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Reimagining Digital Learning for Sustainable Development sets out to be a comprehensive book for both practitioners and other stakeholders by providing a valuable resource that will enable them to explore and reflect about the most current issues around digital learning in an ever changing society where the only constant is uncertainty about what the future will look like. For this reason, both the editor and the different chapter authors provide insights into how to address this uncertainty to prepare workers for a future job market that we are not sure how it will develop. They propose strategies that can work not only in the developed world but most especially in developing countries where the conditions might not be up to par and where both educators and policymakers need to be creative to enable to promotion and development of skills that will allow students to become citizens with the necessary skills to face the uncertain future in light of the UN's ambitious 2030 Sustainable Development Goals (SDGs). They set out the ambitious goal of facilitating mindset changes that will enable emergent countries to join the global digital transformation.

The book is organized into eight themes, the first of which is titled *Learning in the 21st Century*. In the first chapter, Sheila Jagannathan presents an introduction to the whole volume in which she discusses the scale of today's problems regarding education and learning, the needs for reskilling and upskilling and the crucial role of capacity development in light of the fourth industrial revolution and the 2030 agenda for sustainable development. Her main goals are to raise awareness and our collective optimism about education for the future. She discusses some of the proposals and solutions presented by the authors in the volume to close the skills gap through an agile technology-based approach. She continues in chapter two by discussing the opportunities granted by digital learning given that more changes happened in learning in the last decade than in the past millennium. She presents five key shifts reshaping the future of education and skills development as well as five EdTech enablers as catalysts for quality learning, five 21st century digital learning approaches and five sets of actions that highlight how digital blended learning can become an opportunity to address the "new normal" and close the skills gap. In chapter three, Dade and McGivney discuss lifelong learning as a necessary concept in a society where careers are changing so fast that we cannot predict what new occupations will look like in two or three decades. They emphasize the notion that "society must prepare today's young people for six decades of career growth" as the model in which one received education and established into a career in the first three decades of life is obsolete, proposing transformation and unlearning as central principles for change. Ryan Watkings presents a model of decision pathways for successful digital transformation in chapter four, the last one in the first theme of the book. He argues that the path to modernizing learning and development is unique to each institution and outlines the key decisions to be made to accomplish strategic results. His proposed "path to success" includes four phases including assessing and analyzing, designing and developing, implementing and improving, as well as

managing and supporting. He emphasizes the importance of being aware of the choices being made which require ongoing care and changing mindsets considering the complexities of today's learning systems.

Theme two is titled *Innovative Pedagogies to Advance Reach, Relevance and Quality Learning Outcomes* and begins with Jagannathan presenting an interview with Tony Bates in which they discuss the importance of reimagining pedagogy for a digital age considering that "good teaching may overcome a poor choice of technology, but technology will never save bad teaching." The main argument is that educators should focus on "merging the best of face-to-face and online learning rather than trying to replace one with the other," as Dr. Bates predicts the continued growth of blended learning noting the importance of the human element. Following, Naidu and Narayan discuss the need for a wide range of pedagogical skills for practitioners to be able to be effective in the rapidly changing fourth industrial revolution in chapter six. They discuss the skills development needs in the South Pacific and how recalibrating pedagogical choreographies through non-traditional approaches could help address these needs through reorientation and redesign considering the affordances of technology and following a set of guiding principles and conditions for learning to ensure transformative change and lasting impact on skills development of current and future generations. In chapter seven, Ehlers discusses the challenges of focusing on quality to create new digital learning cultures by discussing the case of Open ECBCheck and proposing self-evaluation, quality assessment with e-portfolios, social recommendation and community participation to create a culture of quality and ensure excellence in learning and institutions. He warns, however, that "every quality management approach is subject to economic conditions and limitations." Finally, in the last chapter of theme two, Evans presents a "manifesto for teaching online" and discusses the ways in which the ideas presented can address the complexities of digital education. He considers the generative potential of digital education for capacity building, massiveness and open digital environments, digital equities, design and digital capacity building, digital credentialing, artificial intelligence for capacity building and argues that achieving the SDGs requires development of digital skills and literacies and digital learning application should promote the transparency and transferability of qualifications and credentials strengthen regional systems and to free up human capital through automation.

