4 Every child to flourish in a post-COVID-19 world: Eight lessons and visions for the future

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This chapter highlights some of the lessons from the pandemic to inform a vision for the transformation of education and learning. It focuses mainly on innovations from non-governmental organisations and draws on the education continuity as well as HundrED's 2021 Global Collection documenting about 100 innovative practices and solutions. After a review and analysis of some of the trends, the chapter highlights eight lessons from the health crisis and proposes eight vision statements for the future of education.

Introduction

What is the purpose of education? With all that has changed in our daily lives since COVID-19 began, many have been re-evaluating this simple but challenging question. One idealist answer could be, "to help every child flourish, no matter what happens in life" (HundrED, n.d.[1]). Flourishing can mean many things, for example, empowering students to discover their strengths and interests and then supporting them to orient these towards a contribution to the world (Zhao, 2020[2]). This answer, and most others, have pointed to the idea that the value of education is so much more than getting good grades or simply a place to keep children supervised when adults go to work (Sahlberg and Doyle, 2019[3]). Young people today are our future, not only as the future creators of a modern workforce quite different from today, but as active

shapers of the society of tomorrow. They will participate in the way communities care and help those less fortunate, resolve local and global conflicts, and demonstrate compassion and understanding towards people different from them. The profound shock to educational systems as a result of the pandemic has re-focused attention on the role of education and how learning in schools today is equipping young people to become responsible adults. Two important questions need to be asked:

1. What can we learn from efforts to ensure young people could continue learning during the COVID-19 pandemic?
2. How can we use these lessons to inform a vision for the transformation of education and learning for a more equitable future?

This chapter proposes eight lessons and eight vision statements for education systems globally from the considerable efforts to keep children learning during COVID-19. These lessons draw from the 45 education continuity stories collected in this report, which describe how a range of stakeholders in different contexts pulled together in extraordinary circumstances to develop innovative solutions and enable learning during lockdown measures and school closures. This chapter presents a critical analysis of the changes made to achieve education continuity and also draws lessons from leading educational innovative practices and solutions that feature in HundrED's *2021 Global Collection* (Petrie and Aladin, 2020[4]) which was also a source for some of the education continuity stories contained in this volume.

HundrED's 2021 global collection

HundrED.org is a Finland-based non-governmental organisation aiming to improve education through researching, identifying, and sharing impactful innovations that are created in all corners of the world. A plethora of new practices and solutions are introduced each year in education, but it is challenging to identify which will lead in their impact and be transferable to multiple contexts. When COVID-19 hit, education had a sudden need to understand which non-governmental innovations were most effective under the new constraints of school closures and social distancing. HundrED's Research Team responded by studying how leading innovations addressed these challenges (Petrie and Aladin, 2020[4]).

One hundred leading education innovative practices and solutions from 38 countries feature in HundrED's 2021 Global Collection. To be selected, innovation organisations underwent a rigorous review process, including a review and voting procedure by 150 selected education experts from 50 countries in the Global South and North, making over 3 400 evaluations from an innovation shortlist. HundrED's annual Global Collections aim to address the wide span of current education needs (e.g., teacher development, learning environments, and more) across all continents (HundrED, n.d.[5]). The majority of the selected innovations in the 2021 Global Collection were established in the last 8 years and many have shown remarkable growth and impact within this short timeframe. Over 90% have been implemented in at least 2 countries with a wide range of users from 350 to 150 million; 41% require digital devices to augment learning and 34% require the Internet to be implemented (Petrie and Aladin, 2020[4]). Several of these innovative practices also feature in the current volume.

