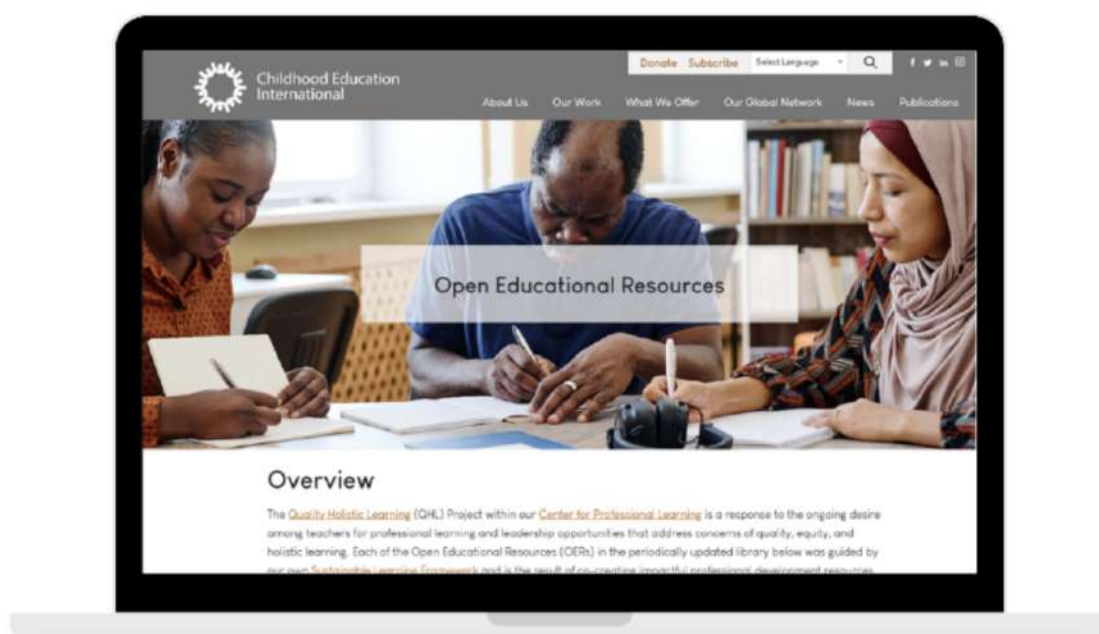# Digital Teacher Professional Development in Education in Displacement (EiD) Settings:

Access, equity, and quality

Focus on the MENA and Sub-Saharan Africa Regions

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Summary

This report is a first step in our search for solutions to deliver digital teacher professional development (TPD) to teachers in displacement contexts, equitably, inclusively, and at a scale commensurate with the need to ensure that educators everywhere have continuous, quality, holistic professional learning opportunities.

By reflecting on our experiences working with a group of educators serving displaced and refugee learners and by reviewing the open access offers provided by large, international organisations, we identify limitations among existing solutions, many of which are not fully responsive to the needs of teachers in low-resource contexts who might be looking for professional development opportunities.

The ecosystem of education in displacement (EiD) is complex and lacking in sufficient resources at all levels. Therefore, sustainable and scalable access to digital TPD requires comprehensive solutions that make use of resources embedded across the ecosystem: starting from teacher motivation and leadership, continuing on to national-level policy support and global contributions of international organisations and funders, and including actors in the open educational resource (OER) community.

Acknowledgements

Many thanks to the Quality Holistic Learning (QHL) Project Fellows and the Center for Professional Learning (CPL) staff members and consultants who have contributed to this report directly and/or through their participation and shared knowledge production in the QHL Project, including:

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Acronyms

CBOs	Community-based organisations
CEMASTEA	Centre for Mathematics, Science and Technology Education in Africa
COVID-19	Coronavirus disease of 2019
CPL	Center for Professional Learning
EdTech	Educational technology
EiD	Education in displacement
ICT	Information communication technology
ICT CFT	UNESCO ICT Competency Framework for Teachers
IFADEM	Initiative francophone pour la formation à distance des maîtres
INEE	Inter-agency Network for Education in Emergencies
INGOs	International non-governmental organisations
ITU	International Telecommunication Union
JRS	Jesuit Refugee Services
LMS	Learning management system
MENA	Middle East and North Africa
OER	Open educational resources
OIF	Organisation Internationale de la Francophonie
PEBL	Partnership for Enhanced and Blended Learning
PSS	Psychosocial support
QHL	Quality holistic learning
RACHEL	Remote Area Community Hotspot for Education and Learning
SEL	Social and emotional learning
SLF	Sustainable Learning Framework
TES	Transforming Education Summit
TESSA	Teacher Education in Sub-Saharan Africa
TPD	Teacher professional development
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund
UNRWA	United Nations Relief and Works Agency for Palestine Refugees

Foreword

The lead author of this study, Dr. Oula Abu-Amsha, is a member of the Center for Professional Learning's (CPL's) Quality Holistic Learning (QHL) Project team. During the first phase of the QHL Project, she worked closely with Teacher Fellows and project partners in the focal countries of Niger, Chad, Lebanon, and Kenya. Through this report, she aims to highlight and situate, in a broader context, some of the Project Fellows' experiences working at distance and becoming familiar with online collaboration tools, professional learning materials, virtual communities of practice, and various digital resources.

QHL Project team members—CPL staff, consultants, and fellows alike—are searching for the best ways to disseminate co-created teacher professional development (TPD) material focused on quality holistic learning as open educational resources (OERs) and are especially keen to understand "the last mile" — or how to bring their teacher-created professional learning resources and opportunities to colleagues in the most remote or least digitally connected education in displacement (EiD) settings. As a first step, we wanted to explore the existing organisations and platforms that offer OERs and other similar TPD resources. We do not claim that this review is exhaustive; nevertheless, we believe that if the author and her teammates, with experience in the field, reliable connectivity, and good research skills, were not able to easily identify a resource or solution, then teachers in lower-resourced contexts would be unlikely to easily discover or make use of it either.

