, which is much broader than formal education and should not only take place within the four walls of a classroom…. Schools, by involving parents and the community, tend to establish better reputations in the community." Working within the community to build this reputation will be particularly important within vocational areas and for training of post-16-year-old learners, who are more involved in the choices for their own progression and how this will lead directly into a profession. If they can collaborate with a local partner to complete their training, this may lead to further opportunities to continue this relationship, and the chance to gain employment with them. By bringing local people into local jobs, the economy will maintain stability or begin to grow.

Online education can follow the same path within the local community. Experts can be sourced from around the world to allow for best practice to be shared and for advancements to be made, to keep up with international standards. Vocational subjects will work alongside the requirements within the local economy to fill gaps in the market and to ensure that workers are able to attain the highest levels of quality.

Online education can provide an alternative to the traditional structure of training, and allow personalization of the curriculum in accordance with local needs. Nisai is able to work with local partners to develop a curriculum that suits the needs and requirements of the local community. This means that each area can specify the areas of support that they require, and Nisai is able to source the expertise and build the community spirit around the project. This could allow learners to go straight into a workplace, or it could provide them with recognized training and certification to allow them to enter a higher education establishment. This progression is the ultimate goal, with the learners being able to recognize an improvement within their personal goals and outcomes. Unfortunately, those areas with the most need are often the ones without the infrastructure to support the required development.

Online learning does not have to mean that the student is alone at their computer all day. This is something that can be included within the wider society. It is sometimes even crucially important that a sense of community is maintained. Some students escape to a school as a sanctuary, where they are safe in the knowledge that there is a routine and support available to them. As Washington (2020) explains, these students live in communities that are violent or economically disadvantaged. The school building is often the one place of peace or the hub of the community.

If school doors keep closing where can the children go? What happens to their social-emotional well-being? Closing the doors of an urban school would be one more inconsistency in the students' lives. Consistency is vital for most learners, as they will be disadvantaged by periods of change wherein they have to settle into new routines and new experiences, thereby losing learning time.

10.4 Online Learning Communities

During the COVID-19 pandemic and the shift to online learning by many traditional schools, learners have found that their lessons did not continue in the same way they did before. Now, learners are responsible for their own work and completing this in a timely fashion. They have to log into new systems to access lessons. They have limited contact with their teachers and have to teach themselves in some instances. Nisai students, who were already used to online learning, saw no disruption. Their teachers were still in the classrooms during the scheduled times, and the work was set and marked the same way throughout the year. They were able to continue to work in preparation for assessment by their teachers at the end of the course, or for their move to the next year of study, without having to deal with a shortfall. Our attendance rates actually increased during this period as our learners came to appreciate the consistency that they were being offered, and to make the most of the opportunities that they have been given over and above their peers.

Traditionally, learners who have been engaging with online learning are those who had found difficulty with mainstream education. They found themselves behind their peers, or needed to find a new way to work that would be beneficial to them. With the changes that came about in response to the need for continued education in the face of COVID-19, these same learners are now finding that their peers are having to adapt to their ways of working. They have been able to achieve more during this time, which in turn has increased their own levels of confidence. Confidence in learning is a vital skill, and can help them to aim for the highest goals.

According to Washington (2020)[1]:

> Decision-makers overlook consistency when it comes to a student's academic success and social-emotional well being. Students need stability in every aspect of their lives. They need it at home and school. The children need security with their family and living situations. Also, students need it in their place of learning. Students need to see the administrators, teachers, and staff members that are a part of their lives Monday through Friday and sometimes on weekends, too. Students want to look at and be with their friends, whom they've known for years. Therefore, they need the persons, places, and things that make them a part of something great.

An online community can be built so that learners do not miss out on the social aspects within their education. The multipurpose use of Nisai's physical centers,

[1] Washington, C. 2020. The importance of consistency in education. https://www.teachandtaketime4u.com/2017/12/04/the-importance-of-consistency-in-education.

such as in Viet Nam, means that a whole community can be built around the needs of the leaners. Our learners are not left on their own to find their way through their education. Rather, they are supported, they are surrounded by staff who are able to help, and they can communicate at a time that suits them from wherever they are.

10.5 Planning for the Future

The development of a suitable curriculum for any course is a difficult process. Many things need to be taken into consideration, including ensuring the longevity of a course by future-proofing the information and skills to be tested. Most world leaders and officials in ministries of education are extremely well educated and so they can be confident in making certain judgments in relation to this. However, the education that they have received, to a high degree, is an academic curriculum, and therefore they have less experience in relation to vocational subjects and what should be on a TVET curriculum at this stage. Expert knowledge is a vital aspect of successful progression into the workplace. Nisai is able to work alongside industry experts to be able to build qualifications that will ensure all requirements are met. These qualifications reflect the skills that the industry experts have highlighted as core skills, as well as those that have been missing from other forms of training. Working alongside exam boards, it is possible to quality assure this process and ensure that both academic and vocational skills are met to equalize standards.

Working with industry experts at the development stage is beneficial to both the industry for final outcomes, and the educational establishment for teaching purposes. Studies have been completed following the growth of demand for TVET, and the results have been mixed. Although there is positivity within the development of technical and vocational studies, teachers still have to find their way within this new area, highlighted through some negative factors. Albashiry (2015) claims that among the challenges encountered were the lack of senior management support, unfavorable work conditions, the high rate of middle managers' attrition, and the lack of formal professional networking and liaisons with industry. Teachers can recognize the importance of working alongside industry experts, and this is something that we need to encourage within further consultations in curriculum design.

Society has developed over the years, and many facets of life have changed to reflect this: shopping can be completed at the click of a button; work is completed remotely; and cars are using electric power to limit the use of fossil fuels. However, education has remained the same. Technology has become the glue of a modern society, and yet education is hesitant to enact further change to embrace this. Ten years ago, changes were beginning to be made in the classroom with the introduction of interactive whiteboards, and yet not much more has happened since then. Schools could already be incorporating the use of virtual exchange programs, demonstrating the ability to personalize learning routes within available resources in an online program, or providing opportunities for anonymous communication to support learners in sharing their concerns during a learning program. The online learning

platform allows for all of this and more. Technology is a tool that can be used for development across many areas of life. And yet, why has education not followed this same process? Rote learning is no longer suitable to our modern society. Change is coming at such a pace that books are being left behind. Technology allows us to stay up-to-date with advances across the globe, and to keep pace with the establishment of a multicultural society.

The development of societal roles within learning gives further call for changes in education. We need to recognize the importance of experience and expertise. This must be reflected in our acceptance of various forms of evidence for accreditation, and may mean that more real-life experience is gained for the learner. If we are living in an online society then why should we not learn in one? Embracing online skills from the outset will make the learner more confident in using these within other elements of their lives, and make them more prepared for entering the workplace and the skills that are required there. The development of new techniques across the globe can be instantly shared with others, meaning that more immediate action can be undertaken to develop an area in need. TVET online learning will therefore not only benefit the learner, but the whole community that they belong to.

The fourth industrial revolution or Industry 4.0 is leaving many young people at risk as industry is changing and developing, becoming more autonomous and introducing more computerized roles that will replace the need for people within these employment areas. According to i-SCOOP (2020),[2]

> Industry 4.0 is the digital transformation of manufacturing/production and related industries and value creation processes…. [A]s Industry 4.0 has unfolded, computers are interconnected and communicate with one another to ultimately take action without human involvement. As a result of the help of smart machines that keep growing technologically, our factories will become more efficient and fruitful, and less wasteful. Ultimately, the network of these machines that are digitally inter-linked with each other creates the true power of Industry 4.0.

It is this level of automation that is a cause for concern for the future of TVET. Entry-level or low-skilled positions are becoming obsolete, with young people requiring more skills now than at any time in the past to be able to enter the job market. We have seen Western countries rely on the outsourcing of positions, such as call centers, to developing countries. The future of this arrangement is now at risk due to the increased automation of first-line support with the role of artificial intelligence. This means that we need TVET to include an increased focus on employability skills, and how to develop our young people to allow them to achieve within the workplace.

However, it is worth pointing out at this point that Industry 4.0 does not guarantee that there will be fewer jobs, only that these may be different. Future Ready Education (2020) tells us that the worker who uses his hands to mould a specific engine part will soon perform similar tasks in a virtual or augmented situation. An employee who stacks products will now use a joystick to do so. This means that some jobs will be removed due to the streamlined nature of development and the efficiency in

[2]i-SCOOP. 2020. Industry 4.0: fourth industrial revolution guide to Industrie 4.0. https://www.i-scoop.eu/industry-4-0/.

which tasks can be completed; however, the majority of jobs will require upskilling. This is what we need to focus our attention on at this time for our young people to be prepared for this new world of work.

Nisai has begun to incorporate changes to certification and accreditation in technical and vocational areas, although we do recognize that we too are still at the start of this journey that is ever evolving. Our experience and established relationships within the UK while working in pursuit of governmental and examination benchmarks means that we have also been able to forge relationships with international partners to consider local requirements and standards. The use of qualified teachers, industry experts, and continued training at all levels ensures that all delivery and assessment methods are appropriate for the required outcome. We have been able to develop a number of projects that have been successful in their implementation, and have allowed us to learn for the future in terms of the benefits and responses to these. I will briefly share a selection of some of these now for reference purposes in line with the innovations that Nisai has launched.

(i) ***Nisai Global School***. The launch of Nisai Global School (NGS) has given us a number of physical centers across Asia. These centers are used for mixed purposes for our own online lessons, and for community use. The learners who are engaged with NGS are able to communicate with peers around the world at the same time they are undergoing continuous learning. We have learners who are hoping to complete qualifications of the UK standard, and use these to aid their progression into international universities for their further studies. Alongside this, we have learners completing courses that are cross-curricular in their design, and which allow for further planning of their skill development or global citizen role. This includes a course around the Sustainable Development Goals, or a course around leadership or enterprise skills. These courses have all been popular and allow for learners to gain a certificate of completion, showing potential educational establishments or employers that the learners have pursued self-development programs along with their academic studies. Assessment within these courses is largely traditional, but will vary from formal examinations to completing a portfolio of evidence to allow for certification.

(ii) ***Accredited qualification.*** Working with one of our international partners, Nisai has established an accreditation of qualifications that allows for the formalization of informal learning. Through joint efforts, a course has been developed to ensure that with the completion of a portfolio of work based on the training that has been delivered, learners are able to gain qualification and prove their ability within their local workforce. Varied use of evidence builds personalization into the course, allowing different students to benefit, regardless of their background and with respect to the opportunities available to them, while still maintaining a high level of quality.

This qualification has been developed with an examination board in the UK, thus reflecting the depth of quality that is required to complete training at this level. By working with a local partner, Nisai is able to ensure that the skills

gained are relevant to the market and would provide the best form of training. The certification can place the learners ahead of their peers when applying for jobs, and allow them to progress further within their future careers.

(iii) ***Community immersion***. Nisai is working with one village that is very remote from other training facilities, and helping to build a community learning project there. Through this we are able to provide learners and local workers with formal qualifications, and help develop their English language proficiency. They will be able to share skills and knowledge for local jobs, as well as consider professions that may have seemed out of their reach previously. This will allow for development of the economy and progression of the community as a whole.

These projects are proving beneficial during the COVID-19 pandemic, but have in fact been in place even before the pandemic. They will continue to be in place going forward. Online education can give learners confidence in using technology, which will benefit them in their future workplace as most workplaces will be heavily relying on technology. COVID-19 is not the only natural disturbance to education. Across the globe there are many issues each and every year. These may include psychological trauma following violent acts at school, natural disasters such as earthquakes and flooding, or even times of war. These issues will not only affect education in these areas, but also the success of businesses. There will be interim periods where businesses may have to close if the environment dictates this, but if they are able to continue by using an online method for remote working, or by using the time effectively to complete staff training, then these businesses may be in a more secure position to be able to reopen when it is suitable.

Since September 2019, the Center for Disaster Philanthropy (2020) has compiled a list of disruptions around the world, as shown in Box 10.2. If the development of learners is adversely affected during the summer break, then how much more will our young people and economy suffer if they have to deal with just a few of those listed events? How will they be able to reach their full potential and challenge their peers to develop and continue to change the world?

Box 10.2 Natural and Human-Made Disruptors to Learning, September 2019–2020

- Hurricane Dorian
- Australian bushfires
- California wildfires
- Tropical Storm Imelda
- Amazon wildfires
- Spring tornadoes
- Puerto Rico earthquakes
- Midland, Michigan dam breaches
- Southern Border humanitarian crisis

- Rohingya refugee crisis
- Yemen humanitarian crisis
- Venezuelan humanitarian and refugee crisis
- Monsoon floods
- Midwest Derecho
- North American wildfire season
- Beirut explosion
- Civil unrest in the United States
- Atlantic hurricane season
- Coronavirus disease

Source Center for Disaster Philanthropy. 2020. https://disasterphilanthropy.org/our-approach/disasters/.

The depth and breadth of these events show that no area is clear of potential disruption to learners, and reinforces the belief that we should all prepare so that the education of our young people can remain consistent through time. Stability within all education and training opportunities is vital.

10.6 Conclusions

There are many possibilities for certification and assessment development within education and training, and this is something that we should embrace. The world is changing around us, and education has to adapt to reflect this. Only through this adaptation will we be preparing our young people for the world of work and a society that they are going to be entering upon completion of their studies. The growth of a community as part of this education and training is vital, with experience and expertise being seen in many settings and situations.

Nontraditional providers of education are going to become more important in future developments. As with Nisai, we can work across many different platforms at one time, incorporating local and global requirements within one place, making developments that can incorporate the needs of all stakeholders, such as the learners, the government, and the employer. This will all come together in building a larger learning community, using local knowledge and expertise from around the globe. There are fewer restrictions to this system than with traditional schooling. Private education providers have a wider scope for development and will be able to react in real time to developing needs and changing environments. The experience that we build from this can be used by the government to formalize required changes to the curriculum and to highlight further changes that will be needed in the future.

Although the global pandemic has caused a lot of difficulties around the world, and many people have found themselves disadvantaged as a result of this, there are also some positives that we can take from this event. The acknowledgment of the

need for change, the continued acceptance of online education as an alternative to traditional learning or alongside it, and the openness of all areas of government and business to establish new routines, show that educational reform is possible, and we must now embrace this opportunity. The learner has been at the center of all plans for change, and the power of this is exciting. The future of education across all levels and platforms can return to the learner and how to prepare them in a practical manner has been recognized as important. Skills have been recognized as being as important as knowledge. This growth can allow us to build larger learning communities, using experience as well as formal training to help to develop our young people.

This is an exciting period in education and training. We are seeing a revolution in an old system and can do our piece to sculpt the future for the benefit of our young people. Certification and accreditation will continue to change. We will continue to find new ways in which we can ensure that young people have the right skills, as well as knowledge, to take them into the workplace. We will see changes to our leadership whose acceptance of the introduction of a multicultural, cross-curricular society will dictate the pace of this change. We cannot rest on our laurels, and we cannot be naïve to think that the changes that we have introduced so far are enough. This is the start of a long journey, and one that I am proud to be a small part of.

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Part IV
Communities as Learning Platforms

Chapter 11
Playful Learning Landscapes: Convergence of Education and City Planning



Helen Shwe Hadani, Rebecca Winthrop, and Kathy Hirsh-Pasek

Abbreviations

6 Cs	collaboration, communication, content, critical thinking, creative innovation, and confidence
COVID-19	coronavirus disease
PLL	Playful Learning Landscapes
SDG	Sustainable Development Goal
STEM	science, technology, engineering, and math

11.1 Introduction

When the world's governments committed to the United Nations Sustainable Development Goals (SDGs) in 2015, they agreed not only to address a common set of issues, but to advance a shared agenda of "leaving no one behind." Addressing

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education inequality is at the heart of SDG 4 and is now more relevant than ever due to school closures from the coronavirus disease (COVID-19). Wealthier families, communities, and countries have found ways to help children continue learning but resource-constrained peers fall farther behind.

In addition to COVID-19, we are also facing complex social challenges that require keeping up with technological innovation, solving problems that require young people to think critically and creatively, identifying and understanding problems we are just encountering, and working together to solve them. Importantly, many of the skills required to be lifelong, engaged learners (e.g., collaboration, communication, content, critical thinking, creative innovation, and confidence—the "6 Cs") are rooted in the science of learning and build on each other beginning at a young age (Golinkoff and Hirsh-Pasek 2016).

The present times are truly a "leapfrog moment" for the global education community. There has never been a more urgent time than now to find new, cost-effective ways of helping young people develop the competencies and skills needed to thrive in work, life, and citizenship. In *Leapfrogging Inequality: Remaking Education to Help Young People Thrive* (Winthrop et al. 2018), one of the four main pillars for accelerating the pace of change, or "leapfrogging", in education is to harness the learning opportunities of a diversity of in-school and out-of-school experiences. The recent pandemic has thrust the role of out-of-school learning experiences onto the agenda, and there is now more interest than ever to explore innovations that complement school-based learning. One such example is Playful Learning Landscapes (PLL), an approach that can supplement and extend school-based learning, and with a modest cost, provide a needed boost for children who are farthest behind.

11.2 What Is Playful Learning and Why Is It Important?

Deep inequalities plague the education systems in many countries. In the United States (US), economic disparities among families lead to large gaps in educational outcomes. Research shows that as early as age three, low-income children lag behind their more affluent peers in language and spatial skills (Golinkoff et al. 2019).

Seeking to close gaps in school readiness and achievement, policy makers have focused on improving access to and quality of formal learning environments. These efforts do not address the 80% of time that young children spend outside the classroom with their families (Meltzoff et al. 2009). Many children living in underserved communities may have more limited access to enriching learning environments outside of school (e.g., libraries and museums; see Haden 2010), to books in their home, or the kinds of conversations that build cognitive and social capital. This places them at a significant disadvantage relative to their more advantaged peers.

Playful learning is an umbrella term based in science that broadly incorporates how children learn through both free play (voluntary, controlled by the child, and

nongoal-directed) and guided play (Zosh et al. 2018). In guided play, an adult helps structure activities centered around a learning goal. Importantly, children maintain control over their learning as interactive discoverers. Guided play affords children the opportunity to learn traditional skills like math, literacy, and spatial skills, while promoting creativity, problem solving, and collaboration (Weisberg et al. 2016).

A growing number of studies point to the importance of caregiver–child interactions in language for school readiness and success. More specifically, research demonstrates that kindergarten language scores are the strongest predictor of school achievement across all subjects in third and fifth grade (Pace et al. 2019). With respect to math skills, the amount of spatial language (words such as big, circle, and flat) that parents use with their young children predicts children's spatial thinking, which is an important component of mathematical success (Pruden et al. 2011). Moreover, parents' number talk with their toddlers predicts later understanding of foundational number concepts (Gunderson and Levine 2011).

11.3 How Children Learn: Playful Learning Principles

Children learn best when they can be active and engaged in learning that is meaningful, socially interactive, iterative, and joyful (Hirsh-Pasek et al. 2015; Zosh et al. 2018). Six characteristics define playful learning contexts:

(i) ***Active ("minds on").*** Research supports the benefits of active learning—where children are focused and engaged in the learning process through questioning and reflection—over passive learning where students memorize information (Chi 2009). When they are actively involved in the learning process, children can build spatial skills (Bower et al. 2020) and learn properties of shapes (Fisher et al. 2013) and new words (Han et al. 2010).

(ii) ***Engaging.*** Filtering out distractions and focusing attention on a task is a central skill. Young children are distracted by inconsequential elements of the environment, as shown by Fisher et al. (2014), who found that kindergarteners who completed science lessons in a highly decorated classroom learned less science content than when they were in a more sparsely decorated classroom.

(iii) ***Meaningful.*** When children connect their experiences and interests to new information, their learning is relevant to their own lives. Research in children's museums suggests that adults help children make learning meaningful by highlighting connections between new concepts and personally relevant and familiar information (Callanan et al. 2017).

(iv) ***Socially interactive.*** Children frequently play with others and this adds social meaning by constructing new knowledge (Chi 2009). Research finds that cooperative play with peers supports aspects of children's development, including areas of cognitive, social, emotional, and linguistic growth (Berk et al. 2006; Howes et al. 1992).

(v) ***Iterative.*** Children generate, test, and revise hypotheses while interacting with their environment based on data (Gopnik 2012). Learning is an iterative process. Research with preschoolers indicates that children will explore objects and causal relationships more when they observe events that violate their expectations (Schulz and Bonawitz 2007).

(vi) ***Joyful.*** Joy and positive emotions are inherent elements of play. Research by Isen et al. (1987) demonstrates that positive affect can boost creativity and make people's thinking more flexible and integrative. A recent model links student participation in activities that bring them joy (e.g., sports and music) to gains in executive function skills and academic outcomes (Diamond 2014).

11.4 What Children Learn: The 6 Cs—A Breadth of Skills Approach

Active, engaged, meaningful, socially interactive, iterative, and joyful activities provide a pedagogical framework for *how* children learn, which leaves open the question of *what* children need to learn to thrive in the twenty-first century. In today's globalized, rapidly changing world, children need to develop a breadth of skills beyond numeracy and literacy that allow them to engage in independent lifelong learning. The 6 Cs—collaboration, communication, content, critical thinking, creative innovation, and confidence—are a suite of skills that are rooted in the science of learning and build on each other (Fig. 11.1).

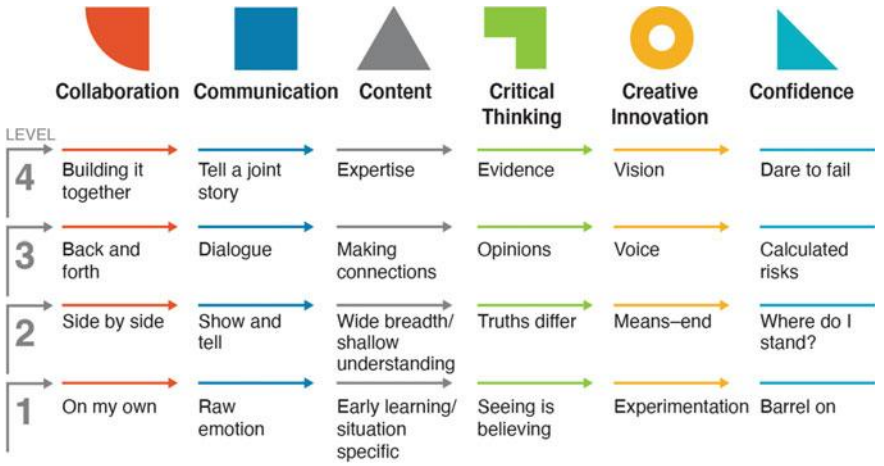


Fig. 11.1 The 6 Cs (*The 6 Cs are a suite of skills that offer a breadth of skills approach to developing twenty-first century skills*). *Source* Adapted from Golinkoff, R. M., and Hirsh-Pasek, K. 2016. *Becoming brilliant: what science tells us about raising successful children*. Washington, DC: American Psychological Association

The following is a brief description of the 6 Cs as presented by Golinkoff and Hirsh-Pasek (2016) in their book *Becoming Brilliant*:

(i) ***Collaboration.*** Collaboration reflects how social engagement is central to human nature. Interestingly, recent neuroscience research shows how collaborative play yields unique patterns of synchronized brain activity between infants and adults (Piazza et al. 2020).

(ii) ***Communication***. Communication—speaking, writing, reading, and listening—is essential in our daily lives. In early childhood, language skills develop through back-and-forth conversations between children and their parents. Hirsh-Pasek et al. (2015) and many others show that children's kindergarten language skills are the strongest predictor of their academic performance in language, reading, and math, as well as their social skills (for a review, see Pace et al. 2019).

(iii) ***Content.*** Traditional content includes reading, writing, math, science, social studies, and the arts, but it is also important to recognize "learning to learn" or executive function skills including attention (Duncan et al. 2007) and working memory (Nguyen and Duncan 2019) that support children's academic achievement. Content builds on collaboration and communication across the disciplines, including math (Bower et al. 2020; Ribner et al. 2020); literacy (Ribner et al. 2020); science; and social studies (Gonzalez et al. 2010).

(iv) ***Critical thinking.*** Strong critical thinkers can evaluate the quality of information they receive and ideally use those skills both inside and outside of the classroom (Halpern 2014). The good news is that critical thinking (Halpern 2014) and the related skill of reasoning (Bunge and Leib 2020) can be taught.

(v) ***Creative innovation***. Creative innovation—the synthesis of content and critical thinking—enables students to use what they know to make something new and develop innovative solutions (Kamenetz 2018). Play directly supports that innovation in both language and art (Garaigordobil and Berrueco 2011).

(vi) ***Confidence.*** Children who are confident in their abilities demonstrate persistence and flexibility, even when they experience failure. Confidence is closely related to "grit," which is defined as "perseverance and passion for long-term goals" (Duckworth et al. 2007) and "growth mindset," the belief that one can improve their abilities because they are not fixed in time at a particular level (Dweck 2015).

11.5 Playful Learning Landscapes: A Way to Use the *How* and *What* of Learning in Practice

Together, the *how* and *what* of learning offer an evidence-based model of education that can be used in formal and informal learning environments to reduce inequities and encourage leapfrogging.

By merging architectural design and placemaking with the science of learning, PLL embeds learning opportunities in places where families regularly go (e.g., bus

stops, parks, supermarkets, and laundromats) and transforms them into engaging and enriched learning hubs. The creation of these spaces is guided by the 6 Cs and playful learning principles in what and how children learn. For example, PLL's Urban Thinkscape—which transformed an abandoned lot next to a bus stop in West Philadelphia into an interactive play space—includes a bench with puzzles on the back and a hopscotch game that promotes flexibility and self-control. The activities and structures in Urban Thinkscape provide opportunities for children to engage in high-quality communication with their caregivers and peers, engage in collaborative problem solving, and take risks to build confidence.

While PLL benefits all children, evidence indicates that targeting communities where families have less access to extracurricular enrichment activities (e.g., libraries, museums, summer camps, music lessons) could help them enter and engage in formal schooling on a more level playing field, setting a positive trajectory for life outcomes. When young children enter formal schooling lagging in areas such as language development, spatial skills, and early numeracy, their overall learning trajectories can be set back. These inequities had been growing in many cities prior to the COVID-19 pandemic, which further accelerated the issue (Fisher et al. 2020). Urban public spaces offer a promising yet underutilized platform for dual impact – learning interventions to support learning outcomes in under-resourced communities and activating public spaces for the communal good.

As communities look to "build back better" after COVID-19, there is an opportunity to reimagine the learning environment and supplement the learning that takes place in the classroom by providing enriching, interactive, and social environments in public and shared spaces.

What makes PLL unique is a critical layer of playful learning—a spectrum of child-directed play methods that include free play (no direct adult involvement), guided play (supported by adults toward a learning goal), and games (rule-based activities with learning goals) informed by the latest findings in developmental science (Zosh et al. 2018). As described previously, guided play—the focus of interactions in PLL—allows children to maintain control over their learning with the guidance of an adult to provide structure and focus the activity around a learning goal (e.g., a well-curated exhibit at a children's museum).

Going back to the Urban Thinkscape example, our activities and structures target specific areas of learning including (i) spatial skills, (ii) language development, and (iii) executive function (Hassinger-Das et al. 2020) (Fig. 11.2). The game "jumping feet", a series of stones with either one shoe print or two encourages children to jump following a pattern. Signs prompt children to put one foot where they see two and vice versa. This twist on hopscotch embeds cognitive science in the design of the activity and is based on a task used by researchers to gauge children's memory and attention. The intentionality behind the design is the key component for promoting learning through play.



Fig. 11.2 Urban Thinkscape (*The game "jumping feet" is a variation of hopscotch that develops children's memory and attention [photo by Sahar Coston-Hardyp]*). *Source* Playful Learning Landscapes Action Network. Urban Thinkscape. https://playfullearninglandscapes.com/project/urban-thinkscape/. Accessed 5 November 2020

11.6 Playful Learning Landscapes Work: The Evidence

Pilots in Chicago, Philadelphia, and Santa Ana in the US have shown that PLL promotes the kinds of caregiver–child behaviors and interactions directly related to later progress in science, technology, engineering, and math (STEM); literacy; and executive function. With more children growing up in socially, economically, and racially stratified neighborhoods, city and community leaders are increasingly looking to PLL as a promising way to engage communities living in low-resourced areas as they design and implement creative spaces where children, caregivers, and community members can interact with one another.

Data from pilot installations and activities demonstrates the following advantages of PLL:

(i) ***Increases caregivers' attitudes about the connection between play and learning.*** Parents' understanding of play determines whether and how parents play with their children (Fisher et al. 2008) and what affordances for play children have access to in home and community settings (Chak 2007). The Ultimate Block Party brought over 50,000 people together in New York's Central Park to engage in activities highlighting the link between play and learning. It demonstrated that families are interested in playful learning activities and caregivers' attitudes about the play–learning connection can be shaped in a community setting. Results showed that when parents visited 3–4 playful learning installations, they had more positive attitudes about the

play–learning connection than did parents who visited fewer installations (Grob et al. 2017).

(ii) ***Promotes the kinds of caregiver–child communication that supports relationship building and language learning.*** Research shows that the quantity and quality of language interactions between caregivers and children predict language growth (Adamson et al. 2014; Hart and Risley 1995; Hoff and Naigles 2002). *Supermarket Speak* transformed a daily trip to the supermarket into a learning opportunity to promote caregiver–child conversations by adding simple signage, "Where does milk come from?" (Fig. 11.3). Results showed a 33% increase in conversations between children and caregivers when signs were up in under-resourced neighborhoods (Ridge et al. 2015).

In *Urban Thinkscape*, the bus stop transformation, researchers found a significant increase in conversations between caregivers and children that include six or more turns (where participants speak one at a time in alternating turns). In addition, there was an increase in the number of families using language related to numbers, colors, spatial patterns, and letters (from 2.2% at pretest to 36% at posttest) (Hassinger-Das et al. 2020).

(iii) ***Encourages children's talk about numbers, letters, colors, and spatial relations.*** Talking about math predicts children's acquisition of number words better than socioeconomic backgrounds (Levine et al. 2010). Parkopolis (Fig. 11.4) enriched a public space with math and science learning by engaging children and their caregivers in a life-size board game where they roll "fraction dice" and move one and a half spaces around the board. Compared to



Fig. 11.3 Supermarket Speak (*Signage increases conversations between children and caregivers [photo by Sahar Coston-Hardy]*). *Source* Playful Learning Landscapes Action Network. Supermarket Speak. https://playfullearninglandscapes.com/project/supermarket-speak/. Accessed November 2020



Fig. 11.4 Parkopolis (*Parkopolis is a life-size board game where children and their caregivers roll "fraction dice" and move one and a half spaces around the board [photo by Sahar Coston-Hardy]*). *Source* Playful Learning Landscapes Action Network. Parkopolis. https://playfullearninglandscapes.com/project/parkopolis/. Accessed 5 November 2020

another STEM exhibit, caregivers produced more STEM language, had higher engagement and physical activity, asked more questions, and spent less time on their cell phones in Parkopolis (Bustamante et al. 2020).

Meanwhile, *Play and Learn Library* embedded playful learning activities in public libraries to promote quality adult-child interactions. Results found that the number of children using spatial-related language—terms referring to size (e.g., big, small); features (e.g., heavy, light); directions (e.g., above, under); or shapes—was 24.2% higher at the Play and Learn spaces than at the non-Play and Learn sites. Similarly, the number of children using letter- and/or sound-related language (terms referring to colors, letters, or literacy skills) was 18.8% higher (Hassinger-Das et al. 2020).

(iv) ***Increases children's understanding of mathematical concepts including fractions and decimal arithmetic.*** Research shows that rational math (e.g., ratios like fractions and decimals) is a gatekeeper for learning complex math and science concepts (Booth and Newton 2012). PLL's Fraction Ball reimagines the lines of a basketball court to emphasize fractions and decimal learning by allowing children to take shots that are worth a fraction of a point. Results from pilot testing found that students who played fraction ball in physical education class (versus regular physical education classes) demonstrated significantly greater learning from pretest to posttest on assessments of fractions and decimal numbers (Bustamante et al. 2020).

11.7 A Path Forward: Scaling Playful Learning in Cities

A Brookings report on PLL in Philadelphia highlights that the aim of scaling playful learning in cities is moving beyond replication of a single installation to infusing playful learning principles into the mainstream practices of government, businesses, and other organizations (Robinson 2019). Building on that work, Hadani and Vey (2020) discuss five key steps that cities can take to adopt and scale playful learning in their communities.

First, coordination within and across city agencies is needed to support the design and integration of playful learning efforts into new and existing projects. Change at the city level is unlikely without the commitment of the mayor or someone in the mayor's office, but scaling playful learning requires institutionalization and coordination across city agencies—from public works, to transportation, to the health department. For example, in Tel-Aviv, Yafo City and community leaders organized a city-wide event that attracted over 8000 visitors in Rabin Square—a central plaza located in the heart of Tel Aviv—focused on the importance of early childhood and play. Both the theme and location of the event conveyed to the families of Tel Aviv that early childhood and play are a priority for the municipality.

Second, cities do not have to start from scratch. Collaborating with national organizations, many of which are already deeply engaged with local philanthropic, civic, and neighborhood groups to support playful learning, can help to maximize limited resources and increase impact. Internationally, the Playful Learning Landscapes Action Network is working around the world to advise partners on how they can create installations in their cities. In the US, for example, Philadelphia's Playful Learning City initiative, funded by the William Penn Foundation, transformed a bus stop into a learning hub and supermarkets into places that groomed language growth. Too Small to Fail, an initiative of the Clinton Foundation, has created a unique partnership with the Laundry Cares Foundation to transform laundromats into literacy-rich spaces. The national partnership has distributed literacy materials (e.g., children's books and posters featuring parent–child conversation prompts) to 5000 laundromats across the country and helped to facilitate connections with local libraries to deliver programming to families.

Third, working with local partners spurs meaningful engagement with the community, which leads to a better understanding of their needs and ensuring local buy-in. Michigan's Great Start initiative on early childhood reaches local communities by partnering with churches in Detroit to encourage caregivers to talk, read, and sing to their children. Pastors embed messages around early learning and the importance of language-rich experiences for school success in church bulletins, and banners around the church reinforce these messages to families.

Fourth, to reach busy and overwhelmed parents, messaging needs to be concise and shared in various formats and venues. For example, Chicago PlayStreets—a community engagement initiative led by the Chicago Department of Public Health—encourages active play for children and adults by transforming residential streets into safe gathering spaces for families. A key to success of this initiative is

communicating to residents the important link between physical activity and play for improved cognitive, social, and physical health and development—and how closing streets is a low-cost way to promote exercise and socialization when other play spaces are limited.

Lastly, cities can engage in playful learning through many entry points, but they need to streamline processes to more seamlessly embed playful learning in urban planning and design decisions. One way to address this challenge is training urban planners and designers to embed playful learning into projects and programs from the start so it is not seen as an added effort or cost. Making it easy should not be hard.

11.8 How Playful Learning Landscapes Allow Us to Build a Breadth of Skills and Leapfrog to Sustainability

Leapfrogging to promote an effective learning society is only possible if we have the right inputs for children. Young children learn best in active, meaningful, interactive, and engaged contexts. Through fun, interactive installations co-located in spaces that families frequent, PLL encourages the development of critical skills and connections, allowing children from under-resourced neighborhoods to enter into formal schooling on a more even playing field, and setting a positive trajectory for later life outcomes. Through evidence-based engagement and communications strategies, PLL fosters the development of healthy communities by encouraging positive, intergenerational social interaction in public spaces and engaging the community in design and implementation, fostering a sense of pride and responsiveness to community. By thinking differently about the potential of our public and shared spaces, we can enhance urban environments while at the same time making them more powerful experiences for families.

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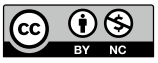
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Chapter 12
Advancing Learning Cities: Lifelong Learning and the Creation of a Learning Society



David Atchoarena and Alex Howells

Abbreviations

EC	European Commission
GNLC	Global Network of Learning Cities
ICLC	International Conference on Learning Cities
ISCE	International Standard Classification of Education
OECD	Organisation for Economic Co-operation and Development
SDGs	Sustainable Development Goals
UIL	UNESCO Institute for Lifelong Learning
UNESCO	United Nations Educational, Scientific and Cultural Organization

12.1 Introduction

As the world grapples with the most profound public health challenge in a century in the form of the coronavirus disease (COVID-19), humanity is also coming to terms with a number of potentially epoch-defining transformations, including the climate crisis, demographic change, technological transformation as part of the fourth industrial revolution or Industry 4.0, and artificial intelligence, all of which impact on transforming the new world of work. While lifelong learning is not a perfect solution, it has a key role to play in responding to these challenges and achieving sustainable economic and social development that is also fair and inclusive.

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Lifelong learning is a multifaceted concept shaped by decades of policy debate and a mixed record of intervention at the country level. Lifelong learning calls for holistic investment in learning opportunities for all, across the whole life span; demands an open environment for access; and requires a system of incentives that encourages individuals and communities to become autonomous learners. Such enabling conditions allow the promotion of flexible transitions between education and work, support professional development, and foster physical and mental well-being, which are essential during a health emergency and everyday life.

Those global trends and challenges are felt in urban and rural areas alike, yet, in combination, they manifest with particular intensity in cities. By virtue of their larger populations of people concentrated in small geographical areas, cities epitomize humanity's susceptibility to, and potential to overcome, these wide-ranging challenges. Though they vary in size as well as in their cultural, social, economic, and political structures, cities have many common characteristics that determine and shape urban development. As a result, certain principles of action and policy features are equally relevant and applicable to a wide range of cities in a diversity of development contexts. This is the rationale behind international networks of cities such as the United Nations Educational, Scientific and Cultural Organization (UNESCO) Global Network of Learning Cities (GNLC). Member cities of the GNLC have made a commitment to lifelong learning. Regardless of size, demographic composition, political orientation or history, learning cities across world regions are determined to revitalize learning in their communities, at home and in work, while ensuring opportunities are equitable and accessible to all. Inclusion is more than a rhetorical aspiration: the GNLC encourages learning cities to establish the necessary infrastructure for the inclusion of vulnerable populations, such as migrants, youth at risk, elderly people, digitally excluded populations and people with disabilities, with a particular attention to gender equality.

Within the framework of the GNLC, a comprehensive understanding of the learning cities concept acknowledges a set of core values that should unite all member cities and guide their policies. They include an aspiration to the right to lifelong learning, active and global citizenship, and local democracy. Furthermore, in the midst of the global pandemic, resilience and recovery have also emerged as critical dimensions of learning cities' values and activities. Translating these dimensions into concrete policies and actions requires participatory, cross-sectoral processes. By working in this way, learning cities are putting in place the foundations of a learning society.

This chapter discusses the concept of lifelong learning, its emergence, recent developments, and implementation through public policies. Following an analysis of some of the most promising innovations to promote lifelong learning, particular focus is placed on the territorial approach or the concept of learning cities, which then fosters the establishment of a learning society.

12.2 Lifelong Learning: From Utopia to Reality, from Education to Capabilities

The concept of learning cities, operationalized by frameworks such as the GNLC, has far-reaching dimensions beyond education, which can be drawn upon in a forward-looking way to advance lifelong learning at the local level. Those dimensions include the right to lifelong learning, learner engagement, citizenship and local democracy, and resilience and recovery. The last two are particularly relevant in the context of the COVID-19 pandemic. When cities advance in these dimensions, they establish the foundations necessary to build a learning society and promote sustainable development.