Theme three is titled *New Models for Deeper Learning,* and in its first chapter Rubenstein presents a vision on how MOOCS are changing the world and what lies ahead. This author presents the foundational principles for the edX platform and open learning, how it has become the largest online learning platform in the world and how new solutions allow institutions to integrate its catalog into their curricula. He present the case of the Burkina Institute of Technology and how the MOOC movement provides a deployable and highly credible solution for new and alternative credentialing arguing that "MOOC course certificates serve as the great equalizer, where candidates can all earn the same credential from top universities… [and] the employer gains a signaling device that enables the opportunity to evaluate candidates from a skills and competency standpoint." In chapter ten, Traxler discusses game mechanics for digital learning as a way in which communities of learners can be created and be allowed to evaluate resources to develop their own judgments. For this to happen, the author argues that it is essential to have mechanisms by which learners can critically evaluate resources created by others as well as the reviews provided by the community through the renewed use of game mechanics and functionalities. Next, in chapter eleven Groested discusses how games, simulations and virtual reality make the future of learning an immersive experience. He argues that "the time has come to transform the power of video games as a force for good, especially as it has proven to boost learner engagement and overall learning outcome," and provides examples on how we could use game environments, virtual and augmented reality as well as artificial intelligence to make learning more experiential which according to the

author can have significant implications for developing countries in their efforts to build capacity for achieving the SDGs.

Theme four, titled *Digital and Blended Learning in Action. Good Practices and Cases*, starts with chapter twelve's exposition by Ruiz Pérez on how Tec de Monterrey is linking learning to jobs and service delivery in the public sector. She uses this institution's case to showcase how through its evolution it has become an EdTech center of excellence focusing on comprehensive, flexible education solutions for diverse audiences and pointing out that achieving SDGs involves engaging with agents of change, an integrated approach, fostering peer-to-peer learning to develop lifelong learning in an effective manner. In the next chapter, Ahmed presents the lessons learned from Malaysian experience on transforming higher education institutions through the adoption of e-learning. It discusses the national economic model's three pillars -high-income, inclusiveness and sustainability- and how e-learning can contribute to achieve the goals set by this model which included the establishment of an e-learning taskforce, adopting a standardized definition of e-learning and the implementation of a roadmap that included infrastructure, organization, professional development, content creation and enculturation. This allowed Malaysian higher education institutions to easily adapt to the COVID-19 situation and focus on lifelong learning. Chapter fourteen presents the Inter-American Development Bank's (IDB) experience with e-learning to improve employability and performance. González, Porto and Cotón discuss a strategy set out for the continued upskilling of the public sector through an e-learning ecosystem which the Inter-American Institute for Economic and Social Development (INDES) developed with collaboration of key players to improve performance, competencies and employability of learners. Some of the strategies included tutor-lead courses, Open Educational Resources (OERs), Massive Open Online Courses (MOOCs) to improve technical and transversal competencies such as problem solving, planning and communication creating opportunities, fostering collaboration and enhancing institutional performance. Challenges include reducing the digital divide to achieve greater social inclusion and equality in the region. Next, Huang et. al. discuss the lessons learned from two EdTech initiatives in China. In the first case presented, the authors discuss a holistic approach to digital learning for capacity building in the China Construction Bank University (CCBU) which highlights how digital learning benefits staff development, external clients and the general public contributing to the accomplishment of SDGs. The second case discusses how gamification and artificial intelligence can promote digital learning in internet companies through the example of Net Dragon Websoft Holdings Limited. These strategies can improve staff performance through comprehensive training and evaluation, the development of skills using innovative pedagogical methods, integrating digital learning formats to enrich the learning experiences and the adoption of a new set of metrics to measure their impact. Emerging challenges include the development of trainers, dealing with huge amounts of data, confidentiality and the need to continually enhance online learning strategies to provide the best possible options for learners. Finally, in chapter sixteen, Kumar presents the case of the National Skill Development Corporation in India where he first discusses the challenge of skilling a massive and rapidly increasing workforce for which the Skill India Mission was launched in 2015 including a program called Pradhan Mantri Kaushal Vikas Yojana (PMKVY). This program, which has trained over 8.7 million individuals so far, contemplates three training routes including short-term training for fresh skilling, recognition of prior learning to deepen existing skills and special projects to address vulnerable groups. The author highlights the notion of technology as a platform for learning and an enabler for job seekers through newer jobs and the building of standards and quality in the program, pointing out that "the government can play a vital role as a market maker for skill development."

Theme five, titled *Future of Content Development. Leveraging Open Resources,* consists of only one chapter in which Mishra discusses how open educational resources (OER) can become a tool for achieving the sustainable development goals considering the challenges to access learning resources and the affordances provided by the former to address these challenges and provide new pathways for lifelong learning. The author first defines OER and explains how they may be identified as well as the advantages of their use for governments, institutions, teachers and especially learners who may otherwise not have the means to access educational materials given their high cost. He also discusses the use of trustworthy repositories to find quality OER and how to use them for teaching and learning as well as some guidelines for policy development and capacity building emphasizing the notion that special efforts may be required to support teachers in utilizing the potentials of OER.