The learnings yielded from the challenges in 2020 by these innovation leaders are highly valuable to discussions about how we might move forward in the future. The remainder of this chapter is divided into three main sections: (1) a critical analysis of overall trends on what happened during the pandemic, drawing from the continuity stories in this volume and the experiences of non-governmental innovations in HundrED's 2021 Global Collection; (2) a synthesis of the reported long-term lessons from these experiences and what they might mean for education; and (3) a conclusion which sets out several ambitious vision statements for reimagining the future of education after the crisis. It is our hope that the learnings and visions presented here will support education system leaders to (a) see potential ways to create thriving educational systems which learn from diversity across stakeholders, countries, and both

bottom-up and top-down initiatives; (b) embrace more innovation and flexibility to enable the exploration of more ideas in education ecosystems that can translate into concrete actions for improvement.

Overall trends of what happened: Analysis of innovator challenges and successes

The vast range of contextual challenges and modes of learning around the world required significantly different responses to the pandemic by non-governmental innovations. For example, Chinese Taipei and New Zealand closed schools only for a few months in 2020, while for India and many other countries, schools closed for most of the year (Our World in Data, n.d.[6]). However, eight common trends emerged on how normal operations were disrupted regardless of context challenges and type of innovation:

1. Teacher and student technology capability and access to digital technologies with a reliable Internet connection was particularly challenging in low- and middle-income countries but was also reported in high-income countries.

2. Innovations that operate out-of-school programmes had greater flexibility to adapt their operations without needing to adhere to school restrictions and requirements. Many in-person out-of-school programmes were able to rapidly develop, prototype, test, and scale hybrid-learning solutions so they could achieve education continuity within a short period after the pandemic forced home learning.

3. The initial frenzy of activity in response to the school closures was overwhelming and confusing for everyone in education, but communicating and managing parent and student expectations during this period was particularly stressful for innovation leaders.

4. Most educational stakeholders were unprepared for the dramatic change to implement the pedagogy needed to engage students and sustain their attention. There was also a need to identify the best way to support educators to respond to these challenges.

5. The more heavily non-governmental learning providers needed in-person contact and purpose-built environments for their learning models to work, the greater the disruption. Innovations that involved minimal physical infrastructure were the most agile in responding to the crisis.

6. Especially at the primary level, it was more challenging to achieve education continuity for younger age groups during the pandemic. Educators had to rely heavily on their students having access to stable home learning environments with modern digital devices and engaged parental support.

7. School closures illuminated the widely mixed degree to which students can be self-managing and disciplined with the increased freedom of distance learning, where many educators found it more difficult to sustain their engagement and interest.

8. Parental engagement increased overall, which helped to strengthen connections on learning between educator, student, and parent.

It is important to acknowledge the differentiated impact that these trends had across different kinds of contexts and for varying sorts of innovations addressed to different groups of students. This becomes particularly visible in relation to the role of technology and what it could and could not provide during school closures. Notably, purely online EdTech innovations that already had an established reputation and user base, like Kahn Academy and Scratch, experienced a boom in their number of users by 2-4 times in 2020 (Kosarchyn, 2020[7]; Scratch, n.d.[8]). This sudden user surge caused an urgent challenge for their software development staff to provide dramatic increases to their network bandwidth (Patel and Erickson, 2020[9]). This demand was encouraged by many EdTech providers by offering free or heavy discounts for paid services to students and educators (Teräs et al., 2020[10]). Consequently, educators were flooded with emails from EdTech providers offering their services with extended school trials at no cost during school lockdowns. Some educators reacted negatively to these offerings (particularly from for-profit

organisations), arguing it was opportunistic and unethical to try and profit from a crisis (Teräs et al., 2020[10]). However, for many non-profit EdTech organisations like Kahn Academy, the sharp increase caused unanticipated financial strain to provide increased bandwidth for their services, which resulted in needing to publicly ask for donations (Scratch Foundation, n.d.[11]).

All innovators, even those already working online, provided more support through the pandemic in the form of targeted webinars, resources, and programmes with teachers, parents, and leaders. Additional guidance through learning pathways for different grade levels was provided with suggested timetables, lesson plans, and COVID-19 related education resources. However, the adoption of these resources was mostly limited only to those who already had access to digital devices and an Internet connection. As the crisis highlighted, the extent of the digital divide globally was a surprise for many, even for high-income countries in the Global North (Fox, n.d.[12]). However, China was reported as particularly successful at rolling out country wide cloud-based education and low technology solutions – like a dedicated education television channel for example (Xue et al., 2020[13]).