Lifelong learning is not a new concept. It has been part of policy debates in the fields of education and employment for decades. Following the adoption in 2015 of the 2030 Agenda for Sustainable Development, including Sustainable Development Goal (SDG) 4 on education, which promotes lifelong learning opportunities for all, the concept constitutes a benchmark for designing and reforming education systems and policies; and builds a bridge between education and other sectors, notably employment and social protection (UNESCO 2016). Lifelong learning is not just an extension of the learning process initiated at school, but involves linking learning with all domains of life, including work, family, citizenship, and personal development. In that sense, it is truly life-wide. This broad perspective also highlights the diversity of learning environments and experiences, usually categorized as formal, nonformal, and informal.

The formal categorization is defined in the International Standard Classification of Education 2011 developed by the UNESCO Institute for Statistics (UIS 2012), which describes formal education as "institutionalised, intentional and planned through public organizations and recognised private bodies" (UIS 2012, p. 11). Participation in formal education, which also includes vocational education, special needs education, and some parts of adult education, is often called initial education, meaning participation in formal education before entering the labor market.

Nonformal education is also an institutionalized form of learning that is intentional and planned by an education provider but defined as complementing or substituting formal education. Meanwhile, informal learning is intentional, but not institutionalized. Informal learning may include learning activities that occur in the family, at work, or in the community, as well as self-directed forms of learning. It is distinct from incidental or random learning that results from ordinary life activities, or from participating in events that are not designed as educational activities.

In reality, it is not always easy to clearly differentiate these three categories of learning. Boundaries can be fine and at times blurred, especially considering the rise of digital provision. More and more, lifelong learning is described as a continuum that integrates throughout life various types of education activities, which are characterized by diverse degrees of formalization; and which correspond to a wide range of goals, including education, employment, civic engagement, personal

development, and entertainment. This is sometimes described as a biography of learning.

12.2.1 The Individual Approach

Increasingly, the concept of lifelong learning is becoming learner-centered. The focus is placed on the individual and the way one's own learning pathway is built throughout life, articulating the learning process to different life contexts. The interaction between education and its application in real-life situations gives a sense of purpose to lifelong learning. The concept of adaptation has often been used to describe this goal—adaptation to the labor market, to society, to life; and increasingly, the focus on individuals is combined with an emphasis on autonomy. The challenge is not only to ensure that individuals can adapt to a changing environment, but to give them the capacity to choose their learning experience in terms of pathway and content, and eventually to shape their future at work, as active citizens, and through their life choices. From that perspective, lifelong learning can be seen as a unifying concept that brings together different dimensions: education, work, family, citizenship, personal development. This vision is gradually being translated in policy instruments that open access to a range of social rights for individuals.

12.2.2 The Social Approach

While the learner-centered approach remains topical, the social dimension continues to play a key role in shaping public policies:

(i) In the 1960s, industrialized countries, facing major changes on the labor market and guided by the modernization ideology, introduced deep education reforms to drive and accommodate the trends toward massification and developed adult education programs, notably to provide a "second chance" to people with low levels of education. As a result, the scope of public policies in education went beyond schooling (or the formal system and initial education) to encompass a diversity of programs and aim at various objectives.

(ii) In the 1990s, in Europe, the adoption of the *White Paper on Education and Training: Teaching and Learning—Towards the Learning Society* (European Commission 1995) prompted a new approach to lifelong learning in industrialized countries inspired by the acceleration and deepening of changes, particularly in the population (aging, migration); and in the labor market (employment shift toward services, structural unemployment issues). Furthermore, the discourse on the knowledge economy and the knowledge society (Bindé 2005) increasingly placed lifelong learning at the core of the agenda for competitiveness, investing in human capital, and in cultural capital,

forming part of the policy mix implemented by an increasing number of countries. Hence, lifelong learning tended to become an imperative to upskill and reskill the workforce, particularly workers with low levels of qualification.

Despite the deep transformation of the labor market and the end of stable, active lifelong employment in the formal economy as the norm, work remains key to social inclusion. Hence, lifelong learning has been increasingly incorporated within social protection policies, to prevent labor market exclusion that eventually leads to social exclusion. The concept of flexicurity[1] illustrates this approach, which transcends the former rationale for second-chance education: in an increasingly unpredictable and rapidly changing labor market, as reflected in Industry 4.0, flexibility and security is needed for all, so is lifelong learning (International Labour Organization 2019). In developing economies where informality remains the norm for most of the active population, opening up learning opportunities throughout life and introducing mechanisms to recognize informal learning can contribute to de-segment dualized labor markets.

12.2.3 The "5th Pillar" Approach

Besides the conventional dichotomy between the individual approach and the social approach, the vision of lifelong learning today is also shaped by new developments in teaching and learning processes, and the rise of new pedagogies. The centrality of the learner, a slogan largely adopted in the formal system, also drives the provision of lifelong learning opportunities and the learning processes throughout life. The disruption that technology introduced in provision and participation patterns potentially offers unlimited opportunities to individuals to engage in self-directed learning and to get their learning outcomes certified through micro-credentials. With technology, informal education tends to become the driving force of lifelong learning. In addition, methodologies and tools for knowledge capitalization have been instrumental in facilitating learning pathways.

Making learning outcomes visible is particularly important for the most disadvantaged groups, or those who do not hold a qualification. Hence, the gradual design of mechanisms and procedures to assess, validate, and recognize learning outcomes, including prior learning, has truly been a transformative process to open the way to lifelong learning pathways, and to promote inclusion. Recognition, validation, and accreditation of nonformal and informal learning forms one of the pillars of effective lifelong learning policies (Singh 2012), increasing employability, encouraging further learning, and constituting a form of social recognition for those

[1] Initially introduced in Demark in the 1990s, "flexicurity" is defined by the European Commission (2007, p. 5) as a means to "create more and better jobs, modernise labour markets, and promote good work", with four main components listed as "flexible and reliable contractual arrangements, comprehensive lifelong learning strategies, effective active labour market policies, and modern, adequate and sustainable social protection systems."

left behind by the school system. Within that framework, learning to learn, sometimes called the "5th pillar"[2] of education, emerged as a key competency for learners of all ages. Hence, more than a new pedagogy, placing the learner at the center has become a new philosophy for designing lifelong learning policies and systems. This is not only about acquiring knowledge, skills, competencies, and possibly achieving a qualification, it is about empowering people. This philosophy also reconciles the individual with the social rationale, and involves granting new rights to individuals as well as providing the policy environments and the institutional opportunities that allow them to exercise those.

On the provision side, those developments required the creation of new functions. Providers are no longer only expected to teach, and offer content and tutorials, they are also increasingly responsible for information, guidance, and counselling through methodologies similar to coaching. The rapid development of artificial intelligence is likely to fundamentally transform those functions by developing technology-driven individualized services accessible through digital modes, enabling people to follow and inform learning patterns throughout life.

12.2.4 The Legal Approach

Beyond introducing new learning rights in education, the most significant policy developments are labor and social laws, which reflect an integrative approach, combining all those dimensions in comprehensive instruments such as the "compte personnel d'activité" (individual activity account) in France, which includes three elements: training, protection, and civic engagement. In Singapore, SkillsFuture offers comprehensive opportunities for all to access lifelong learning at different stages of their lives through a holistic system of education and training that includes, for instance, a universal learning credit.

Today, lifelong learning goes much further than ensuring learning opportunities to all throughout life. It reflects a societal vision based on a focus on learners considered in their complexity (students, workers, family members, citizens) and on inclusion, via redistributive mechanisms giving more opportunities and support to the most disadvantaged. This logic of empowerment eventually displaced the discourse from a human rights approach to a focus on capabilities as defined by Amartya Sen (2005).

Finally, another key dimension of the recent developments in lifelong learning is the rise of a territorial approach (OECD 2020), exemplified by the emergence of learning cities as a concept, a policy, and a social practice.

[2]Reference to the four pillars of education: learning to know, learning to do, learning to live together, learning to be (Delors et al. 1996).

12.3 The "Learning City" and Its Implementation Through the Global Network of Learning Cities

Educating cities was the theme of two OECD conferences, in Barcelona in 1989, and in Gothenburg in 1992. The discussions and analyses that took place during those meetings inspired the publication *City Strategies for Lifelong Learning* (OECD 1992). Cooperation between the municipal government, local learning institutions, and the private sector—with the aim of addressing the human resource demands of the city's economy—was identified as a key success factor. In this framework, the concept of learning placed emphasis on improving the economy and the labor market.

In 1996, the European Year of Lifelong Learning resulted in the launch in the United Kingdom of the Learning Cities Network, which aims to encourage and support lifelong learning. In the 3 decades since, an increasing number of countries around world have established national networks of learning cities, including the People's Republic of China, the Republic of Korea, and Mexico.

12.3.1 Learning Cities and the Sustainable Development Goals

Learning cities are urban entities committed to promote lifelong learning for all, as a manifestation of the right to education and as an instrument to achieve sustainable development. They do this by uniting the actions of a wide range of stakeholders and by mobilizing resources to promote inclusive learning at all levels of education. This includes establishing networks of education and training institutions at the local level, revitalizing learning in families and communities, encouraging workplace learning, and extending connectivity and the use of technology.

In recent years, UNESCO has played an active role in promoting the concept of learning cities as a strategy in making lifelong learning available to all.[3] The fundamental elements of what constitutes a learning city for UNESCO are defined in the 2013 *Beijing Declaration on Building Learning Cities* (UIL 2013a), which also confirmed the role of the GNLC as a hub of intercity exchange and as a framework for the promotion of lifelong learning in cities (UIL 2015). The "culture of learning throughout life" enshrined in the Beijing Declaration is also the clarion call of UIL's future-oriented report, *Embracing a Culture of Lifelong Learning* (UIL 2020).

Despite the disruption caused by the COVID-19 pandemic, countries continue to strive for sustainable development for people, for the planet, and for prosperity. Countries' commitment to the United Nations 2030 Agenda for Sustainable Development and its 17 SDGs is pressing, with only 10 years left to achieve them. Lifelong learning is a key principle of SDG 4, yet has wide-ranging, cross-cutting

[3] *Source* UIL. Forthcoming. *Making lifelong learning a reality: a handbook.* Hamburg.

implications for all 17 SDGs. There is an increasing understanding, for example, of how education (SDG 4), health (SDG 3), and gender (SDG 5) are linked by lifelong learning (English and Carlsen 2019). More broadly, lifelong learning opportunities for all engender progress in all areas of development, including also the SDGs related to poverty, hunger, work, responsible consumption, climate, and peace (International Council for Science and International Social Science Council 2015).

Furthermore, just as lifelong learning has its own "dedicated" goal in SDG 4, so too do cities in SDG 11 ("make cities inclusive, safe, resilient and sustainable"). The importance of cities to the 2030 Agenda has been at the heart of debates on local and urban sustainability (Doll 2015; Sustainable Development Solutions Network 2016; OECD 2020; Woodbridge 2016). With a focus on multilevel governance in cities in the context of decentralization, these debates highlight the importance of civic engagement in local decision making, the centrality of planning for mainstreaming the SDGs in local strategies, and the need to facilitate connections and peer learning with other cities. Those are also some of the directions that the GNLC attempts to promote.

12.3.2 The Global Network of Learning Cities

The GNLC was formally established by UNESCO in 2012 but opened to applications for membership in 2015. Since then, the GNLC has welcomed a new cohort of cities each year committed to promoting lifelong learning through dedicated policies, programs, and practices, while also mainstreaming lifelong learning in urban policies for sustainable development. Regular exchanges have made the network a vibrant entity, with the International Conference on Learning Cities organized periodically to bring city representatives and education stakeholders together. The first ICLC took place in 2013 in Beijing, where the foundational declaration was endorsed. The subsequent International Conferences on Learning Cities took place in 2015 at Mexico City; in 2017 at Cork, Ireland; and in 2019 at Medellín, Colombia, in which learning cities adopted the *Medellín Manifesto*, a pledge to boost inclusion (UIL 2019).

The fourth ICLC in Medellín also adopted a strategy for the network to further promote policy dialogue, best practice exchange, peer learning, partnership, and capacity building. To guide cities in advancing their lifelong learning agenda, the GNLC developed monitoring and planning tools. In 2015, a set of *Guidelines for Building Learning Cities* was published, containing practical recommendations for aspiring learning cities focused on six areas: planning, involvement, celebration, accessibility, monitoring and evaluation, and funding (UIL 2015). In 2013, the network issued the *Key Features of Learning Cities* (UIL 2013b) as an indicative instrument for measuring learning cities' progress in becoming learning cities. These features relate to (i) the wider benefits of building learning cities, (ii) the major building blocks of learning cities, and (iii) the fundamental conditions for building learning cities. Across these three categories, there are 42 features with

suggested indicators and data sources, including quantitative as well as qualitative data. By measuring their progress toward the 42 features, learning cities can identify their strengths and areas for improvement, thus marking tangible milestones in a continuous learning city process.

In the context of COVID-19, the GNLC has facilitated exchange on learning cities' responses to the pandemic, creating a platform for mutual learning at a time when severe restrictions on public life have been imposed. Learning cities have demonstrated how, during the crisis, they were able to mobilize distance education technology; higher education institutions; family and intergenerational learning practices; and the cultural sector to sustain access to learning, maintain the social fabric, increase health awareness and prevention, and reskill workers for tomorrow's labor market. Such measures illustrate how cities have responded by using lifelong learning to develop emergency responses, prepare recovery, and foster resilience.[4] A selection of interesting initiatives have been compiled in a publication, *Snapshots of Learning Cities' Responses to COVID-19*,[5] which provides an insight into 13 initiatives from cities around the world and how they were set up during a time of crisis.

The learning city model at the heart of the GNLC has been the subject of much discussion in academia, civil society, and international organizations. It provides a globally applicable framework for cities to come to grips with the concept and its application. The editorial of the *Oxford Review of Education*'s 2019 special issue on learning cities flags some of the arguments against, and potential pitfalls of, normative learning city models, i.e., that they may tend to prioritize certain forms of education and training based on an economic rationale and neglect other domains; that the governance approaches they promote could result in giving too much emphasis on planning while neglecting actual practices; and that international networks, benchmarks and indicators might encourage cities to conform to a vision far from their reality (Facer and Buchczyk 2019).

As a normative framework, the GNLC is indeed subject to such risks. However, the approach the network takes encourages an inclusive, collaborative, and humanistic understanding of the learning city model. With lifelong learning at its core, the network highlights the value of every learning endeavor, whether aimed at economic development, community cohesion, career development, or simply enjoyment; and regardless of where it takes place—school, workplace, community, family, or online. Moreover, the network's approach clearly places learning at the core of sustainable development (Ofei-Manu et al. 2018). It does advocate a governance approach, but one that is multilevel in nature, influenced by bottom-up processes and inclusive of learners, community groups, local organizations, businesses, and government.

Finally, the *Key Features of Learning Cities*, sometimes considered as benchmarks, constitute a comprehensive and indicative instrument that learning cities

[4] *Source* UNESCO Institute for Lifelong Learning. GNLC webinars: UNESCO learning cities' response to COVID-19. https://uil.unesco.org/lifelong-learning/learning-cities/gnlc-webinars-unesco-learning-cities-response-covid-19.

[5] *Source* UIL. Forthcoming. *Snapshots of learning cities' responses to COVID-19*. Hamburg.

are invited to use as long as it helps them get a sense of their own development. This has been acknowledged in the development of other instruments to measure learning city development. Learning city indicators allow cities to gauge strengths and weaknesses in implementing a lifelong learning strategy at the local level. However, they are used in a way that takes cognizance of each city's unique context (Preisinger-Kleine 2013). The attraction of the GNLC is evident in its continued growth and in the make-up of its membership: cities from various regions and development contexts, with different socioeconomic statuses, demographics, and political outlooks. Cities as diverse as Shanghai in the People's Republic of China, Espoo in Finland, and Huejotzingo in Mexico have joined the network, contribute to its activities, and benefit from the opportunities it creates for exchange and learning. This is the universal significance of an international learning city network.

12.4 Advancing Learning Cities to Build a Learning Society

UIL's report *Embracing a Culture of Lifelong Learning* (UIL 2020, p. 35) makes the case for establishing lifelong learning as a human right: "The right to education must be renewed, reaffirming lifelong learning as human right. This right is thus no longer limited to accessing the school system, but rather serves to guarantee continuity of learning throughout life, including relevant guidance and digitally portable assessment of all learning outcomes." Lifelong learning should therefore be seen as an individual and a social right and, in the context of climate change, as a public good in environmental terms as well. It involves caring for oneself, for others and for the planet (UIL 2020).

The right to lifelong learning is an ideal that can be made tangible through social inclusion and inclusive education. Social inclusion in cities ensures that citizens are involved in decision-making processes and have access to public services, including education. Inclusive education aims at involving all—with a particular focus on vulnerable groups—in learning opportunities. In this framework, the concept of access goes beyond the traditional education institutions (schools, universities, community learning centers, vocational training institutions) to include a wide diversity of spaces likely to become learning places, such as libraries, museums, workplaces, digital spaces, and private homes, through the promotion of family and intergenerational learning (UIL 2020). The topic is explored in depth, with examples from cities around the world, in UIL's upcoming publication, *Inclusive Lifelong Learning in Cities: Policies and Practices for Vulnerable Groups*.[6]

Learner engagement, citizenship, and local democracy constitute another fundamental dimension of the learning cities concept. Cities have been an important reference point for thinking through questions of citizenship and democracy (Biesta and Cowell 2016). Democratic control of local resources; the role of local

[6] *Source* UIL. Forthcoming. *Inclusive lifelong learning in cities: policies and practices for vulnerable groups.* Hamburg.

governments in wealth redistribution to favor inclusion; and their capacity to care for people, communities, and the learning needs of all are some of the attributes expected from learning cities. Reclaiming of the city, its space, its planning, and its ability to remake itself in the interest of all are some of challenges that learning cities have to face. While similar ideals can be found in national policies, their reinterpretation and ownership at the city level, in a context of decentralized governance and civic engagement, have a considerable potential to accommodate and be shaped by the needs and aspirations of local people. This capacity is enhanced when an understanding of the learning cities concept incorporates associated forms of collective learning at the micro level within and around the city, including study circles, family learning, learning communities, learning villages, learning neighborhoods, and learning territories (James et al. 2018).

All these types of bottom-up, community-led learning contribute to building a learning society. They are often spontaneous in nature and reflect an attempt to mobilize knowledge to respond to local development and sustainability issues; for example, initiatives to improve recycling practices or preserve local green spaces, and campaigns to prevent gender-based violence and improve women's and children's health. Such responses have been mushrooming in the context of the COVID-19 pandemic where communities, supporting and sometimes substituting government efforts, have contributed to disseminating health information, coordinating local deliveries, and organizing online learning communities.

Such community responses value the social advantages of learning while enriching and benefiting from the learning cities concept. In turn, learning cities value socially oriented learning due to its positive impact on community cohesion. As well as encouraging these forms of learning at the micro level, learning cities see great worth in creating connections between community groups, institutions, and industries. Hence, cities that have operationalized the learning cities concept have fostered partnerships between civil society organizations, education and training institutions, employers, and the public sector. Those partnerships enable people to connect their learning experiences to everyday life, articulate their learning demands, build their own agency to choose, and construct individualized learning pathways (UIL 2020). This empowerment of individuals not only increases their engagement in lifelong learning and in the life of the city, but also contributes to strengthen local democracy.

Resilience and recovery constitute another important dimension in considering the future of learning cities. The effect of learning on "urban resilience" has been discussed in academic literature for a number of years, often in terms of local people's capacity to identify and respond to disruption in the event of a major disaster (Robin et al. 2019). The notion of resilience in cities is captured by SDG 11 and reiterated in *Learning Cities and the SDGs: A Guide to Action* (UIL 2017) in an approach to link global goals to local communities. The recent contribution by Robin et al. (2019) on urban crisis in the city of Cape Town found that crisis management processes resulted in knowledge being formally documented and disseminated, the formation of new multi-stakeholder networks, and the potential for new knowledge networks to shape learning during and after the crisis. Such examples suggest that learning cities are prompted by crises to develop their capacity for resilience. In the long term, resilience

should be a priority for learning cities, as resilience equips local infrastructure and people with the ability to adapt rapidly to changing circumstances, which can only be an asset in an era of increasing uncertainty.

Resilience in learning cities—particularly resilience in connection with recovery—has taken on a new significance as a result of the COVID-19 pandemic. In June 2020, a UNESCO meeting on Urban Solutions: Learning from Cities' Responses to COVID-19 considered how, in responding to COVID-19, cities can transform in "meaningful ways that not only protect vulnerable people from immediate threats but also build resilience for the looming climate crisis and other emergencies." It also discussed how stakeholders in cities can "rethink their urban policies to strengthen their risk preparedness and response capacity, and become more resilient by making cities smarter, greener, more inclusive and resilient" (UNESCO 2020, p. 6). A webinar organized by the GNLC on strategies for recovery from the COVID-19 pandemic identified planning the implementation of responses, including for the emergency phase, and articulating various levels of jurisdiction within decentralized systems as key for recovery.[7]

In various parts of the world, COVID-19 has generated mistrust between citizens and institutions, and sometimes increased domestic and urban violence. Cities have had to develop conflict prevention and conflict resolution mechanisms to address these threats, often affecting, in particular, the most vulnerable: children and women. Learning to live together and the consolidation of peace are essential to having resilient cities and communities. To that effect, promoting citizen participation to design solutions has been at the center of efforts for many learning cities. Based on the steadfast commitment of politicians and administrators, learning cities encourage a participatory approach and include different voices in public decision making, particularly by engaging in a continuous and open dialogue with civil society. Many local governments have already advanced strategies for the enhancement of involvement in decision making processes. Citizens are encouraged to engage in a great variety of initiatives and models, such as neighborhood committees, youth councils, and participatory budgeting (UN-Habitat 2015).

These challenges influence a learning city's capacity to recover from a major disruption such as the COVID-19 pandemic and will eventually determine its progress toward a more resilient future and a learning society.

12.5 COVID-19: A "Stress Test" for Learning Cities, a Lesson for the Learning Society

Re-imagining learning cities and their contribution to lifelong learning in the age of COVID-19 is what is at stake today. In this framework, advancing the concept of

[7]UNESCO. UNESCO learning cities' responses to COVID-19—Outcomes of webinar on 27 May. https://uil.unesco.org/lifelong-learning/learning-cities/unesco-learning-cities-responses-covid-19-outcomes-webinar-27-may.

learning cities requires that we deepen some of the guiding principles and design new practical steps within the framework of integrated urban policies to pave the way to a learning society.

Placing inclusion first has emerged as a priority everywhere in the world, while in the midst of the pandemic, structural inequality appeared more than ever as one of the major obstacles to lifelong learning, blocking the path to sustainable development. To this mirror effect, which resulted in increasing policy attention on the issue, the pandemic amplified the deepening, existing inequalities and added new ones. In this context, disadvantaged groups such as young people and older adults at risk, people suffering from disabilities, and refugees deserve priority attention, with reinforced consideration for gender equality. Working with other levels of governance, including the central level, municipal governments have a key role to play in guaranteeing universal access to basic services for all, especially the vulnerable groups, starting with health and education.

Increasingly, learning cities must also become smart cities. The way in which technology emerged as a compulsory resort to ensure the continuity of teaching and learning during the pandemic highlighted the need to address connectivity issues and access to digital networks, devices, and educational resources. Learning cities have often been creative in contributing to ensuring that all learners would continue to have access to education through distance modes, including online. Many also faced severe limitations due to the lack of connectivity, shortage of equipment and content, low levels of digital literacy among learners, and lack of digital skills within the teaching force. The concept of smart cities has often been driven by technology, and learning cities are ideally placed to redefine this notion and place it at the service of open access to digital educational tools and resources to offer lifelong learning opportunities for all.

Reconsidering governance models constitutes another necessary dimension of our response to the challenges ahead. The COVID-19 pandemic has revealed the limitations of conventional governance models in terms of coordination between departments across sectors and levels of governance, and in the way public services are provided, including education. The need to design integrated responses able to address diverse but interconnected needs (food security, health, social protection, education, work, etc.) has become a necessity for cities.

Learning cities provide an opportunity to rethink civic engagement, citizenship, and democratic participation in the light of urban dynamics. The COVID-19 crisis gave new impetus to an already vibrant debate on the transformation of current democratic models in a way that allows local governments, which are best placed to develop an understanding of urban problems at the "human scale", to have their voices heard at the national level. While the pandemic has, in many cases, deepened the divide between citizens and institutions, forms of democratic participation at the local levels provide an opportunity to rebuild trust between citizens and decision makers. Furthermore, the participative processes that have mushroomed at the local level during the crisis have enhanced community development, community work, and community education. Those experiences demonstrated the benefits to learning

cities of giving priority to citizens, encouraging civic engagement, and supporting learning and engaged citizens.

Finally, advancing learning cities also require strengthening policy sharing, exchange of good practices, and peer learning. COVID-19 illustrated how local government networks, such as the GNLC, can quickly provide to their members information on effective strategies and measures to contain such crisis. As a platform for exchange of experiences, the network provided the space for learning cities to create new solutions for addressing some of the challenges that the pandemic has highlighted or created. It helped them to improve planning and delivery, from emergency responses to recovery, in all areas of public policy beyond health issues, and to place lifelong learning at the core of integrated responses. In so doing, they illustrated a broader principle that can lay the ground for building a learning society.

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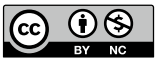
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Chapter 13
Learning for All: Lessons from ASER and Pratham in India on the Role of Citizens and Communities in Improving Children's Learning



Rukmini Banerji

Abbreviations

ASER	Annual Status of Education Report
NEP	New Education Policy
SMS	short message service
TaRL	Teaching-at-the-Right-Level

13.1 Introduction

Around the turn of the century, global attention as well as national policy in most developing countries were focused on expanding school enrollment and universalizing primary education. Children who were "left out" of school were "visible", and strategies on how to bring them into school were developed based on local contexts and needs. But as more and more children were enrolled in school, a more "invisible" problem was sensed: children getting "left behind". Despite being in school, many were not at the level expected of them at their grade. Teachers tried to grapple with this fact in classroom transactions. Parents, often not very educated themselves, were frustrated with their children's lack of progress.

The success of universalizing primary schooling can be attributed to both government efforts to provide schooling, and to parents who enrolled their children. These efforts were based on a common understanding of what schooling entailed. "Every child in school" was a goal that governments and citizens could relate to and work toward. Similarly, to enable "every child to learn well", a shared vision was

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needed. The problem of being left behind needs to be visible, to be clearly identified, and to be articulated in a way that most people could understand.

This chapter highlights a set of experiences from the last 20 years in India of how community-based learning assessments helped in raising awareness at the local level, at the same time influencing policy and practice at the macro level. The chapter analyzes how community involvement can fill the gap in the education system using past experiences, as well as recent lessons from the coronavirus disease (COVID-19) crisis. The discussion points to promising directions for how societies can learn to deal with disruptions and discontinuities, and identifies ways in which a broader set of actors can play a role in helping children learn.

13.2 Origins of Community-Based Learning Assessment

Pratham Education Foundation, a civil society organization, started its work in India around 1994, with the mission of "every child in school and learning well".[1] Even before the new millennium, a large part of Pratham's efforts concentrated on how to help children who were already in school but not learning. As these activities gathered steam, it became clear that inability to read was a critical stumbling block. If a child could not read, he or she could not progress in the school system. If a child had not picked up basic reading proficiency by grade 2 or 3, then the chances of falling behind were high. In India, there were no examinations in primary school that assessed learning levels in the early grades. Children moved automatically from one grade to the next. The dynamics of the downward spiral were straightforward—as the pace of the curriculum got faster, as content become more difficult, and grade level expectations got higher, the child slipped further and further back academically.

To arrest this learning slide, and to help the child "catch up", Pratham developed a "learning to read" technique that helped children aged 7 or 8 and above learn to read in about 6–8 weeks (with focused time of about 2 hours a day). A key element of this approach was to start with a clear understanding of where the child was. The instructor spent time with each child one-on-one, individually working on a few simple reading tasks. The child was asked to recognize letters, then to try reading a set of simple common words in everyday use. The tasks were progressive, moving from easy to more difficult. The next task was to read a four-sentence paragraph at the grade 1 level of difficulty. The final and "highest" level was a short story of 8–10 sentences, very much like texts found in grade 2 textbooks. This assessment was essential before the instructor or teacher could start instructional activities. In a matter of a few minutes, the teacher had a good sense of each child but also of the composition of the group of children in terms of the distribution of their current reading abilities. (A similar assessment was done for arithmetic.)

[1] Pratham works in the field of children's education and youth skilling in India. For more information see www.pratham.org.

The assessment was followed by a set of activities that helped the child move from his or her current level to the next level of reading. The instructor could periodically track progress of each child, and also of the entire group. This approach is now well known as Teaching-at-the-Right-Level or TaRL (see discussion in Sect. 5).

The reading assessment also led to other interactions that had not been originally anticipated. For example, parents often asked what was being done. To explain the objective of the exercise to uneducated or often illiterate parents, it was easy to point to the "story" level text and read it aloud. This demonstrated to them what the goal of exercise was. For many parents, this was the "a-ha" moment. They would shake their heads and say, "So now I know what my child is supposed to learn in school".

The learning to read tool helped to demystify "learning". It enabled parents, families, and communities to understand the problem and clearly see the goal of what was being attempted. The assessment helped to make a felt problem "visible" and in so doing, opened up the possibilities of devising solutions (Banerji 2013; Banerji et al. 2013).

13.3 Scaling up Community-Based Learning Assessments: The Journey of the Annual Status of Education Report

A "schooled" society would not by itself lead to a "learning" society. The focus on "every child in school" needs to shift to "learning for all". Among planners, policy makers, practitioners, and parents, the basic assumption is that schooling would automatically lead to learning. This notion has to be challenged; people have to see that under current circumstances, something different has to be done.

If a simple set of tasks can enable a teacher to quickly understand the foundational learning level of a child and help the child's parents figure out where their child stands, then by the same logic, such a testing tool and process can be used in a community to establish the learning status of all children, or a district to get a sense of how children in the district are faring. This is the idea behind preparing society to get ready for "every child learning well". The basic testing tool and the simple process of assessment, described in the previous section, formed the core for launching what is now well known as the Annual Status of Education Report (ASER).

To put "learning for all" on the education agenda, it was important to make ordinary people, especially parents, learn about the status of children's learning either by using simple tools themselves or by digesting results available for their localities. The ASER tool and assessment process is a good example of how ordinary people can participate in and contribute toward evidence-based problem solving.

Could a citizen-led, community-based assessment exercise influence how a country perceives children's schooling and learning? When Pratham launched the first ASER initiative in 2005, this was the objective. The architecture of ASER was designed to engage individuals and institutions in each district in India in preparing a status report on schooling and learning. The underlying idea was that if local

people participate in understanding the problem, they will also discuss possible solutions, and many will push the government and themselves to find answers to the questions before them. To ensure widespread participation of citizens, the metrics and methods of assessment were kept easy to understand and not complicated to execute. Modes and mechanisms of training, monitoring, reporting, and disseminating were straightforward. Right from the start until the present, the balance between simplicity and rigor was strictly maintained and the cost of the entire exercise kept as frugal as possible.

From inception, the goal of ASER was to cover all 600 + rural districts in India with a sufficient sample to be able to generate reliable district-level estimates of schooling and basic learning (reading and arithmetic), as well as state and national figures. (Interestingly, there are hardly any district-level estimates in any social sector domain in India. Even the government's National Sample Survey data is at a "regional" level where an aggregation of several districts makes up the unit). The ASER reports were the first in India to annually bring out current figures on reading and basic arithmetic for children across the elementary school age group for each district, state, and for all of India. The participatory citizen-led exercise assumed that if people together learned what the problem was, then solutions would follow.

From 2005 to 2014 and then in 2016 and 2018, ASER has reached between 500,000 to 700,000 children annually. Across the country, more than 25,000 volunteers from approximately 500 institutions partner with ASER each year. In every district, a local organization or institution participates in the effort. Anywhere between 30 to 60 surveyors go in pairs to 30 randomly selected villages in the district to survey children in 20 randomly selected households in the sampled village. The results from each district are put together in the form of state reports and a national report.

From preparation to launch, the ASER cycle is about 100 days. Without fail, the report is released in mid-January every year. From 2005 to 2014, the main nationwide ASER was done annually. From 2014, it has been conducted every other year (see Box 13.1).

Box 13.1 The ASER Village Survey Process

The Annual Status of Education Report (ASER) starts with a pair of volunteers who will go to a village to conduct the survey. Each pair is given a village pack that contains "all the tools, formats, instructions, and communications materials to be used in the village" (*Source* http://www.asercentre.org/p/231.html). The survey in a village is conducted over 2 days, normally on Saturday and Sunday. On day one, the volunteers usually visit the village head to apprise him or her of the purpose of their visit. They then proceed to the village school to collect school information, talk to people, and map the village.

In mapping the village, the volunteers divide the village into four sections or hamlets, and use their "5th household rule" to sample 20 households: five from each of the four divisions or hamlets. They collect basic information

from each household and assess the reading and arithmetic skills of children in that household belonging to the target age group of 5–16 years. This data collection process is monitored by the master trainers, and a high proportion of the entire set of responses are rechecked using different methods. After verification, the data comes to the central team, which analyzes it to produce the ASER Centre's *Annual Status of Education Reports*. These reports have had a notable and undeniable impact on India's education policy.

Source Pratham Education Foundation.

In the Indian social sector where good quality data collection is still a major challenge, ASER's practices of community mobilization and logistical management are exemplary. ASER volunteers are trained at the district level by master trainers who themselves have been trained rigorously at the state level. The actual volunteer training lasts for 2–3 days, with 1 day devoted to field practice. At the end of the training period, volunteers take a test or a quiz. Only those who have participated satisfactorily in training, showed good practical understanding in the field, and who performed well in the quiz are selected to go ahead with the actual survey.

One of the key reasons behind ASER's scalability across rural India has been the simplicity of its tools to measure learning outcomes. The reading and math assessment tools[2] are designed to be simple, quick, and cost-effective "floor tests", rather than grade-level tests, and are used face-to-face, one-on-one, orally, and individually with each child.[3] Many empirical studies (see Vagh 2012) have confirmed the reliability and validity of ASER tools.

Doing ASER is easy. Understanding the results is straightforward. Using the same tool is possible for a school or for a neighborhood. The availability of these tools in the public domain (on the ASER Centre website) and in 20 Indian languages makes it a national resource.[4] These features have also enabled the ASER approach and architecture to be transplanted and adapted in over 15 countries for over a decade. Together this people's movement has come to be called "citizen-led assessments".[5]

[2]See ASER Centre. ASER reading tools. http://www.asercentre.org/p/141.html.

[3]The highest level is a grade 2 level text, which is in the form of a short story.

[4]Apart from its use in the actual ASER survey, over the years, the ASER tools have been used in many other ways, e.g., in village report cards, research studies, impact evaluations, and measurement of change in ongoing programs; as well as by a variety of government and other agencies in the education space and in the social sector more widely.

[5]See People's Action for Learning. www.palnetwork.org for details of how ASER-like citizen led assessment initiatives have spread to other countries in South Asia, sub-Saharan Africa, and to Mexico and Nicaragua.

13.4 Translating Assessment into Action: Mobilizing for Learning

It takes a village to raise a child.

What would it take to move policy and practice beyond schooling to learning? The ASER journey describes how a simple assessment that originated as an integral part of instructional practice—of teaching children to read—grew to be a mechanism for a country to understand a major problem.

What about moving from assessment to action? What role could ordinary people play in this process? How can people, many of whom did not have much education themselves, start to engage with "children's learning"? Going back to the history of large-scale campaigns for school enrollment, it is clear that forces have been at play both on the demand and supply side. Without government providing schools, and without parents demanding schooling, enrollment levels would not have reached the high levels we see today. Thus, for any large-scale effort to succeed, the mission needs to be owned and driven by those who want the change.

The contemporary education discourse is becoming preoccupied with issues like twenty-first century skills and emerging technologies. In India, it is only in the last 10 years or since 2010, that in many households, for the first time, a family member has been able to complete 8 years of schooling and reach the end of the elementary stage. In this context, it is essential both for the future of the individual, of the family, and of the country, that these 8 years of schooling translate successfully into an equivalent 8 years of learning. Current estimates from India suggest that even after 5 years of schooling, less than half of all children are able to reach learning levels expected of children in grade 2.[6] While most parents understand the importance of "schooling", and know how to support their children's schooling, they often do not understand how they could contribute to "learning" or how to create a supportive learning environment at home.

13.5 Current Interventions: Village Ownership for Children's Learning

By definition, a "learning society" is one that promotes a culture of lifelong learning and enables ordinary people to learn and to support others to learn as well. For uneducated or poorly educated parents, what would help them to engage first with their own children's learning journey and then later to work toward imagining what a learning community could be like?

[6]See ASER reports including ASER 2018 (www.asercentre.org) or data from the National Achievement Surveys 2017 (Ministry of Human Resource Development. National achievement survey. http://nas.schooleduinfo.in/).

In Pratham's 25-year history, almost all education programs have had a community component. Building on previous experiences and accumulated evidence, Pratham's current flagship program in education, *Hamara Gaon* (Our Village) has put in place the strongest and longest thrust for building community ownership for children's learning.

In this program, there is an ongoing Pratham presence in the village for a period of at least 3 years. Pratham's method for accelerating learning called Teaching-at-the-Right-Level or TaRL, has considerably evolved over time. The TaRL method is used in a "learning camp" mode in government schools (Banerji et al. 2020). Learning camps are short bursts of activity, 7 or 10 days at time, and repeated at intervals. In any given school, 3–5 learning camps could be done over 3 months. These activities are conducted by Pratham team members and unpaid community volunteers to help children quickly acquire foundational skills. At the same time, children are organized into small groups in their neighborhood where they can do activities together (homework, projects, performances) helped by someone from the immediate community (usually a youth volunteer or a family member). While the learning camp only lasts for 30–50 days, the children's groups meet daily or frequently. The hope is that the group activity supported by an adult will be able to sustain children's learning gains and grow them.

At the heart of the *Hamara Gaon* intervention is the "village report card", a key instrument for participation and building an understanding of the status of children's learning. By now, the village report card activity has morphed into what is called the *Jhat Pat Mohalla Report* (roughly translated to mean a quick and fast report) at the *mohalla* (neighborhood) level. The current process includes the following key steps:

(i) Demonstrate fun activities or learning games that can be done with several children, which not only encourage children from a hamlet to come together, but also show their parents simple activities that can be done at home.
(ii) Do a quick testing using a simplified version of the ASER tool.[7] Compile a list of children getting testing, along with their results.
(iii) Declare among people present results from the assessment. Encourage a handful of children who read well to come forward and read aloud to show what everyone should aim for.
(iv) Display using a simple poster, the results for the day for that hamlet.
(v) Discuss with community members possible solutions to some of the challenges faced. Encourage them to brainstorm suggestions, distribute responsibilities, and lend support moving forward.