Theme six, titled *The Power of the Platform. Smart Technologies and Tools*, begins with Dougiamas' discussion of the Moodle platform as an exemplary referent of open educational technology which allows community building for sustainable development and lifelong learning highlighting that "the most important decision made" in his life was to design the platform as an open source project. The author continues by explaining how this platform is designed for low-bandwidth environments and the easy transfer of content, presenting some considerations for implementing it effectively and concluding by discussing the future of open education noting how it "needs to be reinvented around the efficient, flexible technology that is now possible." Chapter 19 presents the implications for education, uskilling and lifelong learning of artificial intelligence (AI), blockchain and 5G. Balaji and Carr first discuss the potentialities and uses of AI in education, especially focusing on key considerations for developing countries and emphasizing the notion that special care should be focused on understanding the implications of these uses for both regulatory and practical purposes, especially ethical ones. They also present blockchain and 5G technologies and their applications, including the challenges and potentialities for accreditation, lifelong learning and implications for developing countries concluding that the three technologies "can be leveraged no only to increase access to quality education...but to increase flexibility in learning...to create personalized learning experiences for all learners." Along similar lines, Guralnick invites us to reimagine educational experiences via artificial intelligence and new technologies such as virtual and augmented reality, holograms, the internet of things, 5G, blockchain and neuro headsets. He argues that "...taking advantage of technology to create novel experiences that are humanizing rather than dehumanizing and encourage creativity and critical thinking rather than rote memorization and scorekeeping, all in a way that, thanks to technology, scales up...," and advocates for equitable access to educational experiences that are based on the principles of active learning, learning by doing, situated learning, constructivism and constructionism and user-centered design, such as stories and examples which allow individuals to design their own learning. Finally, Singh et. al. presents a metaknowledge framework for the training of trainers using smart mobile learning (SML) applications which considers SML approaches including the creation of micro-content, assessment of learning, immediacy of response, pervasive collaboration, co-creation of content, sharing of experiences, agility of control by learners, ease of access and responsiveness and leveraging smart-sensing abilities. The SCALED framework considers six aspects which stand for each letter in the acronym: stakeholders, competencies, affordances, learner/trainer characteristics, evaluation and design intentions. The authors present two cases where the framework was applied, the Post Graduate Diploma in Curriculum Design and Development -a UNESCO-HBMSU initiative in Arab states and a program where smart technologies were used to train health professionals in Southeast Asia, and concluded that using the SCALED framework could allow trainers "to make effective use of SML applications in ways that are valued by stakeholders and program designers, focusing on deliberate and responsive uses of the SML applications."

Theme seven, titled *Modernizing Learning Measurement, Evaluation and Credentialing Through Data Analytics for Insights and Decision Making*, opens with a chapter by Guerra-López where she discusses how organizations can support workplace learning that contributes to positive social impact by evaluating and improving the impact of digital learning. She argues that "impact is always about societal results" and that "both [monitoring and evaluation] are needed to manage programs, projects and policies." She then presents a framework for evaluating the impact of digital and blended learning program which consists of six steps: 1) engaging stakeholders and defining expectations; 2) mapping the program's theory of change; 3) agreeing on evaluation questions and purpose; 4) preparing and executing the evaluation design; 5) preparing evaluation deliverables; and, 6) supporting dissemination and continual improvement. She concludes by emphasizing the notion that evaluation plays a key role in improving the quality of continuous learning and provides a checklist to guide the readers through the process of implementing her framework. In the next chapter, Natriello examines the use of learning analytics to accelerate change by taking advantage of the data being gathered by digital learning environments and programs. He highlights that "formal curriculum components delivered online… make it easy to gather fine-grained data on the exposure of students to these educational program components… [and] to gather data on student responses/engagement..." He presents seven major areas to gather data for learning analytics including learner, program, instruction, social interaction, resource, engagement and learning data which require certain measures to reflect the underlying variable and can be rendered in a suitable form for automated data collection. He then presents the steps for analyzing big data on learning (clustering and identifying patterns, social network analysis, regression analysis, semantic analysis and data visualization) and the use of learning analytics for capacity building with educational leaders, instructors and learners. He concludes by emphasizing the importance of considering the ethical issues involved, as "the potential for great improvement and for misuse" are both present and that "it is the obligation of educators to understand how systems operate and to ensure that they are used for the benefit of learners." Finally, Hickey and Buchem make a point for advancing sustainable educational ecosystems with open digital credentials and badges as "traditional credentialling practices hinder the deployment of the innovations described" in the book's other chapters. The authors outline the challenges presented by traditional credentialing systems and possible responses to concerns over these. They then outline the various functions that open digital badges may serve including finding learning, capturing learning evidence, recognizing learning and a broader range of competencies openly, motivating learning and endorsing learning. as opposed to traditional credentialing where only a few know the criteria behind it "badges are transparent and information rich. Everything is bundled into one click, allowing us to see what someone did to earn the credential, including a link to the evidence behind the learning, maybe a testimonial from the instructor, comments from peers, or even an endorsement from an expert." They conclude by warning that "educational institutions that are currently ignoring digital credentials may- end- up- in- the-same tenuous- position- currently- facing- retailers- and- publishers- who- were- slow- to embrace- e--commerce."