Lower- and middle-income countries, however, often could not rely on access to digital devices and a connection to the Internet (UNESDOC Digital Library, 2020[14]). There are many multi-dimensional and contextual issues on this point; for example, the majority of the world is still poor with the average global income being well below the poverty line when adjusted for price level in each country (The World Bank, n.d.[15]). Average income is predicted to be reduced further with the economic downturn resulting from the pandemic in the coming years. For example, BRAC Remote Play Labs based in Bangladesh found the best use of their resources was not more technology, but to support families with non-educational basic needs like food, health services, psychological support, and even cash transfers (HundrED, 2020[16]). If we consider these basic needs from the bottom two tiers of Maslow's Hierarchy of Needs (Mcleod, 2020[17]) as vital for education to take place at all, then innovations across sectors (not only in education) need to collaborate to ensure these are in place first. While low-income countries have greater basic needs not being met resulting from systemic issues, the pandemic highlighted and exacerbated pre-pandemic inequality in high-income countries as well (United Nations, 2020[18]). Additionally, an often-overlooked area is providing quality education for young people with the vast array of special needs who have been especially affected by widespread school closures (Cerna, Rutigliano and Mezzanotte, 2020[19]). If we are to take the United Nations 2030 Sustainable Development Goal 4 "quality education for all" seriously, we need highly effective innovations for disadvantaged children the most.

Low-tech solutions like television, SMS, radio, and low data smart phone applications were commonly used to achieve education continuity by innovators in lower income contexts, and the use of television was also commonly seen in higher income countries (see Finland story in this volume, for example). However, many rural settings are still severely limited in their access to television and other technologies, which meant mixed results when rolling out scalable solutions for equitable access to education where only in-person communication channels were possible (Cerna, Rutigliano and Mezzanotte, 2020[19]). Teacher professional development for using and teaching with technology is a major bottleneck globally, where even in the European Union, less than half (49.1%) of teachers report any kind of formal ICT education or training (European Commission, 2020[20]). In many cases, home deliveries of physical resources and learning kits were developed to provide the resources normally only stored in workshops or classrooms for contexts where access to digital devices was not possible. In other cases, innovative technical solutions were developed that allowed access to banks of Internet resources – even in contexts with little or no connectivity (see Kolibri story in this volume for example). It is clear that more equitable technology access is needed globally to achieve scalable education continuity during school closures. However, technology access alone does not improve education; consideration of how it is integrated into the larger education ecosystem is critical (Yanguas, 2020[21]).

What technology could not provide

Most agree the learning that occurs in school and in person is much more holistic than the learning outcomes set by curricula in traditional subjects, which are often the focus of learning solutions that use only technology (Reimers, 2021[22]; Sahlberg and Doyle, 2019[3]). One of the greatest concerns for innovators in education during COVID-19 was the reduced learning related to social and emotional learning (SEL). SEL is commonly developed through spontaneous interactions at school and in person, as well as by play and collaboration (CASEL, 2020[23]). Because SEL is undervalued in traditional school systems, learning loss and development in this area from the pandemic is not understood very well at large. However, it may be difficult for students to form close friendships and maintain old ones when so much of their interaction is online.

SEL is vital to ensure students develop a healthy sense of their holistic well-being. The emotional shift from well-oiled routines for teachers, parents, and students was massive, which eroded the well-being of many. Innovators reported a wide range of distressing issues that they felt they had to respond to, including (but not limited to): parents feeling overwhelmed and unsure about what was happening, student loneliness, concerns about the increase of screentime, anxious staff concerned about cutbacks and potential job losses, and a vast array of new technology related issues for everyone. One innovation leader aptly said that dealing with this shift felt like a "roller-coaster ride" of emotional stress requiring him to respond swiftly and provide answers to problems even when he simply did not have those answers (Liou and Petrie, 2022[24]). The efforts of educational stakeholders and innovation leaders learning to cope with this unusual onslaught has gone mostly unrecognised—yet their resilience deserves special praise.