These hamlet-level assessments ended up forming a cornerstone of Pratham's work in villages. By demystifying what "learning" means, the business of learning can be unpacked in ways that the broader community can engage in. This assessment is

[7]To ensure things remained simple and fast, the assessment was limited to a simple paragraph (grade 1 level text) for reading, and a subtraction problem for arithmetic. The testing tool was simple while the assessment process was visual and oral, and therefore straightforward, even for parents unable to read themselves; and was intended to encourage others to test as well.

typically followed by several activities, some led by Pratham teams and others by local community actors themselves.

The direct instructional activity in learning camps described above, and the collaborative learning groups of children, are a common feature across many Pratham locations. In addition, other events like community fairs or *melas* are organized by villagers for school readiness, math, or science. These are done to engage children of all ages and families to celebrate progress and establish a wider community connection. For younger children, mothers' groups are also set up where mothers are oriented on simple activities that they can do at home with children.

These simple activities are critical steps for making the business of education the responsibility of the community at large. In 2019/2020, Pratham's *Hamara Gaon* intervention was implemented in more than 3500 communities across India. In addition, in 2019, a randomized control trial was also launched in Uttar Pradesh, where elements of this approach started trials, with the aim to dig deeper into how community actors could be convinced to take ownership of their children's learning (Bhattacharjea and Sabates 2020). Another randomized control trial in Assam found promising "value added" in children's learning for villages that had children's groups compared to those that did not.[8]

For the past few years, Pratham has carried out a special experiment in about 1000 villages called "hybrid learning communities" where all children aged 10 and above form part of a neighborhood peer group. There is no Pratham instructional activity in these locations; instead, the children's groups share digital devices like tablets, access a variety of digital content, and perform a range of group activities both with and without technology (World Economic Forum 2019).

Learnings from Pratham's hybrid learning program have been transplanted into other Pratham programs. These hybrid learning communities can be seen as an attempt to enable children and communities to be "future-ready" in five distinct ways:

(i) Recognizing that the curricular space in the school is crowded with academic content leaving little room for other kinds of exposure, in the hybrid learning program, content was designed with three domains in mind: learning for school (academic content); learning for life (a wide variety of everyday domains like art, music, sport, first aid, environment, and other such domains); and learning for work (skills like digital familiarity, communication).

(ii) From focus on individuals, the approach has moved to groups, encouraging groups to work together on tasks and projects.

(iii) The technology used by Pratham does not only receive or transmit content but is also used as a trigger for other activities. For example, the camera and video capability of a device is instrumental in taking forward many projects including documentation of various aspects of community life.

[8]This randomized control trial conducted by researchers from the Stockholm School of Economics is yet to be published.

(iv) "Learning by doing" was seen as the primary way of learning rather than "chalk-talk" or rote learning from textbooks, which is usually the mode used in schools.
(v) By placing activities centrally in communities and outside of school, the program explicitly recognized and encouraged participation of family and community members.

Pratham celebrated its 25th anniversary in 2020, but it would be wrong to state that it has already developed a sure shot, silver bullet for raising community involvement in education. Like the children and families that Pratham works with, the organization is continuing to learn every day. By helping communities understand, and more importantly, believe in the role they can play in their children's education, the process of empowering families and communities to learn and to help their children learn has started.

Over the years, many state governments have used ASER results to initiate learning improvement programs, and have used ASER-like tools to measure learning improvements. Interestingly, India's New Education Policy 2020 or NEP2020 was launched in 2020, which strongly recommends a national priority for building foundational skills like reading and arithmetic—goals that ASER has been advocating for over a decade and a half. NEP2020 also highlights the crucial importance of bringing in family and community to help children learn (Ministry of Education 2020).

13.6 The Coronavirus Disease Crisis and Community Interaction for Children's Learning

As the COVID-19 pandemic hit the world, a sudden lockdown was imposed on the last week of March 2020 all over India. Movement was heavily restricted as uncertainty and fear gripped the entire country. Schools closed suddenly and with no preparation. Children were stuck at home for an indefinite period of time with limited access to any teaching–learning material or any organized educational activity.

In this crisis, two elements of Pratham's prior work played a vital role in building a new layer of virtual, two-way communication onto the networks that already existed. First, unlike many other education organizations, over the years, Pratham has worked both inside schools and also in communities. The prior investment in building social networks in the community proved to be invaluable during the lockdown and for the entire period that schools were closed. Second, Pratham's past work in making simple digital content available in 11 regional languages proved to be very useful. In March 2020, across all Pratham programs, there was direct contact with approximately 7000 or so rural and urban communities. As an immediate response to the lockdown, Pratham teams started reaching out to parents, youth, and community members whom they had regularly met face-to-face before the crisis. As soon as contact was established, Pratham sent out a message via phone to the family of the child. Initially

these were WhatsApp messages (instructions and video clips for activities available in the local language). Given the overall atmosphere of tension, Pratham's aim was to connect to children using engaging activities to get their minds off the stress. As far as possible, WhatsApp messages were accompanied at least once a week by an actual phone call for feedback and follow-up from someone in Pratham whom the child and the family knew from before.

Despite relatively high smartphone penetration in rural India, by April, Pratham had realized that many children did not have access to smartphones. Hence to maximize reach, it was essential to be able to connect via basic phones. Another round of outreach was initiated. First contact was established through one person in a village. Through the first contact, outreach was done using phone numbers and contacts in each hamlet of the village. Then through the hamlet contact, an attempt was made to reach as many households as possible.

This systematic strategy of maximizing contact in communities evolved quickly. By June 2020, Pratham was sending out close to 200,000 messages in more than 10,000 rural and urban communities across the country. New and engaging content soon had to be created for basic phones that could be sent through old-tech SMS messages. At least half of the total messages were SMS going to basic phones.

At every stage, as soon as contact was established with an individual or a family, messages began to flow back and forth between the Pratham team member and the contact. The message contained simple activities that the family could do with their children. During the week it was also very common for families to send messages—voice, text, and videos—of what their children were doing based on the instructions that had been sent. This two-way communication became the backbone of the ongoing interactions that have been sustained throughout 2020.

India's stringent lockdown restrictions began to be loosened by July even as the number of COVID-19 cases continued to rise.[9] Movement within villages had begun and everyone was encouraged to follow social distancing norms and to wear masks. Pratham teams soon started experimenting by running volunteer-led classes in hamlets. With remote guidance by Pratham team members, these hamlet sessions were like mini learning camps run by a local volunteer for children in grades 1–5. The volunteers had been trained on Pratham's TaRL methodology of grouping children by learning level and doing simple language and math activities. Social distancing norms were strictly followed, and volunteer-led classes also had COVID-19 awareness modules for children. A local volunteer or a local youth typically mobilized 5–10 children. Early data from these experiments show promising results.

Like organizations, governments too were putting together quick coping strategies both in terms of how to reach children, and type of content that could be sent. Digital content especially in regional languages was in demand. Although in prior years, partnerships with government in implementing programs on the ground took time to

[9]Confirmed COVID-19 cases for the whole of India at the end of June were 566,840. This number rose to 1,583,792 by end of July; to 6,145,291 by end of September; and to 8,137,119 by end of October 2020 (*Source* PRS Legislative Research. Details on cases. https://prsindia.org/covid-19/cases; with source data from the Ministry of Health and Family Welfare.).

germinate, during the pandemic, collaborations moved quickly. In the months since April, Pratham's digital content was used by 14 government education platforms like DIKSHA, or as part of pandemic outreach packages for phones, which went out to children via teachers. (Pratham's SMS message packages were used by three state governments and WhatsApp messages by eight state governments.) As time went by, governments began to move from coping strategies to longer-term efforts that could be sustained. School systems also realized the critical importance of reaching out to children whose families did not have smartphones. Thus, newer strategies included use of traditional media—television programming and radio broadcast (Box 13.2).

Box 13.2 Local Community and State Government Cooperation for Continued Learning During the Coronavirus Disease Lockdowns

Pratham collaborated with the state governments of Maharashtra and Uttar Pradesh during the coronavirus disease (COVID-19) pandemic to air radio programs that were broadcast in communities. In Bihar, 2 hours of daily programming on television was also provided by Pratham. The Maharashtra government (starting from six districts in Nagpur division) combined Pratham's short message service or SMS messaging with radio programs, and appealed to several departments (including education, women and child welfare, and rural development) in its outreach efforts. The net result was that radio was able to reach an estimated 400,000 children across the state. Many villages broadcast Pratham's radio programs over public loudspeakers, and village councils mobilized local youth to help children in their neighborhoods. In this case, not only was Pratham able to provide remote messaging, but Pratham's models of social mobilization were also incorporated in the government's outreach strategy during the school closures arising from COVID-19.

Source Pratham Education Foundation

From 2014, the main nationwide ASER for schooling and learning was being done in alternate years. 2020 was to be the year for this task. But given the COVID-19 crisis, plans had to be changed. Instead, it seemed much more important to figure out what was going on in the household for children's learning during the prolonged period of school closure. Use of digital means was being quoted in the press, and daily announcements of new apps or software were being reported. Given all this hectic activity to establish remote learning channels, it was essential to take a close look at what was actually reaching children. ASER mounted a national phone survey in September 2020 using the ASER 2018 sample. Over 100,000 households across the country were sampled, and the findings embodied in the *Annual Status of Education Report 2020* were released at the end of October 2020 while schools across the country were still closed (ASER Centre 2020).

The findings were interesting. First, before September, state governments had managed to deliver textbooks for the current grade to well over 80% of all students. Second, 70% of households reported that there was someone in the family who could help children with learning activities. The breakdown of this support indicated that in addition to parents, siblings and other family members also contributed. Although smartphone ownership had almost doubled in 2 years from 2018 to 2020 (since the last ASER was done), depending on the state, at least 30% of families did not have access to smartphones. In the week prior to the survey, about 30% of families had received some form of learning materials or activities from their children's schools. Although much of this remote messaging came via WhatsApp messages, for public school children, there was a clear effort to reach out via phone calls and home or school visits. The overall picture that emerged was of a society where families and communities were able and eager to help children learn, albeit using traditional means like textbooks and worksheets.

13.7 Conclusions

Pratham's work over the last 25 years as well as its experiences during the pandemic have underlined the critical need to involve families and communities as an integral part of any education strategy, be it local or global. The COVID-19 crisis has clearly brought out the fact that there are many resources outside schools that are willing to help children learn. The linear demands of curriculum, or the rigid teaching practices often practiced in school systems in the developing world, leave behind parents and family members who are not educated or who did not get a chance to get schooling. Yet, to teach children at the right level it is important to reach people at their own level to help children.

The COVID-19 crisis has brought forward important lessons for future education strategies. It is clear that learning opportunities in the home–neighborhood–community continuum should be maintained and strengthened as a long-term goal. The ongoing two-way communication with parents has been a big source of learning on what children need and how families can be supported to provide this help. This is an essential piece of the education puzzle and now that clues are available, focus and attention must be used to strengthen this piece.

Clearly, technology has played a major role in making remote connection possible. At the same time, Pratham learned that it was the "hybrid" combination of technology and human interaction that kept processes growing and deepening through the crisis.

Finally, what kept children engaged and families interested were activities that applied and built in different skills in everyday contexts. All of these features will become enduring elements in shaping learning in the future.

In a stark and critical way, the COVID-19 crisis has challenged the key questions of "why", "what", "how", "who", and "when" of education. The core principles that form the framework for school functioning needs urgent change. The crisis

has visibly demonstrated that the "how" has to change. The need to set up alternative mechanisms to reach children is obvious. From in-school, face-to-face, teaching–learning activities; to SMS messages in a 160-character format, all are modes that need to be in place to cope with the varied contexts in which education will have to be delivered. Digital literacy for the entire population (parents, teachers, children) is a must so that people are prepared to use digital devices, navigate digital pathways, and deal with digital content in different forms.

However, the more fundamental questions that have to be answered are "what" needs to be learned and "why". Why should "learning for school" have greater primacy over "learning for life"? Whether in terms of health services, education, livelihoods, or economic security, economies and societies were not at all well prepared to cope with the current crisis. But learning from this one, how do families and schools prepare children for life in the future and possibly future crises? Experiences from the ground and data from sources like ASER have strongly pointed out that there is a vast cast of characters other than teachers who are available and willing to help with children's learning. The question will be how to harness this energy and effort to help to "build back better".

The real danger facing the world is not so much the learning loss from school closures but what the school system decides to do when schools open. If there is a rush to get back to "business as usual"; e.g., grade-level teaching using grade-level curriculum, there is a strong chance that there may be lasting damage to children's future possibilities. Once schools reopen, reconnecting to peers, friends, and teachers is urgently needed—the re-building of the social fabric underlying education; the celebration and recognition of families and communities in the period of school closure; as well as the building of mechanisms of having them as integral pieces of the education system. Ensuring foundational skills or rebuilding them, as the case may be, will be required. This is the time to take stock of where we have reached, how we have reached, and where and how we want to go in the future.

If we do not learn in a meaningful way from our past experiences and particularly from this deep, current crisis, we will not be able to envision a learning society. A learning society can only be possible when everyone can learn throughout their lifetime to change and adapt as the context requires, and empower others to learn as well. It is only in an environment like this that children will grow, thrive, and become ready for the future.

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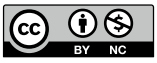
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Chapter 14
SkillsFuture: The Roles of Public and Private Sectors in Developing a Learning Society in Singapore



Michael Fung, Renzo Taal, and William Sim

Abbreviations

COVID-19	coronavirus disease
OECD	Organisation for Economic Co-operation and Development

14.1 Introduction

In a globalized knowledge-driven economy, the biggest asset for a country according to the Organisation for Economic Co-operation and Development (OECD) is its human and intellectual capital, represented by the education and skills attainment of its populace (OECD 2019). Engendering a culture of learning with investments in high-quality education and skills development programs is the key to economic success in today's knowledge-driven digital economy.

From the turn of the millennium, a confluence of factors has generated disruptions that pose challenges to traditional education and training systems, which are becoming inadequate and inefficient in imparting the necessary skills in an environment where change is a constant. Graduates need to be adequately prepared

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with the relevant skills, knowledge, and expertise to meet the requirements of today's and future jobs, where disruptions are changing the nature of jobs at a breakneck speed (Krishnan 2020). Skills and knowledge of the workforce are becoming obsolete within a few short years as companies transform their business models (Bughin et al. 2018). A new paradigm for education systems and pedagogy is required to provide accessible opportunities to learn new skills throughout life, enabling individuals to remain relevant and employable at the workplace.

Continuous upskilling is key to success for both organizations as well as employees in a technology-driven world. Singapore is a case in point for what a country can achieve through focused and sustained investment in human capital development.

14.2 Disruptions to the Future of Work and Learning

Economies and societies globally are being disrupted by a number of factors, including technological advancements fuelling the fourth industrial revolution or Industry 4.0, shifting demographics of the labor force, extended life expectancy and careers, and more recently, the economic and social impact brought about by the coronavirus disease (COVID-19) pandemic (Fig. 14.1). All these factors have profound implications on the future of work and learning.

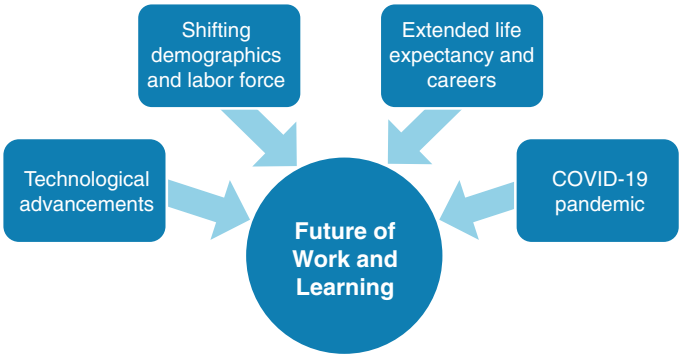


Fig. 14.1 Major drivers impacting the future of work and learning. (*Disruptions have accentuated the need to speed up the development of learning societies, where access to lifelong learning for all supports the acquisition of relevant skills that will help navigate an uncertain future*). COVID-19 = coronavirus disease. *Source* Authors' representation

14.2.1 Technological Advancements

Rapid advances in technologies such as artificial intelligence, robotics and automation, cloud computing, and others, along with increasing connectivity due to the internet and social media channels, have ushered in an era where today's technologies quickly become obsolete. Technological innovations are being used by companies to attract new customers, strengthen relationships with suppliers and customers, and improve productivity. Companies are seeing market share increases as they digitalize and transform.

Competitive differentiation is no longer restricted to product features, and embracing new technologies can create new and better ways of serving customers, in which a deep understanding of customers' experience in buying, using, and consuming products and services is becoming a vital component of competitive advantage (Kramer 2019). Businesses will need new capabilities to leverage on technology to develop such customer insights and raise their competitiveness. To keep up with this rapidly changing technology and innovation landscape, employees need to continually undergo training and upgrade their skill sets to match evolving industry needs.

14.2.2 Shifting Demographics and Labor Force

Many advanced economies, including Japan and Singapore, face the specter of a shrinking labor force due to sustained decreases in fertility rates. The labor supply of many Asian countries is predicted to decrease over time, with the World Economic Forum projecting that Japan's workforce will be 20% smaller by 2040 compared to 2019 (Fleming 2019).

To maintain economic growth despite a shrinking labor force, there needs to be an increase in productivity resulting from upskilling of the workforce, improving business processes, and adopting technology. Another approach is to create opportunities for economically inactive segments of the population to enter or re-enter the workforce. These segments are very likely to require reskilling to confidently take on jobs in an environment where job tasks have been evolving rapidly due to technological disruptions.

In developing economies, the relatively large segment of unemployed youth represents an economic potential frequently referred to as a "youth dividend". The challenge is to ensure that the educational attainment of the young people match the needs of the growing economic sectors. An adaptive education and training system is required to ensure that the skill sets of those joining the labor force support the economic strategies of the country, including advanced technological skills (Fore 2018).

14.2.3 Extended Life Expectancy and Careers

For the first time in history, humans are on average living more than 60 years, irrespective of the level of development in the countries in which they reside. According to the United Nations, this is one of the most significant social transformations of the twenty-first century (United Nations 2015). Life expectancy in Singapore stands at 83.6 years, one of the highest in the world (Department of Statistics 2019). The average Singaporean also enjoys the longest period of living in good health at 74.2 years (Ministry of Health 2018). Greater longevity and better health translate to longer working lives and delayed retirement (Vernon 2016). The proportion of Singaporeans aged 65 and older and still working increased from just 3% in 2010 to 7.2% of the workforce in 2019 (Hirschmann 2020). A similar trend is observed in the United States, with 31.9% of those aged 65 to 74 projected to still be working in 2022, up from 20.4% in 2002 and 26.8% in 2012 (Toosi 2013).

In a paradigm where people are living longer with active lives, the well-accepted three-stage approach to our typical lives—education, followed by work and then retirement—is becoming increasingly detached from reality. Gratton and Scott (2016) postulate that with greater longevity inching toward 100-year lifespans, this three-stage approach would have to evolve into a multistage iterative model of education–work–re-education–work, and so on (Gratton and Scott 2016). This is corroborated by Deloitte's projection that the half-life of skills will decrease to 5 years (Pelster et al. 2017), and that individuals embarking on a 30-year career would have to update and refresh their skills at least six times throughout their working life (Schwartz et al. 2017). This multistage, multiple-career life model entails substantial reskilling for individuals to move from one phase of their life to another, and to take on work that align with their experience and corresponding life-stage as they age.

14.2.4 Coronavirus Disease Pandemic

The trend of technology disruption impacting economies and societies that we have been witnessing since the start of the new millennium has been dramatically exacerbated by the outbreak of the COVID-19 pandemic in 2020, which resulted in massive disruptions to businesses across nearly every industry sector, impacting daily lives of entire populations across the globe.

The COVID-19 pandemic has accelerated the need for change in how businesses and individuals operate, in order to survive and adapt to public health and safety concerns. The power of technology is evident as companies and employees around the world switched to new working arrangements, enabled by digitalization of business processes, remote working, and online interactions and learning. Many companies have leveraged on technology to usher in new business models and to upskill employees during this period, and these models are likely to become the new norm postpandemic.

14.3 The Need for a New Learning Architecture for Powering Learning Societies

The emerging digital age, combined with frequent disruptions and extended working lifespan, is engendering a situation where the ongoing employability of the workforce depends more heavily on the ability to acquire new skills in a timely manner throughout life, and less on initial qualifications earned during early education. To address this new reality, the education emphasis needs to shift from imparting subject knowledge to learners, to nurturing the propensity, efficacy, and self-agency to acquire new knowledge and skills. Avenues for learning have to be broadened to encompass multiple pathways and sources, given that many emerging skills are being defined and advanced by industry. Such emergent knowledge and skills often evolve at a rate faster than the ability of traditional education institutions to update their curriculum and equip their teachers.

Consequently, a new learning architecture (Fig. 14.2) is required for education and training systems to impart the necessary skills for new jobs and job tasks on an ongoing basis to accommodate the reskilling and upskilling needs of individuals. The learning architecture must be inclusive to cater to the needs of different population

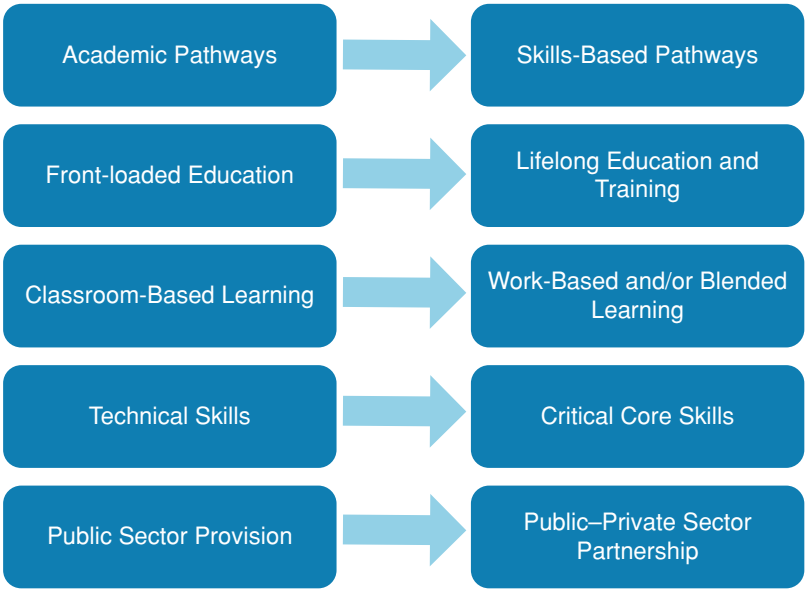


Fig. 14.2 Shifts in the new learning architecture (*The emerging digital age is engendering a situation where the ongoing employability of the workforce depends more heavily on the ability to acquire new skills, and less on initial qualifications earned during early education*). *Source* Authors' representation

segments working in different industries, regardless of their age, financial status, or educational background.

14.3.1 Academic Pathways to Skills-Based Pathways

Academic education has been favored over vocational educational in many countries, as academic education is viewed as a more established route to career success and higher lifetime earnings (Korber and Oesch 2019). Globally, there has been a sharp increase in the proportion of individuals with tertiary education entering the workforce. In 1998, about 23% of those aged between 25 and 34 attained tertiary qualifications, and this proportion had nearly doubled to 42% by 2016 (OECD 2020). In Singapore, 48.2% of residents aged 25 and above attained tertiary qualifications in 2019 (Department of Statistics 2020).

Despite the increase in tertiary qualifications, the overall unemployment rate has steadily increased in many countries, particularly among the youth (Coskun 2019). Employers have also reported difficulties in filling certain job roles, suggesting a potential mismatch between demand and supply of workforce skills. Policy makers concerned with structural unemployment and underemployment are looking for ways to ensure that the stock of workforce skills meets the needs of the economy. To address these challenges, there is a need to shift from an academically oriented system to one that incorporates skills-based progression as mainstream pathways.

In Singapore, the Institute of Technical Education and Polytechnics offers a strong brand of education that is more vocational and skills-based in nature, to prepare students to enter the workforce upon graduation. The higher education landscape has been further diversified with the establishment of two applied universities—the Singapore Institute of Technology and the Singapore University of Social Sciences—in addition to the existing four academically oriented universities. The Ministry of Education announced in 2019 a target of 12% of every student cohort going through work–study pathways, with substantial emphasis on the acquisition of work-relevant skills at workplaces (Wong 2019). By developing work–study into a mainstream pathway and increasing the capacity of institutes of higher learning to deliver industry-relevant modular courses to support lifelong learning, more learners would be able to benefit from learning at workplaces and in the classrooms (Ang 2020). These multiple pathways are helping to bring about better matching of the aspirations of individuals with the specific needs of employers.

14.3.2 Front-Loaded Education to Lifelong Education and Training

The reliance on an education paradigm that concentrates learning in the first 2 decades of individuals' lives cannot comprehensively inculcate in young adults the knowledge and skills required for the jobs of the future. The education system must shift toward equipping individuals with critical foundational skills in these early years, so that they can continually learn and remain adaptable throughout their lives as self-directed learners who take personal responsibility to develop and deepen their skills.

Learning institutions need to evolve beyond providing education and training based on fixed syllabi taught over specified durations, to delivery models that support learners in their lifelong quest for skills mastery. Learning institutions must evolve from their traditional focus on pre-employment learning to playing a larger role in continuing professional development. A fit-for-purpose continuing education and training sector is required to enable ongoing upskilling and reskilling of the workforce, in support of the changes and transformation of industries, governments, and societies. Individuals must be attuned to industry developments and needs, while employers must play their part to support and value continuous learning. In response to these needs, the institutes of higher learning in Singapore have established dedicated continuing education and training outfits to serve the wider workforce. Several universities have also set up mechanisms, such as alumni credits, to encourage their graduates to continue to upskill themselves throughout their careers.

14.3.3 Classroom-Based Learning to Work-Based and Blended Learning

Studies have shown that adult learning could be made more effective by offering different learning modes (Lawless 2019), and educational systems should move from classroom-based experiences to more holistic training approaches (Tan et al. 2018), incorporating blended modes such as work-based learning, remote learning, and workplace learning. Learning content has to be modular for learners to step in and out as needed, to efficiently acquire bite-sized knowledge and skills.

A holistic blended learning approach requires adjustment of educational delivery models, which are still predominantly classroom-centric and institution-centric in most countries. While there has been some experimentation in using technology tools for learning, such as video classes and immersive learning techniques, more has to be done in redesigning curricula and pedagogy to adapt to a paradigm where learning happens anywhere, anytime, and at any pace. A blended approach to incorporate multiple modes of learning is important, as knowledge and skills can be acquired through multiple channels, and certain skills are best acquired outside of classrooms, particularly in workplaces.

Singapore has embraced this shift by working toward an institution-based system that strengthens work-based learning, through initiatives like enhanced internships and work–study programs, structured as cooperative education and contextualized for participant companies. In addition, the National Centre of Excellence for Workplace Learning was established in 2018 to help over 1000 companies, in particular small and medium-sized enterprises, to transform into learning workplaces, by building systems and best practices to train and develop their employees.

14.3.4 Technical Skills to Critical Core Skills

While employers have traditionally placed greater emphasis on technical skills, transversal or soft skills are becoming increasingly important, with employers favoring individuals who are able to think critically, communicate and collaborate effectively, and embrace change. This holistic focus on technical and soft skills presents an opportunity for employers to work closely with training institutions and government bodies to develop customized training programs for the workplace, and thus equip employees with the necessary technical and transversal skills to become more effective at work.

As part of the 4.5 billion Singapore dollar industry transformation program launched in 2016, which was overseen by Singapore's Future Economy Council, a set of 23 industry transformation maps were developed to raise productivity, skill sets, innovation, and internationalization of various industry sectors. In tandem, 34 skills frameworks have been developed to provide information on job roles, career pathways, and skills needed for employees to progress in each key sector of the industry. Co-created by employers, industry bodies, educational institutions, unions, and governmental agencies, these frameworks encapsulate descriptors of the occupational and/or technical and cross-cutting skills needed for each job role, including critical core skills into the domains of thinking critically, interacting with others, and staying relevant. This signals to individuals that working toward a promotion or a new job may not simply be about getting better technically at what they do, but also about picking up new skills such as collaboration and leadership. It also signals to employers that these areas must be addressed when developing their workforce, and to training providers to deliver on such skills needs.

14.4 Public Sector Provision Versus Public–Private Sector Collaboration

The public sector has traditionally played a principal role in the provision of educational opportunities by designing, developing, and funding education and training systems based on literacy goals and sensing of economic and societal needs.

With the rapid and continual disruption of jobs and skills, significant involvement of the private sector is becoming increasingly vital to match the supply of skills from the education and training landscape with demand for skills needed for jobs across various industry sectors.

Both the public and private sectors should play important and complementary roles in the future of work (Bonic 2015). In particular, they should work in tandem to create a flexible and adaptive structure that provides relevant and accessible opportunities for lifelong learning. For instance, the public sector can redesign the curriculum of formal educational programs, and work with the private sector to infuse greater elements of work-based learning, through internships and cooperative arrangements, to impart work-relevant skills and critical core skills. Another possibility is for the private sector to curate leading-edge skills being championed by the industry (for example, artificial intelligence and robotics), and transmit such skills to the wider workforce. Such partnerships will facilitate strategic co-investments, align strategic directions, and spur joint initiatives between the two sectors.

Co-investing between the public and private sectors helps to reduce the public sector's fiscal burden in the provision of education and training opportunities, and reduces the burden on private enterprises in scouring for the right talents and skill sets required in today's fast-moving technology landscape. Such partnerships are win–win arrangements for both public and private sectors.

An example of a successful public–private partnership is the Salesforce Youth Programme, a joint collaboration between SkillsFuture Singapore and Salesforce. With subsidies for the initial training investment and first 6 months of salary, the program encourages employers to hire promising young employees without having to worry about their initial lack of relevant skills, providing youth with the opportunity to apply for jobs that they previously would not have been qualified for. This collaboration resulted in wins for the employee, employer, and government.

14.4.1 Making Training Accessible and Affordable

Ensuring the availability of skilled human resources is a high priority for all organizations irrespective of size. Apart from efforts by governments, employers will have to build up workplace learning capabilities to keep their workforce resilient, adaptable, and highly skilled. Employers face the challenge of ensuring that skill sets of employees meet the needs of their organizations as their business processes and requirements evolve. Some employers address the skills set challenge by hiring new staff, and inadvertently contributing to a growing problem where the demand for talent with specific skills outstrips the supply. Furthermore, the opportunity costs of ongoing training may be prohibitive for employees to undertake on their own accord.

Salesforce looked at this skills set challenge and saw an opportunity to democratize learning for an ever-evolving technological environment, not just for internal staff but also for the wider workforce. Thus, Trailhead (Fig. 14.3) was created to empower anyone to learn marketable skills for free.

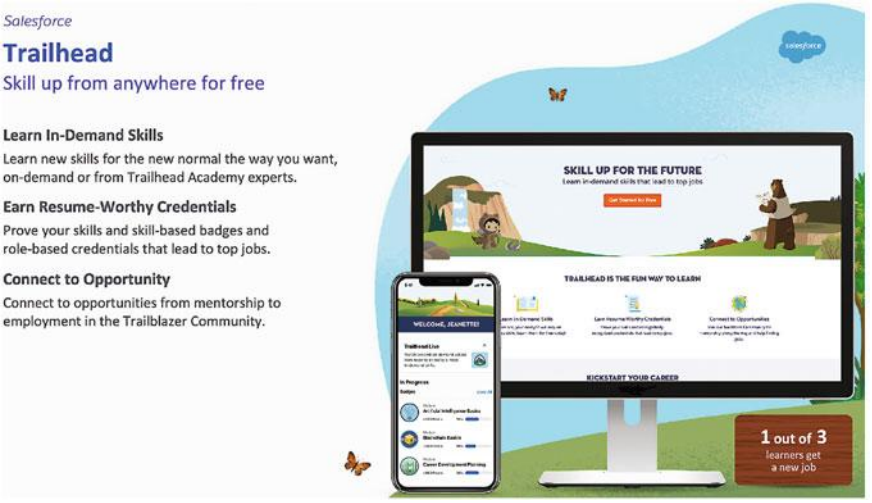


Fig. 14.3 Trailhead—Salesforce's learning experience platform (*Trailhead is a learning platform created by Salesforce to allow members of the public to learn new technologies for free*). *Source* Salesforce Inc. [2020]. Trailhead presentation. Unpublished. San Francisco

Similarly, UiPath, a global software company that has developed a platform that can emulate and automate actions of human activities, such as moving files and opening emails within a digital environment, offers a free and open online training platform called UiPath Academy available to people all over the world. UiPath Academic Alliance is a program that prepares students and experienced professionals for in-demand automation jobs upon graduation. UiPath has made its curriculum available to higher learning institutions and workforce development organizations across the world through the program.

Learning platforms like Trailhead and UiPath Academy are examples of how the private sector can upskill and reskill employees to combat the disruptions created by technological advancement. Offering training for free removes employers' reluctance to upskill their employees due to budgetary reasons, thereby making the quest for lifelong learning by employees more achievable.

14.4.2 Positioning Lifelong Learning as a Public Good

With lifelong learning becoming a necessity in a digital world where skills-in-demand continually evolve, the need for constant skills upgrading is becoming a "must have" in order to perform and retain one's job, and to live well in technology-enabled societies. However, the cost of training could be a major deterrence for organizations and individuals. The United Nations Educational, Scientific and Cultural Organization (UNESCO) report on *Rethinking Education* advocates that

education should be viewed as a public good (Bokova 2015), and the rising need for lifelong learning raises the imperative to consider universal access and provision as a collective social endeavor. UNESCO further advocates the need for private businesses and civil society to invest in education beyond their immediate needs as this would help alleviate the strain on the state and bring about greater inclusivity.

In moving toward positioning lifelong learning as a public good, governments need to rethink their fiscal policies and governance principles relating to education and training. Ultimately, the goal is to make lifelong learning accessible and affordable to everyone. Governments should also involve the private sector and the community at large to be part of such an endeavor.

The SkillsFuture movement in Singapore is a case study of providing near universal access to education and training opportunities throughout life. With the provision of individual learning accounts (SkillsFuture Credit), subventions to lower the cost of training, and targeted programs for disadvantaged population segments, there is support for lifelong learning for people from all walks of life. Integration between formal and nonformal education and training systems help to establish multiple pathways for individuals to acquire relevant skills, regardless of their starting points. Multistakeholder partnerships with industry, trade bodies, and unions are part of the holistic and inclusive approach.

14.5 Conclusions

Technological advancements, demographic shifts, extended lifespans and careers, and the COVID-19 pandemic have led to major disruptions in the nature of work and workplaces. Businesses have to transform to compete and survive. To enable this transformation, businesses will need a skilled and adaptable workforce conversant with technology trends. Workers need to continually hone their capabilities to match the needs of businesses and remain employable throughout their working lives. These imperatives have further accentuated the need to speed up the development of learning societies, where access to lifelong learning for all supports the acquisition of relevant skills that will help businesses and individuals build resilience, increase their ability to adapt, and have the confidence to navigate an uncertain future.

The development of learning societies adaptive to the increasing pace of change calls for a new paradigm for education and training. The public sector has the opportunity to rethink existing education and training structures; to design a new learning ecosystem that is integrated, accessible, flexible, and agile—one that is highly responsive to the needs of industry and workforce. The private sector can play a key role in this ecosystem by early identification of new in-demand technologies and skills, creation of job opportunities for such skills, and contribution to accessible and affordable learning platforms and opportunities for the wider workforce. Companies should put in place favorable policies to support their employees in pursuing their lifelong learning pursuits.

Drawing upon Singapore's experience, the following policy interventions could be considered by policy makers leading the development of learning societies within their respective countries:

(i) Establish a broad vision and plans to develop an integrated education and training system that provides multiple progression pathways for individuals to learn throughout life.
(ii) Implement mechanisms to make learning accessible to all, by developing the supply of relevant training delivered via multiple modes, and lowering the opportunity costs of learning.
(iii) Set directions and devise levers to expand the role of existing educational institutions to substantively support lifelong learning.
(iv) Undertake sustained actions to align and mobilize all key stakeholders, including government agencies, industry bodies, unions, and private companies to support inclusive outreach and effective functioning of the new learning architecture and systems.

These are the critical blocks to be overcome by an empowered learning society in order to build a more dynamic, holistic, and collaborative learning ecosystem; one that powers our economies and societies to confidently navigate current and future disruptions, and to emerge stronger in the new normal.

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Part V
Learning Societies and Industry 4.0

Chapter 15
New Directions for Apprenticeships



Ashwani Aggarwal and Geerija Aggarwal

Abbreviations

Cedefop	European Centre for the Development of Vocational Training
COVID-19	coronavirus disease
GTO	group training organization
ICT	information and communication technology
ILO	International Labour Organization
MNE	multinational enterprise
SMEs	small and medium-sized enterprises
TVET	technical and vocational education and training

15.1 Introduction

Skills development is central to improving employability, decent work, and productivity. Yet, education and training systems are often unable to equip learners with skills as per the demands of the world of work. The resulting skills mismatch negatively affects individuals, businesses, and society at large by not fully utilizing existing human capital and by constraining economic growth and opportunities that generate decent jobs, alleviate poverty, and improve living conditions.

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The perennial issue of skills mismatch is being further accentuated by megatrends such as technological advancements, globalization, climate change, and demographic shifts. In today's fast-changing world of work, one job for life is no longer valid for individuals. All individuals need to continuously learn to acquire new skills and update existing skills throughout their working life to remain employable. Furthermore, increased longevity also implies that working lives are increasingly extended. Therefore, older workers who choose to stay in the labor market should be provided with adequate opportunities for lifelong learning.

Apprenticeships are known to be one of the most efficient modes for acquiring skills relevant to the market demand for young people at the entry point to the labor market. Accordingly, the design of training and working conditions for apprentices are usually more suited to the needs of young persons. However, in times of rapid change, increased longevity, unpredictability, and disruptive technologies, it is important to situate apprenticeships within the framework of learning societies. Therefore, a key issue is how apprenticeship programs can become more flexible and responsive to the learning needs of all individuals and offer learning opportunities in a variety of settings, whether formal, informal, and nonformal, and throughout their working life. Also, apprenticeships should adapt to changing learning and working preferences among the millennials and digital natives.

15.2 The Concept of Apprenticeship

Apprenticeship is a centuries-old tradition in which a young person acquires the skills of a trade while working with a master craftsperson. In some countries (for example, England and Germany), this traditional form (informal apprenticeships) has evolved to formal apprenticeships that combine training at the workplace with part-time education in a technical and vocational education and training (TVET) institute or school (Ryan 2012). Meanwhile, it continues to operate in the traditional form in many countries, particularly those with large informal economies (ILO 2019a).

The informal system of transfer of competencies from a master craftsperson to a young apprentice is called informal apprenticeship. The apprentice acquires competencies in a trade by way of observation, imitation, and repetition while working with the master craftsperson. Usually, an oral agreement, which is based on the norms and practices followed by the local community, guides the transfer of competencies between master craftsperson and apprentice. The law of a country does not regulate the training and agreement (Aggarwal 2013; ILO 2012).