In a spirit of shared discovery, learning, and critical self-reflection, then, we humbly offer this report as one step toward providing quality, holistic professional learning to *each and every* educator around the world. We look forward to continuing to learn and grow with the EiD community in the months and years ahead.

Introduction

The need for this study emerged from the questions and the needs that the QHL Project team, partners, and funders identified throughout the project, particularly regarding dissemination and uptake of digital TPD resources.

The purpose of the QHL Project[1] is to increase quality holistic learning outcomes, including both academic and social and emotional learning (SEL), for children in displacement contexts. The project aims to achieve this through (1) a participatory development process that centres teachers as experts in their local educational contexts who are best situated to guide development of professional learning resources and (2) the provision of these co-created, quality holistic professional learning resources and opportunities for educators across EiD contexts as OERs.

Throughout 2021 and in the spring of 2022, teachers and other key education stakeholders in four target countries—Chad, Kenya, Lebanon, and Niger—created, tested, evaluated, and revised OERs in Arabic, English, and French that include professional development online courses and offline trainings, handbooks, communities of practice tools, micro-credentials, and a mobile learning analytics app dedicated to assessing teacher and student wellbeing and SEL. The team continued work in Fall 2022 and will extend into Spring 2023, focusing on asset-based pedagogies and differentiated instruction as additional, key facets of QHL.

The QHL Project is built using the Sustainable Learning Framework (SLF)[2], a framework created by Dr. Diana Woolis that identifies five core disciplines and levers for change in education: Purposeful Pedagogy, Systems Thinking, Looped Learning, Democratic Engagement, and Digital Inclusion. High-quality, holistic learning provides the base for our Purposeful Pedagogy, which situates teachers' practice within larger circles of research, evidence, and impact from the field and as shared knowledge co-created with practitioners. We are aware that a positive impact requires comprehensive solutions involving multiple levels and actors within the complex EiD ecosystem, an aspect of the project we address through a focus on Systems Thinking. In addition to reflection as part of Looped Learning, the project design focuses on teachers' deep and sustained involvement through communities of practice and in leadership roles, identified as Democratic Engagement in the framework. Finally, the development of information communication technology (ICT) proficiency among all teachers, the co-design of innovations, and the drive toward more connected, accessible professional learning pathways for educators in displacement speaks to our emphasis on Digital Inclusion.

At this phase of the QHL Project, the team seeks to identify the most adapted means and ways to allow teachers in displacement and other lower-resourced contexts to easily and equitably access and use the QHL professional learning resources. Hence, this report is not intended to provide an exhaustive landscape review of all open digital resources for TPD. Rather, we present a sample of initiatives and programmes with promise and from which we can learn, analysing their convenience and access limitations for teachers in displacement contexts. We also reflect

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[1] "Quality Holistic Learning". Childhood Education International. Accessed November 1, 2022. https://ceinternational1892.org/cpl/quality-holistic-learning.

[2] "Sustainable Development Goals". Childhood Education International. Accessed November 1, 2022. https://ceinternational1892.org/cpl/sustainable-learning/

on our experience working with teachers from different underserved contexts and with diverse skill sets. We conclude with a list of recommendations and good practices at different levels of the EiD ecosystem to ensure that access to quality digital TPD is available equitably, inclusively, and in a sustainable way.

Every educator, regardless of their role in the learning ecosystem, even in the most remote or challenging situations, should have easy access to quality professional learning content they can freely select from to enrich their classroom practice, support quality teaching and learning in their local context, and nurture their professional development. Additionally, every educator deserves to be able to connect with peers through virtual and local communities of practice to share resources and experiences and to grow mutually in a supportive network. Digital TPD can support both of these goals.

Many teachers in displacement contexts don't have this digital access, however; without it, they lose some of their professional autonomy. In the worst cases, they may have no digital access at all. In other cases, educators may not have either the personal know-how or a guide to find rich, diverse, and relevant training opportunities. If these obstacles can be overcome, digital TPD has the potential to both empower and equip educators and bridge gaps in knowledge, skill, and resources across the EiD ecosystem.

We build communities of practice and professional learning resources with this hope and promise in mind, calling upon everyone who cares about education equity and inclusion to work creatively, collaboratively, and with urgency to overcome the many challenges identified during the recent Transforming Education Summit, including cultivation of capacity to skillfully access and use digital resources through ICT skills training and improvement of electricity and digital infrastructure for global connectivity.[3]

Our work with QHL Project Fellows living in diverse, dispersed, and challenging contexts demonstrates some of the ways teachers can, and do, flourish with proper support, including through practices and processes that not only offer dignity, respect, and autonomy, but also start with a belief in their capabilities and contributions to the profession. We see teachers as learners and as leaders. They can show us the way forward, alongside the students and families they serve, to achieve more equitable, inclusive, and quality education systems. This study is an intentional step we take to best understand how we, and other actors, can offer opportunities for quality holistic professional learning at scale, so that we, and many others, can provide rich, sustained, responsive, and relevant professional learning for all teachers that is built by, with, and for them.

Rationale

Digital resources can help teachers pursue lifelong learning and adapt to ever-changing education needs. An increasing number of such resources are designed for multiple contexts and diverse uses, and can serve a broad range of learners. Other resources are developed with more localised or specific realities in mind. In either case, resources must be accessible and adaptable across countries, contexts, and educational settings to address the shifting demands educators face and to meet the unique needs of each learner in diverse EiD learning communities.

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[3] "Assuring and Improving Quality Public Digital Learning for All". United Nations. Accessed November 1, 2022. https://www.un.org/en/transforming-education-summit/digital-learning-all

With disruptions in education caused by crisis and displacement, including the recent COVID-19 pandemic, the need for access to such resources is even more urgent. Given that (1) almost 40 per cent of the world still does not have access to the internet[4] and (2) there is a wealth of online digital resources that could reach and serve these people, the purpose of this study is to help identify sustainable and scalable solutions to make digital TPD more accessible in displacement and lower-resourced contexts.