What technology does better

While it is difficult for online learning to offer the full range and experience of human interaction, there are many significant pedagogical advantages to online learning that have been developed and researched for decades that are yet to be adopted by educators at large (Starkey et al., 2021[25]). During 2020, innovators found that great scalable solutions exist, especially when less responsibility for time-intensive repetitive tasks is left to individual teachers. For example, online instruction makes it much easier for teachers to collaborate and provide support by easily "dropping into" scheduled classes. We also know software is changing fast to automate more and more repetitive tasks – thereby freeing up teachers to spend more time helping students. In particular, the emergence of Artificial Intelligent learning systems that provide dynamic content which adapts to the student is becoming more possible (Bryant et al., 2020[26]). Still, innovators recognise a clear need in this space for a range of teacher development and support solutions to bring pedagogically sound instruction into the way they can effectively deliver online learning. To help address this need, HundrED collaborated with The World Bank and conducted a research project called "Teachers for a Changing World" (HundrED, 2020[27]).

Analysis of evidence gathered on these changes

Changes made by innovators to achieve education continuity were initially emergency reactive solutions designed to bridge the learning gap in the short term as best they could. However, the uncertainty of how long the pandemic was going to continue with more waves lasting the foreseeable future meant that the impact and efficacy of these solutions was not necessarily measured in a robust and consistent way. Larger more established organisations generally had standard impact systems in place to measure changes and compare findings. In particular, some EdTech innovations had a clear advantage on being able to automate the gathering of quantitative data. However, many publicly available reports only indicate increases in student engagement with shallow details on the nature of that engagement. Innovations catering for lower resource and remote contexts naturally found it much more difficult to measure changes with the need to record this data manually.

Overall, innovation leaders who had the resources conducted "light" internal reports that largely yielded positive findings, which often did not rigorously analyse comparisons to their pre-pandemic operations. In-depth external and independent evaluation reports were rare during 2020 because the extensive resources they require were out of scope for many non-governmental organisations. Thus, while it is encouraging to see positive findings from the changes made to achieve education continuity, comparisons between pre- and post-pandemic efficacy are not clear in most cases to confirm learning improvement or that potential gaps have been addressed or acknowledged.

While research on different modifications to learning models during the pandemic is now emerging, the longitudinal effects for the vast array of different contexts and sub-groups of students and teachers in K12 education largely still needs to be investigated for non-governmental innovations. Nevertheless, the majority of innovation leaders reported that many of the changes made during the pandemic are likely to continue even when all COVID-19 restrictions are lifted. For example, they recognised the need to have effective ready-to-go hybrid models of learning in place and continued professional development of educators, not only to provide education continuity during a crisis, but to take better advantage of all types of learning modes (including in-person, hybrid, and online environments).

Eight lessons from the pandemic

Drawing from these trends, the following pages highlight eight major lessons from the experiences of non-governmental innovation leaders.

Lesson 1: Uncertainty is here to stay and equitable continuity plans are needed

A complete eradication of the virus is not possible – making progress in the future non-linear and difficult to predict (Phillips, 2021[28]). Moreover, throughout 2020, COVID-19 greatly exacerbated existing inequities in education systems and emergency response measures, which often only provided partial and temporary solutions (e.g. television, radio, SMS); many do not provide deep and holistic learning experiences necessary for a quality education (Starkey et al., 2021[25]). There is an obvious need to create better continuity plans, and in many contexts, a more developed digital infrastructure. Any development efforts should ensure they take on board what we have learnt from the pandemic about the extensive and highly differentiated nature of the digital divide to ensure quality education continues to be provided for *all* students and that systems are ready for future crises.