The characteristics and quality of apprenticeship programs differ significantly around the world, and as such, there is no single or standard definition. The International Labour Organization (ILO) introduced the concept of quality apprenticeships as programs that not only combine off-the-job and on-the-job learning, but also are "regulated and financed by laws, collective agreements and policy decisions arising from social dialogues, and require a written contract that details the respective roles and responsibilities of the apprentice and the employer"

(ILO 2017, p. 4). In contrast to the informal arrangements in informal apprenticeships, quality apprenticeships provide the apprentice with remuneration and standard social protection coverage, in addition to recognizing the successful completion of training through a qualification.

The ILO approach to developing quality apprenticeship systems is based on six key building blocks: (i) meaningful social dialogue, (ii) a robust regulatory framework, (iii) clear roles and responsibilities of all stakeholders, (iv) equitable funding arrangements, (v) strong labor market relevance, and (vi) inclusiveness. These characteristics also distinguish quality apprenticeships from other forms of work-based learning such as informal apprenticeships, internships, and traineeships.

15.3 Benefits of Quality Apprenticeships

Quality apprenticeships are beneficial for three main stakeholders: apprentices, enterprises, and government. The main benefits are (i) increasing employability, (ii) lowering the cost of training, (iii) increasing productivity, (iv) reducing skills mismatch, and (v) enhancing collaboration between TVET institutes and employers.

15.3.1 Increasing Employability

Apprenticeships consistently lead to positive employment outcomes (ILO 2019a). In the Netherlands, a comparison of labor market outcomes between work-based apprenticeship and school-based routes can be done as people can acquire the same vocational qualification through either of the two routes. The unemployment rate of apprenticeship graduates was much lower (2–5%) compared to the unemployment rate (11–30%) of school-based vocational training graduates. Also, the gross hourly wage for apprenticeship graduates was 16.29 US dollars ($)[1] compared to $12.22 for the latter for level 4 qualifications (Ministry of Education, Culture and Science 2014).

15.3.2 Lowering the Cost of Training

The apprenticeship training is cost-effective compared to a school-based vocational training program. While a training center has to invest in creating infrastructure (land and building) and purchasing equipment and tools for providing practical training to students, enterprises do not need to invest as they already have these facilities.

[1]Exchange rate used is €1 = $1.215 (as of 20 January 2021, x-rates.com).

15.3.3 Increasing Productivity

The findings from employers' surveys indicate that apprentices promote productivity and innovation in enterprises. An Inter-American Development Bank report indicated that over 60% of employers have seen improved productivity in their enterprises because of apprenticeships (Fazio et al. 2016). A study by the Centre for Economics and Business Research (2013) in the United Kingdom (UK) estimated that the productivity of workers who have completed apprenticeships increased by $292.46[2] per week on average (ILO 2019a).

15.3.4 Reducing Skills Mismatches

In most countries, school-based vocational education and training systems are not able to keep pace with fast labor market transformations, resulting in growing skills mismatches. Apprenticeships take less time to adjust training programs to changing labor market needs (ILO 2019a).

15.3.5 Enhancing Collaboration Between TVET Institutes and Employers

One of the main challenges faced by TVET systems is the lack of effective collaboration between TVET institutes and employers, which is essential to ensure the quality and relevance of the training. As apprenticeships, also referred to as dual TVET, are planned and implemented together by TVET institutes and employers, it naturally promotes a systematic means of collaboration between the two.

15.4 Challenges in Apprenticeships

The main challenges faced by countries in implementing apprenticeships are (i) social stigma, (ii) low participation of employers, (iii) situating apprenticeships in the context of lifelong learning, and (iv) ensuring the quality of apprenticeship training in the informal economy.

[2]Exchange rate used is £1 = $1.367 (as of 20 January 2021, x-rates.com).

15.4.1 Social Stigma

People, specifically the millennials and digital natives, tend to associate apprenticeships with blue-collar jobs, dead-end qualifications, and students who cannot gain admission to universities. The negative social perception of apprenticeships in many countries is due to their unavailability in the services sector and other emerging sectors of the economy such as the digital and green economy. Furthermore, low quality training and poor working conditions of apprentices in the informal sector also contribute to this poor image. The negative social stigma attached to apprenticeships makes it the "second choice" for many young people and jobseekers.

15.4.2 Low Participation of Employers

The proportion of young persons joining apprenticeships is lower than those going to TVET institutes in most countries. One of the reasons is the nonavailability of sufficient training places as a large number of enterprises, especially small and medium-sized enterprises (SMEs), do not offer apprenticeship programs. According to the European Centre for the Development of Vocational Training (Cedefop), many SMEs are reluctant to offer apprenticeships due to an unfavorable business environment, burdensome legislation, and internal shortfalls (Cedefop 2015).

15.4.3 Apprenticeships in the Context of Lifelong Learning

The fast-changing labor marketplaces demand that people acquire new skills and update existing skills throughout their working life. Since apprenticeships are traditionally meant for young persons, reorienting and customizing apprenticeships to meet the specific needs of adults and older workers in the context of lifelong learning is a major challenge.

15.4.4 Large Informal Sector in Developing Countries

The informal economy comprises more than half of the global labor force and more than 90% of micro and small enterprises worldwide.[3] In developing countries, the informal economy accounts for 35%–90% of total employment.[4]

[3]International Labour Organization. Informal economy. https://www.ilo.org/employment/units/emp-invest/informal-economy/lang--en/index.htm.

[4]International Labour Organization. Informal economy. https://www.ilo.org/wcmsp5/groups/public/---ed_emp/documents/publication/wcms_140951.pdf.

Apprenticeships in the informal economy, or informal apprenticeships, are widespread and are an important means for learning skills and knowledge in developing countries. However, they have many shortcomings. Informal apprenticeships can be exploitative as they are not regulated by law. The skills and technology in the informal sector tend to lag behind those used by enterprises in the formal sector; hence, the skills acquired by apprentices in the informal sector may not meet the needs of modern sectors of the economy. Also, the skills and knowledge acquired by apprentices are neither certified nor recognized nationally, thus making it difficult for them to access further education and training, and to be mobile in the labor market.

15.5 New Directions in Apprenticeships

The future of work discussions in the context of the fast-changing world of work and skills needs have generated strong momentum for skills and lifelong learning. Usually, school-based TVET systems face challenges in quickly adjusting to these changes. Although quality apprenticeships tend to respond faster to the changing skills needs, the traditional model is designed to provide skills to young persons at the time of entry to the labor market. Apprenticeship systems, therefore, need to be reformed to make them more effective in meeting the needs of adults and older workers, as well as to make them attractive for millennials and digital natives. At the G20 2016 Summit in Hangzhou, for instance, the Leaders of the G20 endorsed the "G20 Initiative to Promote Quality Apprenticeships" (G20 2016).

This section provides an overview of the innovations and new developments that have the potential to make apprenticeships more attractive and effective, particularly for adults and older workers, including millennials and digital natives.

15.5.1 New Learning Venues

Learning in apprenticeships typically takes place in two venues: enterprises and TVET institutes; thus, it is also referred to as a dual training system. However, in the process of strengthening apprenticeship systems especially by supporting SMEs in implementing apprenticeship programs, new types of learning venues (managed by a third party or intermediary) have been set up. An intermediary in apprenticeships can be broadly defined as an organization "which act[s] on behalf of, link, are somewhere in between or mediate between the main parties— apprentices and employers" (ILO 2019b, p. 2). Primarily, intermediaries can address the challenges faced by employers in offering apprenticeships by performing all administrative and reporting functions and by organizing training for which a particular enterprise does not have the facility. It can employ apprentices as a third-party employer; train apprentices on behalf of

employers; and provide apprentice support services, or group smaller enterprises in delivering apprenticeship training.

Depending upon the regulations in a country, various types of organizations such as industry associations, chambers, and not-for-profit organizations can act as intermediaries. For example, in Australia, group training organizations (GTOs) are not-for-profit enterprises supported by the government. The GTOs act as the employer of apprentices and deploy them to various enterprises, from whom they charge a fee. GTOs also support enterprises in the management of off- and on-the-job training, and rotation of apprentices among participating enterprises to ensure that apprentices acquire the full range of training as per the standards (Field et al. 2010).

Although existing literature does not provide sufficient information on the impact of different types of intermediaries, the establishment of intermediaries is a promising practice to encourage employers, in particular SMEs, to offer apprenticeship training. The success of intermediaries also hinges on whether the regulatory framework in a country facilitates a sustainable business and funding model for them. In low- and middle-income countries, governments would need to share the cost of operations of intermediaries, and at the same time give autonomy to employers' organizations, industry associations, and chambers to manage them.

With the rapid adoption of online learning and learning apps, virtual learning has gradually become a part of apprenticeship training. This virtual learning venue allows an apprentice to learn any time and at any place. While it can exacerbate the digital divide and create challenges for older workers, it can attract millennials and digital natives toward apprenticeships, and improve apprenticeships' effectiveness, as observed in the next section.

15.6 Digital Technologies for Modernizing Apprenticeships

While the innovations in digital technologies are causing challenges for education and training systems to meet the fast-changing demands of the world of work, the use of digital technologies can significantly improve the implementation of all processes involved in apprenticeship programs.

One of the main challenges most apprenticeship systems face is the harmonization between on-the-job training in enterprises and off-the-job training in schools. The use of digital technologies is blurring the conventional boundaries between workplace and classroom by providing opportunities for apprentices to acquire underpinning knowledge online at any time. As stated in the *ILO Toolkit for Quality Apprenticeships—Volume 2: Guide for Practitioners* "[c]onventional day-release arrangement for apprentices may no longer be relevant since online learning can take place in almost any location" (see module 6 in ILO 2020, p. 2). The use of mobile logbooks in place of conventional logbooks has a significant advantage in that teachers in school and trainers in the workplace can simultaneously review the progress of apprentices. For example, in British Columbia, an apprentice can use a mobile logbook called *SkillRecord* to demonstrate his or her work experience

and competencies, and control one's learning process. The logbook automatically summarizes entries by an employer, equipment, and other criteria, providing broader and more complete picture of apprentices' experience and skills.

The ILO Toolkit elaborates on the following new trends in the use of digital technology (ILO 2020):

(i) ***creating awareness and promoting apprenticeships*** through online vocational and career guidance portals;
(ii) ***recruiting apprentices*** through digital platforms to match apprenticeships and employers, and conduct online tests for the selection of apprentices;
(iii) ***enhancing learning experience*** through digital instructional and learning media, including 3D visualization;
(iv) ***creating stronger relationships and coordinated support*** between enterprises and TVET providers, through portals connecting different learning venues;
(v) ***monitoring of training*** through online (self) assessment and the use of mobile logbooks throughout the apprenticeship; and
(vi) ***strengthening of knowledge sharing and networking*** with mobile apps and online portals.

15.6.1 Apprenticeships for Digital Skills

The demand for digital skills has been increasing rapidly due to technological advancements in the information and communication technology (ICT) sector as well as other sectors of the economy. The curriculum development process, however, is unable to keep pace with the fast-changing technology. According to the World Economic Forum, [the curriculum development process is] so time-consuming that even cutting-edge skills and information can be outdated when the new curriculum is adopted (Advani 2019). In addition to the slow development and revision of curricula, the greater challenge lies in the implementation of the curricula due to the lack of the latest equipment, facilities, and qualified trainers. The skills gap resulting from the mismatch between demand and supply of digital skills can hold back economic growth.

Apprenticeships, in comparison to the school-based training systems, are better placed to reduce the skills gap by equipping individuals with the skills needed to adapt to the emerging digital economy. Countries such as Singapore, the UK, and the United States have started implementing apprenticeship programs for occupations in the digital economy. Singapore has started the Artificial Intelligence Apprenticeship Programme[5] to address skills shortages in artificial intelligence and machine learning, by developing a strong pipeline of artificial intelligence talent. An example of the collaboration between universities and enterprises in the UK to incorporate apprenticeships into their degree programs is given in Box 15.1.

[5] See AI Singapore. AI apprenticeship programme (AIAP): growing our own timber. https://www.aisingapore.org/industryinnovation/aiap/.

Box 15.1 Tech Industry Gold Degree Apprenticeships

Tech Partnership Degrees is a not-for-profit organization, which unites employers and universities to improve the flow of talent into the digital workforce. As a professional, statutory, and regulatory body in the United Kingdom, it operates Tech Industry Gold, the industry accreditation for digital and technology higher education, creating high-quality degrees and degree apprenticeships that meet employer-defined standards for content, delivery, and assessment.

Digital degree apprenticeships, designed by leading employers in the digital sector, equip apprentices for work in a wide range of graduate-level technology roles, including cyber security analyst, data analyst, business analyst, network engineer, software engineer, and many more. In 2019, there were over 1,600 degree apprentices on Tech Industry Gold degree apprenticeships, employed by more than 80 companies.

Source Tech Partnership Degrees. www.tpdegrees.com.

Some countries are also including the training of digital skills into apprenticeship curricula of various trades. For example, in Austria, apprenticeship programs are being revised to include digital skills in the training contents of occupations in various sectors. It is expected that the digital orientation of programs will increase the attractiveness of apprenticeships for young people.[6]

15.6.2 Adult Entrants to Apprenticeships

In today's fast-changing labor markets and aging societies in some countries, it is necessary for workers of all ages to regularly upgrade their skills and knowledge throughout their working life to remain employable. As the apprenticeship model allows individuals to acquire skills through on-the-job learning, it has the potential to reskill and upskill adults and older workers at the workplace. However, traditionally the apprenticeship programs are designed for young persons. For example, Brazil has an upper age limit of 24 years to join an apprenticeship (ILO 2019a).

To make an apprenticeship program accessible and effective for adults and older workers, changes would be required in the training and working conditions stipulated in apprenticeship system and programs (ILO 2020). While some apprenticeship systems allow older workers to join apprenticeships, such as by providing credits for the skills they already have and the opportunity to complete the program in a shorter period, this topic remains largely under-researched and underdeveloped. Some of the specific questions that need to be addressed include the following:

[6]European Centre for the Development of Vocational Training (Cedefop). https://www.cedefop.europa.eu/en/news-and-press/news/austria-digitisation-promoted-new-apprenticeship-occupations.

(i) For youth and older workers in the same occupation, should the learning program and pedagogic methods be the same?
(ii) How can customized apprenticeship programs of varying duration be offered according to the needs of workers with diverse competencies?
(iii) How much remuneration should youth and older workers receive during the apprenticeship period?
(iv) Who pays for the cost of apprenticeships for existing workers seeking to reskill and upskill?
(v) What would motivate an employer to provide a customized, short-term apprenticeship for a worker of another employer?

15.6.3 Higher-Level or Degree-Level Apprenticeships

The unemployment rate of graduates who have completed a university degree is higher compared to apprenticeship graduates in many countries. The latter also earn while learning, thus avoiding the need to take student loans during their studies, unlike many of their peers studying in universities. The introduction of apprenticeship programs at the university level can also improve permeability and provide opportunities for apprentices for vertical mobility from secondary to higher education level. Thus, apprenticeship can contribute to promoting learning societies and increasing the attractiveness of apprenticeships for young persons. Accordingly, some countries such as Australia, Germany, India, Switzerland, the UK, and the United States have started to expand apprenticeships at the higher education level (ILO 2020). "Oxbridge" (the collective term for the universities of Oxford and Cambridge), considered as among the top universities in the world, has also started offering apprenticeships. For example, Cambridge University offers apprenticeship programs up to master's degree level (ILO 2020).

However, despite the benefits, few countries have started apprenticeship programs in universities for some courses. Apprenticeships require education institutes to work in partnership with employers in designing and organizing training both at universities and in the industry. For many academics and administrators in the universities, this is a daunting, complex task. Furthermore, the traditional model of apprenticeship requires an apprentice to spend a majority of total time (up to 80%) at the workplace, which may not be appropriate for many university courses. It is also not easy to find enough placements in the industry for on-the-job training for all students undergoing a vast range of courses in universities.

15.6.4 *Provision of Quality Learning Opportunities in the Informal Sector*

Despite having many weaknesses, informal apprenticeships are widespread in countries with a large informal sector. Table 15.1 presents an analysis of the reasons or factors behind its popularity.

Considering the importance of informal apprenticeships for learning knowledge and skills in many countries, it is highly desirable to strengthen this informal system

Table 15.1 Suitability of informal apprenticeships for developing countries

Situation in developing countries	Suitability of informal apprenticeships
• Formal training systems have inadequate training capacity to meet the huge demand for acquiring skills from young women and men entering the labor market and those who want to upgrade their skills	• Small and micro enterprises in the informal economy are widespread in developing countries and have vast potential to impart skills to a large number of women and men
• Formal training usually focuses on meeting the demand of the formal economy. At the same time, the relevance of training is sometimes questionable	• Informal apprenticeship is a socially accepted practice for transmitting skills from one generation to the next. At their workplaces, apprentices not only learn relevant technical skills but are also introduced to business culture and business networks. Familiarity with these environments increases their chances of employment once the apprenticeship is complete. For example, in Malawi, the employment rate of graduates of informal apprenticeships was 97% (Aggarwal et al. 2010)
• A large percentage of school dropouts who are not eligible for admission to formal training programs	• Informal apprenticeships provide access to training for school dropouts
• A large percentage of the population lives under poverty who find it difficult to afford the cost of formal training • Governments do not have sufficient resources to establish quality training infrastructure for all	• Improved and effective informal apprenticeship systems can train young people in developing countries, and therefore expand the skills base of national economies at a much lower cost than the formal technical and vocational education and training systems • Many apprentices start earning wages once they demonstrate their proficiency in some tasks during their training period

Informal apprenticeships are widespread in countries with a large informal sector
Source Adapted from Aggarwal, A. 2013. Lessons learnt from informal apprenticeship initiatives in Southern and Eastern Africa. In A. Salim et al. *Apprenticeship in a globalised world: premises, promises and pitfalls*. Zurich: LIT Verlag. https://www.inap.uni-bremen.de/dl/inap%20conference%20proceedings%202013.pdf

of learning to extend quality lifelong learning and decent work opportunities to informal apprentices and master craftpersons working in the informal sector.

Accordingly, the ILO has designed and implemented innovative pilot programs to upgrade informal apprenticeships in many countries such as Bangladesh, Benin, Burkina Faso, Kenya, Malawi, and Tanzania. Based on the lessons learned from various pilot programs, the ILO recommends having an integrated strategy for upgrading informal apprenticeships to quality apprenticeships, and supporting micro and small enterprises (Box 15.2).

Box 15.2 Strategies to Upgrade Informal Apprenticeship

- The strategy should be developed based on a thorough understanding of local customs and practices, rather than policy adopted from another country.
- Within the informal economy, the aim of the strategy may be to promote a self-regulating mechanism. While public authorities facilitate such a mechanism, stakeholders involved in the informal apprenticeships should be provided support services and appropriate incentives.
- The development of quality assurance and regulations is very important but these functions may preferably be performed by small business associations of master craftspersons in the informal economy rather than directly by a public authority.
- The capacity of small business associations to function as regulators of apprenticeships, register agreements, assess skills, and award certificates should be strengthened.
- The capacity of micro and small enterprises can be strengthened by providing training to master craftspersons to improve their technical, pedagogical, and business skills; ensuring access to business development services and microfinance; and improving occupational safety and health at work.
- The skills of apprentices should be improved by supplementing on-the-job learning with off-the-job learning covering related theory, technical and business skills and core work skills; and rotating apprentices among various small businesses.
- The acquisition of national qualifications through the recognition of prior learning should be facilitated.

Source International Labour Organization. 2020. ILO toolkit for quality apprenticeships—volume 2: guide for practitioners. Geneva. https://www.ilo.org/skills/pubs/WCMS_607466/lang–en/index.htm.

15.7 A New Normal for Apprenticeships in the Context of the Coronavirus Disease Pandemic

The coronavirus disease (COVID-19) pandemic has seriously disrupted the training of apprentices. With the closure of workplaces, practical on-the-job training for apprentices cannot be continued in many enterprises. While many countries have shifted off-the-job trainings online, enterprises and education institutions face many challenges in delivering effective online learning, such as infrastructure issues (e.g., insufficient access to a high speed, reliable internet connection and computers); high internet costs; limited digital literacy of users; limited competence of trainers to develop effective online learning materials; lack of adapted training programs; and electrical power cuts (ILO, forthcoming).

Based on the findings from a global survey of enterprises on the impact of the COVID-19 pandemic on skilling, upskilling, and reskilling of employees, apprentices and interns conducted by 10 development partners,[7] the training of apprentices has been interrupted in 86% of the surveyed enterprises, and nearly half of the enterprises have stopped paying stipends or wages to apprentices.

The main challenge was in continuing practical on-the-job training during the lockdown. While it was possible to do so for some occupations in the ICT and services sector, enterprises could not find feasible alternatives for most of the "traditional occupations" even though some initiatives were taken, such as using simulators, and virtual and augmented reality. It also needs to be acknowledged that the priority of enterprises was on the health and well-being of employees, and resumption of operations.

As lockdown measures were relaxed, enterprises resumed work-based learning by introducing precautionary measures such as social distancing, wearing of face mask, disinfecting workplaces, introducing temperature checks, and reducing the number of apprentices in a group.

While relatively limited research has been conducted on this topic, the findings indicated the number of apprenticeship training opportunities would be reduced in the medium term. According to research conducted by The Mitchell Institute for Education and Health Policy at Victoria University in Australia, new apprenticeships and/or traineeship offers will decline by 30% within 2 years (from the beginning of the pandemic in early 2020 to June 2023). The findings from the global survey have also indicated that over half of the surveyed enterprises (61% of SMEs compared to 49% of large and multinational enterprises) are intending to reduce investments in training due to financial constraints following the pandemic (ILO, forthcoming).

To mitigate the challenges faced by enterprises and boost intake for apprenticeship training, countries such as Australia and the UK have announced policy measures, including wage subsidies.

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[7] African Development Bank, Asian Development Bank, European Commission, European Training Foundation, Cedefop, Global Apprenticeship Network, ILO, Organisation for Economic Co-operation and Development, UNESCO, and the World Bank Group.

Even after the pandemic is over, online learning is likely to remain as another learning venue in apprenticeship systems as it offers many advantages. However, to overcome the digital divide and make digital learning more equitable and accessible to all, countries need to ensure that all learners have affordable access to computers and the internet. For example, the Government of South Africa has decided to provide free laptops to poor students for online learning (BusinessTech 2020). To improve the effectiveness of online learning, the capacity of trainers to deliver high-quality online training, and of apprentices to use digital platforms and tools, should be strengthened. The use of blended learning methods combining face-to-face learning and online learning would be more appropriate, rather than completely switching to online learning.

15.8 Conclusions

This article explores promising practices that can give new directions to apprenticeship systems to ensure their relevance for learning societies. These include using intermediaries to increase the participation of employers, in particular SMEs, in apprenticeship training; improving the management of various processes of apprenticeship training with the help of digital technology; bridging the skills gap in digital economy; introducing higher-level or degree-level apprenticeships; making apprenticeship program accessible and effective for adults and older workers; and providing quality learning opportunities in the informal sector.

To design and implement the reforms effectively, governments should ensure the active participation of social partners and other relevant stakeholders in the process of developing and implementing new policy measures. Governments may include apprenticeships in any strategy for promoting lifelong learning; provide an enabling environment for enterprises to implement apprenticeships with ease, and a regulatory framework and equitable financing mechanism that balances the interest of both employers as well as apprentices; develop the capacity of social partners; provide need-based incentives and support services to enterprises; ensure permeability between general education and apprenticeships; and promote gender equality and inclusiveness. The reforms may also aim at developing alternative models of apprenticeships suitable for people of all age groups, formal and informal economies, traditional and emerging sectors, and secondary and higher education levels.

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Chapter 16
Promoting Workforce Planning as a Means of Embedding a Learning Culture in the Rail Sector



Mark Holmes and Neil Robertson

Abbreviations

SIM	Skills Intelligence Model
SMEs	small and medium-sized enterprises
UK	United Kingdom

16.1 How Skills Intelligence and a Workforce Planning Approach Underpin Sector Improvements

16.1.1 Overview

Governments everywhere regularly invest billions of dollars in infrastructure projects. Their successful delivery rests not only on investment in physical resources, but also relies heavily on having the right human capital in place. Governments require access to high-quality data in order to take an evidence-based approach to policy making for skills development; however, the private sector also needs to be convinced that positive returns will be forthcoming if they are to invest in people for the long term. Experience from the United Kingdom (UK) demonstrates how robust, accessible evidence of current and future skills needs informs policy and forward

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planning, helps target investment, improves the quality of education and training, and encourages dialogue and action among stakeholders.

The Skills Intelligence Model (SIM) designed by the National Skills Academy for Rail (NSAR) in the UK has galvanized the rail sector to build a focused, continuous learning and training approach to underpin its safe operation. The SIM developed a workforce planning strategy that contributes to improved productivity and profitability and helps to anticipate the impact of potential disruption—including from new technology, demographic trends, and global pandemics. Although the SIM has been applied to the rail sector, the model provides a methodology for systematically collecting, organizing, and presenting data as intelligence, then using it to help embed a lifelong learning culture with demonstrable benefits to governments, the private sector, communities, and individuals.

The chapter discusses the skills challenges facing the wider infrastructure sector highlighted by the available data; NSAR's use of its innovative SIM to undertake a thorough analysis of supply and demand in the rail sector; and detailed results of the study that have succeeded in driving a continuous learning culture within an industry, which until recently, was noted more for a short-term approach to skills development. It closes with some lessons learned and recommendations.

16.1.2 Opportunities and Challenges Facing the Infrastructure Sector

As a result of the government's ambitions to improve the UK's infrastructure, the projected demand for skills is well documented in reports such as the National Infrastructure Plan for Skills prepared by the UK HM Treasury (HM Treasury 2015), and the Department for Transport's Transport Infrastructure Skills Strategy (Department for Transport 2016). These £600 billion ($810 billion)[1] plans to upgrade the UK's primary infrastructure over the next decade or so entail new power stations, transmission lines, rail lines, and trains; as well as upgrades to existing rail, water, telecommunications, road, and energy infrastructure.

The growth in infrastructure investment set out in the National Needs Assessment—a vision of the UK's infrastructure—created a demand for over 250,000 construction and over 150,000 engineering construction workers, driving a need to recruit and train nearly 100,000 additional workers.

Supported by strong data sets, industry agreed that skills training clearly needed to extend to and be embedded into franchise operations, procurement contracts, and supply chains. This required a complete overhaul of the way people are recruited, developed, and deployed within the sectors involved. However, for employers to buy into and participate in the proposed learning culture, they need to see the value in it and in the supporting skills programs that government has put in place.

[1]Conversion rate: £1 = $1.35 as of 15 December 2020.

16.1.3 Economic Costs and Risks of Not Meeting the Skills Challenge

If the construction sector (in its widest sense) does not secure the skills it needs, it will put at risk the timelines for delivering government's planned infrastructure projects. This will put pressure on costs and profit margins if the sector has to buy in the skills it needs in an already competitive market, as a result of the UK leaving the European Union.

The HM Treasury has very clear expectations of success for the projects, especially the return on investment required. Skill shortages will create delays and have a consequential effect on economic growth forecasts and confidence.

Already, there is evidence of wage inflation in rail construction, and employers as well as government want to ensure that this does not extend across more sectors—or out into the wider economy. In construction overall, wage inflation in 2008–2014 was 5% compared to 75% in rail construction (Fig. 16.1).

This is evident mismatch of skilled labor supply and demand, with insufficient training as one of the principal contributors.

16.1.4 Industry Response and Technology

Employers have now committed time and money to understanding the problem, analyzing the available data, developing new apprenticeships, and assessing where they can add value.

Rail, for example, has a skills delivery plan. This tackles issues such as the aging workforce, technology challenges, and the increased demand for rail use through a

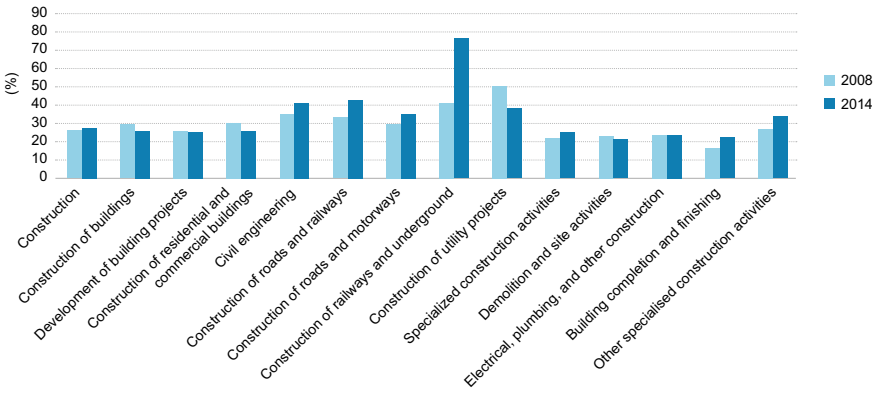


Fig. 16.1 Comparison of average employee cost by business sector (%) (*Already, there is evidence of wage inflation in rail construction*). *Source* National Skills Academy for Rail. 2017. *NSAR productivity review, 2017*. London: UK Government Office for National Statistics. Unpublished

variety of measures: improvements in training and quality assurance, standards and qualifications, recruitment and retention, promotion and attraction, intelligence, and leadership and productivity.

All of the reports into future skills needs highlight the challenges created by new technology. Skill sets are changing by 40% in some cases, as digital-driven systems replace analog or mechanical ones. This is creating enormous challenges for employees and employers. But while investment in new technology is critical, there are concerns that the short-term horizons associated with projects are undermining the prospects for this investment. Employers need to have greater confidence in the future and some time to see the return on investment in skills and in new technology.

16.1.5 The Potential of Procurement to Incentivize Training

An increasing feature of the UK government's policy to drive a learning economy and society is the incentivizing of apprenticeships through the procurement process. An early attempt to formally link infrastructure procurement to skills development was in the Transport for London tube upgrade in 2007. Transport for London wanted successful contractors to engage and train specific numbers of young apprentices from particular postcodes. Other more recent examples are Crossrail, the new line across London, and the new High Speed rail program.

Much has been learned about how to mandate training with precision. Specifying a ratio-to-contract spend for example, of one apprentice per £3 million spent, is workable and, crucially, relatively easy to measure. However, there is a need to vary the ratio or have other measures such as percentage of the workforce.

The government has encouraged this paradigm shift in delivering apprenticeships through procurement. But under European Union state aid laws, they can only intervene in the market if they have evidence of skills market failure, so they need a way of producing this. Other countries are also pursuing this route: Malaysia's offset program takes an analogous approach but lacks the underpinning data. Similarly, in the People's Republic of China, the skills passport system allows the management of supply and demand, but demand is based on fairly crude ratios, which are insensitive to local markets.

The crucial role of data in underpinning and helping to formulate government skills policy is clear. But industry is primarily concerned with profit, and employers want evidence that skills development will drive productivity.

16.1.6 Productivity for Skills Development

The UK's infrastructure program is designed with a core requirement to boost productivity. The much-quoted statistic is that if the UK matched the productivity of the United States, then gross domestic product would be 31% higher. Productivity

will be one of the key measures for the sector as well as for the country. But what does the data show?

While transport and storage had returned to prerecession trends by 2013, according to annual business survey data from NSAR (National Skills Academy for Rail 2017), construction productivity has failed to do so. This might suggest that there is overcapacity in the construction sector that can respond to growing future demand (Figs. 16.2 and 16.3).

Within construction, productivity has remained broadly flat since 2005. This trend had continued up until the COVID-19 pandemic was declared in March 2020. The estimate for productivity improvements after employee costs are stripped out is 15%, which is much reduced.

Companies have historically followed fairly understandable processes to protect margins. In response to either rising costs or falling demand they initially seek to raise prices and, if this is unsuccessful (as it often is), they reduce costs accordingly cutting staff, training, and/or investment in technology and processes. In these circumstances it is much harder to argue at the Board level for investment in new technology and a for process of business transformation that would ultimately lead to lower costs. We have seen this in Asian markets too, such as the People's Republic of China where the UK Government FCDO Prosperity Fund project offered free training but local employers were reluctant to release workers to attend. However, clear evidence that demonstrates the risk of not investing in new technology and business transformation has caused a change of mindset in the UK's infrastructure. In summary, investing in skills is a core part of productivity, but companies often do not do it. Data has shown

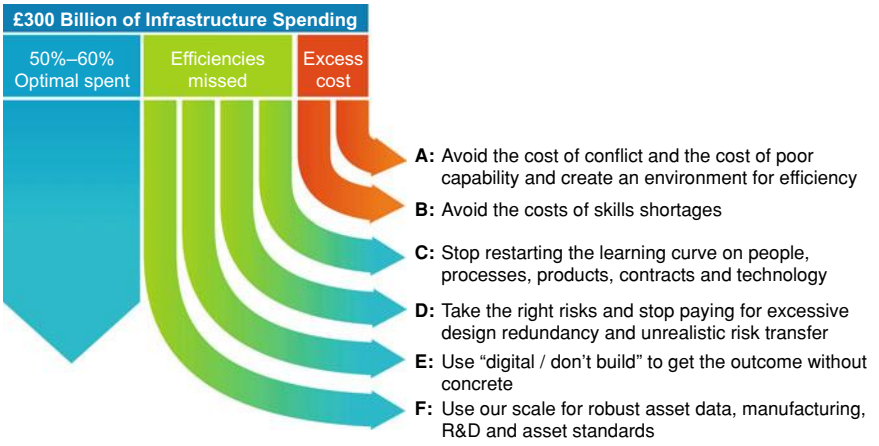


Fig. 16.2 Productivity strategy (*Using pretested tools and benchmarks, the maturity of trainees was assessed against six factors, with particular focus on two or three areas for improvement*). *Note* A to F represent six opportunities to avoid capital cost overruns and deliver efficiencies. *Source* Infrastructure and Projects Authority. 2017. *Transforming infrastructure performance.* UK HM Treasury. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/664920/transforming_infrastructure_performance_web.pdf

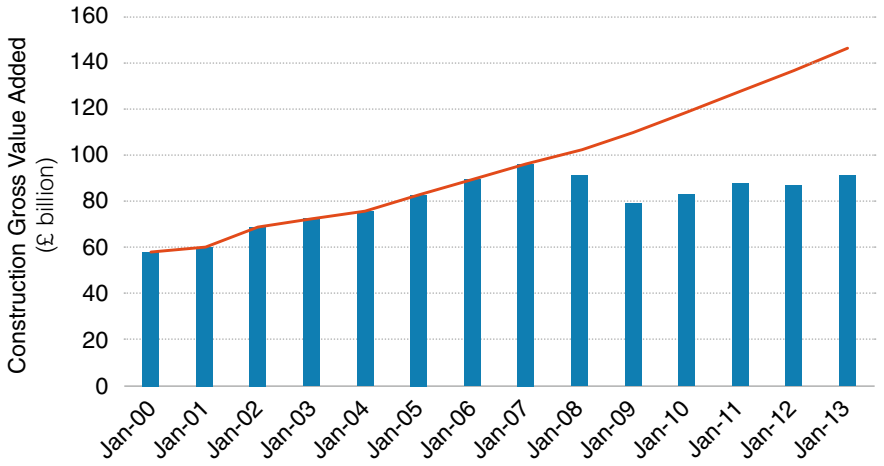


Fig. 16.3 Productivity index for the construction sector in the United Kingdom 2000–2013 (*Productivity has remained broadly flat since 2005, and overcapacity is evident*). *Note* Actual versus extrapolation. *Source* National Skills Academy for Rail. 2017. *NSAR productivity review, 2017*. London: UK Government Office for National Statistics. Unpublished

that employers would rather risk wage inflation than train workers. This has been due to a short-term view of demand and workforce requirements.

COVID-19 has exacerbated the existing market failure in infrastructure at a time when the economic and political dependency on the infrastructure sector has never been greater. In spite of 15 years of government skills strategies that have identified the importance of employer training to a wider learning culture (Leitch 2006), the market for skills and training had not been producing enough skilled workers. In fact, employer investment in learning has stagnated, as employers take a short-term view and rely on economic migrants for lower-skilled roles. As a result, wage inflation in technical roles and unemployment in the indigenous workforce has set in, with whole communities left behind.

The next section identifies opportunities that a data-led approach can bring to reversing this trend.

16.2 The National Skills Academy for Rail and Its Skills Intelligence Model

The National Skills Academy for Rail is part of a network of National Skills Academies—employer-led organizations established by the UK government in 2006 to raise the quality of training provision in their sector and broker better relationships between employers and training providers (Institute for Employment Studies 2011). Part of their remit is to attract significant employer investment in skills, and design

and deliver standards, qualifications, and curricula that meet current and future sector needs.

Through workforce data, NSAR helps the rail sector to make informed decisions and target investment in resource planning. It enables the industry to increase its competitiveness by matching skills and workforce demand to training and education supply for both upskilling and apprenticeships, thus enabling rail companies to deliver a more efficient railway.

In support of its work, NSAR has developed its Skills Intelligence Model (SIM), a detailed and innovative skills forecasting tool that provides a comprehensive picture of which skills are needed now and in the future. Assured by the UK's Department of Transport, it is a statistical tool that can report both at industry and at company level in a way that is easily interpreted by end users. The information collected shows the "gap" between the requirements of the future workforce and the current workplace, allowing industry to plan ahead of time to address any gaps.

The SIM allows users to conduct scenario mapping, business modelling, and cost saving and efficiency projections. The power of the SIM is its ability to deliver intelligence that informs the industry, skills supply chain, and prospective new talent, rather than simply "data".

The SIM is the central tool used for workforce planning in prominent organizations such as the UK government, Network Rail, the offshore wind industry, and Heathrow Airport. Among infrastructure employers in the UK, workforce planning has become central to creating a learning culture to prepare for Industry 4.0, as well as the accelerated technological change brought about the COVID-19 pandemic.

16.2.1 Development of a Workforce Development Strategy Using the Skills Intelligence Model

In light of the demand for skills created by the planned investments in the UK's national infrastructure outlined above, and the burgeoning evidence of mismatch between labor supply and demand, in late 2019, NSAR conducted a comprehensive study of supply and demand in the rail supply chain in the UK. All reasonable demand scenarios were considered, and the most likely one extensively modelled. Using the SIM, a large confidential data pack was collated. The modelling showed that the supply chain lacks sufficient capability and capacity to fill the gaps—clearly a market failure. As a result, a long-term workforce training and implementation plan was prepared to resolve this.

The analysis showed that the forecasted skills shortage is certain to lead to further wage inflation especially in the rail and civil engineering supply chain (from 5.6 to 8%). The business plan for the investment expected that the economic value of the associated jobs would be £6.3 billion ($8.3 billion, rising to over £8 billion ($10.8 billion) if a full social mobility approach was adopted. The practical impact of this market failure would be to reduce the economic benefits by 40%, or £2.5 billion

($3.4 billion). This outcome would have risked the whole business case and cost projections. Planned and unplanned disruptions (Britain's exit from the European Union and the COVID-19 pandemic) exacerbated the situation. Given that the time required to train to the level required by industry (level 3 in the UK) is 3 years, a long-term plan and renewed approach was deemed necessary to address education and learning challenges in these disruptive times. In this case, the SIM planned for a period of 15 years.