Experience and research over the past two years of lockdown suggest that simply providing devices and resources to students learning from home is not sufficient to support quality learning opportunities and maintain student engagement. In fact, the main determinant of quality education during the pandemic was digital access and (remote) pedagogical skills of teachers.[5] Additionally, research highlights the importance of trained teachers, mentors, and educators for effective ICT-supported learning in displacement contexts. Educators need adequate training and ongoing support to address pedagogical and technical issues.[6]

Digital learning and transformation was one of the action tracks at the Transforming Education Summit (TES), held in September 2022 at the United Nations in New York City. The summit highlighted the comprehensive global effort to ensure teachers are equipped with the knowledge, skills, and resources to use digital learning tools effectively.

It was noted that when teachers master technology, they become able to facilitate effective, evidence-based educational practices.[7] There is a need, the education leaders attending the TES emphasised, for content, capacity, and connectivity to ensure digital equity in education.

Audience

This report is not a systematic landscape review; rather, it is an introductory report where we reflect on our experience and then share information about relevant programmes and initiatives that provoke our thinking and push this conversation forward toward more equitable and inclusive digital TPD. We know that face-to-face training offers powerful opportunities to connect and learn, but that mode of TPD is not financially sustainable for most EiD systems nor is it scalable at the levels needed to reach *every* teacher globally and continuously, over the life of their career, so as to move all classrooms toward quality holistic learning outcomes for *every* child. Digital TPD holds this promise, a promise only realised if we all become more adept at reaching those teachers who are hardest to reach and, thus, often left out of professional learning opportunities.

We hope this report will benefit colleagues globally, and within specific, localised contexts, who aim to work virtually or in blended and connected formats with teachers and other educators in lower-resourced contexts. This report is for education leaders and practitioners who, like us, face technical and organisational challenges reaching *every* teacher or ensuring that *every*

[4] "Publications". The UN Specialized Agency for ICTs. Accessed November 1, 2022. https://www.itu.int/hub/pubs

[5] "Distance Learning and Teacher Training Strategies. Lessons from the Caribbean". International Taskforce on Teachers for Education 2030. Teacher Task Force. Accessed November 8, 2022. https://teachertaskforce.org/knowledge-hub/distance-learning-and-teacher-training-strategies-lessons-caribbean

[6] Tauson, M., & Stannard, L. (2016). *EdTech for Learning in Emergencies and Displaced Settings: A Rigorous Review and Narrative Synthesis*. London: Save the Children.

[7] "Thematic Action Track 4 on Digital Learning and Transformation Discussion Paper." United Nations Transforming Education Summit.New York, NY: United Nations. https://transformingeducationsummit.sdg4education2030.org/AT4DiscussionPaper

teacher in EiD settings has access to quality TPD. This report aims to guide our collective TPD efforts at local, national, and global levels.

This report also aims to inform programme designers, funders, and decision-makers about the different aspects and dimensions to be considered when designing effective and equitable supports for teachers despite their locations, connectivity status, or ICT skills. Designing and delivering equitable and accessible TPD requires a systemic approach that goes beyond quality content creation and sharing, involving—among other dimensions—ICT skills development, access to the internet, and teacher valorisation and empowerment.

Methodology

Our starting point was to identify existing good practices, as well as gaps, related to how entities (1) deliver digital TPD, (2) share resources and other OERs, and (3) co-create materials with teachers in displacement, with a focus on equity, inclusivity, and sustainability. We present, hereafter, a selection of contributions to digital TPD from international organisations supporting education in lower-resourced contexts, such as UNESCO, the World Bank, l'Organisation Internationale de la Francophonie (OIF) for French language resources and UNRWA for Arabic ones, and other large INGOs engaged specifically in EiD contexts. By focusing on the work of organisations with extensive reach and resources, we are hoping to understand issues of access and impact for programmes currently working at a decidedly global scale.

Unlike the Inter-agency Network for Education in Emergencies (INEE) *Distance Education in Emergencies Background Paper*[8], we limited our research to discoverable web resources focused on TPD with the idea that if our team was not able to identify or locate resources, it would be unlikely that educators with fewer resources and/or limited ICT skills could discover them either.

Prior to this targeted landscape review, however, we share learnings from our own TPD co-development process and the ways of working that we adopt in the QHL project as a starting point for reflection on digital TPD within a QHL framework, or with professional learning and personal growth and wellbeing in mind. This methodological consideration—which centres teachers' voices, experiences, and outcomes—is our lens for the landscape review and digital TPD recommendations that round out our analysis in this report.

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[8] "Background Paper Distance Education in Emergencies". 2022. New York, NY: INEE.
https://inee.org/resources/distance-education-emergencies-background-paper

Digital TPD Case Study: The QHL Project

We begin with a brief case study as a means of situating our team, surfacing our perspectives and biases, and making explicit our demands and hopes for digital TPD before turning to a larger landscape review and our recommendations for our own team and others working in, serving, influencing, and shaping the EiD ecosystem. As noted in the introduction, the Quality Holistic Learning (QHL) Project is a project started in 2021 that continues into 2023 and, we hope, well beyond. It is a project supported by a vibrant community of practice comprising teachers and other educators in Kenya, Lebanon, and Niger; consultants and staff members from around the world and of varied education, displacement, and leadership backgrounds; partners from local CBOs and NGOs as well as from INGOs and international collaborative working groups and collectives convened by project funders; and others. Teachers are the heart of the QHL Project community of practice, influencing design, delivery, evaluation, and next steps of the work. We start with their reflections.