Lesson 2: More system-wide clarity of communication and co-ordination of leadership is needed

When the pandemic disrupted the normal operation of schools, there was much confusion and disarray across all education stakeholders. For example Béché (2020[29]) found that efforts to achieve education continuity in Cameroon were seriously hampered by disorganisation across education stakeholders. Leaders and educators need to be applauded for navigating many nuanced and challenging issues without clear official guidance on how to manage such sudden changes. Unfortunately, the accumulated stress from these efforts has caused many experienced educational stakeholders and leaders to strongly consider leaving the profession or retiring early (Sokal, Trudel and Babb, 2020[30]; Yle, 2020[31]). Far clearer communication and protocols of co-ordination for system-wide management strategies are needed for the effective implementation of innovative practices and solutions. It is essential that student, parent, and teacher voices are heard, understood, and responded to in the formulation and continuous development of these strategies to improve their efficacy.

Lesson 3: There is a need to invest most in innovations that provide quality education to disadvantaged children

Unfortunately, there is no silver bullet or sure linear path to solving inequities and ensuring quality education is provided for disadvantaged children in every context. In part, this is because such inequity can often be the result of dysfunction in other sectors and failures to provide consistent access to basic needs like nutrition and shelter (Cerna, Rutigliano and Mezzanotte, 2020[19]). But if effective action is not taken soon, then the high degree of social unrest seen in 2020 is only likely to increase with more people in desperate need for answers and solutions (Reimers, 2021[22]). Counter to popular belief, more investment is not an automatic solution for high-income countries with long tails of under achievement in education: for example, like in many OECD countries, New Zealand spending has increased substantially per pupil in the last two decades, yet across multiple international assessments [Progress in International Reading Literacy Study (PIRLS), the Trends in Mathematics and Science Study (TIMSS), and the Programme for International Student Assessment (PISA)], its performance has declined over this time (Law and Hernandez, 2021[32]). In other contexts, Luxembourg spends more than three times per student than Hungary, yet both have similar assessment results (OECD, 2020[33]). We need to identify innovations in and outside of the education system that strive to do much more with similar or fewer resources. Basic needs should be met as the first priority, and then it is essential investment in education is targeted at the sweet spot that combines the highest need and most impact for sustained improvement tailored for each context.

Lesson 4: Scalable teacher development solutions fostering sound digital pedagogical skills are needed

COVID-19 has made it clear that schools need robust hybrid models of learning that utilise the advantages of both online and in-person education. The right balance still needs to be widely agreed upon for different ages and contexts. For those with consistent online access, the pandemic has brought teacher professional development especially into the foreground with dramatically increased technology use for online learning. It has also shone a spotlight on the urgent need for sound digital pedagogical skills to be used. One of the key challenges here is how to scale the unlearning of teaching habits that may have worked well in person but are impractical online (Ko, 2021[34]). Some schools simply tried to replicate an in-person learning experience by having the same classes and pedagogical approach online (Starkey et al., 2021[25]), resulting in excessive mandatory time in front of a screen (Skates and Chan, 2020[35]).

Lesson 5: Social and emotional learning is vital to student development and often relies on meeting in person with diverse groups of people

Future generations will need to interact in person with other young people whose opinions, backgrounds, and personalities vary widely. This interaction is essential to cultivate a future society in which people are curious, compassionate to needs other than their own, and able to listen deeply in order to understand one another. Developmental efforts to cultivate SEL in schools should not be solely focused on providing access (e.g. to technology, physical resources, MOOCs etc.), but rather by growing a community that thrives on diversity, positive support, and enabling young people to collaborate, critically evaluate ideas, and engage in creativity. Studies such as the OECD's Study of Social and Emotional Skills and the Collaborative for Academic, Social, and Emotional Learning (CASEL) framework identify the essential dimensions of SEL development as including self-awareness, self-management, social-awareness, relationship skills, and responsible decision making (CASEL, 2020[23]). Some interventions, such as Slam Out Loud's Art for All programme in India (see story in this volume) have used art to support students to express themselves, develop their creativity, and SEL skills online during the pandemic. However, SEL has remained a challenge for many and more attention needs to be given to how best to develop such skills in a range of learning environments.