16.2.2 A Socially Inclusive Plan to Deliver the Skills Required

Like many governments, the UK government is attracted to investments in less developed areas of the country, expecting that these will create both construction and operational jobs. However, the modelling done for the rail sector showed that on its own, this policy would not have the desired impact. The SIM also showed that it would be possible to grow capacity and capability in the supply chain, but it would need to be a conscious and concerted strategy. As a model, the SIM and its application to workforce planning can be applied much more widely, not just in the UK, and way beyond the rail sector.

The SIM process follows a typical sequence: preparation of a strategic workforce plan, a full statement of anticipated demand for skills and people, and mapping against supply to understand the gaps. Next a recruitment plan is drawn up outlining how many will be recruited, when, and into what roles; and identifying options for how this is to be done, e.g., by promotion, upskilling, but mostly by new recruitment. Once the who, where, and how many need to be recruited is known, a training plan is drawn up. This is in effect a guide to the training supply chain (training providers) to deliver the necessary upskilling, and notably to bring in new skills such as digital and management skills.

Public sector clients increasingly expect social value outcomes, so a social inclusion plan is also prepared—a clear and relatively simple plan to target recruitment for roles and training places from a more diverse range of backgrounds and communities. This social inclusion plan sets out practical steps for employers, such as how to work with local colleges to offer work experience programs in the industry. Procurement contracts for infrastructure projects include clauses such as a minimum 10% (up to 20%) of recruits should come from disadvantaged backgrounds. Colleges are provided with additional funding to enable them to meet demand. The preferred training model is the people-focused apprenticeship, which plans are then integrated into the wider "value for money" strategy—or what is called a "productivity plan", referring to both quality and efficiency (see Fig. 16.2).

Investments in new technology alone do not realize value if staff and managers are not trained. Research has shown that 50% of the time, returns are not realized because of a lack of skills and/or understanding. A productivity maturity tool (see

Table 16.1) helps to create understanding, which incentivizes employers to invest in training, even when they do not see the importance of the wider learning culture and approach. An example of this in the UK composites industry (Lewis 2013) (Table 16.1).

16.2.3 Impact of the Skills Intelligence Model and Subsequent Workforce Development Plan

With an investment pipeline of £600 billion ($810 billion), views were sought on how infrastructure could be delivered without major wage inflation, with strong socioeconomic benefits, and especially with maximum value to the local communities. In order to embed learning society values in industries that had

Table 16.1 Productivity maturity tool

Value	5%–10%	10%–20%	20%–40%+	
Timeframe (months)	0–18	18–36	36–48	48+
People	Team dynamics	Workforce levelling, training	Long-term career development	Culture change
Processes	Explicit method reuse	Documented processes	Continuous process improvement	ISO standards for continuous delivery
Designs	Design templates	Repeat building same asset	Standard assets	DfMA Asset standards
Contracts	Heavy lifting to document intent	Reuse and/or extend same framework	Small changes	Repeatable standard call-off
Technology	Project tools and templates	Automated design and reporting	Whole life asset management	Digital replicas of assets
Resourcing	Consultants, contractors, and subcontracts		Employees, trainees, and long-term supplier relationships and talent development	

A productivity maturity tool helps to incentivize employers to invest in training, even when they do not see the importance of the wider learning culture and approach
Source National Skills Academy for Rail. 2017. *NSAR productivity review, 2017.* London: UK Government Office for National Statistics. Unpublished. *Note* Design for manufacture and assembly (DfMA) is a design approach that focuses on ease of manufacture and efficiency of assembly, and is increasingly adopted for use in off-site construction

previously shown a reluctance to train, the immediate negative impact of traditional approaches needed to be demonstrated. The SIM showed a number of key choke points in demand and supply. On the assumption that it takes at least 5 years to create a meaningful increase in supply of skilled workers, it was clear that the workforce development plan needed to be implemented immediately.

To facilitate this, a committee called the Strategic Transport Apprenticeship Taskforce (STAT) was established (Strategic Transport Apprenticeship Taskforce 2017) to manage the increase in workers, and a sister committee called Transport Infrastructure Efficiency Task Force looked after the wider plan. An industrial strategy (Rail Supply Group 2016) added further value.

The STAT vision includes the following:

(i) Create a national and regional strategic workforce plans.
(ii) Adjust policy and regulation such that procurement can induce greater supply chain forward business confidence (possible target: 3.5 years).
(iii) Train 5000 more local people to level 2 or level 3, using pre-apprenticeship provision to increase the proportion from disadvantaged backgrounds.
(iv) Assertively link recruitment to these programs, incentivized through procurement.
(v) Orient the skills supply chain to this demand, increasing capacity where required.
(vi) Prepare and deliver a development plan for small and medium-sized enterprises (SMEs), and local skills capacity in tier 2 and 3 companies.
(vii) Implement a transport policy that leads to government to "levelling out" demand and limiting poaching of skilled workers.

16.2.4 Lessons Learned About Strengthening Investment in Learning and Skills

The first lesson learned is about the power of comprehensive reliable data, presented in an accessible way that resonates with the skills challenges facing policy makers, the private sector, and individuals. Data gathered and presented as intelligence has the power to bring people to the table, instigate dialogue, highlight issues, and make a compelling case for action, even in sectors or organizations that have previously eschewed building a learning culture for the long term, in favor of short-term fixes to human resource problems.

The most effective route to engaging the private sector's participation in a learning society culture is through the medium of productivity and intelligence related to this. Building on the compelling data already available, and taking this further, a workforce planning approach enables employers to see the costs, benefits, and returns for their investment. This is what NSAR did, and as a result of their analysis, for the first time in recent history, employers became convinced of the value of training and do not need to be compelled to invest in it.

An important finding from a 2-year study (National Skills Academy for Rail 2017) was that change needs a "burning platform"—change needs to become a priority at the Board level. In the more "protected" worlds of regulated infrastructure, the burning platform has often come through regulation. Economic regulation has played an important role in reducing unit costs in regulated infrastructure. Intended as a protection for consumers from monopoly commercial providers, there has been a clear focus on unit costs, with some successes and a body of good practice established. In the UK, this is particularly associated with energy and utility regulator that set the price that producers can charge within fixed time periods known as "RIIO" (revenue = incentive + innovation + outputs) The charging model includes an allowance for the training of new people to address an ageing workforce.

Economic regulation is of necessity sectoral in nature. Issues are complex, technical knowledge requirements are high, and a rich understanding of current business practices are key to effective decision making. However, the businesses that are among the most affected by regulation are often the few, large, tier 1 contractors who work across a number of regulated sectors and have common supply chains. There is a well-documented inefficiency associated with contracting and procurement uncertainty, which is that opportunity arises to "even out" demand, understand the cumulative impact of regulation, and share good practice. This requires an agency, individual, or project to look across the main sectors, and then directly influence decision making.

Where more radical changes in supply chain are required, e.g., to grow a more highly and widely skilled supply chain, other measures may also be necessary. The case of Offshore Wind is instructive. Unit costs of offshore wind power were over £150 ($202.50) per megawatt-hour. Investment was needed to reduce these and increase local labor content and skills. The policy of "contracts for difference" was followed, where long-term contracts with price guarantees were agreed with suppliers, who in turn invested in people and technology. The price dropped to £47 ($63.50), a point where incentives and subsidies are barely needed, and a whole new local infrastructure is in place.

While regulation and procurement may sound technical and divorced from learning, it should be acknowledged that a slew of government initiatives, reports, studies, policies, and even regulations have collectively failed to encourage employer investment in learning, where these measures are succeeding in developing and embedding the culture of a learning society.

16.3 Impact of COVID-19

Evidence from the SIM is able to show the impact that COVID-19 has had on the infrastructure sectors in the UK, which includes the accelerated use of technology, offering the prospect of greater productivity, reduced asset ratios, and more investment. Interestingly, there has been a net increase in the demand for training, as existing workers are upskilled for new technologies. Sharp declines in

employment in adjacent sectors such as aviation have led to skilled staff from those sectors seeking roles in growth infrastructure sectors, in turn requiring reskilling programs. The net effect of COVID-19 so far appears to be a positive focus on workforce planning, training, and wider productivity.

16.4 Moving Forward with Lessons Learned—Some Recommendations

Based on what has been learned, below are some recommendations to consider for a national workforce planning approach that seeks to embed a culture of learning and skills development for infrastructure sectors:

(i) ***Develop best practice models across infrastructure and allied sectors***. Professional approaches such as SIM-style data and workforce planning can be used to drive a longer-term view of linking continuous learning and training with improving productivity.

(ii) ***Explore productivity deals with governments***. This can be done by raising skill levels that are directly attributable to savings.

(iii) ***Engage multinational companies and industry associations more actively to support SMEs***. SMEs are the backbone of most economies and supply chains. Supporting learning links between large and small companies for skills development, for example, through learning and development, will improve their resource efficiency, reduce the impacts of disruption, strengthen value chains across the infrastructure industry, and enhance standards.

(iv) ***Pursue sustainable supply chains***. These will contribute to boosting business confidence, which in turn leads to investment and includes skills development.

(v) ***Aim for liquidity of employment***. Avoiding peaks and troughs can be through skills passports. Employers taking on someone from elsewhere in the sector need to know their capabilities and development needs and to have confidence that this assessment is sound.

(vi) ***Enhance entry arrangements for people with technical skills***. This is to improve the incentive for technical education and training in support of infrastructure. Possible routes include high-quality, 2-year, college-based programs aligned to apprenticeships that smooth the pathway between learning and training and jobs.

(vii) ***Incentivize apprenticeships through procurement of infrastructure contracts***. Linking skills development formally to infrastructure procurement will directly contribute to a learning culture at the workplace and bridge gaps between institutional and hands-on training, thereby improving the technical caliber of the workforce. Ultimately, this will drive a learning economy and society that benefits the infrastructure sector.

(viii) ***Capitalize on sector attractiveness***. Data can be used to understand skills gaps and create learning pathways that offer entry and progression points for learners. The use of data and evidence amplifies prospects of helping new entrants to the workforce as well as existing workers to understand job and career opportunities in the sector.

(ix) ***Increase diversity***. Strengthening existing industry-wide plans will require targeted and coordinated action across the industry if the pool of skilled and talented workers is to grow.

(x) ***Emphasize leadership skills***. Include the design and delivery of an industry-wide leadership program to enhance leadership capability at all levels, and prepare leaders both for managing the present and preparing for the future (see Department for Transport and HM Treasury 2016).

(xi) ***Safeguard quality***. Strengthen end-assessment verification to ensure quality of provision, adopt new high-quality standards, and observe continuous monitoring and tracking of quality.

Infrastructure projects drive economic growth and increased job opportunities. Critical investments in skills development in a lifelong learning paradigm addressing young and old workers will help to reap both economic and social benefits. Increasing adoption of digital technologies is causing skill sets to change by 40% and more, calling for more real-time attention to ongoing skills development for infrastructure projects to be completed on time and to high standards. The promotion of greater uptake of energy-efficient and climate-resilient infrastructure would need adequate talent pools and technical expertise to design, execute, and maintain projects. The need for an in-depth understanding of current and future skills requirements to inform workforce planning seems set to develop and grow. This type of knowledge is power in the context of understanding how to build and strengthen a culture of learning to serve economic sectors such as infrastructure through focused training and continuous skills development.

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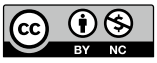
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Chapter 17
Workplace-Based Training in the European Union and the Experience of Skillman



Giovanni Crisonà

Abbreviations

Cedefop	European Centre for the Development of Vocational Training
CoVEs	centers of vocational excellence
COVID-19	coronavirus disease
ETF	European Training Foundation
IoT	Internet of Things
PLCs	Peer Learning Clubs
SAT	Self-Assessment Tool
SAW	Skills Anticipation Wave
SIF	Skillman International Forum
SMEs	small and medium-sized enterprises
TVET	technical and vocational education and training
WBL	work-based learning

17.1 Introduction

The Skillman Network is a nongovernment organization based in the European Union (EU) that is engaged in the technical and vocation education and training (TVET) domain to design and distribute work-based learning (WBL) solutions to address skills mismatch. Skillman is a worldwide community of practitioners, researchers, and institutions committed to responding to the need for learning solutions by

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creating tools and operating conditions for its community, based on the principles of participatory learning and distributed collaboration.

According to the latest vision statement of the EU, companies expect workers to have the skills needed to master green and digital transitions, and to be able to get the right education and training to thrive in life (European Commission 2020b). The efforts needed to provide people with these rights require a TVET learning community that is able to reflect, identify, and share ideas, tools, and solutions; and above all, able to design frameworks that enable this progress to contribute to a wider opportunity for the development of a learning society.

To introduce these progressive adaptations, the chapter starts with the origins of Skillman, the background against which the network was formed, focusing on the EU policies and challenges associated with skills mismatch. The context in which the tools and solutions of the Skillman Network have evolved, their current features, and how they were designed and implemented in the era of the coronavirus disease (COVID-19) are discussed. The Skillman tools and the solutions presented in this chapter are Skills Anticipation Wave (SAW); Global Centres of Vocational Excellence (CoVEs) Framework, a transnational platform of CoVEs for emerging skills in advanced manufacturing; Peer Learning Clubs (PLCs); and Skillman's Self-Assessment Tool (SAT).

In relation to the challenges associated with the WBL approach to skills mismatch, the chapter presents a view that links all qualifications to education, labor market, and society. Skillman adopts solutions that have been designed and implemented over time for a large participative model of interaction among stakeholders. All of these converge into a discussion of the equitable approach to WBL, which connects curricula design with ethics and values; promotes inclusion and social cohesion; tackles adult unemployment and underemployment; and supports company and country policies and strategies for innovation, competitiveness, and growth (Cedefop 2015).

The chapter concludes with a presentation of Skillman solutions with a reflection on the meaning of "excellence" in TVET that Skillman members espouse; and the approach that the TVET community could take in this regard.

17.2 How Skillman Forms Its Proposals for a Work-Based Learning Approach

Skillman operates on a voluntary basis, and promotes a participative model and peer learning approach among its members. It pursues a sectoral skills model that includes sustainability and ethical values. Since 2014, values, principles, and solutions that the Skillman Network promotes have evolved to offer the most appropriate strategic tools to address industry needs, policies of the EU, and changes and influences coming from the international debate on education and training. During the COVID-19 pandemic, the European Commission put skills at the heart of its policy agenda, steering toward

investment in people and their skills for a sustainable recovery. As a result, Skillman has recently incorporated the effects of the COVID-19 pandemic on TVET.

17.2.1 Early Beginnings: Aligning Technical and Vocational Education and Training with Market Needs

The European Commission launched in 2002 the Copenhagen Declaration, a European enhanced cooperation in vocational education and training (European Commission 2002). In 2010, the European Commission through the Bruges Communiqué called upon its members to support and ensure a better alignment of TVET with market needs to define new strategic objectives for TVET reform with the support of vocational excellence for smart and sustainable growth (European Commission 2010). Thereafter, the Sector Skills Alliances was created comprising three core groups of stakeholders, namely, industrial sectoral representatives, regulatory authorities, and TVET providers (European Commission 2014).

Starting from this decision, a group of stakeholders founded the Skillman Network in 2014, putting together industry leaders, research bodies, and TVET providers that included, among others, Fiat FCA, National Research Centre of the Italian Ministry of Education, University and Research, Jaguar Land Rover, and Scandinavian Airlines System.

With funding support from the EU, Skillman Network started operations in 2015,[1] promoting a **Sector Skills Alliance for Advanced Manufacturing** (Crisonà 2017) to deliver concrete and innovative solutions to the skills needs in the field of advanced manufacturing for the transport, automotive, aerospace, and train sectors. Skillman began delivering around 60 units of learning and curricula in the fields of production and Industry 4.0, energy management, robotics, composite materials, etc.[2]

17.2.2 Aligning Technical and Vocational Education and Training with Innovation Systems

In 2017, the European Commission issued the Communication on Strengthening Innovation in Europe's Regions (European Commission 2017), pointing to the need to link TVET to innovation systems as part of the EU's smart specialization

[1] Founders in alphabetical order: Associazione Tecnica dell'Automobile Consulting & Solutions srl/Italy, Birmingham Metropolitan College/UK, Centro Ricerche FIAT FCA/Italy, Centro Studi Cultura Sviluppo/Italy, CEPAS, Organismo di certificazione delle professionalità e delle competenze/Italy, Consiglio Nazionale delle Ricerche/Italy, Excellence, Achievement and Learning Ltd/UK, Industrens uddannelser/Denmark, Jaguar Land Rover Limited/UK, Scandinavian Airlines System Denmark–Norway–Sweden SAS/Denmark, Teknisk Erhvervsskole Center/Denmark.

[2] *Source* Skillman.eu. http://learn.skillman.eu/course/index.php?categoryid=11.

strategies at a regional level. The Skillman Network presented its vision on how to integrate the skills anticipation lifecycle to the smart specialization platforms, defining a new approach called Skills Anticipation Wave (SAW). This concept, inspired by the salmon ascent route, focuses on the importance of continuously gathering information from all the actors involved in the innovation tunnels at a regional level; acquiring the latest information so that these can be promptly included in the TVET pathways; and effectively anticipating the skills needed by the labor market (Fig. 17.1).

17.2.3 Integrating Technical and Vocational Education and Training with a Learning Society Approach

In May 2018, the European Commission published its proposal for the new Erasmus+ Program 2021–2027 (European Commission 2018), indicating the need to develop transnational platforms of called Centres of Vocational Excellence (CoVEs). The proposal gives, for the first time, a substantial role to the EU CoVEs in contributing to a learning society approach, indicating that they have to become closely integrated in local and regional strategies for growth, innovation, and competitiveness; and to

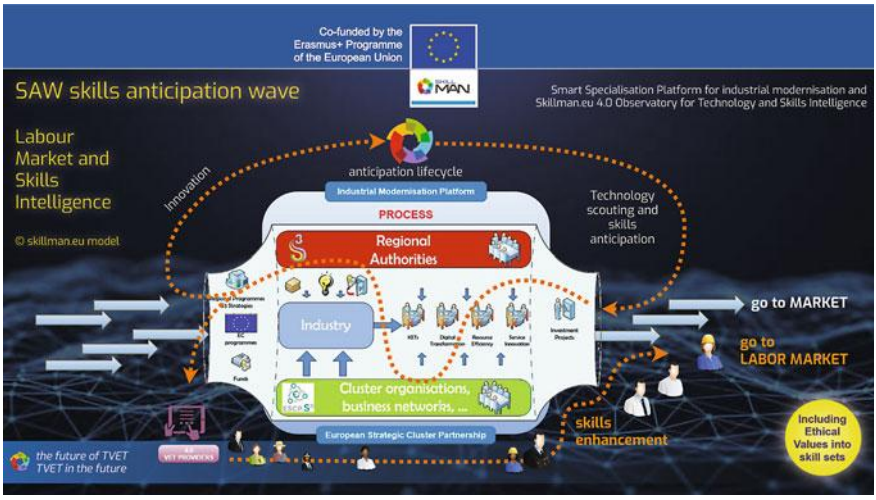


Fig. 17.1 Skills anticipation wave (*The graphic shows the Skillman conceptual model of anticipation lifecycle applied within the organizational context of the Smart Specialization Platform of the European Commission*). *Note* The orange arrows represent a process of continuous acquisition of information, done by Skillman's 4.0 Observatory for Technology and Skills Intelligence, and established to transfer detected skills needs into curricula design and learning pathways. CoVEs = Centres of Vocational Excellence, SAW = skills anticipation wave, TVET = technical and vocational education and training. *Source* Skillman Network

act as drivers of quality vocational skills in a context of sectoral challenges, while supporting overall structural changes and socioeconomic policies in the European Union.

Also in 2018, some 900 stakeholders joined the Fourth Skillman International Forum where they discussed solutions to integrate TVET in local and regional strategies for growth, innovation, and competitiveness. In addition, delegates discussed strategies in relation to the large interest and collaboration that the Skillman Network was forming on the ethical responsibilities of TVET, for inclusion in renewed strategies for lifelong learning and decentralized learning approaches.

During this time, the Skillman community had changed from a few dozen supporters to about 350 full partner volunteer members who, to better represent their vision and renewed composition, and in line with the latest EU trends, adopted their new definition of the Skillman Network: "**Transnational platform of centres of vocational excellence for the emerging skills in advanced manufacturing**" (ETF Team on Centres of Vocational Excellence 2020). The decision was taken to promote, disseminate, and encourage the community and members to act as drivers of excellence in TVET. In addition, to source and spread the Skillman vision, a Skillman magazine, *CoVE—A Sectoral Skills Model that Includes Sustainability and Ethical Values*, was launched, whose maiden issue was officially presented at the International Conference of Comparative and International Education Society held April 2019 in San Francisco.

To define more effectively its own support plan, the European Commission launched a study, *Mapping of Centres of Vocational Excellence (CoVE)*, on the characteristics of centers of professional excellence, which was published in November 2019 (European Commission 2019).

Also in September 2019, a select group of Skillman members participated in the preparation of the Fifth Skillman International Forum, held October 2019, wherein the Skillman Network launched its Global CoVEs Framework (Crisonà et al. 2019), which is Skillman's flagship initiative for TVET quality improvement. The Skillman systematic approach to excellence in TVET, called Self-Assessment Tool (SAT), was also launched.

The SAT was designed by Skillman members as a subtle mechanism for the continuous evaluation and finetuning of 25 variables for excellence in TVET, to stimulate solid interaction and continuous learning among TVET stakeholders on the basis of concrete data.

The tool represents an approach to a networked vocational training system of the future that draws stakeholders' attention to real data in order to involve them to learn and improve from sharing standards and objectives.

By 2020, for the first time, the Global CoVEs Framework had operationalized the early version of SAT,[3] that of promoting a shared vison on the future of excellence in TVET (Table 17.1).

[3] "*…implementing a self-assessment tool based on the maturity model—this would enable VET providers to identify areas for development and to access relevant support, e.g. good practice examples, peer learning activities*" (European Commission 2019, p. 9).

Table 17.1 General data from the first application of the survey

103 Organizations surveyed	**1742** Oldest year of constitution	**2, 3, 4, 5, 6, 7, 8** EQF levels covered by the group
424.486 Learners	**2019** Earliest year of constitution	**1.202** Active projects in the VET sector
13.212 Teachers	**17.794** Incubated companies	**1.802** Number of publications in the VET field in 2018
84.180 Employees	**%68,64** Percentage of employees who speak English	**21.972** Computers
1.371 New projects in the last 3 years	**3.001.897** Total number of projects from the constitution	**€ 218.171.499,29** Value in Euros of the owned of didactic equipment
	1.874 Agreements active with other organisations	**€ 24.577.278.185,47** Annual turnover in Euros Sum of all survey participants

Example of data collected with the first application of the Self-Assessment Tool survey, End-2019–February 2020
EQF = European Qualifications Framework, VET = vocational education and training
Source Skillman Network

To enable a shared learning experience among TVET stakeholders as a basis for a wider network of interconnected TVET providers, the SAT aims at continuous improvement of CoVEs by targeting the progress milestones indicated in the Maturity Model for CoVE Development (European Commission 2019), and by grouping performance under three clusters: (i) teaching and learning, (ii) cooperation and partnerships, and (iii) governance and financing or funding (Fig. 17.2).

In the last stage of its development, SAT allows for the following (see Fig. 17.3, steps 1–3):

(i) measuring and monitoring performance over time at the individual CoVEs level; territorial level (regional, national, and continental groupings); and framework level (all Global CoVEs members);
(ii) real-time publishing of visual presentations (radar maps) and definition of individualized concrete objectives (target levels) and standard levels; and
(iii) finetuning of the 25 variables for excellence (European Commission 2019), as integrated with the variables of the evaluation matrix in the Maturity Model for CoVE Development.

The SAT is consistent with the needs of the TVET sector for the following reasons:

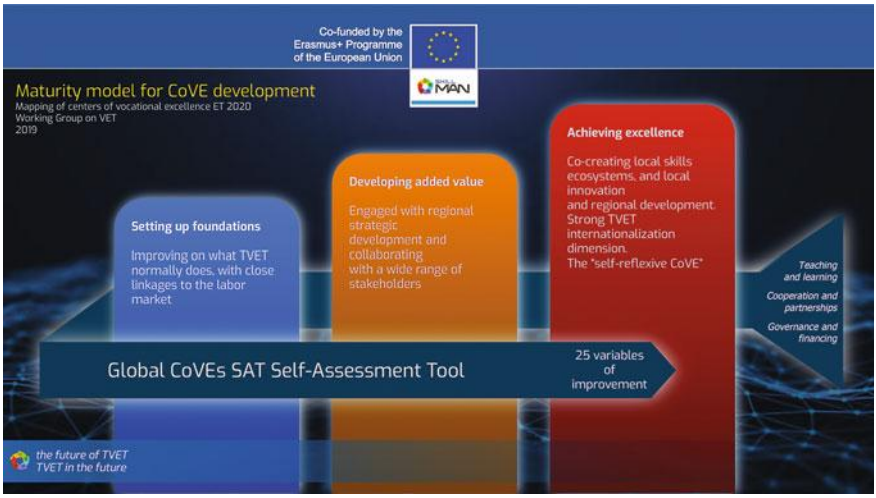


Fig. 17.2 Maturity model for development of centres of vocational excellence (*The picture shows three pillars identified by the EU Working Group on VET in 2019 to bring CoVEs to achieve excellence in TVET, based on 25 variables implemented in SAT*). CoVEs = Centres of Vocational Excellence, EU = European Union, SAT = Self-Assessment Tool, TVET = technical and vocational education and training. *Source* European Commission. 2019. *Mapping of centres of vocational excellence (CoVEs).* Luxembourg: Publications Office of the European Union. https://op.europa.eu/en/publication-detail/-/publication/566920f4-ee2d-11e9-a32c-01aa75ed71a1/language-en

(i) it allows scaling up of implementation to a large number of TVET providers and not only to the Global CoVEs members, ensuring a deep and wide impact;
(ii) it allows continuous self-assessments, audits, and certifications, enabling the creation of an accreditation system for CoVEs in advanced manufacturing;
(iii) it enables a transparent approach that facilitates efforts and recognition of excellence; and
(iv) it produces results that ensure the success of the matchmaking exercise for the best peer learning collaboration among the members of the platform. Each of the 25 variables are positioned in different stages of development of VET excellence.

17.3 Principles and Settings to Examine in the Future of Work-Based Learning

The launch of Skillman's Global CoVEs Framework involved selected members of the network and their related stakeholders with activities, which included an important debate to contribute to the formation of the Skillman Florence Declaration, *TVET for Green, Sustainable and Inclusive Development in Response to the*



Fig. 17.3 Self-assessment tool (*The picture presents the three steps in SAT application. Organizations collect their data into the system to start the design of their drives to excellence, set their own targets, validate the drives to be realized, and finally update their performance with a continuous application of actions for improvement. The model is conceived as a continuous exercise of analyses, planning, and execution*). CoVEs = Centres of Vocational Excellence, SAT = Self-Assessment Tool, TVET = technical and vocational education and training. *Source* Skillman Network

Fourth Industrial Revolution, the Emerging Needs of Industry 4.0 and Ethical Considerations (Skillman.eu 2020).

The Skillman Florence Declaration was also adopted as a fundamental charter of reference for the Global CoVEs Framework. ***Global CoVEs is currently the learning framework of Skillman that helps its members produce innovation, new ideas, and proposals for change for a society that wishes to plan its future through curriculum design***. The Global CoVEs Framework is consistent with the European Skills Agenda for sustainable competitiveness, social fairness, and resilience, which is also the latest initiative that the EU Commission introduced in July 2020 (European Commission 2020a) to extract Europe's competitiveness and innovation out of the COVID-19 pandemic effects.

Within the European Skills Agenda, the Pact for Skills puts skills at the heart of the EU's political agenda, and aims to mobilize member states, companies, and social partners for more and better opportunities for people to train and to unlock public and private investments in industrial and skills ecosystems (European Commission 2020a).

For 2020–2021, under the aegis of the European Commission and also using the consultations format, the Skillman Network is implementing its "Skillnet Catalogue".[4] Skillnet Catalogue consists of a dense list of events and participatory meetings aimed at sharing Skillman's responses to the pandemic challenges relating to the fourth industrial revolution or Industry 4.0; emerging needs of Industry 4.0; green, sustainable, and inclusive development; and increasing importance of ethical issues.

The activities of the Skillnet Catalogue will stimulate a participatory peer learning approach, and usher the construction of a new vision on major changes—megatrends—that affect global and national economies and societies, to shape the future of education; provoke a natural flow of information; and facilitate the interaction of Skillman members and other stakeholders with different organizations and supranational bodies.

Participants are actively involved in the international debate on the future of TVET within a participatory learning and action cycle that encourages them to contribute to the formation of a common, critical, and constructive point of view for a fair and inclusive society. Such society addresses sustainable development issues by focusing on quality education and lifelong learning in the age of robotics; the Internet of Things (IoT); Big Data; TVET digitalization; and green, sustainable, and inclusive development.

Among its specific topics, this participatory process proposes the original Skillman.eu mission, which is the facilitation of the EU Skills Agenda designing new learning pathways in the advanced manufacturing sector. Also included is the particular debate that is still alive among the members, which is about the implementation of **the 17 Sustainable Development Goals**, with the awareness that more than ever, we need partnerships to innovate, transform, and fulfill the right to education (UNESCO 2019).

The same process was also related, in particular, to the ethical values that connect the competencies necessary for advanced manufacturing to the personal responsibility and to an increasing focus on the relevance of social networking (Box 17.1).

Box 17.1 Work-Based Learning as a Key for Inclusion and Social Cohesion

The Skillman Network drives, into all its discussions, clear points to reflect an **equitable approach to work-based learning (WBL)**. Skillman places a special focus on the relevance of WBL, not only because Skillman represents industries, but especially because of the potential of WBL to promote inclusion and social cohesion, to tackle adult unemployment and underemployment, and to support company and country policies and strategies for innovation, competitiveness, and growth.

[4] Skillman.eu. https://skillman.eu/skillnet-events.

Source European Centre for the Development of Vocational Training (Cedefop). 2015. *Work-based learning in continuing vocational education and training: policies and practices in Europe.* Luxembourg: Publications Office of the European Union.

To address the policy makers and the general public with concrete proposals in the field of TVET, particularly its work-based forms, Skillman's participatory process is organized into four phases that run for specific periods. In the first phase or step, participants are actively engaged in groups called Peer Learning Clubs (PLCs) that begin to build their visions from the identification of challenges (Fig. 17.4).

The second step of their interaction consists in identifying existing and possible solutions. The third phase makes them involved in addressing their own counterparts to interact, discussing the proposals, and spreading the new ideas. Finally, the fourth phase merges all efforts in final documents that are circulated to the general public and among the stakeholders and policy makers.

The PLCs are composed of experts covering all roles (TVET providers, companies, governance representatives, and any other interested individuals) grouped to discuss, exchange ideas, and empower themself via online and on-site activities and using a bottom-up approach. They are organized into four specific objectives:



Fig. 17.4 Four phases in the peer learning club action cycle (*Peer Learning Clubs start with engagement of stakeholders including TVET practitioners and industry experts who produce policy papers and other initiatives and campaigns to influence the policy arena. Through numerous dissemination activities such as webinars and other learning events offered by the Skillman Network, interested participants move to peer learning collaboration, producing their own concepts for innovation in TVET*). CoVEs = Centres of Vocational Excellence, PLC = Peer Learning Club, TVET = technical and vocational education and training. *Source* Skillman Network

(i) advanced manufacturing sector (sectoral dimension);
(ii) advocacy and policy influencing (empowering dimension, social equity dimension);
(iii) WBL and standards (WBL dimension, quality assurance dimension, curricular dimension); and
(iv) train-the-trainers (operational dimension).

These groups help to undertake large international events involving a considerable number of participants and promote a virtual international campus approach to finding ways, despite the current uncertainty of the pandemic, to build the basis for concrete mobility opportunities for trainers and students among connected CoVEs. In this respect, PLCs are preparatory to a lifelong learning activity that takes place according to a specific organization, and includes online workshops, working groups, sharing of best practices, open debates, etc.

17.4 Answering the Need for More Skilled People

The Skillman platform fosters the principles of the latest EU policy agenda on reforms and of the most relevant European key policy landmarks related to Industry 4.0. The 2020–2021 initiatives of the Skillnet Catalogue addressed to the Global CoVEs Framework are designed and realized in tandem by the Skillman Secretariat and the European Training Foundation, which focus on carrying out an innovative process of awareness-raising and broadening the audience of beneficiaries of the Global CoVEs Framework to redefine the future of learning.

These initiatives have led to a strengthened vision of the ethical concepts connected to competence-based training and allow the participants to discuss and agree on new ideas, solutions, and tools. In order to bring out ideas and proposals, the Skillman Stakeholders' debate expands its scope to several broad areas such as vocational excellence, artificial intelligence or AI, IoT, ethical values, TVET digitalization, green and inclusive development, and last but not the least, the issue of the challenges of the COVID-19 pandemic.

All the initiatives deployed by the Skillman members, even if they may look very different from each other, have a common root and share the same essence, that of the learning society, as they all aim to boost a learning community to promote excellence in TVET; plan future skills needs and learning pathways; and, finally, develop collaborative assessment and benchmarking approaches for better learning practice. Box 17.2 lists aspects of Skillman's agenda.

Box 17.2 The Skillman Agenda

- Advance the contribution of technical and vocational education and training (TVET) and applied learning to green, sustainable, and inclusive development, in response to Industry 4.0 needs for a more qualified workforce and to particular challenges related to robotics, artificial intelligence, and the Internet of Things.
- Stress the increasing importance of ethical issues and social rights such as attention to gender discrimination, decent work, privacy rights, promotion of sustainable competitiveness, social fairness, and resilience.
- Promote the need to design curricula including ethical skills into learning pathways.
- Pursue a systematic approach to excellence in TVET.

Source Skillman Network.

The society of tomorrow requires an advanced manufacturing sector that needs a more qualified workforce with different profiles, endowed with skills and ethical values that currently are still lacking both in the labor market in general and in industrial companies in particular (i.e., in terms of numbers, knowledge, and know-how).

The tasks and capabilities of the suppliers who carry out the training courses require different approaches from the design phase to the manufacturing phase—from the technician to be engaged in the factory, to the technologically skilled workers for particular tasks in specific industrial sectors.

As a result of the wide need for a qualified workforce and its importance at the operational level, the Skillman Network looks, within the Global CoVEs initiative, at improving the quality of TVET among its partner organizations, specifically structural and organizational changes for excellence.

In order to raise their ability to provide people with the missing skills through the provision of the right education and training, these partner organizations receive concrete and practical support to implement WBL solutions; to design trainings applying the "learning by doing" method; and to take advantage of all existing European tools and the most advanced solutions of WBL technologies such as the European Skills, Competences, Qualifications and Occupations classification database[5]; European Qualifications Framework and/or European Credit System for Vocational Education and Training; Europass[6]; and Self-reflection on Effective Learning by Fostering the Use of Innovative Educational Technologies,[7] among others.

As part of the Global CoVEs Framework, Skillman members seek to improve on their quality and respond to changes as required by industry and society. Global

[5] *Source* European Commission. Skills/competences. https://ec.europa.eu/esco/portal/skill.

[6] *Source* Europass. The European qualifications framework (EQF). https://europa.eu/europass/en/european-qualifications-framework-eqf.

[7] *Source* European Commission. SELFIE. https://ec.europa.eu/education/schools-go-digital_en.

CoVEs is Skillman's flagship initiative for TVET quality improvement. The Global CoVEs Framework includes several organizations like the Austrian Federal Ministry of Digital and Economic Affairs, the Italian Ministry of Education, several regional authorities, and governments. In 2020, it was envisaged to have eight subgroups distributed across six countries in seven regions from the south, central, and northern regions of the European Union.

The initial composition of Global CoVEs was 36 full partner organizations, supported by an additional 96 associated partner organizations. The model of this collaboration is to pay attention to sustainability and ethical values in all EU countries and also outside the EU. The partnership is very rich and aligns a wide mix of complementary organizations representing TVET. Industry leaders like Fiat FCA, Toyota, Festo, Kohler–Lombardini, and even more SMEs that are linked through industry associations and clusters, all count as members (Box 17.3).

Box 17.3 The Skillman Framework of "coves.eu"—Centres of Vocational Excellence

The strengths of the coves.eu framework are as follows:

- a strong interaction capacity and collaboration among the companies and technical and vocation education and training (TVET) providers;
- a strong ethical commitment of all members;
- implementation of a tested method to deploy the skills foresight exercise;
- implementation of the Skillman Network's Self-Assessment Tool, currently considered a unique tool to assess and finetune excellence in TVET, and which implements a systematic approach;
- a strong connection with several available European Union tools; and
- the capacity to be embedded at the regional level within the European Union's Smart Specialization Strategies.

Source Skillman Network.

17.5 Conclusions

During the Skillman International Forum in 2019, Skillman members discussed the major "disruptors" and their implications for Skillman and work-based training. Five megatrends were identified that are affecting global and national economies and societies, which have implications for the European Union:

(i) global shifts such as rapid urbanization;
(ii) climate change, and resource scarcity;
(iii) shift in global economic power;
(iv) demographic and social change; and

(v) technological breakthroughs that are changing the way we live and do business.[8]

Their conclusion was that economic and workplace changes, which today include the COVID-19 pandemic first and foremost, are making human capital more and more important, driving Skillman members to conceive TVET as a homeostatic system that needs to raise its excellence at all levels and in all its components for a perfect integration with societal needs.

In line with this scenario and with recent policies of the EU, the challenges that the Skillman Network faces are focused on the promotion of excellence in TVET, although there are various distinctions and clarifications that Skillman members wish to make in fostering their participatory approach to excellence.

17.5.1 Excellence with Ethics and Productivity Needs

The network believes that particular attention should be paid to ethical and environmental principles aiming to understand and make the public reflect on the characteristics of the curricula we design today—the impact they may have on tomorrow's society. Also, how TVET organizations could help and what are the consequences of a TVET system that is limited only to responding to productivity needs, without considering the needs of a fair, peaceful, and green society fairly, are important concerns.

Skillman members consider the term "excellence" as a controversial term that is linked to the high quality of training and education, but which can also imply a wider, more complete, and inclusive conceptualization of the offer of competencies—addressing innovation, pedagogy, social justice, lifelong learning, transversal skills, organizational and continuing professional learning, and community needs (ETF Team on Centres of Vocational Excellence 2020).

17.5.2 Excellence of the Whole, not of the Elites

Incorporating ethical values into skill sets and ensuring that no one is left behind is a concept that Skillman is putting into practice. Skillman is endeavoring to provide advanced manufacturing skills to everyone with a special focus on underdeveloped economies.

The gaps that the Skillman Network had sought to fill to promote excellence in TVET stems precisely from the lack of a broad approach in engaging TVET stakeholders so as to give them the opportunity to drive solutions together. There is

[8] PwC. Megatrends: 5 global shifts changing the way we live and do business. www.pwc.co.uk/megatrends.

a need to re-engineer TVET for change, to pursue a holistic approach. In this regard, Skillman has identified two important gaps:

(i) ***There is a gap in the understanding of excellence as a sustainable goal***. A large aggregate of subjects aim at levelling up their performance not so much out of competition but to the exclusion of others who are not part of their own group.