QHL Project Fellows' Reflections

> *I have to note that the QHL project is the first and only one during which we have received months of mentoring on holistic learning and how to integrate social emotional and psychosocial learning in a displacement context. It has helped us deal with our daily challenges due to our new normal. Several teachers and administration staff have benefited from the QHL project through workshops our team has organised to cascade the knowledge we acquired during our mentoring.*
>
> - Educator in Niamey, Niger & QHL Project Fellow

> *I feel that I was lucky to find the time, energy, and motivation to keep moving forward. However, I know that others are not as lucky. So, it is our job, fellows and leaders, to empower teachers and equip them with the needed skills. This is the aim behind developing tools and online courses. These have been developed by us, the teachers, for the teachers. Teachers who live in the same context of struggle as other teachers. The tools aim to fill in the gaps that we teachers see in our communities, classrooms, and ourselves. These gaps include knowledge in SEL and its importance for our students and self-care for teachers that we are not aware of. These are addressed by the tools as they provide experiences and examples from our classrooms, written using our words and catering to our needs as teachers and students.*
>
> - Educator in Beirut, Lebanon & QHL Project Fellow/Consultant

> *I learnt and understood the importance of not only impacting knowledge to the learners as a teacher but also championing for the social emotional learning and psychosocial support of my students. Through the resources provided I was able to integrate these key aspects into my lesson plans and so far my students have shown extreme improvement not only in their performance but also in their interaction with one another.*
>
> - Educator in Kenya & QHL Project Fellow

> *Le projet AHQ m'a permis d'apprendre beaucoup de choses mais ce que je considère comme la chose la plus importante que j'ai apprise est la relation entre les émotions et la capacité à apprendre.*
> [The QHL project allowed me to learn a lot of things but what I consider to be the most important thing I learned was the relationship between emotions and the ability to learn.]
>
> - Educator in Niger & QHL Project Fellow

Why is our course different?

> *Most of the courses that we have in Lebanon are created by academics not educators in which they overlook the needs of the educators and learners. Most of the courses are just theories that can't be implemented in the classroom. Moreover, in times of crisis different approaches should be taken, this is where the need for our course emerged, from educators to educators with specific activities to be implemented in the classroom.*
>
> *Also the courses either have subject based activities or SEL/PSS activities alone, where our course gives specific methods of integrating SEL and PSS activities since not all educators can do SEL/PSS activities in the classroom due to many reasons (lack of time because of strikes……)*
>
> *What made me more excited about the course when I started implementing the activities in my classroom. I always thought that we don't have time for such activities, but after seeing the learners' joy and excitement I realised the huge positive impacts of such activities. The learners became more disciplined in the classroom and interested in studying English. Even I, as a teacher, became more energetic and enthusiatic after hearing their whispers while going back to the classroom.*
>
> - Educator in Saida, Lebanon & QHL Project Fellow

> *Mon cas est un exemple assez parlant avant de s'engager dans le métier de l'enseignement j'ignorais beaucoup de choses mais mes années d'expérience et surtout ma participation au projet sont venus combler les insuffisances que j'avais concernant l'apprentissage holistique de qualité ! Et fort de toutes ces compétences je deviens une sorte de référence et je partage à chaque fois que l'occasion se présente avec mes collègues dans le besoin !*
>
> [My own case is a fairly telling example. Before I became a teacher, I was unaware of many things but my years of experience and especially my participation in the project came to fill the gaps I had concerning quality holistic learning! And with all the skills I acquired through my participation in the project, I am at present a kind of a reference person and I share whenever the opportunity arises with my colleagues in need!]
>
> - Educator in Niamey, Niger & QHL Project Fellow

> *I gained much 1. Strategies to use to help students learn by themselves 2. How to handle learners kindly and motivate them 3. Learnt much about technology: zoom, google services like google docs, slides, drive, emails whatsapp,...*
>
> - Educator in Nairobi, Kenya & QHL Project Fellow

[We] are involved in decisions that are to take place. We are consulted and decide when and how our activities can be beneficial to all of us by giving some flexibility and accommodation of others' challenges to support one another with empathy. Strategies are put in place to treat every teacher with the esteem he/she deserves to feel a boost. We learn alone or in groups and work at our own pace to achieve our autonomy. We acquire many learning/teaching techniques with our learners, colleagues and fellows from daily routines, forums, weekly Zoom/class meetings, journalling, content sharing through teaching, games, Google applications, continuous communication by phone, WhatsApp, email and others. All these facilities help us become a friendly village of educators across the world.

- Educator in Kakuma Refugee Camp in Kenya & QHL Project Fellow

The fundamental competency of the teacher in displacement contexts is to be socially aware of the needs of the community, to also be able to understand the emotions of the learners. Unfortunately this holistic approach to education is still unknown to the majority of the educators or they do not master it at all here in Niger. This lack of knowledge and mastery blocks them from playing their role well.

In this sense, the training created through our project can be very useful. In my opinion, it will help save the schooling (prevent the drop out) of many children on the move. If a displaced student is poorly cared for, he or she would necessarily drop out of school. Good psychosocial and academic support will give these children every chance to pursue their education.

- Educator in Niger & QHL Project Fellow

QHL Project Processes

Forming the teacher fellow(ship) teams

The QHL Project core team started with recruiting teams of teacher fellows in 4 countries of focus—Lebanon, Kenya, Niger, and Chad—through local CBOs and NGOs, university teacher training programme networks, INGO networks, and word of mouth amongst teachers themselves. Teacher Fellows were recruited from diverse locations in each country, and were selected for their motivation to support students in displacement contexts and for their self-reported ability to participate in online TPD co-creation and facilitation activities. Efforts were made to create teams in each target country composed of both national and refugee-status teachers, with gender and rural/urban balance. Ultimately, we were unable to create a team in Chad and the team in Niger was largely limited to Nigerien national teachers living in Niamey or its vicinity. Teams in Lebanon and Kenya reflected greater diversity, partially due to the fact that, although still limited and a constraining factor, there was greater digital connectivity overall in these two countries as compared to Niger and Chad. From the hundreds of applicants, 20 educators were selected as fellows for the Spring 2021-Spring 2022 project period.