Lesson 6: Leadership well-being should not be ignored

Leaders of organisations are responsible for ensuring the well-being of everyone in the organisation, which is not only critical for meaningful learning to happen, but also for the healthy operation of the whole organisation. Innovators had to quickly develop new compatible learning models for distance learning and co-ordination, which shifted constantly in each context. What became clear from interviewing innovators across HundrED's 2021 Global Collection was that they were looking after their own well-being *last*. While it is essential for a leader to support everyone's well-being in their organisation, this crisis highlighted that leaders themselves also need support to cope with extreme situations like this in the future. Connecting to other like-minded innovators through organisations such as HundrED.org can be especially helpful because it enables leaders to share experiences and learnings on a global scale.

Lesson 7: Self-directed learning abilities are vitally important

In the United Kingdom alone, it has been reported that only around 60% of teachers had regular engagement with students and only 42% returned work during school closures (Lucas, Nelson and Sims, 2020[36]). Distance learning requires more grit and self-discipline from students; for example, the ability to independently decompose tasks into manageable chunks, tolerate ambiguity, evaluate the quality and validity of resources, and ask the right questions that will lead to solutions (as well as knowing when the question being asked is the wrong one). In some cases, students who had already developed these attributes relished the chance to take charge of their learning and experiment with different areas of learning that interested them (Mintz, 2020[37]). However, without educators and peers there to provide spontaneous and interactive help, many students' motivation and engagement levels simply switched off (Domina et al., 2021[38]; Ko, 2021[34]).

If students had previously been heavily relying on highly guided "recipes" of learning from teachers and resources to work through curricula, then the increased responsibility and need for self-discipline caused much confusion on how to navigate themselves through new problems. Suddenly jumping from old pedagogical approaches of highly scripted learning paths to more student-led learning is likely to leave many feeling lost and overwhelmed without adequate scaffolding. Therefore, curricula, schools, pedagogy, and teachers need to be intentional about how they are developing self-reliance and self-directed learning skills appropriate to each age level, which are personalised to each student.

Lesson 8: Motivational focused learning loops across stakeholders need to be implemented

To cope with the major challenges in 2020, innovation leaders found that having strong iterative learning loops firmly in place was one of the key strategies for rapidly moving forward. They often used existing methodologies and frameworks, like agile and design thinking, to formulate strategies to integrate these loops into organisational processes. Smaller independent organisations can easily integrate flexible feedback loops from users into their development and prototyping processes given their agility and lack of bureaucracy. In this way, non-governmental innovators were rapidly able to experiment with different distance-learning prototypes and create lean production supply chains. However, the rapid nature of changes during the early stages of the COVID-19 pandemic meant that many did not have time to put in place robust impact evaluation and monitoring systems.

Despite the difficulties of rapid adaptation, innovators recognised that innovations ideally should be driven first by a verified needs assessment and by both qualitative and quantitative (mixed-method) data where possible (Maheshwari-Kanoria, Zahir and Petrie, 2022[39]). Trust was reported as a critical pillar to the success of innovations, and is easier to establish when data and analysis are transparent and open to scrutiny for multiple stakeholders. Innovators also found that updating processes involved "unlearning" old ones and the necessity of making advantages clear so stakeholders could see that new processes were

theoretically "worth it". Behaviour changes on an individual level are challenging by themselves, let alone at an organisational level. So, with schools commonly reporting being time poor and overwhelmed especially in this crisis, learning loops are unlikely to be well implemented without increased support. Nevertheless, innovators from non-governmental organisations have a lot to teach and be inspired from in terms of how learning loops can be implemented effectively in education at an organisational level.