(ii) ***There is a gap in the ability of TVET systems to connect the best performers to the weakest***. In addition, there is a gap in the quantity and quality of the participatory opportunities that can improve the quality of the contributions that TVET stakeholders make to the future of education.

The question this author asks (compared to the solutions currently discussed in Europe to promote excellence in TVET), is whether it is still appropriate to strengthen some organizations that are already good performers with additional support and funds; or whether it would be more beneficial to understand excellence as a sustainable objective that must be targeted at large aggregates that also incorporate lower-level performers.

In this regard, the Skillman SAT is the new direction envisaged by the network. This tool in fact has the ethical aim of integrating the most powerful TVET organizations within an ecosystem where excellence does not belong only to an individual organization but is the result of the combined contribution of all members.

17.5.3 A Digitalized Learning Society Today for the Society of Tomorrow

This combination of efforts also leads to an analysis of Skillman's learning society approach to TVET changes. A perfect combination of TVET providers and companies to concretize the broad concept of a learning factory is a digitalized workplace full of sensors, which allows movement from the virtual to the real world, and which allows an effective integration of the learning environment into the production environment.

Skillman is promoting a bottom-up process to rethink what is required of TVET to meet the workforce and society's wider concerns within the advanced manufacturing sector. The new relevance that TVET is taking on in this context also points to the need to shift from the role of education to a more central role for TVET in helping to form the conscience of those who learn, because all qualifications have a role in education, in the labor market, and in society.

A good understanding of future skills needs with a bottom-up approach is therefore a natural and necessary consequence for TVET's roles in education, the labor market, and society, in order to coexist with rapid change and commitment to innovation.

Skillman Network members develop and revise curricula in various fields like robotics, IoT, composite materials, production management, digital and mechatronic, and other industrial occupations, in support of the transition to green and sustainable

energy consumption. These curricula are designed today, but what the future needs is how TVET stakeholders can contribute to the design of tomorrow's society by being aware that tomorrow's society is in today's curricula.

In this process, learners have to become one of the most aware and responsible parties in curriculum design. The skills forecasting exercise presented with the Skillman Skills Anticipation Wave model is therefore not just a business process and cannot be limited only to education, but is a social project that needs broad consensus and interaction at all levels.

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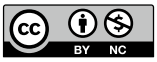
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Chapter 18
Work and Learning Balance for the Post-COVID-19 Era: Insights from the Republic of Korea



Chan Lee

Abbreviations

COVID-19	coronavirus disease
HRD	human resources development
ILO	International Labour Organization
OECD	Organisation for Economic Co-operation and Development
OJT	on-the-job training
WLB	work and learning balance

18.1 Introduction

The coronavirus disease (COVID-19), the pandemic that has snatched our daily lives away from us, is creating a global crisis. In the Republic of Korea, based on data as of 13 April 2020, new applicants for job-seeking support had increased 24.8% from 31,000 in March 2019 to 156,000 in March 2020 (Ministry of Employment and Labor 2020). Even in the United States, within 5 weeks after 16 March 2020, 26.5 million people had lost their livelihoods. On 1 April 2020, the International Labour Organization (ILO) put out the grim prospect that by the second quarter of 2020, labor hours will decrease by 6.7% and 195 million people would lose their jobs (ILO 2020). According to Statistics Korea's July Employment Trend, the number of employed workers in July 2020 is the first since the 2007–2008 global financial crisis to have decreased for 5 months straight, while the unemployment rate reached its highest in 21 years (Song 2020).

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Such pessimistic transitions are not confined to the labor market. Socioeconomic change is also very much apparent. Financial sectors, especially profitability of banks, have deteriorated considerably because of the decrease in interest rates and the increase in loan delinquencies as a result of the economic recession from COVID-19. The manufacturing industry is in no better position. Performance of general manufacturers (of cars, cellphones, displays, and so on) is worsening. Meanwhile, aviation and oil industries are also suffering blows from the pandemic (Yang 2020).

COVID-19 has brought notable changes into education as well. In the Republic of Korea, 10 million students from elementary to university level have participated in distance learning, and all formal curricula have been converted from offline to online (Fig. 18.1). According to the data and analytics platform AppAnnie, the number of mobile educational application downloads for the first quarter of 2020 has increased 90% compared to the first quarter of 2019 (Yang 2020). In a research by ILO, United Nations Educational, Scientific and Cultural Organization (UNESCO), and World Bank Group, among 1349 respondents from vocational education and training providers, ministries of labor and education, employers, and labor organizations from 126 countries, 64% replied to have proceeded with their education by turning fully remote, while 16% answered that their education was cancelled due to COVID-19 (ILO, UNESCO, and WBG 2020).

These clearly show that COVID-19 not only impacted the society, economy, and culture, but education as well. As the changes and new environment brought in by a virus that nobody expected become the norm, it is urgent to exert multilateral effort to cope with these aberrations.

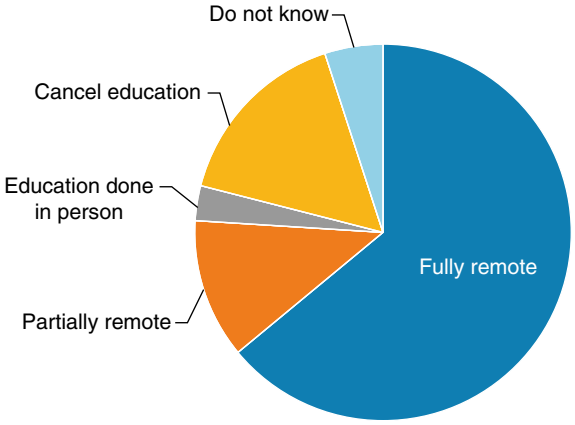


Fig. 18.1 How education was provided after elevation of COVID-19 alert level to "serious" (red) stage (%) (*In the Republic of Korea, 10 million students from elementary to tertiary level have participated in online learning*). COVID-19 = coronavirus disease. *Source* Lee, C., and B. Park. 2020. Post COVID-19, survey on the actual condition of Korea about work & learning balance (WLB). Paper presented in The Korean Society for Human Resource Development Annual Conference. 12 June 2020, Korea

18.2 The Reality of Work and Learning Balance in the Republic of Korea

Significant changes are occurring within the purview of human resource development (HRD) in this COVID-19 era. A substantial number of in-person educational assemblies are being cancelled while remote work trend is rapidly expanding. In order to figure out the reality of this massive transition, our research team from Seoul National University investigated the state of HRD before and after COVID-19 (Lee and Park 2020).[1] We set 23 February 2020 as the starting point, the day when the government announced it was raising the COVID-19 crisis alert to level 3 or "red" (serious). From this central date, the team split the timeline into two sections, before COVID-19 and after COVID-19. We asked questions for each division using a structured survey of 213 people from the Republic of Korea who were either in charge of human resource management and/or HRD (Fig. 18.2).

18.2.1 Number and Duration of Training Sessions

Prior to COVID-19, an average of seven training sessions (33.5%) were held per quarter and were at least 20 hours in duration (32.1%). However, after the alert level was elevated to "red," 34.3% of the respondents answered that no quarterly training sessions were held; and 42.5% answered that on average, 1–2 sessions per quarter were held. Meanwhile, the proportion of those who answered that the sessions

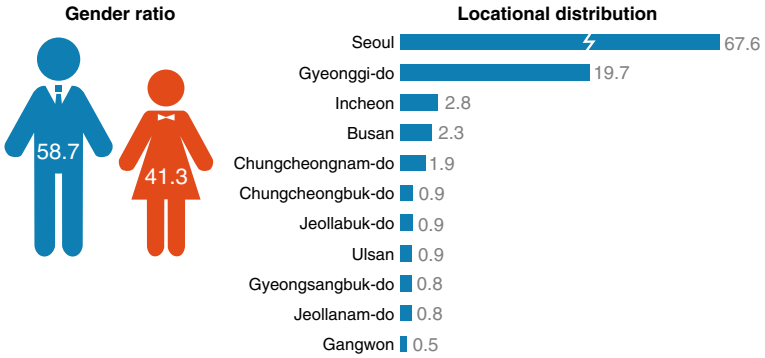


Fig. 18.2 Distribution by sex and location of respondents (%) (*Respondents were in charge of human resource management and/or human resource development*). *Note* $N = 213$. *Source* Lee, C., and B. Park. 2020. Post COVID-19, survey on the actual condition of Korea about work & learning balance (WLB). Paper presented in The Korean Society for Human Resource Development Annual Conference, Republic of Korea, 12 June

[1] "WLB" is a compound word meaning work–learning balance. *Source* Lee, C. 2020. Presentation in a virtual ATD 2020 Conference, 4 June 2020, based on Lee and Park (2020).

lasted for more than 20 hours decreased greatly from 32.1 to 8.5%; while 27.8% of the respondents answered that theirs lasted for 1–3 hours; and 37.8% reported 4–7 hours. These replies suggest that the duration of the quarterly training sessions have decreased significantly (Fig. 18.3).

18.2.2 Type of Training

The difference between the conditions prior to and post-COVID-19 alert level "red" can also be seen from the field and the form of training held on the corresponding times. Prior to elevation to "red," trainings were held mostly on-the-job (OJT) at 58.5% and as position training at 30.2%; however, after the elevation, the number for those training areas slightly decreased (45.8% for OJT, 16.5% for position training). In other areas of training (e.g., legal training, leadership training, organization invigoration training, etc.) the number of trainings increased by 6.5% in 2020 compared to 23.1% in 2019 as face-to-face training greatly decreased and turned into online sessions (Fig. 18.4).

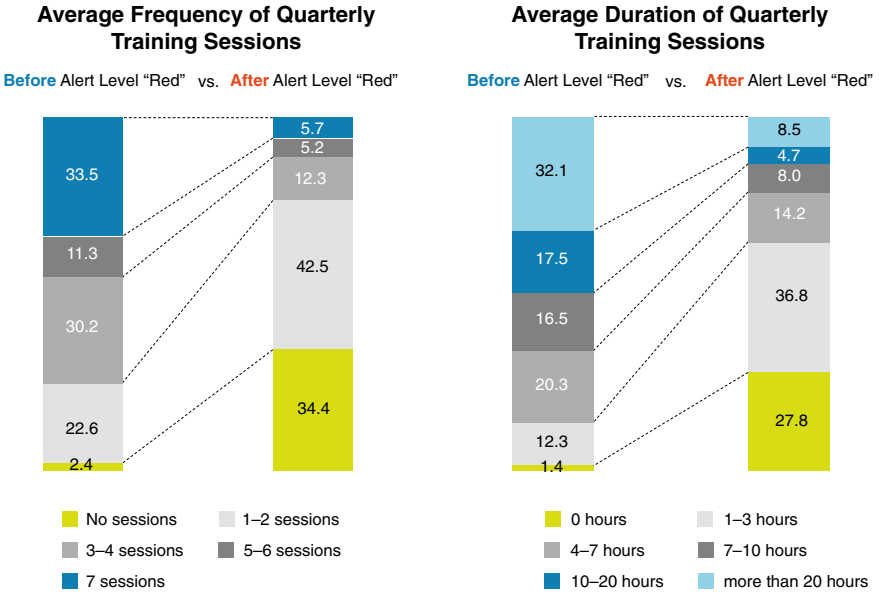


Fig. 18.3 Comparison between average number and duration of quarterly training sessions held before and after elevation of alert level to "red" (frequency, hours) (*From 20 hours, training sessions in the Republic of Korea declined to as low as 1–3 hours from 20 hours during the coronavirus disease pandemic*). *Source* Lee, C. 2020a. Present and future of HRD. Paper presented in the HRD Conference, Human Resources Development Service of Korea, Republic of Korea, 10 September

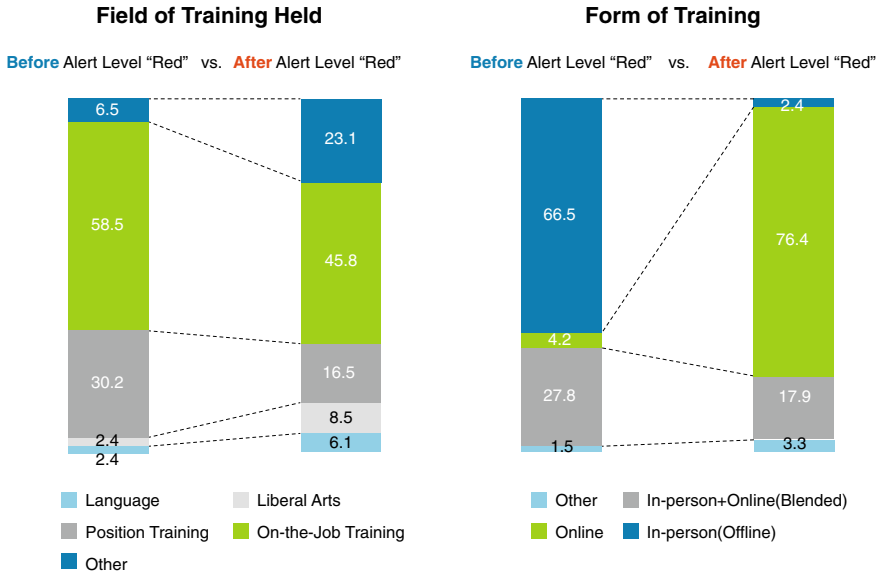


Fig. 18.4 Comparison between field and form of training before and after the elevation of alert level to "red" (%) (*Face-to-face training greatly decreased and turned into online sessions during the coronavirus disease pandemic*). *Note* In the "field of training" panel, "other" comprises legal training (security, prevention of sexual harassment); leadership training; organization invigoration, and so on. *Source* Lee, C. 2020a. Present and future of HRD. Paper presented in the HRD Conference, Human Resources Development Service of Korea, Republic of Korea, 10 September

18.2.3 Education Methods

As to the education method used during the training sessions, prior to the elevation of the alert level, the training method consisted mostly of lectures, discussions, and debates, and were practice-oriented. After the elevation, discussions and practical experience-oriented training decreased sharply. An interesting point to note is the visible pattern (from 6.6 to >15.6%) in the relative weight that OJT held within the corporate environment before and after the elevation. Since collective training and other human-to-human, interaction-based trainings were either being cancelled or postponed due to COVID-19, "learning within the workplace" was instead activated. Nevertheless, there is a high possibility that this is not a systemized OJT but probably a disorganized one (Fig. 18.5).

18.2.4 Keywords

The positive and negative experiences on HRD before and after the elevation to alert level "red" revealed that the keywords for positive experiences are "communication



Fig. 18.5 Comparison between educational method used before and after the elevation of alert level to "red" (%, repeated response) (*Since collective training and other personal, interaction-based trainings were either being cancelled or postponed due to coronavirus disease, "learning within the workplace" was activated*). *Source* Lee, C. 2020a. Present and future of HRD. Paper presented in the HRD Conference, Human Resources Development Service of Korea, Republic of Korea, 10 September

and/or networking" (30 cases); "offline, face-to-face, assembly training" (28 cases); and "capacity development" (15 cases). On the other hand, "time, budget deficit" (39 cases); "convention and/or one-sided" (24 cases); "inadequate measure of effectiveness" (19 cases); and "inefficient, shortage in outcome" (14 cases) are the keywords for negative experiences (Fig. 18.6).

In addition, "online, non-contact, remote learning" (76 cases); "new change" (16 cases); and "effectiveness" (12 cases) were keywords for positive experiences. For negative experiences, the keywords are "lack of interaction" (31 cases); "lack of learning opportunity" (25 cases); and "prohibition of assembly education" (16 cases) (Fig. 18.7).

18.2.5 Prearranged Education

For prearranged education, after the elevation of alert level to "red," most education programs were either postponed (49.8%) or cancelled altogether (27.7%). However, even if the program was still continued, it was done from one's own seat (38.5%) or in one's own house (23.9%) (Fig. 18.8).

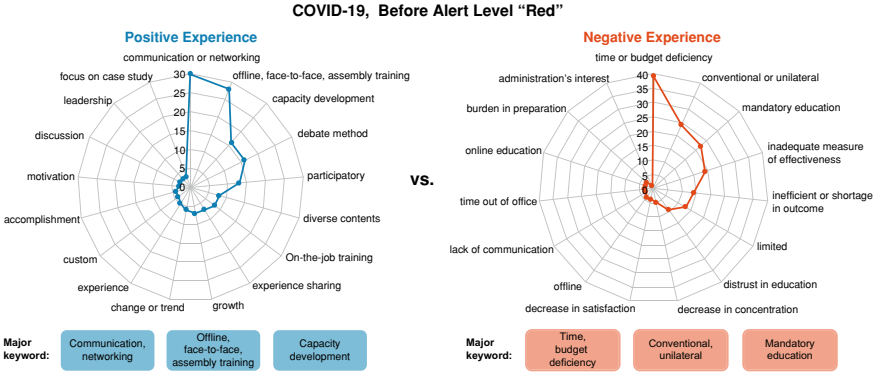


Fig. 18.6 Comparison between positive and negative experience before elevation of alert level to "red" (*Prior to the COVID-19 level 3 alert, "communication and/or networking" are the top keywords with a positive association in human resource development, while "offline, face-to-face, assembly training" were the top keywords associated with negative attributes*). COVID-19 = coronavirus disease. *Notes* $N = 196$ cases. 23 February 2020 is the cutoff date for "prior to elevation of COVID alert level to 'red'." *Source* Lee, C. 2020c. Vocational competency development and employment prospects in Korea after COVID-19. Paper presented in the 2020 ASEAN+3 HRD Forum, Human Resources Development Service of Korea, Republic of Korea, 17 November

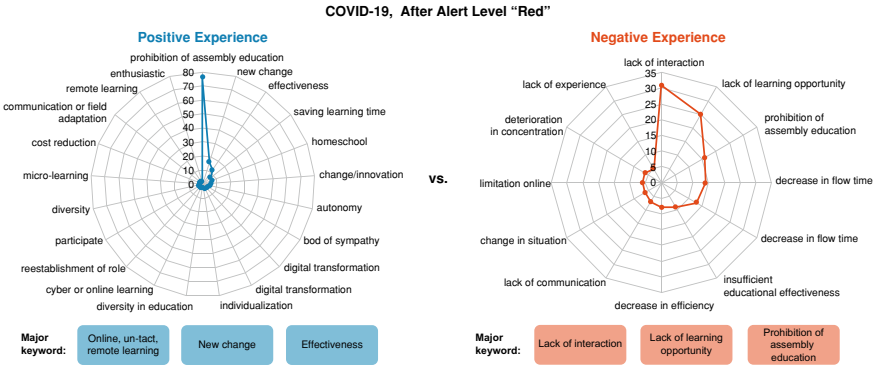


Fig. 18.7 Comparison between positive and negative experiences on human resource development, after the elevation of alert levels to "red" (*After the COVID-19 level 3 alert, what used to be negative attributes such as "online, no contact, and remote learning" became positive attributes*). *Note* Total cases reporting positive experiences = 188 cases; total for negative experiences = 195 cases. 23 February 2020 is the cutoff date for "prior to elevation of COVID alert level to 'red'." *Source* Lee, C. 2020c. Vocational competency development and employment prospects in Korea after COVID-19. Paper presented in the 2020 ASEAN+3 HRD Forum, Human Resources Development Service of Korea, Republic of Korea, 17 November

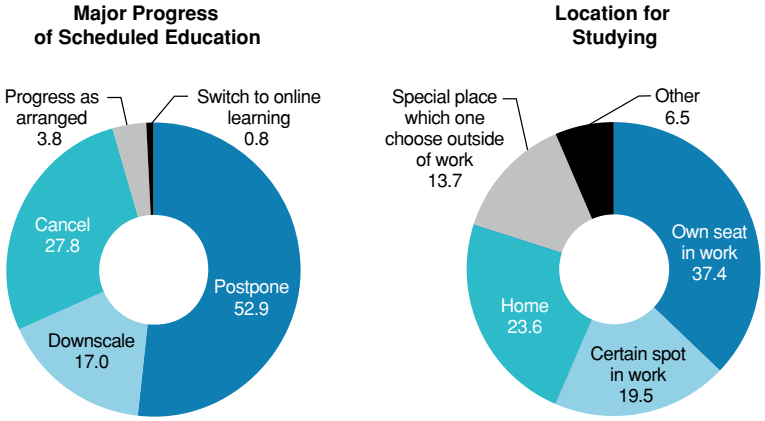


Fig. 18.8 Educational progress and learning location after the elevation to "red" (%) (*Education is quickly shifting to an online format*). *Source* Lee, C. 2020b. The reality of work & learning balance: WLB and the prospect of HRD in South Korea, post COVID-19. Korea Research Institute for Vocational Education and Training. *The HRD Review* 23 (3): 144–165

As can be seen from Fig. 18.8, education is quickly shifting into online format. The contents of the online curriculum are mostly delivered through e-Learning (45.5%), and, in the case of the content platform, through Zoom (46.5%) (Fig. 18.9).

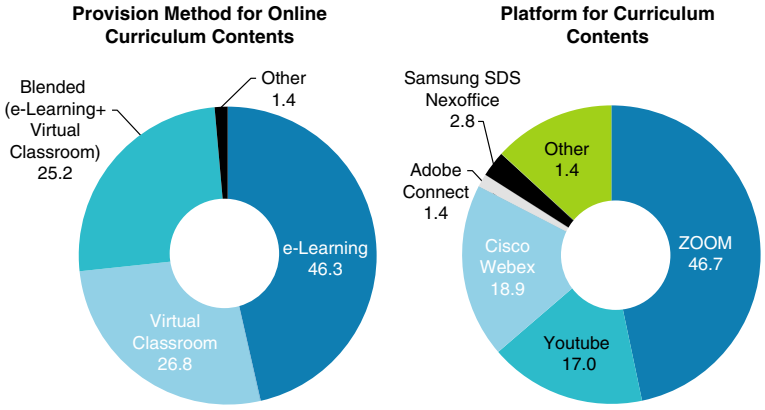


Fig. 18.9 Method and platform used to provide online curriculum contents after elevation to "red" (%) (*Curriculum delivery has become mostly through* Zoom). *Source* Lee, C. 2020b. The reality of work & learning balance: WLB and the prospect of HRD in South Korea, post COVID-19. Korea Research Institute for Vocational Education and Training. *The HRD Review* 23 (3): 144–165

18.2.6 Curriculum Quality

On the aspect of curriculum quality, the results show that there is no prominent difference between the states before and after 23 February 2020; or if there was any, the degree was moderate with no particular dissatisfaction (43.4%). Moreover, there were also responses of satisfaction (29.2%), the reasons being the chance to have new experiences in online classes and the convenient nature of the online class itself. On the other hand, the reasons for dissatisfaction were decrease in educational feedback, limitations of operational process or contents development infrastructure, dismissal of learner's needs, and so on (Fig. 18.10).

18.2.7 Cooperation and Collaboration

Changes also occurred in methods of cooperation, one of which was the increase in online cooperation (63.2%) since more work is now done at home. These online meetings are mostly done for business negotiations with other departments (43.4%), work conferences between teams (30.7%), and weekly business meetings (28.8%) (Fig. 18.11).

The responses on satisfaction via collaboration using remote methods showed that the smoothness of the process was perceived as high (around 6.2 points), but compared to face-to-face work, in terms of effectiveness, it was low at 4.9 points out of 10 (see Fig. 18.12).

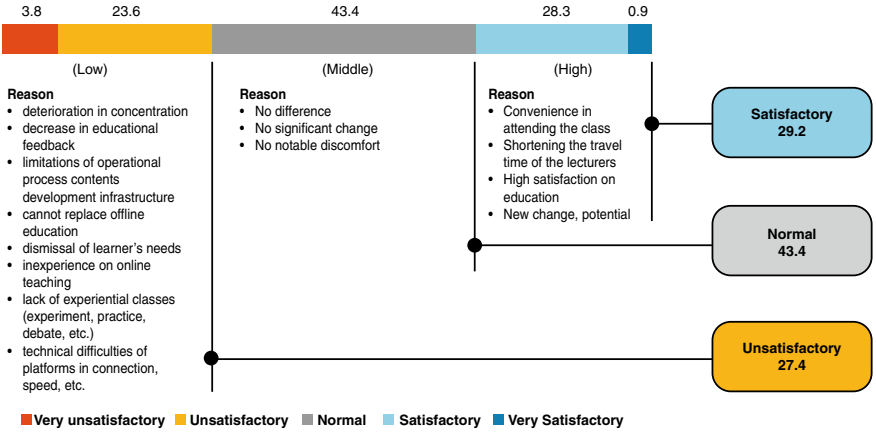


Fig. 18.10 Satisfaction rate on curriculum quality after elevation of alert level to "red" (%) (*The level of satisfaction for the curriculum has remained basically the same before and after the elevation to alert level 3*). *Source* Lee, C. 2020b. The reality of work & learning balance: WLB and the prospect of HRD in South Korea, post COVID-19. Korea Research Institute for Vocational Education and Training. *The HRD Review* 23 (3): 144–165

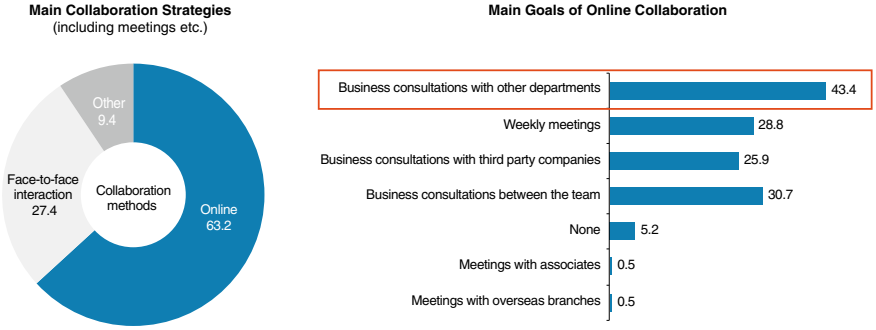


Fig. 18.11 Collaboration strategies and goals of online collaboration after elevation of alert level to "red" (%) (*With work now done mostly at home, online cooperation has increased*). *Notes* "Others" include options such as face-to-face meetings, communication via email, refraining from meetings, etc. "Main goals of online collaboration" is a survey with multiple selection answers. *Source* Lee, C., and B. Park. 2020. Post COVID-19, survey on the actual condition of Korea about work & learning balance (WLB). Paper presented in The Korean Society for Human Resource Development Annual Conference, Republic of Korea, 12 June

Remote Collaboration	Smoothness of collaboration	Collaboration with my co-worker went extremely smoothly via remote working	6.2
	Connectivity	I felt very connected with my teammates and superior	5.7
	Reliability	I felt that my superior had trust in me while conducting remote working	6.1
	Leadership	My superior showed good leadership during remote working	5.9
	Productivity	My subordinate showed higher productivity while conducting remote working	5.8
	Teamwork	My subordinate showed higher productivity while conducting remote working	5.4
	Effectiveness	In terms of collaboration, remote working is more effective than face-to-face working	4.9

Fig. 18.12 Satisfaction on collaboration using remote methods after elevation of alert level to "red" (points) (*While collaboration using remote methods was perceived as smooth, it was perceived as less effective compared to face-to-face work*). *Source* Lee, C., and B. Park. 2020. Post COVID-19, survey on the actual condition of Korea about work & learning balance (WLB). Paper presented in The Korean Society for Human Resource Development Annual Conference, Republic of Korea, 12 June

18.2.8 Human Resource Development

The survey results above indicate that the HRD environment has drastically changed after elevation to level 3 COVID-19 risk. Therefore, it is crucial to investigate the core abilities that are required while working in this new, remote working environment. An investigation was made regarding the abilities needed for oneself and one's superiors in this changed environment. Results showed that "abilities required for oneself" included digital proficiency (55.7%), flexible thinking (51.4%), and usage of

data (31.6%). Meanwhile, abilities required of a superior included flexible thinking (51.4%), leadership (41.5%), and digital proficiency (39.2%) (see Fig. 18.13).

In the same survey, 82.9% of the participants replied that they had **no** experience working from home before the level alert was raised. However, after the elevation, the number *decreased* to 39.1% as participants reported working from home for 1 day (6.6%), 2 days (9.9%), 3 days (12.3%), 4 days (4.3%), and 5 days (7.5%) of the week. Some worked from home for 1–4 days (3.3%), while others reported intermittently working for the month (17%) (see Fig. 18.14).

Before elevation to level 3, satisfaction about working from home was at 12.2%, rising to 38.7% after the elevation (see Fig. 18.15).

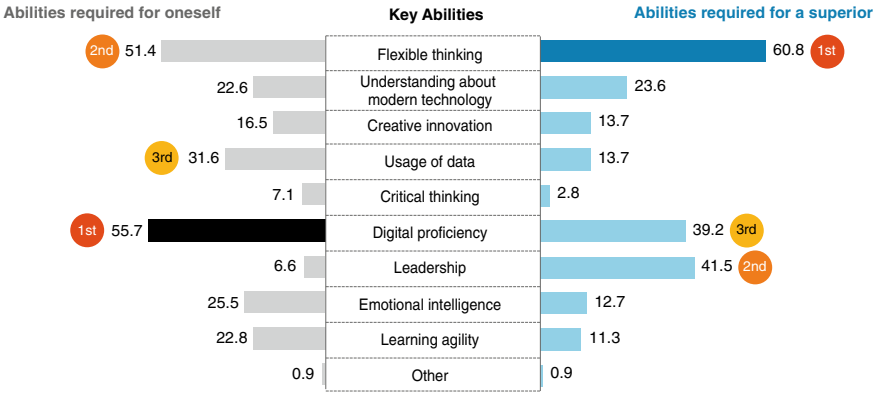


Fig. 18.13 Key abilities required for remote working after elevation of alert level to "red" (%) (*In the new, remote working environment, digital proficiency and flexible thinking rated highly as individual abilities one needs to acquire*). *Source* Lee, C., and B. Park. 2020. Post COVID-19, survey on the actual condition of Korea about work & learning balance (WLB). Paper presented in The Korean Society for Human Resource Development Annual Conference, Republic of Korea, 12 June

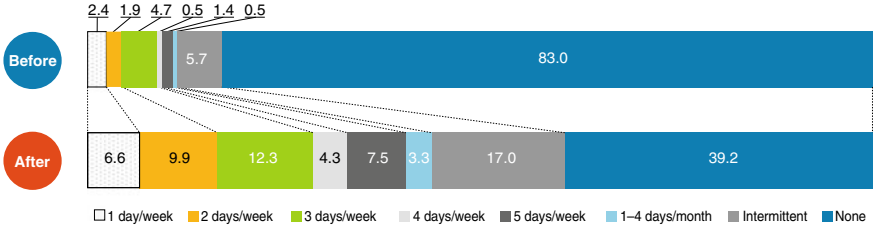


Fig. 18.14 Average number of days working from home per week before and after elevation of alert level to "red" (%) (*Before the level alert was raised, around 8 out of 10 had no experience working from home. After the elevation, most of the respondents reported working from home for 3 days*). *Source* Lee, C. 2020a. Present and future of HRD. Paper presented in the HRD Conference, Human Resources Development Service of Korea, Republic of Korea, 10 September

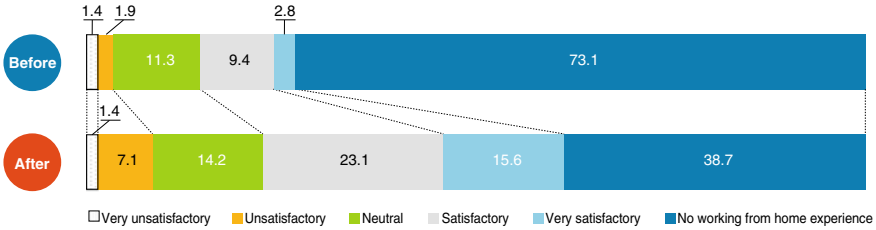


Fig. 18.15 Satisfaction on working from home before and after elevation of alert level to "red" (%) (*Satisfaction with working from home tripled after the elevation to level 3*). *Source* Lee, C. 2020a. Present and future of HRD. Paper presented in the HRD Conference, Human Resources Development Service of Korea, Republic of Korea, 10 September

18.3 Human Resource Development Trends in the Postcoronavirus Disease Era

This study on HRD trends in the Republic of Korea before and after the elevation to level 3 suggests that the COVID-19 pandemic is bringing unprecedented changes to enterprises and organizations, and the effort to "change" in the HRD department is now an essential factor of survival. Due to COVID-19, there are new HRD trends appearing that are different from any other that have been experienced before, mainly in the form of changes in the way of education and in the way of working.

18.3.1 Education

The first HRD trend that must be noted is the change in the way of education. As seen in the surveys, collective, face-to-face learning before and after COVID-19 has shown an immense decrease of 64.1% from 66.5 to 2.4%. As the traditional way of face-to-face collective learning is diminishing, it can be said that the trend in education is in a transition phase to becoming mainly online-based. Due to the ongoing developments in technology and more possible risks from the pandemic, it seems crucial to include digital literacy in the education curriculum, for which it is important to seek diversity and efficiency, as well as to maximize the learning effects of education in this online environment.

Furthermore, it is anticipated that the outbreak will change the traditional "education via professor" teaching method to focus on other methods such as blended learning and flipped learning. This moderated way of learning will essentially alter the role of schools and teachers, the teaching method, the evaluation of teaching methods, and the education environment, including facilities and equipment, demanding for innovative change. For this to happen, a proper study must happen on educational design, which has been overlooked by internal experts. The essential contents of

online education must be strengthened and exactly curated. Box 18.1 is a case that shows a preemptive response in online learning.

Box 18.1 DHL's Virtual Reality Education Program

An illustration of preemptive response to the shift to online learning is the case of the logistics company DHL with its Virtual Reality (VR) education program. The VR practice program uses digital technology as a foundation, wherein internal experts analyze the organization's core abilities, incorporating these into training contents that are both safe and efficient. DHL is currently hosting a training program called CIS (Certified International Specialist) for individuals wishing to become international specialists. In this program, trainees gain general knowledge needed to become an international specialist, and the main four values that they must be conscious of as a member of DHL: Speed, Can Do, Passion, and Right 1st time.

What is notable in DHL's VR program is the fact that it used VR to create complicated simulations in the CIS process, allowing trainees to focus on their tasks. By doing so, VR technology and systematic competency analysis create an education program that not only increases productivity and gives workers self-satisfaction, but also provides quality education for DHL employees all over the world without time and location constraints.

Source DHL. Augmented and virtual reality. https://www.dhl.com/global-en/home/insights-and-innovation/thought-leadership/trend-reports/augmented-reality.html.

18.3.2 Ways of Working

Another new trend brought about by COVID-19 is the way people work. After the outbreak, the traditional commuting system put to place after industrialization changed to a new normal—the work-from-home—wherein existing working hours and commuting paradigms are changing. Initially practiced in information technology enterprises before the pandemic, other enterprises soon promoted work-from-home to stop the spread of COVID-19, an innovation to the old "working together face-to-face" culture in the office. In a survey conducted by the investigative agency Gartner among 317 American chief financial officers, 84% responded "yes" to the question of whether they will continue to implement a work-from-home program even after the COVID-19 pandemic (Gartner 2020). Furthermore, according to the results from the Global Work-from-Home Experience Survey Report (Global Workplace Analytics 2020), 68% of participants reported that working from home was very successful.

Therefore, the future prospects in the way of working will have to develop into collaboration without spatial limitations, ultimately adjusting to a business-oriented performance management without constraints on time. Working trends changing to remote methods will allow for collaboration based on online connection without limitations on space, and working processes mainly based in the office will take place in a distributive manner. It is anticipated that working environments with no limitations to space will globally expand the scope of business. Box 18.2 depicts such a transition to work-from-home.

Box 18.2 L Group's "Smart Offices"

In the Republic of Korea, as of May 2020, the domestic enterprise L Group has initiated a "one day per week working from home" program, starting with L Holdings and L Shopping. The chairman of L Group is also participating in this work-from-home program, engaging in online meetings with overseas business establishments.

L Group has also formed several "smart-offices" in regions such as Ilsan, Incheon Terminal, Nowon, Pyeongchon, and Yeongdeungpo, allowing for a free commuting policy. For example, on Monday, one can work from home; on Tuesday and Wednesday, one can commute to the office; and on Thursday and Friday one can go to the "smart-offices".

Using a mixture of the "one day per week working from home" policy and the smart offices, L Group has established a working environment that is based on connection that goes beyond spatial limitations. Connectivity and collaboration in order to create value has been growing increasingly important with the changes in the working environment; thus, it is crucial to adapt to the rapidly changing new way of working that promotes remote management and skills in collaboration.

Source Chu, I. 2020. Shin Dong-bin's "work transformation" order…L Shopping's first base office (in Korean). JoongAng Ilbo. https://news.joins.com/article/23813604.

18.3.3 Performance Management

In a no-contact era, a change from the traditional performance evaluation to a task-oriented assessment is needed. As the concept of commuting is being increasingly reduced and a flexible working environment is on the rise, it is anticipated that the working attitude assessment concept will also decrease. Therefore to evaluate task performance it is crucial to consider other methods of evaluation such as absolute evaluation and frequent evaluation. Box 18.3 illustrates a new way of performance review.

Box 18.3: Adobe's "Absolute" Evaluation System

Adobe is known for focusing on a performance management culture that will be needed in the postcoronavirus disease (COVID-19) era. In 2012, in order to change from an assessment method based on ranking to a performance-oriented evaluation, Adobe abolished its existing "relative" personnel evaluation system to an "absolute" evaluation system. Additionally, Adobe's "check-in" system allows for a performance evaluation that is based on direct communication and feedback between the administrators and employees without a personnel audit.

Through these two systems, employees are able to continuously check up with their managers about the business goals that have been set at the beginning of the year, actively altering the goals as they go along. The human resources department acts as human resource business partners for the managers, training and helping them in effectively using "check-in."

As was the case for Adobe, a shift has to be made from performance management to performance orientation in this rapidly changing environment due to the COVID-19 pandemic. Therefore, domestic enterprises that still adhere to the "relative evaluation system" that Jack Welch introduced in General Electric need to consider establishing a new and improved performance evaluation system.

Source Jung, E. 2018. Korea Adobe Systems "check-in" increases efficiency and activity in performance management (in Korean). https://www.hrinsight.co.kr/view/view.asp?in_cate=109&gopage=1&bi_pidx=27725.

18.4 Key Abilities in the Postcoronavirus Disease Era

18.4.1 Empowering Leadership

The first key ability in the new COVID-19 era is empowering leadership, which is grounded on trust in the capacity of employees. There have been worries that remote methods of work and education may cause anxiety within the leaders of groups. The reason for this is based on the opinion that if one cannot oversee, one might feel mistrust. However, changes in the working environment due to COVID-19 will have a huge effect on leaders and the leadership of organizations as well.

Empowering leadership may be defined as the act of a leader sharing authority with employees and constantly increasing the level of internal motivation (Srivastava et al. 2006). In transitioning to work-from-home, the time and space between the leaders and employees are divided, meaning that an organic leadership must be established via empowering leadership methods. At this time, it is necessary to explore ways to transform problematic structures such as having too many decision

makers, interorganizational barriers, and boss-oriented organizational cultures into being more flexible and adaptable (agile) through empowering leadership. Among foreign companies, Amazon, Microsoft, and Netflix are pursuing to become agile organizations through frequent feedback and a smooth communication system.