Co-creating TPD resources with the Teacher Fellows

Digital connection quality and access varied greatly between countries due to electricity cuts, felt most acutely in Lebanon, and limited Wi-Fi access across all contexts (see [Table 1](#), p. 19). Familiarity of the Teacher Fellows with ICT and EdTech tools was equally variable, and their ability to quickly familiarise themselves with and make use of new tools was proportional to their routine use of and access to online resources prior to involvement in the QHL Project. Familiarity and prior experience with digital TPD clearly influenced their choices when we discussed the format of the resources to be co-created. Although the three country-based teams decided to work on the same topic (PSS-SEL), the Lebanese team opted for an online course, the Kenyan team preferred to develop a handbook to be used in teacher circles and blended training settings, and the Nigerien team preferred to design materials for use in face-to-face, offline, workshops.

The same pattern was also visible in the relative autonomy of the groups. The Teacher Fellows in Lebanon were most likely to self-organise and interact regularly outside of scheduled project meetings to discuss and work on TPD curriculum development tasks. Fellows in Niger and Kenya needed more guidance due to less familiarity with digital TPD and virtual collaboration or co-creative processes. In the end, the tacit and expert knowledge of every QHL Project Fellow was built upon to create a suite of resources for online, offline, and blended study focused on social and emotional learning (SEL) and psychosocial support (PSS).

Pilot testing, evaluating, revising, and publishing

Fellows in Lebanon, Kenya, and Niger organised, facilitated, and supported pilot testing of the resources they created (an online course, a handbook, and workshops, respectively) in their local communities and, in some cases, in their countries or regions more broadly. One of the project consultants also piloted materials in Chad through a collaboration with implementing partners operating in the refugee camps across Chad. Data and feedback from the pilot activities were reviewed by the Project Fellows, consultants, and staff, and then revisions were made to the materials before publishing. Following are some specifics from each country-context that speak to both the challenges and opportunities digital TPD presents in displacement and lower-resourced settings.

Lebanon

In Lebanon, the online course created by Teacher Fellows was piloted twice, in bilingual (English and Arabic) versions each time. The first cohort included teachers from two sites (Bekaa Valley and Beirut) working for Jusoor, a partnering NGO that provided access to computer labs and embedded professional learning time as support for participating teachers. Teacher Fellows, as pilot course facilitators, organised Zoom sessions and moderated WhatsApp groups to closely support the participants and engage them in discussions and activities. As the teachers in Bekaa were sharing the same slow connection, however, Zoom became dysfunctional; therefore, a co-located fellow moved the meeting to a face-to-face format, while the teachers in Beirut continued to use Zoom for weekly sessions. The second pilot was open to all across Lebanon (with some educators joining from Jordan, Syria, and Yemen). The design was to work largely asynchronously using the LMS forum features; however, the facilitators and participants found WhatsApp and Zoom to be important supporting spaces. The live Zoom sessions were especially helpful for discussing implementation experiences, hopes, and challenges. A PDF of the course was provided to participants for offline study, which eased the strain of limited electricity and Wi-Fi access. For these pilots, we underscore the adaptations made to support learners in blended formats and with various technologies, made possible thanks to the full engagement, creativity, and autonomy of the facilitators. What was originally envisioned as a largely asynchronous online course was, ultimately, delivered using multiple channels—both synchronous and asynchronous—to respond to the participants' needs and aspirations.

Kenya

Project Fellows in Kenya coordinated two pilot activities in the form of virtual teacher learning circles (TLCs). These professional learning communities were composed of colleagues from Kakuma and the Jamhuri Estate area of Nairobi, in the first instance, and a team of teachers from partnering schools in Nairobi (Rusinga Schools and Desai Memorial School), in the second formation. Each cohort was provided a PDF copy, via WhatsApp and/or email, of the *Holistic Learning Handbook* created by the Project Fellows in Kenya. Fellows facilitated weekly meetings with participants to discuss sections of the handbook, including implementation successes and challenges. WhatsApp provided an asynchronous discussion channel for the TLCs, but most of the discussions happened in live Zoom meetings. Fellows modified timelines and methods in response to participants' technology access, experience levels, questions, and learning goals. Participants were invited to contribute ideas for revision of the handbook, making it a much more robust and responsive tool for professional learning. Google Docs were shared by participants, with new information, and the entire handbook was co-written, revised, and styled

in Google Docs. Learning how to use both Google Docs and Zoom was a meaningful aspect of professional learning for many of the Project Fellows in Kenya.

Niger

In Niger, the Teacher Fellows' aim to pilot a large-scale, 4-day workshop across Niamey with ministry support was not possible to realise within the available time frame and project budget. Eager to pilot the material, however, the team offered a shortened version of the workshops during a weekend to their colleagues. The workshop slide decks were made available to the participants in both electronic and printed formats. As there was no internet in the meeting room, all the multimedia sequences were downloaded and shared with the Teacher Fellows for local use in their workshop facilitation. Initially, the participants were seated in small groups to engage with some of the training activities. On the second day, a power cut occurred in the meeting room, and the principal allowed the group to use his office. Although it was not possible to work in groups in this office setting, the facilitators managed to deliver most of the planned material and to engage their colleagues, who stayed for a couple of hours beyond the set end of the training. Though the workshops themselves were delivered offline, they were created by the Fellows in an online community of practice and are being shared virtually as well.

Chad

It was not possible to develop a team of Teacher Fellows to lead the work in Chad due to severe limits in digital access. Rather, the materials created with Fellows in Niger were tested in partnership with United Nations High Commissioner for Refugees (UNHCR) and Jesuit Refugee Services (JRS) colleagues in Chad, with both remote facilitation by a QHL Project consultant and local support from NGO staff. The participants were experienced Sudanese refugee teachers living in the East of Chad. They travelled long distances to gather in two separate sites where electricity and connection were supposed to be guaranteed. The 3-day training was intended to familiarise the participants with the materials in the 4 workshop slide decks and to introduce them to participatory facilitation practices, with the hope that they would then be able to conduct training for their peers in their schools. In short, it was a training of trainers model. Participants expressed excitement about engaging in a remote training. They revealed that this was the first time for them to interact with a trainer at a distance. Workshop materials were sent ahead of time to JRS to allow the teachers to study prior to the convening. A WhatsApp group was created including most of the participating educators (a few didn't have a smartphone). The training was supposed to be delivered over Microsoft Teams, and centre coordinators planned to facilitate delivery and communication with the trainer on a separate WhatsApp channel. The quality of the connection fluctuated greatly during the training, and it was often impossible to connect with both centres at the same time. The interactions then moved to WhatsApp, but the trainer faced challenges as the teachers seemed unfamiliar with WhatsApp for professional uses. Despite all the challenges, the teachers continued to be engaged and motivated until the end of the 3-day convening. They returned to their camp locations with resources to share. It has not been possible, however, to gather insight on their turnkey training activities.