Eight vision statements for the future of education

The eight lessons synthesised from the education continuity stories in this volume and from experiences of the 100 innovation leaders featured in HundrED's Global Collection highlighted that, similar to the advantages that start-ups have over large established companies, non-governmental innovations in education often have a higher degree of flexibility to prototype and deploy solutions to a crisis like COVID-19. For example, some innovators developed, prototyped, and iterated various physical learning kits, which were delivered to the student's home so they could create and equip "maker space" areas to use in their distance learning. In the increasingly unpredictable world we face today, it would be beneficial to create formal pathways for non-governmental innovations in education to thoughtfully learn from and utilise the insights and lessons outlined here. Drawing from the eight lessons outlined above, eight visions that could help every child to flourish in a post-COVID-19 world follow:

Vision 1: Engagement with leading innovative practices and solutions outside of the local area

The structural boundaries of education systems mean many of the most effective practices and solutions never make it outside of the classroom, school, city, or country. While there are no silver bullets to solve the major educational challenges that can work for every context, all education stakeholders can learn from and be inspired by learning practices and solutions from other countries, which can be adapted in their context. HundrED have been researching and celebrating leading innovations on a global scale for over five years now, but much more could be done to learn, engage in meaningful dialogue that results in concrete action, and strategies for piloting for those innovations assessed as appropriate for multiple contexts. If COVID-19 has taught us anything, we need to be more open to the lessons outside of local education silos, and there are more similarities in our educational challenges to learn from one another than there are differences (as the education continuity stories contained in this volume showcase).

Vision 2: Time and resources to support the well-being of educators are provided before anything else is added

One of the negative side effects of the pandemic is the high potential for a mass exodus of leaders and educators from the stress and exhaustion in responding to the crisis (Sokal, Trudel and Babb, 2020[30]; Weale, 2020[40]; Yle, 2020[31]). These issues have been also well documented in education prior to the pandemic. Effective strategies in this area are likely to require investment, however, little progress on any initiative for change will be sustained without allocating resources for educators to have adequate time and support.

Vision 3: Two-way dialogue and co-operation across education stakeholders and non-governmental innovations are open

Through a collaborative process where multiple stakeholders engage in intentional dialogue about contextualising and adapting innovations for low-resource contexts, non-governmental innovations can play a role in helping make the United Nation Sustainability Development #4 a reality by 2030. This dialogue should be centred around developing new and better processes as opposed to simply providing

tools and resources only. One promising example of cross-stakeholder co-operation is how, in Pittsburgh (United States), school leaders, department heads, and non-governmental organisations work together on new innovative learning models (Behr, 2020[41]). Every region in the world should have open and transparent forums to cultivate an innovation-friendly culture in education.

Vision 4: Hybrid models of learning that are appropriate for each level of education are developed

There are clear advantages and disadvantages to both learning online and in person. However, how schools and teachers co-ordinate these modes across different ages and needs is much less understood. Thus, we need robust, clear, and flexible guidelines and protocols backed by trustworthy research for all educators and systems. These hybrid models and guidelines should have education continuity plans for long and short-term school closures that keep student and teacher well-being and holistic development core to their design.

Vision 5: Thriving communities are the answer, not more technology

Initiatives to provide reliable Internet and quality digital devices are important, but providing access alone does not improve learning outcomes and solve inequities. For example, we need to be more critical of "technology worship" type of thinking like the One Laptop per Child initiative, which has fallen short of its hype and expectations in Paraguay (Yanguas, 2020[21]). While urgently addressing the digital divide is still important, supporting local and global communities to thrive inside and outside of schools while celebrating diversity may do more to improve education. In this way, collaboration and co-operation between schools and the community needs to be embedded meaningfully into the regular operation of educational systems.