The final theme, titled *Mobilizing Partnerships to Support Pathways to Work*, begins with chapter twenty-five in which Isaacs discusses the issue of partnerships and how they can help sustainable development in the educational technology sector. The author first outlines the types of possible partnerships, including institutional, intergovernmental, public-private partnerships among others and the reasons why these partnerships are critical by noting that "no single entity, institution, or stakeholder group can address complex and 'wicked' education problems on its own." She then presents the different challenges to be addressed (i.e. conflicting value systems, territorial cultures and the lack of capacity to sustain these relationships) as well as partnership-building behaviors and competencies (i.e. ability to build trust, managing

different viewpoints, a sharing,collaborative mindset) pinpointing some principles for forming and leading partnerships (non-exclusivity, accountability, transparency and reciprocity). She highlights the Memorandum of Understanding (MOU) as a "partnership building instrument," and concludes by emphasizing the importance of strong dynamic leadership focused on consistent, clear communication among all partners to ensure success in these endeavors. In the next chapter, Jagannathan addresses ways to accelerate digital learning to achieve SDGS considering the viewpoints of four influencers to move from concepts to action. First, she presents Henry Patrinos' discussion on how remote learning can build the education system of the future and the implications of COVID-19 including policy innovations and financing solutions as according to this influencer governments need to protect education spending, invest in high-quality tutoring, implement just-in-time assessment and provide scholarships to keep students enrolled among other actions. Next, Tom Wambeke's viewpoint on how technology-enhanced learning requires a mindset shift is presented, including the importance of creating new learning experiences to bring new learning opportunities, how the role of teachers and learners have shifted and the importance of addressing the digital divide, the role of learning analytics and organic partnerships to achieve learning impact. Likewise, Foster Ofosu's considerations are presented in a discussion of how innovations by youth, in addition to knowledge, are vital for economic development in Africa including continuous learning, the role of the African Development Bank, multisector partnerships and technologies to self-teach and self-learn. Finally, the author discusses Donald Clark's perspective on how AI is the future of learning through its ubiquity, new user interface, its solutions and quality learning experiences which according to this influencer will continue to grow and help enhance learning by creating unique learning experiences adapted to each individual and providing instant feedback and scaffolding.

Jagannathan concludes the volume by providing a reflection on how the future of learning is already here and outlining a theory of change framework to guide implementation which includes defining and aligning capacity building to each organization's vision and mission, articulating problems, identifying pathways and specifying indicators including the role of data analytics. She then describes how holistic learning transformation is already taking place and how it includes all stakeholders. She recaps all eight themes in the volume and concludes by outlining conditions for success that organizations need to focus on such as equity, inclusion, multi-stakeholder partnerships, empowering learning providers, curating digital resources, capturing data for better decisions and communicating change. She concludes by emphasizing the importance of thinking like a futurist and with a call to action promoting the adoption of a growth mindset to achieve SDGs and connecting every learner to an opportunity as "people who change after change, will survive. People who change with the change, will succeed. People who cause the change will lead" (unknown). She encourages all readers to "be a champion and lead the change."

With this strong conclusion, this edited volume achieves its goal of outlining all challenges as well as the possibilities of technology in education in our current ever-changing reality. The challenges are many as noted by multiple authors in the book and the possibilities are endless as well as uncertain. Educators and educational institutions need to more than ever adopt a growth mindset and be open to changing paradigms as new developments arise. Focusing on life skills such as adaptability and the capacity to continue learning throughout our lifetime seem to be the main lessons to be learned in order to not only survive but thrive in an ever changing world. I strongly recommend this book to anyone interested in bringing their institution up to speed with the current changes in education and technology. We should all be very grateful to Jagannathan and all great scholars and practitioners that she managed to gather under a common goal to provide us with a roadmap to success in these trying times.