A QHL app

Project staff also worked with Fellows and graduate students to adapt a public health app platform for educational purposes. This prototype mobile app allows teachers to assess their own wellbeing as well as monitor SEL and wellbeing among students and adjust their lessons and pedagogical methods accordingly. Teachers can perform daily check-ins using the teacher check-in feature, and they can assess students in the areas of self-efficacy, communication & collaboration, critical thinking & problem solving, and learning how to learn. The application also provides teachers with a brief database of contextualised resources for their continued professional learning and wellbeing support. This app was piloted with small groups of in-service teachers, from across the target countries, who expressed interest in this tool to track student progress as well as changes in wellbeing. The use of the application was limited, however, in the pilot period due to the short duration of the pilot and, most especially, due to high data costs and electricity shortages making even the downloading of the app challenging for many.

Dissemination and uptake of QHL resources

Project Fellows have also been active members of the project in terms of helping to share and support use of the QHL OERs after their publication. In Fall 2022, Project Fellows, consultants, and staff worked to share the materials locally within their personal and professional networks. They have also shared them with NGO and ministry staff members in Lebanon, Kenya, and Niger. UNHCR and the education clusters in Niger and Chad have supported efforts to increase awareness of the OERs in that region. Project Fellows have created workshops and have hosted meetings to help people know about the many different resources, their potential use, implementation supports such as facilitation guides, and also tips for implementation from their own experience. They are also, in some instances, leading TPD events in their organisation or local context.

Lessons Learned

Overall, the ways of working that the QHL project embraces allowed the majority of Project Fellows during the first phase of the work to further develop their existing leadership skills and become more confident exploring and manipulating digital tools for collaboration and for their own pedagogical practice. They now feel equipped and empowered to present in online events and conferences, to share resources digitally with their colleagues, to co-write blogs and other materials in Google Docs, and to facilitate team meetings on Zoom and in other channels and platforms. They are engaging more often in local and global community actions, especially as related to transforming education and uplifting colleagues and learners alike. We have come to understand that project-based learning (such as this QHL Project-based TPD co-creation work we engaged in with Fellows) supports learning and knowledge sharing on many levels: in pedagogical competencies, digital fluency, and transformative leadership. Below, we share some of the most important lessons we learned from working remotely with teachers living in lower-resourced, displacement, and crisis contexts.

Challenges can be overcome with empathy and by availing more time for everyone to contribute. Logistical challenges and limitations, such as severe electricity shortages in Lebanon, personal security concerns in Kakuma camp, limited connectivity, and the need for more guidance with digital tools, taught the team to be patient and flexible in order to accommodate the constraints and needs, while building upon the talents and hopes, of each member in this community of practice.

The quality and cost of digital connectivity are very important factors that clearly influence **ICT proficiency and confidence** of educators in displacement and lower-resourced contexts. When teachers and learners have easy and ubiquitous access to the internet, they gradually familiarise themselves with diverse ICT tools and become more adept at researching, creating content, and sharing knowledge online. Project timelines must include sufficient time for teachers to master the digital tools in use. Additionally, partnerships must be formed to provide digital access and support for participants within their local contexts. The QHL team is grateful to local partners, such as Jusoor in Lebanon, Inzone in Kakuma Camp in Kenya and Azraq Camp in Jordan, and UNHCR and JRS in Chad, who hosted pilot activity participants in computer labs and in spaces with shared electricity and Wi-Fi access.

Digital devices in EiD vary in quality and age. Teachers may own or have access to older devices with limited capabilities. They may be unable to use the most recent versions of some apps, for instance, or may struggle to open PDFs on their mobile phone. Multimedia content can be difficult to download or view, because of data costs but also because of device capabilities. This should be considered in design and dissemination strategies.

Translanguaging and use of multiple language supports throughout the life of a project is vital. The language(s) of collaboration can present a barrier to full participation, especially, as in our case, when the shared working language is English and participants have varying levels of proficiency and comfort using the English language. Additionally, many OERs and research tools related to the project topics are in English. Multilingual supports, including many that are increasingly accurate in their translations and are open source or embedded in

common digital workspaces, can partially overcome language barriers. Quality, fully inclusive, multilingual practice, however, requires additional effort, time, and coordination and must be accounted for in project timelines and budgets.

Many teachers are ready and eager to learn and to lead in their local contexts, as well as on the global stage. Recognizing that the educators we are working with in the QHL Project are extraordinary in many ways, we also note that they represent a powerful segment of the teacher workforce—deeply committed to their profession, determined to improve their pedagogical methods, and networked and connected within their regions and countries, as well as around the world. They are members of various groups, associations, training teams, and networks. They are willing to share their experiences, their knowledge, and their visions for education. The QHL Project has revealed that even in the lowest-resourced contexts and during the most challenging times (COVID-19 pandemic, lack of electricity, government unrest, lack of regular compensation, etc.), there are teachers who show up as lifelong learners and as leaders in their communities and across the world.

Accreditation and recognition by national education systems is a great incentive for teachers, including refugee teachers, to attend and complete TPD programs. Having the support of ministries of education, university teacher preparation programmes, and, in some EiD contexts, UNHCR adds to the credibility of any offered training. Globally, all participants in QHL Project courses, workshops, or learning circles were eager to receive a certificate, even if only from our non-profit organisation. Some teachers also expressed interest in micro-credentials developed as part of the QHL Project. Ideally, these would be recognized within university and national certification systems or pathways.