18.4.2 Digital Literacy

Recently, the international community has recognized the importance of digital literacy and has been supporting national-level education and research to promote digital literacy among students (OECD 2019). First introduced by Gilster (1997), the importance of digital literacy has emerged from a type-based, read–write-oriented study to learning that includes new skills mediated by digital technology (Mills 2010). Kim (2019) defined digital literacy as an ability to understand the characteristics and messages of each media, and to discern the authenticity of information in various content usage. Therefore, such digital literacy is a very important capability in various social contexts and digital environments such as the workplace, school, and leisure.

While many opinions have referred to the fourth industrial revolution, digital transformation, etc., the importance of digital literacy for the digital transformation era has been recognized *more* during the past months of the COVID-19 pandemic than in the past few years. This is because business environments and education methods have been rapidly digitized. Futurelab in the United Kingdom saw digital literacy as a concept that synthesized technology, knowledge, and understanding that could be used critically, creatively, discerningly, and safely through the "digital literacy across the curriculum" (Futurelab 2010). The subcomponent of this consists of functional technology (information and communication technology), creativity, collaboration, communication, search for information, critical thinking, cultural and social understanding, and e-safety (being safe when being digitally active). In sum, the core of digital literacy can be seen as the ability to critically think about and utilize the opportunities and challenges offered by digital technology.

As mentioned above, digital literacy is no longer an ability required for software tasks alone, but has become the fundamental capability that all organization members should have. This is because the ability to discover and produce value using a large amount of information in a digital environment is essential (Han 2019). In addition, due to the spread of remote education, remote learning, and remote working environments, not only members of the organization but also the voices of the instructors within the company (who are essentially the digital literacy education channels), should be considered important. Likewise, recognition and compensation based on performance should be considered in terms of personnel management.

18.4.3 Learning Agility

Learning agility refers to the ability and willingness to quickly and flexibly practice and implement what one has learned based on one's own experience in an unfamiliar, challenging situation (Lombardo and Eichinger 2000). In the wake of the digital transformation era, where digital transformation is accelerating and convergence is becoming common due to COVID-19, a talent development strategy is increasingly being required to overcome the skill gap. In other words, upskilling that allows learners to have the necessary capabilities, knowledge, and skills for post-COVID-19 times is growing more important, suggesting that learning agility (where learners master necessary knowledge and capabilities quickly and apply them to the workplace) is becoming essential.

18.5 Conclusions: Directions in Human Resource Development in the Postcoronavirus Disease Era

Considering the changes in education, work, and performance management methods since COVID-19 and reviewing each core competency, HRD's direction to move forward is as follows.

(i) ***The diversification of learning channels is necessary***. In other words, as learning methods move toward utilizing online platforms, it is necessary to diversify learning content delivery methods to strengthen learners' immersion in learning. Content development should be accelerated to suit the concept. Content development and operation platforms will be needed to realize a new type of education in a timely manner.

(ii) ***Self-directed learning curation must be established***. If there was a limit to the way collective education conveys a unified curriculum to learners, the online-oriented learning system can maximize the immersion of learning through a customized education design by subdividing the learner's experience.

(iii) ***Learning based on employee experience is needed***. Existing HRD practices have segmented HR's detailed elements, such as recruitment, training, evaluation, compensation, and welfare from a supplier-oriented perspective. HRD in the new normal should change in the direction of designing and providing learning opportunities tailored to the individual experience of the employee. It is crucial to focus on the *employees* who are the consumers, and to consider the human resource elements that employees can experience from a comprehensive perspective.

(iv) ***Measurement of performance-oriented learning is called for***. While the existing learning effect measurement focuses on completion of education and satisfaction, in the post-COVID-19 era, education must be designed so that it can be directly connected to work performance through learning. Measures

should be prepared to evaluate learning *performance* rather than learning activity level.

(v) ***The balance between work and learning, or work–learning balance, should be considered***. In the current no-contact era, rather than bringing learners to a training venue or an education center, HRD should enter the actual workplace in a digitally based manner. In other words, it is important to recognize the importance of field-oriented workplace learning. Considering the balance between work and learning is a task yet to be solved from the HRD perspective.

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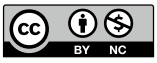
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Part VI
Technology Solutions to Build a Learning Society

Chapter 19
Reskill to Rebuild: Coursera's Global Partnership with Government to Support Workforce Recovery at Scale



Alison Lands and Chad Pasha

Abbreviations

APAC	Asia and the Pacific
COL	Commonwealth of Learning
COVID-19	coronavirus disease
E2i	Employment and Employability Initiative
ILO	International Labour Organization
MEA	Middle East and Africa
MOOC	massive open online course

19.1 Introduction

Within the context of a modern learning society, few technological disruptions embody the democratizing ethos of accessible, lifelong learning as the innovation of massive open online courses (MOOCs), which leverage technology to make academic instruction broadly available to the public. Coursera, an educational technology startup founded in 2012 by Professors Daphne Koller and Andrew Ng of Stanford University, was an early progenitor of the MOOC ecosystem, and the company

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(now with over 70 million global learners[1]) has weathered the peaks and troughs of MOOCs' popularity, emerging as an "edtech" industry leader that provides affordable access to the world's leading university and industry content, with a focus on in-demand digital skills that are forecasted to drive growth in the fourth industrial revolution.

Although industry pundits once questioned the long-term viability of MOOCs (and online instruction generally) to transform the education ecosystem, the coronavirus disease 2019 (COVID-19) pandemic, as in so many other contexts, created a "forcing" mechanism putting online learning to the test. In this virtual environment, Coursera and other MOOCs have fared well in comparison to other learning modalities. The company's response to the pandemic showcases the potential for online learning applications in postsecondary education as well as workforce reskilling. In this context, Coursera, through its mission to improve lives through learning, has been given an unprecedented opportunity to test "the art of the possible" for the future of platform technology in education and lifelong learning.

19.2 How Coursera and Platform Technologies Power the Modern Learning Society

As an enterprise, Coursera partners with top global universities (such as Yale, INSEAD, and Imperial College) and industry partners (such as Google, IBM, and the Boston Consulting Group) to source high-quality instructional content, which is hosted on Coursera's online platform. These courses are made available to corporations, academic and civic institutions, and individuals to consume on-demand (Fig. 19.1). At present, learners access over 4400 online courses and 600 guided projects spanning 11 subject matter domains with an emphasis on business, computer science, and data skills, which are in high global demand across sectors.

Coursera's content is accessible on demand, as well as via mobile app or download (for offline access). Content is presented in an asynchronous format to accommodate adult work and study schedules. Credentials are "stackable" in nature—from a short-form applied project requiring an investment of 1–2 hours, to the full postgraduate online degree, with an emphasis on professional certificates and specializations that support mastery of career-oriented skills. Learners can audit courses for free, but may elect to purchase a subscription or course credential that allows them to certify and share their achievements online. Through its open access, job-ready skills focus, flexible delivery model, and global reach for learners of all proficiency levels, Coursera models the values of a learning society to extend education beyond the classroom, supporting both lifelong learning and workforce development.

[1]Unless otherwise specified, all statistical data referencing Coursera is Coursera data as of September 2020.

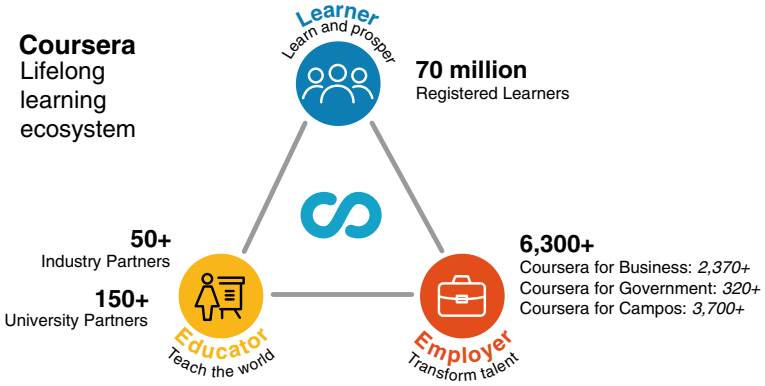


Fig. 19.1 Coursera's cross-sector ecosystem for skills transformation (*Coursera's online learning platform serves over 70 million global learners, as well as an ecosystem of institutional and industry partners*). *Source* Coursera

Coursera also serves the larger policy aspirations of a learning society by crafting a common skills nomenclature across educational, commercial, and government sectors. Coursera learners take 80+ million assessments annually in 40,000 skills; across 100+ countries; 50+ industries; and 7500 companies, and the learning patterns of this global community constitute a rich dataset to observe how the world is learning, which skills matter, and where demand for those skills is concentrated. The platform's courses and assessments feed a dynamic skills taxonomy known as the Skills Graph, which is powered by a series of machine learning models that continuously ingest search and performance data from instructors, universities, individual learners, companies, governments and open source taxonomies to add new skills and calibrate to external standards over time. By analyzing diverse sources of internal and external information, Coursera's Skills Graph is able to capture major changes in the skills landscape, providing a current view of skills demand, as well as a "common language" that universities, governments, and businesses can use to translate their respective skills needs.

Coursera's platform also provides a cohesive environment for the learner to integrate skills acquired throughout the workforce lifecycle. Students often use Coursera to supplement coursework, to access offerings otherwise unavailable to them, and to prepare for the transition from academia to employment. Adult learners primarily use Coursera on the job as part of a corporate learning and development program, in parallel to their work or job search to prevent skills erosion, and to stay relevant in the job market. Government clients use the platform both to upskill civil servants; and to deliver workforce development programs to improve the quality of the labor shed, reskill unemployed workers, and help them reattach to the labor market. Throughout a working lifetime, Coursera represents a nexus for reskilling, a home base from which to acquire the skills needed to succeed today, but also a guide to maintain skills relevancy as business models evolve and new technologies emerge.

In this way, the company and its technology form a foundational infrastructure for skills transformation as well as connective tissue to serve learners from campus, to career, and beyond.

19.3 Current State of Skills Across Asia and the Pacific

Coursera presently has over 16 million learners across Asia and the Pacific, with significant adoption in the People's Republic of China; India; Pakistan; Singapore; and Taipei,China.

In addition to a cadre of regional university partnerships, Coursera's engagement in the region also includes a diverse array of state and quasi-governmental organizations focused on reskilling both civil servants and citizens at scale, as in the following examples:

(i) Asian Development Bank, which is supporting a program to build the capacity of Kazakhstan civil servants across central ministries undergoing digital transformation;
(ii) Malaysia Digital Economy Corporation, where 12,000+ unemployed citizens are receiving training for in-demand job skills including software engineering, data science, and cloud computing;
(iii) Department of Science and Technology, Philippines, where 16,000+ citizens are focused on developing cybersecurity, communications, and marketing skills; and
(iv) Pakistan, where Coursera is working with the Higher Education Commission and the Punjab Skills Development Fund to upgrade the national education system.

Online learning is a critical component of corporate learning and development strategies to efficiently upskill employees in their roles, and to do so at a lower cost compared to traditional instructor-led training. Coursera also works with leading businesses globally to train their employees in data science, finance, technology, and leadership skills to perform competitively within their industries. In Asia and the Pacific, these corporate clients include Samsung, Tata, Temasek, Toyota, and many others. Recognizing the importance of technology and data skills, computer science currently represents the most popular subject for the Coursera learners within the region, along with a substantive mix of business and data science competencies, specifically the Python programming language, data analysis, and business analytics.

Given the company's wealth of global data, Coursera publishes an annual Global Skills Index (Coursera 2020), which benchmarks 60 nations with respect to their learners' proficiencies in the domains of business, technology, and data. In comparison to other regions, Asia and the Pacific is, in aggregate, an emerging region for skills development, with mid-level rankings in business, and lower levels of achievement in technology and data science (Fig. 19.2).

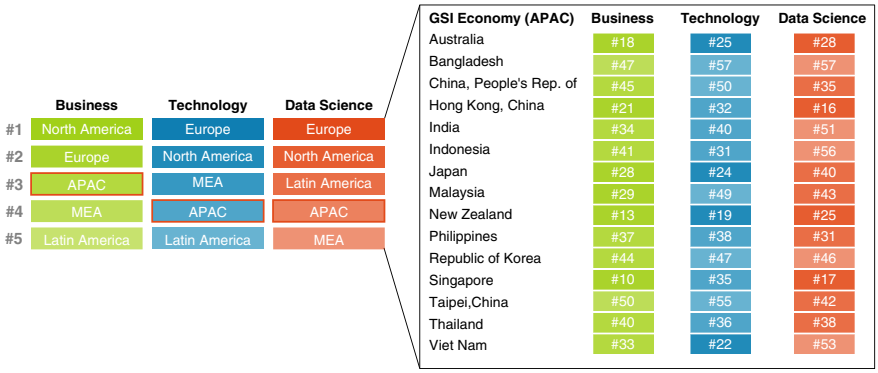


Fig. 19.2 Skills rankings from the 2020 Global Skills Index (*Coursera publishes an annual Global Skills Index, which benchmarks 60 nations with respect to their learners' proficiencies in the domains of business, technology, and data*). APAC = Asia and the Pacific, GSI = Global Skills Index, MEA = Middle East and Africa. *Source* Coursera. 2020. Global Skills Index. https://www.coursera.org/gsi

Despite the increasing focus on human capital investment by Coursera's clientele, skills development across the region remains unequal, highlighting a stark contrast between industrialized and emerging economies' skills proficiency. While Australia, New Zealand, and Singapore have more resources per capita to invest in education and upskilling, developing economies—including Bangladesh, Pakistan, and the Philippines—are among the lowest skilled of Coursera's global users. These countries spend less on education as a percentage of gross domestic product (GDP) and have higher proportions of low-skilled workers (HR in Asia 2016).

Asia and the Pacific, like most regions outside of Europe, faced a skills deficit prior to the COVID-19 pandemic, one that could only be exacerbated by skills erosion resulting from a protracted economic shutdown that has also impacted the region's education systems. Given the substantive positive correlations between skills proficiency and labor force participation, returns to capital, GDP per capita, and social equity (Coursera 2020), Asia, like much of the world, is receiving through COVID-19 an invitation and a challenge to embrace new forms of workforce development and upskilling.

19.4 The "Great Lockdown" of 2020 and Coursera's Workforce Recovery Initiative

If MOOCs were discounted as a fading technology as recently as 2017 (Warner 2017), then few proof points could more fully demonstrate the utility of online learning platforms so clearly as the "Great Lockdown" of 2020. Within weeks of the worldwide alert over COVID-19, campuses in over 188 countries across the globe suspended operations, many of them dismissing students mid-semester, and hastily

shifting to online delivery, affecting as many as 1.8 billion students, or 91% of the global student body (Strauss 2020). Of the 200 million higher education students whose studies were disrupted by COVID-19, 80% were located in countries with emerging or lagging skills. School closures disrupted higher education for millions of students in countries already in need of more accessible learning.

In parallel, hundreds of millions of workers lost their jobs as a result of full or partial lockdown measures affecting almost 2.7 billion—four in five of the world's workers, according to the International Labour Organization (ILO), with particularly sharp effects in the global manufacturing and service sectors (UN News 2020). Applications for unemployment benefits soared, in parallel with the announcement of bankruptcies across industries and firms of all sizes. Even as the economic shutdown resulted in mass worker displacement and deepening economic inequality on a global scale, the resulting lockdown of most daily activities to prevent virus transmission, and the unexpected acceleration of digital consumption of goods and services to provide workarounds to the challenges of a postpandemic world, further hastened the specter of skills erosion. With students out of school and adults out of work, an inability to maintain and improve upon digital skills could make workers vulnerable to permanent underemployment or displacement from the labor market (Lund et al. 2020).

During this same time period, Coursera experienced an unprecedented influx of user enrollments—over 15 million people in the first 4 weeks of the shutdown, for a 644% increase over the prior year. The dramatic increase in volume was mirrored across both geographies and subject domains, as displaced learners and workers used learning as a tool to cope with the uncertainty of their environment.

In response to these exigent and unprecedented circumstances, Coursera extended no-cost access to its course catalog to campuses and displaced workers. The Coursera for Campus Coronavirus Response Initiative made Coursera's platform available to help faculties virtualize instruction, as well as leverage Coursera content to extend course availability during the shutdown. Coursera also developed a machine learning algorithm to assist campuses in mapping their existing syllabi and course catalogs to Coursera's to rapidly identify areas of alignment. The availability of Coursera to campuses through this initiative resulted in over 29,000 global inquiries from faculty, who from March to September 2020 launched over 6000 virtual programs to deliver remote learning to students at scale.

In parallel, the Coursera launched a Workforce Recovery initiative to extend unlimited, no-cost licenses to displaced workers, accessible through their governments, including ministries of labor, education, and economic development; as well as to regional and local intermediaries. To reduce decision fatigue by unemployed workers, align training to areas of robust hiring demand, and streamline implementation by government agencies, the initiative was rolled out with curated collections of courses aligned to common workforce development use cases, including job readiness training, entrepreneurship, upskilling for digital career paths, and basic digital literacy aimed at a broad population.

The intent of the Workforce Recovery effort by Coursera was two-fold: to support short-term recovery, as well as provide a longer-term resource to governments around

the world to invest in online workforce development and digital upskilling at scale. During the shutdown, the initiative sought to provide online learning as a balm to comfort displaced workers and those experiencing a lockdown (Zhang et al. 2018), encouraging them to use their time productively and possibly secure a better job than the one they lost.

Beyond the pandemic, Coursera sought to apply online reskilling as a tool for large-scale economic development and workforce transformation: to serve as a partner of governments and help them deliver digital skills training for unemployed and underemployed workers; align Coursera content to industry requirements; and administer learning at scale through their regional workforce development ecosystems. All of these were to create an agile, scalable resource that supports lifelong learning—the very foundation of a learning society.

19.5 Initial Results of Coursera's Partnerships with Government and Education Institutions

As of September 2020, Coursera's impact partnerships had reached a total of 2 million students enrolled in more than 3700 campuses through the Campus Response initiative; including 1 million displaced workers in over 110 countries through the Workforce Recovery initiative. While these affected populations all battled the same global malady, the approaches taken to leverage Coursera's tools took on the unique flavor and characteristics of the local environment, and political and cultural norms.

If one feature could characterize the adoption of Coursera by participating governments in response to the economic shutdown, it would be the customized approach that agencies took in adapting the platform to their regional economies and learner populations; and personalizing the delivery model, courses offered, channels of communication, and messaging to maximize efficacy within their existing ecosystem. That said, a number of applications prevailed globally:

(i) ***Basic remedial upskilling***. Tailored for the unemployed, upskilling focused on subjects including business English and professional communication, as well as job readiness training in subjects like time management, personal accountability, critical thinking and teamwork, and computer literacy in popular office productivity applications such as spreadsheets.

(ii) ***Digital literacy at a population level***. Anchored by professional certificates and specialization programs aligned to job training for digital occupations, such as the Google IT Support Professional Certification, this application prepared nontechnical workers for an entry-level role in technology.

(iii) ***Customized career learning paths***. Learning paths were also customized for a population of learners, informed by industry and shaped around regional economic development priorities. In some cases, digital badges recognized by employers were assembled by the workforce partner for their learners to pursue.

(iv) ***Youth employment training programs***. These programs targeted both young adults who had missed opportunities to work in their community for pay, as well as out-of-school, out-of-work youth, to help them gain access to meaningful employment.

Even though this mass unemployment event was historically unique, displacing both highly skilled workers alongside those more intractably unemployed, few governments made access to Coursera licenses available to workers without some form of hands-on intervention. While it remains to be seen whether pandemic-displaced workers could efficiently self-serve in an online learning program, in most cases, the government elected to place its imprimatur on the workforce recovery program and to directly engage residents to participate.

Throughout Asia and the Pacific, some case examples highlight the diverse approaches to workforce recovery within the region (see Box 19.1).

Box 19.1 Initiatives on Workforce Recovery in Select Countries in Asia and the Pacific

- The Malaysia Digital Economy Corporation sought enrollment across the country that aligned to the nation's industrial strategy. As of October 2020, over 10,000 learners have enrolled in a program to reskill in accordance with economic development priorities.
- The Philippines' Department of Science and Technology program experienced the second-largest Coursera utilization in Asia and the Pacific, with more than 5000 enrolled learners. This partnership built on previous partnerships with the Philippine government from 2017, which trained workers in data science, artificial intelligence, cybersecurity, and robotics.
- Within India, the Odisha Skills Development Authority, Tamil Nadu Skill Development Corporation, Uttar Pradesh Skill Development Mission, and Telangana Academy for Skills and Knowledge launched statewide workforce recovery programs, building on earlier workforce development efforts with Andhra Pradesh Skills Development Corporation, where over 8000 learners were trained on a range of information technology skills.
- In Singapore, the Employment and Employability Institute equipped 4000 citizens with cutting-edge skills needed for the national economy. The Singapore Civil Service College enabled government officials to upskill in data science, leadership, and technology skills.
- In Uzbekistan, Coursera worked with multiple ministries and centers, including the Innovation Technology and Strategy Center under the Ministry of Public Education, the IT Park, and the Ministry of Higher Education, to train tens of thousands of citizens on a range of business, technology, and data skills.
- The Ministry of Labour and Human Resources in Bhutan is training hundreds of Bhutanese citizens in industry-relevant skills.

- In Sri Lanka, the government is training thousands of unemployed and youth on technical and human skills, through the National Library of Sri Lanka under the Ministry of Education.
- Bangladesh national government agencies, where Coursera is collaborating with the Commonwealth of Learning (COL), are training youth, women, and vulnerable groups on key skills needed to transform their lives.
- In addition to these state-level efforts, under the partnership with COL and regional library associations, a diverse range of learners are receiving online technical and soft skills training across Australia, Cambodia, Fiji, Guam, Indonesia, Kiribati, Maldives, Nauru, New Zealand, Papua New Guinea, Samoa, Solomon Islands, Thailand, Tonga, Tuvalu, Vanuatu, and Viet Nam.
- Coursera and COL are planning to hold a joint virtual convocation in 2021 with senior ministers from across Asia and the Pacific to showcase graduates of the Coursera Workforce Recovery program and testimonials of employers who have hired them.

Source Coursera

19.6 Lessons Learned from Coursera's Pandemic Response Efforts

As of September 2020, the Workforce Recovery and Campus Response initiatives are both ongoing; as such, the space for reflection on their impact and efficacy is limited. In a historic year of global tumult and an unprecedented response to the pandemic crisis, stakeholders across the ecosystem have gained invaluable insights on what it takes to provide reskilling at scale.

An examination of lessons learned has yielded best practices that can and should be continued. These include the following:

(i) ***Rapid intervention for affected campuses***. This finding was evidenced by 156 universities from the Southeast Asian region, which launched Coursera programs with high utilization rates. These insulated students from the negative impact of COVID-19 on their academic progress and outcomes.

(ii) ***Collective action through the work of a consortium***. Collective action, such as that demonstrated by the Commonwealth of Learning, provided connective tissue across partners, as well as technical assistance and support to the response effort.

(iii) ***Adopting an industry focus and partnering with economic development entities***. Industry alignment to inform curriculum design strengthens the virtuous circle between learning and a connection to near-term employment.

(iv) ***Maintaining a long-term perspective***. This "future focus" emphasizes digital skills and thoughtful design around an aspirational future labor market,

recognizing the significant lag time to recovery, in addition to committing to train residents beyond the immediacy of "lifeboat jobs" needed for financial survival, to those that promote long-term economic mobility.

Conversely, lessons learned that can serve to iteratively improve the experience of governments attempting to deliver workforce recovery and upskilling solutions via online remote learning in the future include the following:

(i) ***Recognize technology capabilities***. Within a country, technological abilities can be a limiting factor to service delivery and program efficacy (including population digital literacy, access to broadband and hardware).
(ii) ***Address operational concerns around privacy***. Inadequate privacy systems limit the accessibility of citizen data and records to conduct outreach and provide ongoing support.
(iii) ***Overcome local language barriers***. This finding includes limited availability of translated materials, for which machine translation may provide a future solution.
(iv) ***Identify institutional or political resistance to a perceived "risk" of failure***. In a high-stakes environment, bureaucratic processes can slow speed to action.
(v) ***Face the fundamental issue of scale***. Many local agencies are not equipped to adapt their operations to the scale of the pandemic, lacking either staffing, resources, or internal human capital to structure and deploy a program, even one that did not draw on existing budgets.

What then does it take to reskill a workforce at scale? Drawing on the interactions with Coursera's partners in workforce recovery, the following are some of the critical success factors:

(i) ***Maintain a long-term perspective***. Avoid expectations of a "quick fix" or immediate results. Cultivate a healthy cross-sector ecosystem of relationships among political leadership and those responsible for ground-level implementation of workforce development and education.
(ii) ***Maintain mutual humility***. Respect is necessary between the public sector, educators, and employers who benefit from their labor, as well as recognition that the process will be iterative. There should be a willingness for industry to inform (but not dictate) the learning program, and also a demonstrated commitment on behalf of the corporate sector to employ and continue to train the workers who will undergo a reskilling program.
(iii) ***Exercise creativity***. The most essential ingredient in addressing a "wicked problem" such as workforce development is creativity—the flexibility to explore and push the boundaries of what have existed prior; and to create a fluid system that draws on the best of educational pedagogy and tradition, while designing a method to continuously reskill workers for the jobs we may not yet be able to conceive.

19.7 Looking Ahead

A recent *New York Times* analysis (Leatherby and Gelles 2020) highlighted rapidly accelerating rates of postpandemic consumption for digital goods and services, placing the demand for digitally savvy workers on fast-forward, and expanding the landscape in which corporations search for talent to encompass the farthest reach of the internet itself. While we might have suspected most companies to be ill-equipped to pivot to a weightless economy overnight, many in fact did just that, and the resulting aftershocks that are being felt throughout the macroeconomy underscore how many global workers risk falling further behind unless longer-term interventions to close the digital divide and digital skills gap succeed across sectors.

Online learning platforms (like Coursera) are an example of responsive, agile, scalable workforce development that can adapt at the speed of business, and improve on delivery to overcome many of the previous challenges of instructor-led or classroom training for working adults and the out-of-work. As evidenced by the company's response to the COVID-19 pandemic, these learning technologies not only support operational continuity across sectors, but also help learners themselves sustain focus on their personal goals and cultivate well-being during a stressful episode. This helps them minimize lapses in momentum and stave off skills erosion, which is now becoming essential to achieve a robust economic recovery.

As of September 2020, learners enrolled in Coursera's Workforce Recovery had completed over 10 million hours of training to reskill and regain traction in the labor market. The accelerating demand for digital skills and potential for rolling future waves of economic disruption will increase the need for both remote workers and reskilling resources. Indeed, the stage is now set for a generation of students and workers to embrace self-paced, self-directed online learning as never before. Now, more than ever, it is incumbent upon governments, universities, employers, and platforms to collaborate on an unprecedented scale to encourage this adaptation to the future of work, empowering learners in all corners of the world to successfully navigate the skills landscape successfully and to stake their claim within it.

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Chapter 20
Role of the Private Sector and Technology for Future-Ready Education and Training



Sandeep Aneja and Jetu Lalvani

Abbreviations

COVID-19	coronavirus disease
UNESCO	United Nations Educational, Scientific and Cultural Organization

20.1 Education: A Historical Perspective

20.1.1 The Learning Society and Human History

G. K. Chesterton, well-known British writer, also known as the "prince of paradox", said "Education is simply the soul of a society as it passes from one generation to another" (Chesterton 1924). While this sentence is not an exemplification of his renown for paradox, Chesterton's likely next sentence in the context of our current society could well have been: "The technophilic, emotionally-disconnected, soulless pursuit of laziness and financial stability put this society in a unique position to either find a new purpose for Education or leave humanity at the precipice of an existential cliff."

Examining the role of the private sector and technology toward making our society future-ready in terms of education and training requires that we take a long-term historical perspective.

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Perhaps the initial important lessons learned by humans centered around self-preservation and strength in numbers. Societies formed when the prehistoric version of today's master of multiplanetary ambitions struggled to find safe shelter from larger predatory beings. Lessons around hunting evolved from throwing a rock to fashioning a spear. Much of learning took place in the open, with the longest lasting lessons learned during daylight when fending for oneself. Children learned by mimicking adults; copying their actions and, as a result, indulging in play-based learning. Nights were probably spent next to a fire, seeking warmth and protection. On quieter nights, perhaps, stories were grunted amidst gestures, giving rise to our earliest communication.

Traversing from our cave days to the present, the primary lessons have evolved from the two basic ones of self-preservation and strength in numbers to numerous others. Some of these lessons have been reinforced over millennia and have become part of our instincts. Underlying these lessons are core human qualities. Figure 20.1 shows the evolution of lessons humans acquire, to instincts over generations, many of which are survival instincts. These instincts present themselves as qualities that we possess either individually or as a learning society. One such quality, creativity, was one frequently sought in a leader. While creativity has continued, many new qualities have undergone the whole cycle from lesson, to instinct, to innate quality. An example of such a quality is compassion.

From "learning to survive" to "learning to thrive" to "learning to travel to Mars", our collective learning society has evolved linearly for the most part, and nonlinearly when faced with big events, many of which are documented by Shane Ross (2006) in his compilation of important events in human history. The most recent example of a big event would be the internet. The internet provides a platform for the impact of all big future events to spread pervasively and rapidly. It has created the opportunity to provide access to education to the masses, to close the knowledge gap, and to ultimately foster a dynamic learning society. The internet enables learners to benchmark their knowledge and skills; for employers to assess learners; and for the learning society to collectively accept or reject learning providers based on the quality delivered. From social unrest to pandemics, to their cures, all events are likely to spread with greater certainty and will likely shorten the cycle of "lessons to qualities".

Our qualities also play a role in how we organize learning in the first place. The absence of historical records for most our species' existence leaves much room for speculation on how learning took place in ancient times. It is perhaps intuitive, yet overly simplistic, to assume that historically, governments and semigovernment

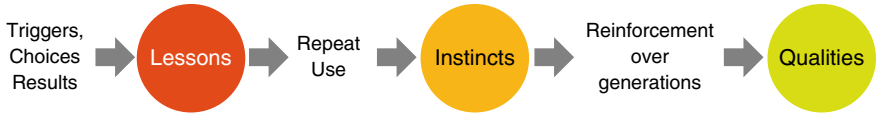


Fig. 20.1 Evolution from "Lessons" to "Qualities" (Humans acquire instincts over generations). *Source* Authors' representation

organizations actively intervened in education with the purpose of building more adept learning societies. The last three millennia of recorded history show us that "formalization" of education is a recent innovation, and more crucially, that education and learning have been in the realm of the private "sector", as shown in Fig. 20.2.

For most of human history, except for the last thousand-odd years where governments have played a role, there was no central planning or coordination of education. Individual communities approached learning in their own, time-honored, traditions. In this sense, education was a private activity. In ancient times, formal education was offered to the elite, which was followed by states using education as a tool to spread political and religious belief systems during the Middle Ages. Only around the eighteenth century did private education spread to the poor amidst increased regulation of the sector (Fig. 20.2). As political and social structures became tighter, as a sense of "collective purpose" influenced human minds, and as new technologies emerged, societies felt the need to educate more of their members in a formalized manner. The intervening period has seen an increasing role of the government in delivering education, and at the same time expansion of the private sector to the bottom of the pyramid, making learning more accessible than ever before.

Today, it is our "instinct" to consider formal education a human right. With this backdrop, the importance of the private sector in shaping the future learning society has never been as critical as it is now.

20.1.2 Looking to the Future

While our instincts around the role of education are formalized, several ongoing and upcoming disruptions in our society have made the future of learning societies both logical and difficult to predict. Logical, to the extent that we know that both society and learning will be fundamentally altered in shape and form. Difficult, because the ultimate direction our society takes will depend on how it responds to some of the vexing questions of our times, and how we organize the very process of learning in our communities.

In calling education the "soul of society", Chesterton underlines its timeless relevance. Learning will remain as intrinsic to future societies as it was to previous ones, even though the future presents a completely new set of problems that learning and education can help resolve.

The current concept of learning as the exclusive domain of schools and colleges is being challenged already. In the future, a learning society must not limit learning to just these institutions; and it is likely that the strong relationship between a learner's age and the grade they are enrolled in will become much weaker. Learning will be much more pervasive, and move into homes, workplaces, and every other part of life. It will become much more "just-in-time" and more fluid as a part of daily life activities—learning as a part of doing, and doing as a part of learning.

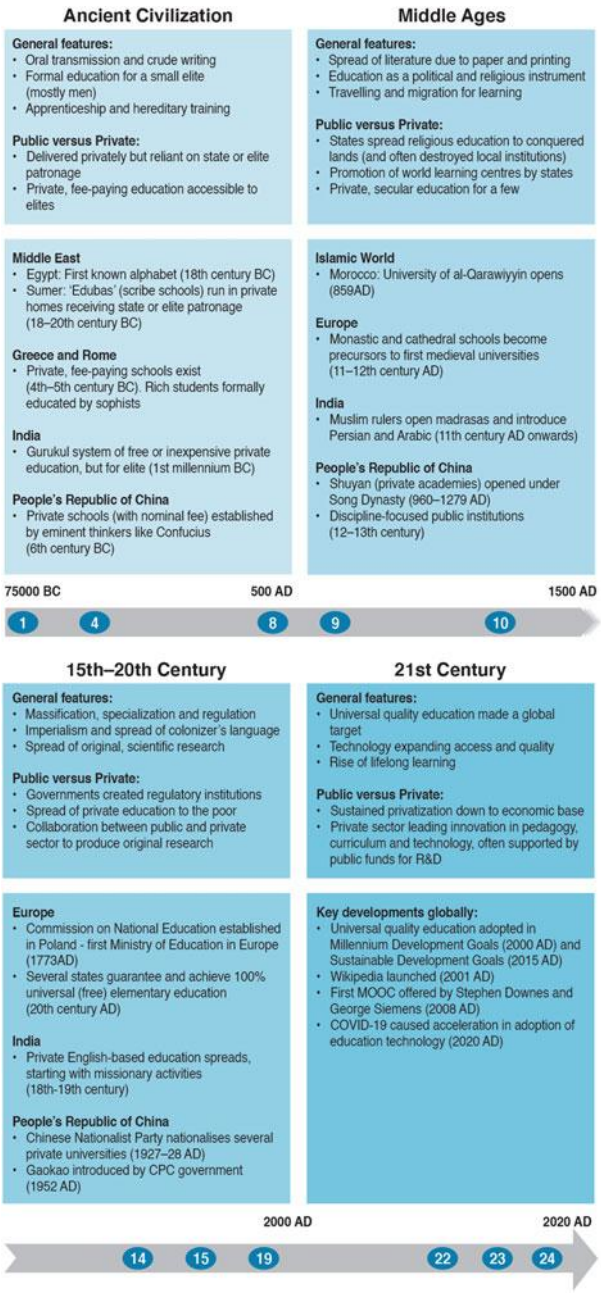


Fig. 20.2 Evolution of education systems and role of private education (*Private participation in education has been recorded as far back as ancient civilization but its role and place in society has evolved over generations*). AD = anno domini, BC = before Christ, COVID-19 = coronavirus disease, MOOC = massive open online course, R&D = research and development. *Source* Authors' representation

20.2 Education: Government Sector-Led and Private Sector-Supported

20.2.1 Education: A Public Good?

The thought of education as a public good is quite intuitive when the argument is from the point of view of the impact it creates. However, from an economist's definition, a public good must satisfy the following two conditions (Samuelson 1954):

(i) ***Nonexcludable.*** This implies that the good should be available to all citizens. This definition is not met in most developing countries, which lack the resources to ensure universal access to education. As a result, many learners remain "excluded" (Currie-Knight 2017). Finance can play a role in making education nonexcludable.

(ii) ***Nonrivalrous***. This implies that the adding a new learner in a classroom should not displace someone else. Despite significant movements toward universal education, the opportunity cost of enrolling one student often takes the form of someone else being left out (Currie-Knight 2017). Unless the classroom is virtual, the condition of "nonrivalry" is not met. Technology can play a role in making education nonrivalrous.

It is important to note that "public good" must not be equated with "government". Here, "public" refers to the desired characteristics of the good being provided, i.e., nonexcludable and nonrivalrous, and can very well be provided by private stakeholders. In the case of education, therefore, there are two factors that can *potentially* make education a true public good in developing countries: finance and technology (Fig. 20.3).

20.2.2 Can Governments Do This Alone?

Like other government-provided services, government expenditure on education in most countries is a function of tax collections. Assuming institutional quality and governance in a country are top-notch, taxes collected will be used efficiently toward "public" services such as health, water, air, education, etc. However, in countries with poor institution quality, taxes may not be effectively used due to reasons such as leakages, rent seeking, or even plain lack of motivation within the government administrative system (Arora and Chong 2018; Allingham and Sandmo 1972). Citizens may thus prefer to choose their source of service, thereby driving private participation in some sectors (Bayar 2016). Therefore, numerous social and political factors stress the ideal relationship between taxes and the split between government–private provisioning of services, as shown in Fig. 20.4.

The coronavirus disease (COVID-19) pandemic has further strengthened the case for private participation in education from a finance perspective. The pandemic is

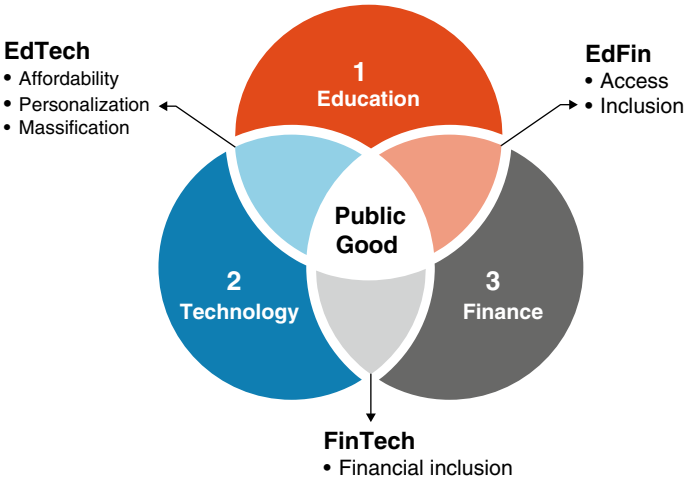


Fig. 20.3 Finance and technology can help education become a true public good (*Education, when well-funded and with the right intent behind technology-led innovation, can positively impact access to higher quality and more relevant learning*). EdFin = education finance, FinTech = financial technology. *Source* Authors' representation

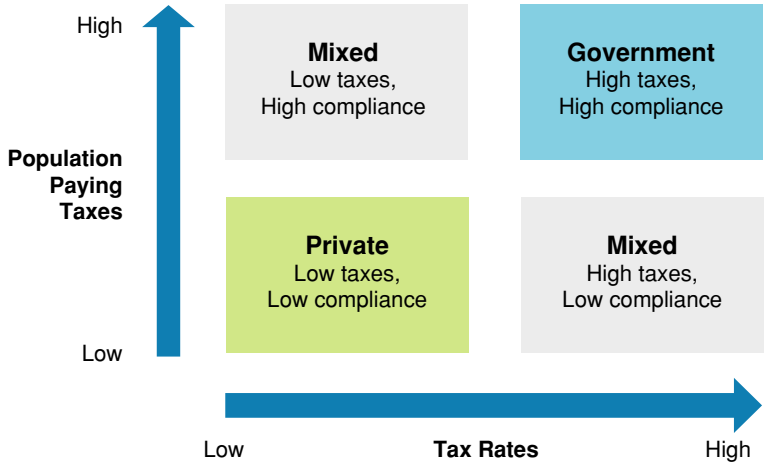


Fig. 20.4 Who should provide "public" services based on tax rates and compliance? (*Countries with higher-quality governance and wider tax collection nets are more likely to see government participation in education, while countries with narrower tax nets and lower tax rates are more likely to see private participation in education*). *Source* Authors' representation

likely to reduce government spending on education in the medium term, as many governments face unforeseen spending increases. The pandemic is also likely to have directly impacted learning levels in the immediate term, with the marginalized sections of society affected more adversely. According to the United Nations Educational, Scientific and Cultural Organization (UNESCO), the post-COVID-19 finance gap toward meeting the United Nations Sustainable Development Goal 4, of ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all, will increase to a number between $1800 and $1945 billion by 2030. This same gap stood at $1480 billion pre-COVID (UNESCO 2020). This increase has to be partially supported by the private sector. In addition, the private sector can accelerate learning loss recovery by innovating and employing technology-led solutions in education.