Vision 6: A culture of risk tolerance is fostered which allows experimental innovative ideas to fail

To truly innovate, educational stakeholders need to be able to implement bold ideas that may not yield the expected results. Educational systems need to tolerate failure as a part of the learning process if we are to discover ways to improve outcomes and scale quality education. It is often claimed today that failure is vital to student development and we need more ways to destigmatise it across the education system (Reimers, 2021[22]; Sahlberg and Doyle, 2019[3]). The same could be said for experimenting with new processes and ways of learning at an educator and organisational level. More than ever, the disruption of COVID-19 has demanded impactful and scalable solutions to address the erosion of quality education in all parts of the world. At the same time, there is an opportunity to reform many of the old processes that, as we already know, do not prepare young people well for the future.

There are valid fears and concerns that carelessly experimenting with learning models as if young people were animals in a science lab can be potentially damaging (Zhao, 2020[2]). However, innovators have developed many strategies to prototype and test new ideas thoughtfully in ways that can also benefit students and help them to develop 21st century skills. For example, the innovation of new learning models often necessitates the involvement of student voices and encourages their engagement in meta-cognitive reflection on their learning process (with questions like "How did that go?", "What could we do better next time?" and the like). If we safely and openly involve students in these discussions about careful learning experiments in education, we can not only learn about how to improve innovative learning ideas, but also provide an environment where students increase their self-awareness about their own learning, which is often lacking in traditional school curricula.

Vision 7: Teachers are well supported to maintain their passion for learning and development

In many school systems around the world, students and staff are overworked and may have to compromise on a healthy work-life balance to develop new skills and knowledge (Sokal, Trudel and Babb, 2020[30]; Weale, 2020[40]; Yle, 2020[31]). Educators need flexibility and time to pursue learning and development. Such development should be acknowledged, rewarded, and integrated into job descriptions, alongside access to supportive professional learning environments and outside expertise. A passion for learning is especially important if teachers are to increase their digital pedagogical skills for hybrid learning. Thus, it is vital to enable and motivate educators to engage in continuous professional development and foster a growth mindset.

Vision 8: Students are listened to and given more agency to direct their learning

Current teaching and learning practices are often dominated by predefined outcomes that involve highly scripted linear learning paths, which are often not relevant to students' lives outside of the school (Sahlberg, Hasak and Rodriguez, 2017[42]; Zhao, 2020[2]). Education in school should explore learning models that emphasise students *doing* things in the real world with uncertain outcomes. Engaging with practical issues often involves pedagogy that promotes question-driven rather than answer-driven tasks, which avoids concentrating solely on problems with predefined answers. Such learning models, often drawn from pedagogical approaches such as constructionism, and design thinking inquiry processes, which can be more flexible, agile, and relevant to student interests and current societal needs (Reich, 2020[43]). This change involves listening to students and giving them more agency, which is key to help them to take more ownership of their learning and become self-directed. Co-creating learning experiences and environments aligned with student interests can help to foster a growth and entrepreneurial mindset, which enables students to engage in learning much more creatively. These more open and diverse educational experiences will help to illuminate to students that there can be a plethora of possible paths to build success in life.

Concluding remarks

The COVID-19 pandemic has debunked assumptions that change has to be slow in education, making ripe the possibility for great strides of progress in educational systems. Never before has an event like this brought together people in search of solutions on a global level all at the same time, and we know that every country and region in the world has undertaken innovations we can all learn from – as the education continuity stories presented in this volume showcase. While there is still much uncertainty, the lessons and visions here can help to energise and inspire two-way collaboration between governmental and non-governmental organisations in education globally. We all have a responsibility to advance towards the UN SDG4. In this spirit, it is our hope the global educational community can be fearless in learning from bold innovative education solutions and practices together, so that every child can flourish in a Post COVID-19 world.

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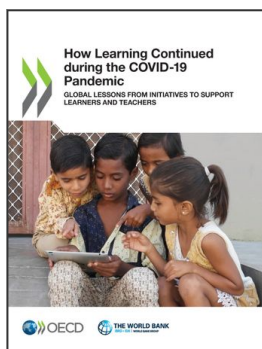
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Notes

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