Incentives and/or cost reimbursement are also strong motivations for participation and, in some contexts, a seeming pre-condition for teachers to join a professional learning activity. Food, transportation fares, data bundles, printing costs, and compensation for time were all requests teachers made in relation to TPD, whether online, blended, or offline in format. Implementation teams must account for these needs in their budgets and/or plan with partners to meet such needs as part of attending to teacher compensation and wellbeing concerns pervasive in the EiD sector.

Localised knowledge of the national education ecosystem is important to engage with teachers for co-creation and then for dissemination and uptake of digital TPD OERs.

Global Readiness for Digital TPD in EiD?

Global Connectivity

Citing the most recent data from 2021, the International Telecommunication Union (ITU, 2022)[9] reports that approximately 95 percent of the world's population is covered by a mobile broadband network of 3G or higher, with 63 percent of the world's population—or about 4.9 billion people (ITU, 2021)[10]—using the internet. While this is a significant leap since before the COVID-19 pandemic, approximately 2.9 billion people still do not have access to the internet. These statistics are much lower in Africa, where only 82 percent of the population has broadband coverage and only 33 percent of people are accessing the internet. ITU's 2022 report highlights five areas for improvement to address gaps in connectivity: infrastructure, affordability, digital skills, devices, and safety and security.

Table 1. World Bank Digital Development Indicators[11] and UNICEF Remote Learning Readiness Index[12]

Country	Access to electricity (% of population)	Fixed broadband subscriptions (per 100 people)	Mobile cellular subscriptions (per 100 people)	Individuals using the Internet (% of population)	Remote Learning Readiness Index
Global Total	90.5	15.89	106	60	-
Lebanon	100 (not at present)	6.33 (18.08 in 2014)	63	84	NA
Kenya	71.4	1.25	114	30	★★★★
Niger	19.3	0.05	59	10 (2018)	★
Chad	11.1	0	53	10	★★

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[9] "Global Connectivity Report 2022". 2022: Geneva, Switzerland. International Telecommunication Union (ITU). https://www.itu.int/hub/publication/d-ind-global-01-2022/

[10] "Facts and Figures". 2021: Geneva, Switzerland. International Telecommunication Union (ITU). (2021). https://www.itu.int/en/myitu/Publications/2021/11/25/14/45/Facts-and-figures-2021

[11] "Data Indicators". The World Bank. Accessed November 2, 2022. https://data.worldbank.org/indicator?tab=all

[12] "Remote Learning Readiness Index Dashboard". UNICEF. Accessed November 2, 2022. https://data.unicef.org/resources/remote-learning-readiness-index-dashboard/

Table 1 shares World Bank Digital Development Indicator values for the QHL Project focal countries, as a snapshot of conditions in varied EiD contexts. It also includes the Remote Learning Readiness Index, a new index introduced by UNICEF in 2021 that measures countries' readiness to deliver remote learning in response to disruption of in-person learning. The index is composed of three domains: households, government's policy response capacity, and emergency preparedness of the national education sector. The index ranks countries' performance, with countries at the top receiving five stars and those at the bottom receiving one star.

Giga, a UNICEF and ITU joint initiative, is one response to these digital gaps or inequities, with a focus on educational access. This effort aims to connect every school to the internet by 2030.[13] The initiative maintains an open source "Project Connect" map of school locations and internet coverage that is updated weekly. At the time of writing this report, in October 2022, only information about Niger was available and it indicates that 100% of the schools didn't have access to the internet.[14]

Emergent Online/Offline Solutions for Low-Connectivity Settings

The COVID-19 pandemic accelerated implementation of online learning and professional development programs, but even prior to the pandemic, many countries were investing in remote learning and EdTech. For example, according to a UNHCR report on EdTech in Uganda, there were 36 national EdTech solutions or projects offered by 29 organisations in 2019[15]. Many online learning programs attempt to accommodate teachers and students with low-bandwidth connections. Nevertheless, there are still spots in the world where connectivity doesn't exist at all, or the bandwidth is so limited that even a Moodle site does not work well on mobile devices. For instance, we invited a group of refugee teachers in Chad to consult the TESSA website in Arabic (described later in this paper) and many of them reported that they were not able to view the site on their devices, perhaps due to slow connections.

TESSA is hosted on a Moodle platform, an open-source learning management system (LMS), more adapted to lower-bandwidth settings than some other LMSs, but there remains a need to provide offline access in contexts similar to the remote, very low to no connectivity refugee camp settings in Chad. Moodle offers offline learning capabilities within its app, but teacher support and access to a network are needed to orient the users, teach them how to download the Moodle app, demonstrate how to access training materials, and practice interacting and making full use of the app.

There are other technologies that support offline access to digital resources, including:

- **Moodlebox**, a portable Moodle server that creates a local area network that learner devices can connect to.[16]

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[13] "Giga at UNGA 2022". United Nations International Children's Emergency Fund. Accessed November 2, 2022. https://giga.global/

[14] "Project Info-Niger". Project Connect. Accessed November 2, 2022. https://projectconnect.unicef.org/map/country/ne

[15] "Mapping EdTech in Uganda, 2019". EdTech Task Team of the Education in Emergencies Working Group in Uganda.

[16] "Moodle Rasberry Moodlebox". Moodlebox. Accessed November 2, 2022. https://moodlebox.net/en/

- **Moodle App,** which allows online/offline access to any online Moodle platform through a learner's mobile device.[17]

- Affordable servers such as **Kolibri** and **RACHEL,** which avail many OER repositories and have features to enable offline access and exchange (described more fully later in this report).

- **Learning Passport**, a platform created by UNICEF (described later in this report)

- **BeekeeBox,**[18] a portable device for blended and online/offline learning that intends to combine the concepts behind Moodlebox and Kolibri (more in a later section).