In the absence of enough tax revenue, the private sector has an important role in supporting innovation in education. Throughout history, technological innovations at various intervals enabled education to spread faster and wider. From the invention of writing, to the printing press, and now the internet, the breakthrough innovations in education were a consequence of our innate creativity and curiosity, and rarely a result of deliberate planning. Innovation requires not just creativity, but also risk-taking and persistence.

Given this unstructured and entrepreneurial nature of innovation, much of it has emerged out of the quest of private individuals for monetary gains. Market forces keep entrepreneurs on their toes, constantly on the lookout for newer ways to edge past the competition. Not only innovation, but the adoption of existing technologies is also faster in the private sector.

All this does not mean that the government has no role in innovation. In fact, as illustrated in Fig. 20.5, quite the opposite. The most disruptive technologies of the last century have come out of long-term, strategic research funding programs. These include the internet, which has its origins in the Cold War; and Google's search algorithm, which was funded in part by a large government grant.

By providing long-term, patient capital, the government is uniquely positioned to dictate the innovation agenda by socializing the risk and promising reward to private sector innovators. Of course, an important concern is that while the risks are socialized, the gains could be privately concentrated. To overcome this, governments need to find a way to plow back earnings from the rewards of innovation back into the research ecosystem.

20.2.3 Smart Leadership and Effective Collaboration

For a learning society to achieve its objectives and consistently innovate, it is important for the government and private sectors to enable each other to succeed. Maintaining a degree of epistemological modesty, recognizing that neither sector alone is the ultimate solution, is critical.

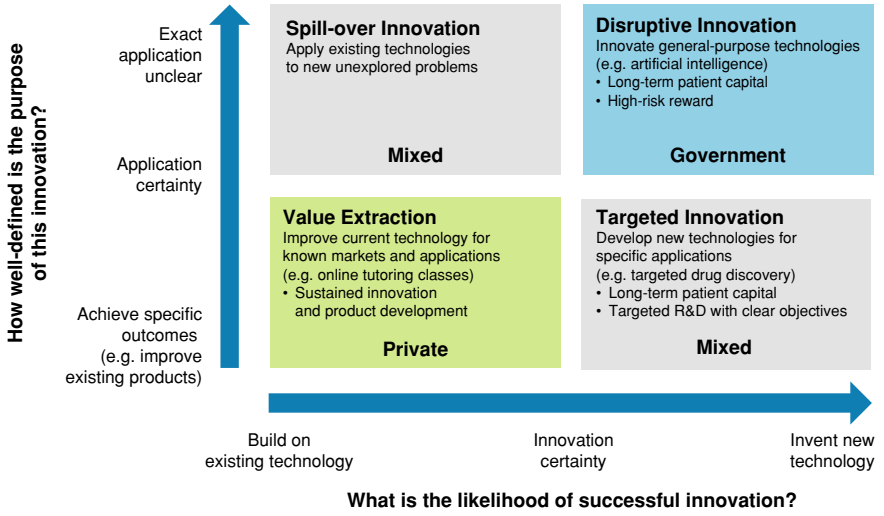


Fig. 20.5 Who should fund technological research based on degree of uncertainty? (*Governments of both low- and high-tax rate countries often fund disruptive innovation without immediately clear applications, whereas the private sector funds more targeted innovations*). R&D = research and development. *Source* Authors' representation

In modern learning societies, the government's key functions of regulating, financing, and enabling education will be reimagined to enable greater personal choice equitably. With learners becoming increasingly more discerning, governments are regulating institutions of learning based on academic, industry, or social outcomes as opposed to the size of classrooms, playing fields, teacher salaries, and other input factors.

Keeping this in mind, the government's key responsibilities include directing private activity in ways that achieve society's goals. A successful learning society also benefits from deep knowledge-sharing networks, for instance between academia and industry, government and citizens, or entrepreneurs and innovators.

Today, with more people learning over longer lifespans, the private sector is employing technology and finance creatively to expand its focus to meaningfully engage all these learners. Its innovations are consistently pushing the boundaries of knowledge, both in terms of what we learn and how we learn. These innovations then, by their very nature, invariably spill over and help the government in performing its role better.

20.3 Role of Private Finance and Technology

As stated in Sect. 20.2, the private sector has a bigger role to play in economies with lower tax collections. Therefore, the private sector must look beyond a short-term rent-seeking goal.

20.3.1 Finance

The main function of finance in education is to expand access and inclusion, thereby fulfilling the requirement of nonexcludability of a public good. Funding is required for providing physical infrastructure as well as human capital, such as teachers, administrators, and innovators. In a world where learning is no longer just centered around traditional systems like schools and universities, private capital is instrumental in expanding quality access to all parts of society (EY-Parthenon 2015). These include noncore and nontraditional learning, such as tutoring, early years education and, more broadly, lifelong learning.

Figure 20.6 illustrates a simplified version of the continuum of private finance targeting education, ranging from grants (which do not seek financial returns on investment) toward debt and equity financing (Asian Venture Philanthropy Network

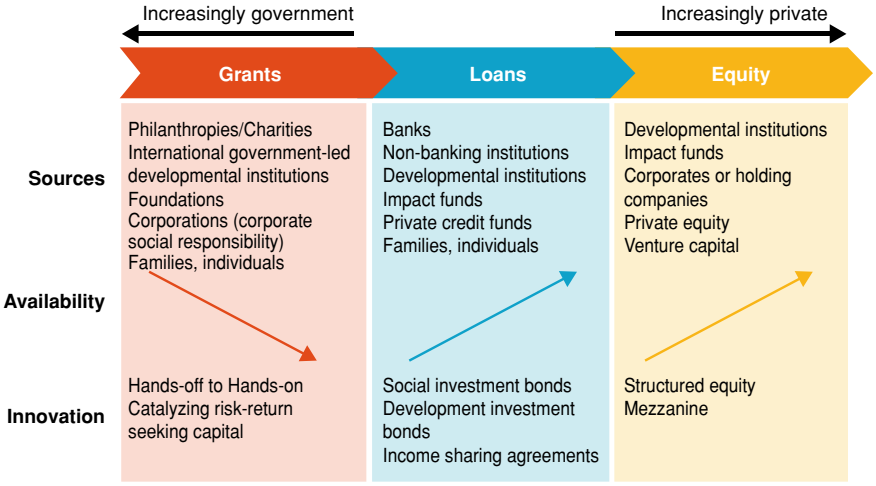


Fig. 20.6 Continuum of private finance in education (*Grant sources have been unable to keep up with the proliferating demand for funds, paving the way for return-seeking private capital to address the shortfall*). *Note* Grants are financial awards given to an organization that do not have to be paid back. Debt financing is money raised from creditors with the promise of repayment, usually of principal plus a predetermined interest rate. Equity financing is money raised by a company from sale of its shares, i.e., a part of its ownership). *Source* Authors' representation

2018). In recent years, grant sources have been unable to keep up with the proliferating demand for funds, paving the way for return-seeking private capital to address the shortfall. In doing so, grant makers have refocused efforts toward sustainability by doubling down on areas that are unable to attract private capital, while leaving it to return-seeking capital to seek areas promising measurable results (Sterling 2019).

Private finance usually targets a narrower development objective compared to government-led financing, which is usually aimed at creating new markets or saving existing ones. It seeks to match the cost of capital to the inherent risk profile of the target. Thus, private finance by its very nature is driven by a requirement for measurement and accountability, without which funders would be compelled to find new applications. Further, earmarking certain areas as being more suitable for private finance also has the effect of making government spending more target-accountable, e.g., delivering basic education or providing subsidies to marginalized learners.

Private finance is usually tightly linked to inputs such as school programs, teacher or leadership training, technology support, etc. as shown in Fig. 20.7.

With the emergence of more patient and broadly focused finance such as impact capital, including blended finance, it is possible to seek longer-term, more holistic targets including overall sustainability.

The emergence of a relatively new category of impact investors since 2000 represents such a desire to combine financial returns with measurable social outcomes (Rockefeller Foundation, ET Jackson & Associates 2012). Innovative financial products like development impact bonds or social impact bonds, introduced in the United Kingdom in 2010, are gaining traction in several developing countries in Africa, Asia, and Latin America, where they are helping increase access to the bottom of the economic pyramid (EY-Parthenon 2015). In these arrangements, a private "investor" provides up-front funding for a development project and is repaid by an "outcome funder" (usually a government or philanthropy) once certain predetermined

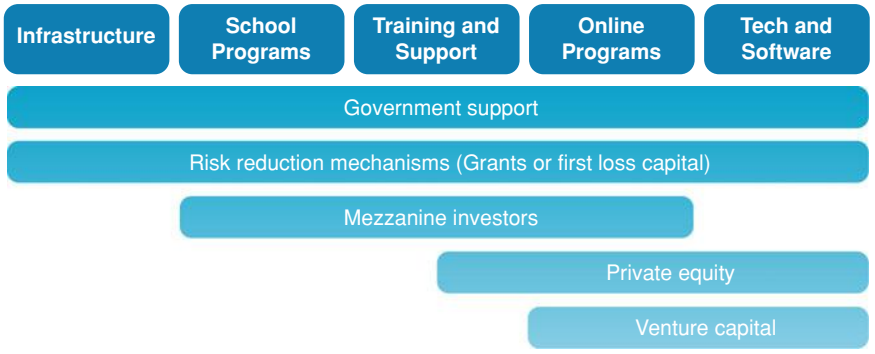


Fig. 20.7 Education funding needs and sources of funds (*Different types of education need to be funded by different types of capital as each type of capital comes with associated expectations*). *Source* Kaizenvest. 2020. Kaizenvest EduFinance white paper. https://www.kaizenvest.com/index.html. Accessed 10 October 2020

objectives are achieved (Convergence and Brookings Institution 2017). In developing countries like India, nonbanking financial corporations have facilitated expansion of affordable learning by providing cheap credit to small and medium-sized enterprises, many of which do not have collateral or credit histories (Kaizenvest 2020).

Blended finance, of which development impact bonds and social impact bonds are a type, uses private and government-led grant capital to catalyze other forms of return-seeking private capital. This enables freeing up grant capital for other more emergent uses, while driving private capital toward a segment by providing some guarantees and protections. The presence of private capital brings more targeted use and thereby takes the system closer to self-sustenance. Various forms of blended finance initiatives have grown over the last 10 years or so but only 2% of such capital has been deployed in education (Convergence 2018). There is clearly room for additional capital to come to the sector.

Private sector-led traditional investments in education and learning have also evolved from a focus on bridging purely infrastructure-led access gaps to more thoughtful measures to plug access gaps though infrastructure, technology, or both; and quality gaps through technology and services-led solutions. Learning outcomes as a measure of success is starting to show up in investor discussions as well. These trends highlight the evolution of investing in the sector over the last few decades.

20.3.2 Technology

Technology promotes equal access by making education a "nonrivalrous" good, and it does so in a nonlinear fashion. By making it possible to add new learners without displacing existing ones, it has the potential to bring "remote" learners into mainstream learning. Technological innovations also help students with special learning needs. As a supplement to traditional classrooms, digital education levels the playing field for those students who do not have access to the best teachers (see Fig. 20.8).

Our future increasingly seems to be one in which not only will student outcomes be monitored real-time, but the learning process itself will artificially learn what each individual needs. In a world that is embracing the artificial and the virtual, immersive technology will deliver experiential learning at a fraction of the cost (ABI Research 2019).

When speaking of technology, it is important to consider its varying degrees of significance for developing and developed countries, as well as the sheer range of applications of education technology. Today, several developing countries are grappling with achieving universal access to learning, even in the form of brick-and-mortar access. On the other hand, developed economies appear to have solved for physical access to, but have not completely embraced technology-led learning in a bid to boost quality. Of course, contextual differences exist within countries and there might be advanced education systems within some developing countries, in the same way that there are pockets of deprivation in developed ones.

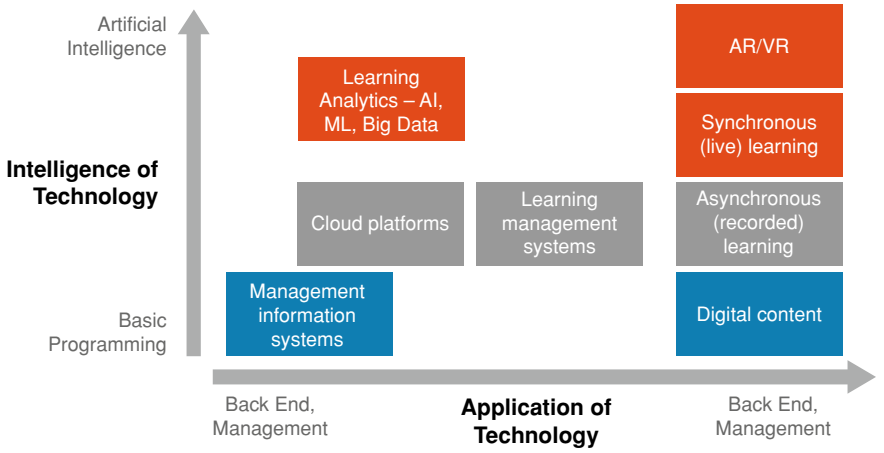


Fig. 20.8 Education funding needs and sources of funds (*Education technology tools range from the basic management systems to the advanced augmented reality or virtual reality systems that make learning more engaging*). AI = artificial intelligence, AR = augmented reality, ML = machine learning, VR = virtual reality. *Source* Authors' representation

These differences in the development stages of countries are represented through two big gaps—finance and digital—shown in a simplified rendition in Fig. 20.9. While some developing countries in Africa, Asia, and Latin America have not yet built enough physical infrastructure for citizens, reflective of the "finance gap", others with adequate hard infrastructure are aiming to bridge the "digital gap" by adopting technology. With increasing focus on digitalization in the modern learning society, most developing countries have a unique opportunity to potentially skip the entire

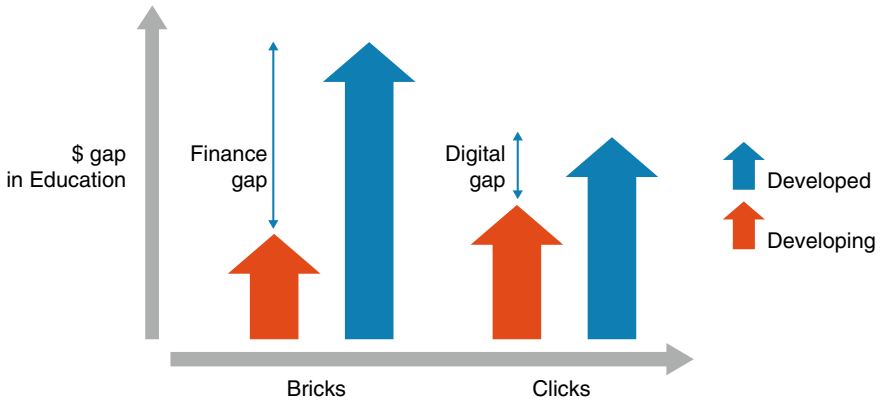


Fig. 20.9 Transitioning from a "bricks"-led to "clicks"-led learning society (*Developing economies have less of a disadvantage when it comes to learning in the emerging clicks-led learning society*). *Source* Authors' representation

"bricks"-led learning society stage and be a "clicks"-led or a hybrid learning society. While the need for physical classrooms will not go way, technology can support expansion of access to a much larger audience and much faster than a traditional brick-and-mortar system can.

The groundwork for moving from bricks to clicks needs to be laid by policy makers as the digital education revolution is already brewing in many countries, led by the private sector. As always, the devil is in the details. If technology has the potential to include people, it can also easily exclude them. To prevent technology from exacerbating inequalities, and to ensure that our learning society represents the entire range of human experience, governments must ensure its spread in a sustainable and inclusive manner. It is perhaps timely to consider a policy framework that targets the worsened digital divide due to COVID-19 to ensure equitable access to the benefits or technology in education.

20.3.3 Finance, Technology, and the Goals of Education

Broadly speaking, there are three goals of education that a learning society strives toward: access, quality, and relevance.

20.3.3.1 Access

Finance and technology drive access. As discussed in Sect. 20.2, developing countries often grapple with capital unavailability. Even when capital is available, it is predominantly used for building infrastructure. By converting the classroom to a virtual one, technology reduces the cost of infrastructure per student by enabling the addition of a new learner at the cost of additional bytes, and not bricks. It also enables access by "unbundling" education and making it modular.

Shifting to technology-led teaching requires a change in teaching philosophy, teacher preparedness, and pedagogy. When there is a system-level transition from brick-and-mortar led learning to technology-led learning, the first problem to be solved consists of access, which precedes quality in most cases. Access covers both sides of the equation: (i) reaching as many learners as possible quickly and affordably, and (ii) driving up knowledge and acceptance of technology-led learning. Leading with a high-quality product or learning solution without having first solved for access is like putting the cart before the horse.

20.3.3.2 Quality

Finance and technology make quality attainable and measurable at scale. Quality is a combination of several factors but is best captured through improvements in learning outcomes. Other symptoms of a high-quality learning system are net promoter score,

user engagement, user retention and return, learning outcomes, and qualitative user feedback.

Technology allows both assessment *of* learning and assessment *for* learning to be conducted more smartly at scale. Learning trajectories of individual learners are tracked, which allows algorithms to drive better personalization. Insights from learners can enable experiential learning, which draws its success from human psychology and its response to various stimuli. Meanwhile finance, apart from funding technology adoption, incentivizes quality in two distinct ways. Firstly, it facilitates greater choice for learners by making more options available to them, either by creating new supply or empowering them to access existing supply, such as through school-choice vouchers. Secondly, as discussed earlier, private finance by its nature is targeted and seeks measurable outcomes. Financial innovations such as income-sharing agreements for student financing are a good example of how funders and educators can be incentivized to invest in learners' success.

20.3.3.3 Relevance

Access and quality together bring a higher degree of relevance to the modern learning society. Realizing the value that learning brings to oneself and to the larger society makes it possible to focus on self-development as well as sustainable development of the society. Citizens of a modern learning society have a sense of collective responsibility and purpose beyond just achieving individual growth. By delivering access and quality, finance and technology make "relevant" learning a possibility.

Figure 20.10a presents these goals and shows the measurable outcomes within each. Figure 20.10b shows how these goals are related to the different stages of individual, social, and planet well-being, and consequently to the various Sustainable Development Goals. Education, when well-funded and with the right intent behind technology-led innovation (as shown in Fig. 20.3), can positively impact access to higher quality and more relevant learning.

Together, finance and technology reinforce each other's gains. Finance keeps the innovation agenda aligned to the overall needs of society by directing funds to emergent areas of research, such as sustainability and biotechnology. It unleashes the creative entrepreneurial forces that are important for society's organic evolution. On the other hand, technology has the potential to increase the efficiency and accountability of deployed capital. By enabling better learning outcomes, technology paves the way for more productive, secure, and knowledgeable individuals who can then seek wider social gains, including financial ones. Finance and technology, thus, create a virtuous cycle of innovation and evolution in a learning society.

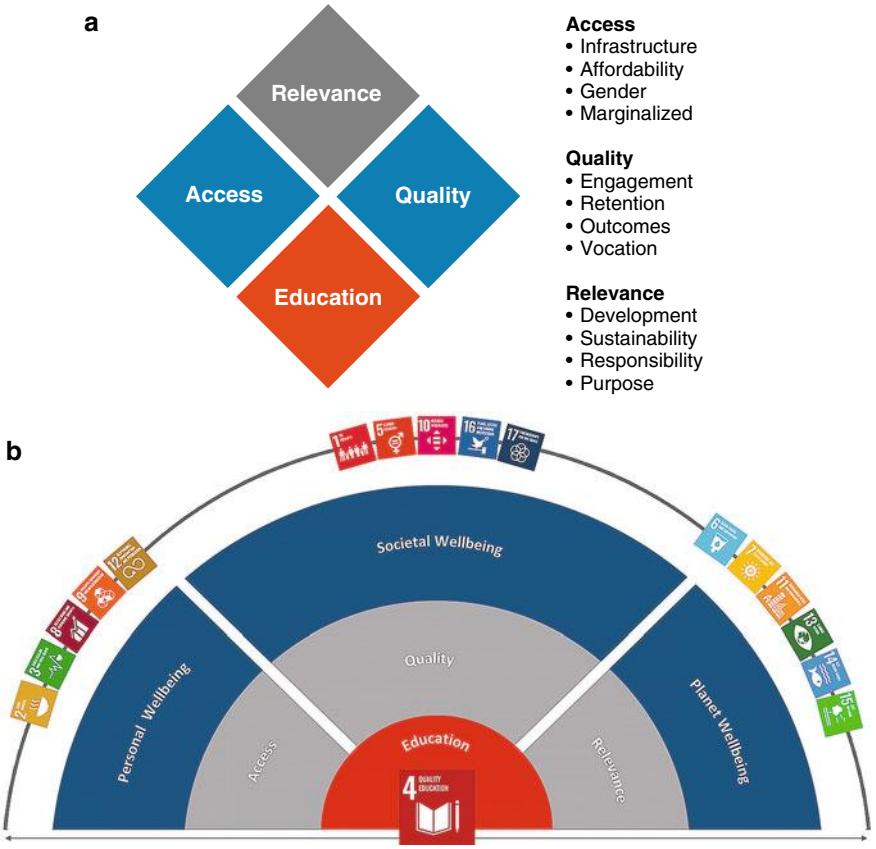


Fig. 20.10 Panel **a** is a Kaizenvest education diamond (*Access, quality, and relevance are the three key dimensions of education impact*). Panel **b** is the Kaizenvest education stage (*Better access to and quality of learning has a direct impact on personal, societal, and global well-being*). *Source* Kaizenvest

20.4 Conclusions and the Way Forward

There is no magic bullet that can define the precise role that the private sector and technology can play in defining a modern learning society. The private sector has been at it for thousands of years and will likely continue to do so. The interaction between the economic realities on the ground, technological developments, financial innovations, the intent of the private sector participants, and the regulatory environment will continue to shape how our future learning society will evolve. What is certain is that technology has the power to bring learning to one's doorstep, and the choice of what one wants to learn can be made irrespective of the driving distance, for example.

The future world of talent will likely not be as concentrated as today. For example, Silicon Valley as the best place to learn and deploy the latest in technology will likely change. While this change will be slow, the modern learning society may well value real skills over framed degrees on the wall as a representation of skills. As these potential changes occur, it is imperative that the public sector and the private sector work closely together to determine and roll out an accountability-led policy framework that empowers individual choice while regulating for quality and outcomes.

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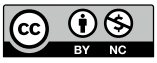
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Chapter 21
How Data and Digital Technologies Can Transform Education Systems



Elizabeth Stuart, Toby Phillips, and Raluca David

Abbreviations

app	application program for computers or mobile phones
COVID-19	coronavirus disease
edtech	education technology
LAYS	learning-adjusted years of schooling
OLPC	One Laptop Per Child
UNESCO	United Nations Educational, Scientific and Cultural Organization

21.1 Introduction

School closures as a result of the coronavirus disease (COVID-19) pandemic have caused unprecedented education disruption for 1.6 billion children (or 91.3% of enrolled learners worldwide, according to the United Nations Educational, Scientific and Cultural Organization (UNESCO 2020a). Lessons from the Ebola crisis show that impacts on education from school closures have the potential to be far-reaching and long-lasting, including loss of learning gains and an increase in school drop-outs, particularly for girls. But COVID-19 comes on top of a preexisting crisis: before the

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pandemic, there were already 258 million children and adolescents around the world out of school (UNESCO 2019). In other words, we currently have the very opposite of a learning society in this current age of disruption.

Technology has been heralded as a powerful complement to education systems, seen as one of the most viable means of quickly reaching out-of-school children. There are already good examples of this happening. In India, a study of a free, after-school program that introduced Mindspark, a digital personalized learning software, showed improvements in mathematics assessment scores of up to 38% in less than 5 months, thereby dramatically reducing students' learning gaps (Muralidharan et al. 2019).

However, the history of education technology or edtech is also littered with failures. This chapter will argue that technology will *only* deliver enhanced learning outcomes—including for marginalized children—if there are effective data and content systems in place. Actionable data in the hands of the right people in the system (teachers and education ministries) can make for vastly improved decision making and accountability. Careful and deliberate low-cost data collection will make it possible to continuously monitor and improve at every level. Good data can also allow personalized lessons and content. These are the kinds of positive disruptions that governments want if they are looking to transform their education outcomes.

Currently however, the opposite is more likely to be the case: many countries are working from a low baseline in effectively capturing and using data. Decision makers rarely have useful data on whether learning outcomes are improving. Even if data is collected, it is rarely acted upon. For example, Edo State in Nigeria has conducted annual teacher performance evaluations, but these evaluations did not affect decisions about workforce management and improvement (Reboot 2013).

Unleashing the full potential of data, in turn, will also require a focus on creating the right enabling digital foundations, including data governance and privacy rules. These data frameworks will enable system managers to learn from experience, compare interventions, and set standardized criteria for success, boosting their ability to understand their system and implement solutions at scale.

21.2 Managing Education Systems

"Technology for education" has traditionally materialized in large-scale investments in infrastructure. A well-known example is the "One Laptop Per Child" (OLPC) program that saw 2 million children and teachers in 42 countries equipped with laptops (OLPC 2020). Although this program has now closed, countries are still heavily investing in hardware (for instance, Japan in 2019; see *Japan News* 2019).

21.3 The Problem of Focusing Investment on Digital Hardware

If anything, the focus on digital hardware has increased during the COVID-19 school closures, and for good reason: when education moves online, students need a computer and internet access. Nearly all (87%) of educational systems surveyed by UNESCO during school closures (UNESCO 2020b) reported that unequal access to digital infrastructure at home was the main barrier toward continued learning. At that time, many countries were investing in a rapid response to boost digital infrastructure, focusing on connectivity rather than hardware: Sri Lanka provided free internet access to the Ministry of Education website, and Maldives provided mobile data to parents.

In the past, large-scale investments in digital infrastructure have tended to fail to improve learning, unveiling a key lesson for policy making, which is that systems are complex. Programs such as OLPC have had little effects on test scores in math or reading, as an evaluation in Peru revealed (Cristia et al. 2017). These programs failed for a diverse range of reasons, from lack of electricity to lack of skills, or disinterest among the teachers. In effect, the real lesson is one step further: that learning is the product of an educational system, in all its complexities, and not of a textbook or a computer alone (Pritchett 2015).

21.3.1 Systems Approach to Investing in Education

Academic research and policy research in education is increasingly taking a "systems approach" (Mansoor and Williams 2018), but this sort of thinking is only just beginning to permeate actual policymaking (Pathways for Prosperity Commission 2019). Two key lessons emerge from the literature on systems: one, that any singular intervention will only produce results if it directly responds to a *specific binding constraint* within the system (e.g., Mansoor and Williams 2018; Pritchett 2015); and two, that as a principle, improving isolated components will be insufficient without concerted changes across the system.

One potential starting point for policy makers is to identify key binding constraints within their educational systems, and analyze how these may be addressed with technology. In developing countries, common binding constraints include low motivation or skills of teachers or poor involvement from students. Digital technologies can help address some of these gaps more efficiently than other policies, but only when well-integrated within the system. For instance, if attendance is a binding constraint, digital systems can monitor and report on teacher and student attendance levels to help principals and other decision makers manage their schools better (Muralihdaran et al. 2019; Duflo et al. 2012; Kisakye et al. 2016; Centre for Education Innovation 2018). However, such interventions should not just be about creating digital attendance police: they work better if complemented with other

interventions, such as personal feedback to teachers (World Bank 2016; Pathways for Prosperity Commission 2019).

In order to manage complex educational systems, data is essential. Without data, it is difficult to even begin identifying binding constraints. In the aftermath of a rapidly evolving situation such as pandemic school closures, data becomes indispensable for answering the most pressing questions (David et al. 2020), including which children have fallen behind, whether they are catching up, or whether the divides are deepening. Good data systems can uncover patterns; for instance, a school that started off poorly on teacher preparedness during COVID-19 might consequently be less able to produce the necessary materials, and eventually fall behind on multiple aspects of learning in the aftermath. The only way to capture this complexity and use it to inform system management is through data.

21.3.2 Using Data to Manage Public Systems

21.3.2.1 Identifying Potential Data Sources

As described earlier, one of the biggest opportunities to improve education systems lies in better systems management and decision making. This is not just true for education, but really for all national-scale public systems—from health to social services. Better data and information can power better decision making, and sometimes even automate it. Policy makers often approach data as a new entity: something around which grand systems of collection and specification need to be built. But it can be more productive to start by looking at what data already exists, or could easily be recorded, within existing systems. Only with strong foundations of basic data can countries work on more powerful analytical tools. In an education system, "basic data" might be simple objective truths: a register of schools and students, records of attendance, and exams taken.

In many systems (including education) there are a variety of different actors who might have useful data already. In addition to government service providers (such as schools), there are also private providers (e.g., private tutors); third-party digital tools (e.g., edtech apps); and completely separate sources of data that could be relevant (e.g., information about childhood nutrition). Many of these actors will already collect data—such as a staff management system for an NGO, or student progress database for an edtech app. The challenge is to put this data to use. For governments, this means focusing on standardization and aggregation.

21.3.2.2 Standardizing Data

The first thing this requires is simple data standards and registries. Without standardized data, much of the information generated by different actors in a system would be completely incompatible (Fry 2018; Cvitkovic 2019). Imagine a health

system: if every NGO has a unique way of recording hospital districts, then their pooled data will not be able to generate useful data about each district. At its most basic, governments can build standard registries (for example, of students, or schools, or curriculum modules) that can be used by others. The second component would be to promulgate basic specifications for how data should be formatted and transmitted for aggregation. If the data from each school, or each community health worker, had the same structure and meaning, it would enable powerful analytical tools. But no one in the system wants to spend hours submitting government reporting forms. Data standards allow each exam board, hospital administrator, edtech app, or social services district office to structure their digital systems however they like, according to their own needs, provided they are able to transmit data that fits the standard specifications.

21.3.2.3 Data Protection and Governance

Finally, such a system needs appropriate governance and safeguards. Citizens need to be assured that their personal and sensitive data is safe from an impulsive bureaucrat who wants to snoop. Simple anonymization such as encrypting identifying information may not be enough. Policy makers will need to build robust legal and technical safeguards to ensure that data is only accessed to certain users in certain ways. For instance, perhaps only a student and their teacher should be able to see the student's individual scores, whereas the district administrators are only ever presented with aggregate data. These protections need to be in place early, as in India, which had to change significant parts of their digital identification system, at huge cost, when the courts ruled that their initial system did not have satisfactory protections (Privacy International 2018).

21.3.3 Data in Education Systems

21.3.3.1 Aggregate Data and Metrics

Managing and improving educational systems with the use of data starts at the level of deciding what to track; and individual student progress is one of the most important missing data points. As policy makers start to set up their systems to tap into the power of data, this should be a priority.

Educational progress is mostly tracked at a nationally aggregate level. Recent innovations such as the metric learning-adjusted years of schooling (LAYS) have helped improve our ability to compare across countries, by seeing how much students are learning, on average, compared to how much they were expected to learn given their years of schooling (Filmer et al. 2020; Angrist et al. 2019). This sort of data can highlight the global learning crisis and mobilize resources. (Pritchett 2015); however, it is not enough. As highlighted by the Pathways for Prosperity Commission (2019),

there is one more fundamental problem: that measuring learning only at a nationally aggregate level is only reflective of *outcomes*, and does not give any insight into the individual *causes* of the learning crisis. Rather, to be informative for decision making, data needs to be collected at the individual student level, where the correlates of poor performance can shed light on what needs to be improved.

21.3.3.2 Tracking Individual Student Progress

Collecting data on individual students' learning, and combining this with insights into systemic feedback loops can help improve learning. The literature on evaluation of digital educational technologies is sparse, although some though digital platforms used in resource-constrained contexts are already helping to bridge the gap between expected years of schooling and LAYS, as Tusome did in Kenya. Tusome involves multiple components: tracking of individual student progress; serving as a repository of digital content and materials; training of teachers to use it; and maintaining a centralized data management system that monitors schools and counties' improvements in student literacy. Early analysis suggests Tusome has been a success, helping 7 million Kenyan children (Piper et al. 2018).

Tools such as Mindspark (mentioned in the introduction) have similarly used their data to track and respond to individual student progress; while VISHWAS, a data collection system in India, uses devices with global positioning system or GPS capability to collect data and improve the performance of not just teachers but also district-level administrators (Centre for Education Innovations 2018). To make such promising outcomes possible, these programs often address multiple components of a system concomitantly, focusing on the *information* and the specific *use case*, for a machine, rather than investing in hardware for hardware's sake. Moreover, they enable feedback loops, not just collect data; and provide this back to users in accessible ways (tailored lesson plans for students, specific feedback for teachers, and statistical dashboards for administrators).

21.3.3.3 Making Connections and Putting Information to Use

A first step toward a data-driven educational system management requires effective "digital plumbing" with teachers at the heart of it. The COVID-19 pandemic has unveiled two key facts about educational systems and technology: (i) educational systems worldwide lacked the foundations to become digital—skills, infrastructure, and procedures; and (ii) the success of any transition to digital education is entirely at the hands of teachers (World Bank 2020). There was also another insight: that some "champion" teachers emerge, and if their know-how can be used to support the teaching community, a whole system may benefit.

There are examples of digital programs put in place with teachers at their center, enabled by the right "digital plumbing". One such example is Sunbird, a platform developed in India to bring information to teachers, pulling together courses,

lesson plans, assessment materials, teacher training, and dashboards for progress (Sunbird 2020). The platform's most important feature is interoperability, allowing the integration of digital infrastructure across the educational system and embedding data collection all throughout. The good news is that, with such a platform, if one digital product works well, or if a "champion teacher's" performance is outstanding, lessons can be learned rapidly, and benefits can be transferred throughout the system.

21.3.4 Disrupting Education

21.3.4.1 Data Can Power a Future Learning Society

When done right, technology does have the potential to positively disrupt education and lead to the learning societies of the future. There are several key visions for how digital technologies can revolutionize the provision of educational services (Pathways for Prosperity Commission 2019).

First and foremost is by enabling *proactive systems.* Fueled by real-time data and feedback loops from teachers all the way to policy makers—and everyone in between—a system is able to adapt in real time to the needs of the students. Equipped with data insights, teachers and school managers can actively identify at-risk students in order to ensure their inclusion.

Second, *virtual systems* will become ever more important to reach all children. Indeed, because of the COVID-19 pandemic, almost every child in the world has had their learning disrupted. Virtual delivery, if done well, can ensure a more equal quality of service delivery throughout a country, for instance through videoconference-based lessons with the best teachers.

Third, adaptive software or apps based on machine learning algorithms are already revealing the vision of *personalized systems*, where lessons are tailored for each individual student's needs, helping to fill their particular learning gaps and build on their individual strengths.

21.3.4.2 Make Sure Learning Societies are Inclusive

Educational systems were set in place to serve all children, and with current digital technologies, inclusive systems may finally become a reality. Inequalities are inherent to educational systems: not all schools are equally resourced, not all teachers are equally prepared, not all students have the same enabling environment at home. The use of data, however, can identify these gaps in real time, enabling policy makers to proactively target resource allocation.

Data can help identify not only which schools or students lag behind, but also precisely on which subjects (e.g., math more than reading) and which specific topics (e.g., multiplication). Such software exists already in pockets. These apps assess a students' current level on a range of topics and give targeted lessons and

practice exercises, and the teacher can access each students' data to guide them. For a traditional educational system, such a precise level of personalized care would have been an impossible task. Technology may be the only conceivable pathway to inclusive education, and it may also become an increasingly realistic pathway: research currently shows that once scaled up, personalized software can become relatively inexpensive.

Last but not least, educational technologies hold a new promise for closing gender gaps in learning. Worldwide, one of the widest gender gaps in employment is in science, technology, engineering, and mathematics (STEM) careers. For instance, in Malaysia, in 2015, only 10% of engineers were female, and in 2020 only around 20% of STEM researchers across Asia were female (UNESCO 2015; Ugwuegbula 2020). The gender gap in math is notoriously difficult to bridge. However, very recently, the personalized learning software "onebillion" prevented the gap from surfacing among first-graders in Malawi, compared to traditional classroom teaching where the gap did emerge (Pitchford et al. 2019).

21.4 Conclusions

This chapter has explored the implications of rapidly increasing the use of data in education systems to enable the promise of edtech to be realized. When solutions are built around meaningful systems and information, then data can power transformational applications, from personalized content for students to advanced analytics and insights for decision makers. This is more than simply investing in hardware and scattering computers across schools. Building a learning society requires deliberate and thoughtful investment in systems.

21.4.1 Focus on Data and "Digital Plumbing"

There are a clear set of policy reforms and initiatives that education leaders can pursue. They need to identify sources of data, invest in "digital plumbing", standardize the information, and make it available for decision makers and teachers. This may sound trivial, but it can enable better teaching, better resource allocation between schools, and better systems management by government officials. It also builds the digital foundations for a learning society of the future.

21.4.2 Ensure Inclusiveness

However, there will need to be a specific effort made to reach those marginalized groups. Edtech will not automatically get children into learning, and indeed may

increase educational (and other) inequalities rather than close them. If the same social norms that prohibit girls from walking longer distances to attend secondary school also limit their access to mobile technology, inequalities will not merely remain but may even be exacerbated. Instead, to maximize benefits from digital transformation, governments will need to make explicit efforts to engage with and build solutions for people who are typically left behind. When conducting pilots, a focus on easy-to-reach groups (such as the urban or middle class population) could at times be defended, for example, to offer a proof of concept or collect evidence on possible impact. New technological solutions will need to be designed to scale to reach all citizens, not just those with higher incomes who enjoy a personal computer, English literacy, and high-speed internet access.

Indeed, if delivered well, the disruptive use of data in education systems can power learning societies and bring hope for inclusion.

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