The EdTech Global Landscape Analysis[19] mentions **mesh networks** as promising local connectivity solutions for rural areas and small villages. In mesh networks, any mesh point can send data to any other mesh point using intermediary nodes as a relay, which means that at least interactions among learners in the same location can be supported and peer-learning can take place. Projects using this technology are already expanding to underserved neighbourhoods in the USA.[20]

Options when connectivity lacks

Where online training is not possible, a solution is likely to involve a patchwork of different approaches from a variety of contexts. Teacher trainers can use popular social media platforms, messaging services, SMS texting, and voice calls to keep in touch with participants in TPD activities. Additionally, teachers in the same community can form teacher circles and develop peer-support with local or remote mentoring structures. Teachers may be able to download materials at a community computer lab and then share the printed resources. Teachers in lower-resourced contexts are resourceful and increasingly adept at finding a way to access materials online when they (1) need them, (2) know that they exist and how to find them online, and (3) believe that those resources can make a difference in their professional learning, their classroom practice, and, ultimately, their students' outcomes, as evidenced by the QHL Project Fellows and the experiences they shared and demonstrated in relation to digital learning and knowledge sharing online.

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[17] "Online Learning: What Can You Access Offline?" Moodle. Accessed November 2, 2022. .https://moodle.com/news/online-learning-can-access-offline-welcome-moodle-mobile-3-1-3/

[18] "What Is the Beekee Box?" Beekee Box. Accessed November 2, 2022. https://beekee.ch/beekeebox/

[19] "The EdTech Global Landscape Analysis: Trends from the Present and Near Future of Technology-enabled Learning". Handshake & IRC, 2021. https://rescue.app.box.com/s/cuvhsseao34myc2kf56e2j1ryrfnh7h9

[20] "About Meta Mesh". Meta Mesh. Accessed November 2, 2022. https://www.metamesh.org/

Low-tech Digital TPD Resources

Teacher professional development (TPD) is one of the pillars of providing QHL opportunities to every child, regardless of their life circumstances, worldwide. Unfortunately, teachers have varied access to initial and continuous TPD that is contextualised and relevant to their learning communities, especially in lower-resourced and EiD contexts. For instance, a 2022 policy brief[21] by UNESCO's Teacher Task Force focused on TPD in Africa during the COVID-19 pandemic indicates that access to training on the use and delivery of distance learning tools varied widely across the continent. Likewise, many teachers did not have access to professional development opportunities to improve their ability to best support the learning needs of vulnerable children. This report is just one of many that underscore limitations teachers faced in accessing timely, relevant, and necessary TPD during the COVID-19 pandemic. These inequities in TPD access and quality are not unique to the pandemic, however, and are exacerbated by differential access to online tools and digital TPD.

Global IT companies, such as Alphabet, Google, and Microsoft, provide training on their products that can help improve teacher ICT proficiency. For instance, Google provides online training on its products through its Google Workspace Learning Center[22] and Google Cloud Skills Boost.[23] Also, there are multiple OER repositories, such as Merlot[24] or Thot,[25] that assume a consistent connectivity and/or provide fee-based services and content. Other organisations, such as Pro Futuro Foundation, provide teacher training materials and online courses in different languages, targeting teachers, including those in refugee and displacement contexts, in Africa and Asia.[26] The main challenge to accessing these courses is that they require robust internet services and good digital navigation skills. In brief, there are digital TPD opportunities offered by public and private sector actors, but not all are easily accessible in lower-resourced settings.

This report does not focus on such resources and repositories, as they are not adapted for the lower-resourced and displacement contexts that we are aiming to support in our work. Many of these resources require a strong, reliable Wi-Fi connection and assume that learners are fluent with navigating the web, able to search through large catalogues of information to find what they need. Rather, in the next section of this report, we share a few platforms offering OERs that are most adapted for use by teachers in lower-resourced contexts, with a focus on platforms for teachers in Sub-Saharan Africa and the MENA regions. As a reminder, there exists an abundance of OER resources to support children and youth as learners. Our focus is on OERs, and specifically on easily accessible digital TPD, for *teachers as learners*. We present some

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[21] "Policy Brief: Teacher Training and Support in Africa During the Pandemic". 2022. Abidjan, Côte d'Ivoire: Association for the Development of Education in Africa.
https://teachertaskforce.org/sites/default/files/2022-02/policy_brief_teacher_training_and_support_0.pdf

[22] "Google Workspace Learning Center". Google. Accessed November 2, 2022.
https://support.google.com/a/users#topic=11499463

[23] "Google Cloud Skills Boost". Google. Accessed November 2, 2022. https://www.cloudskillsboost.google/

[24] "Smart Search". MERLOT. Accessed November 2, 2022. https://www.merlot.org/merlot/

[25] "Online Training and Digital Culture". Cursus. Accessed November 2, 2022. https://cursus.edu/fr

[26] "Resources". ProFuturo. Accessed November 3, 2022. https://profuturo.education/en/resources-teachers

digital TPD tools and organisations supporting digital TPD in alphabetical order for easy reference, followed by a dedicated section on OERs.

Kaya

Kaya[27] is an online learning platform managed by the Humanitarian Leadership Academy. It offers a space for a variety of organisations to deliver free online courses that support stakeholders involved in humanitarian contexts. The platform offers about 60 education-related online courses for teachers[28] designed by INGOs, including courses specific to education in emergencies (EiE). It allows participants to download a digital certificate upon course completion. It is designed for use on all types of digital devices and in multiple languages. It also has an app that allows for offline study after a course has been downloaded.

Kolibri

Kolibri[29] is an open-source educational platform and toolkit designed by Learning Equality to provide offline access to a wide range of OERs in low-resource contexts.

The platform is built to run on a lightweight local server using affordable hardware, with a growing library of OERs, learning management tools, and tools to curate and adapt content to the local curriculum. At present, the library offers 130 collections that can be browsed online to identify which are best suited for a specific learning context and needs.[30] The main focus of the organisation is to align resources to national curricula in the target countries where Learning Equality partners with UNHCR [31] and national ministries of education to provide learning resources through local hubs. Through these partnerships, Learning Equality provides a training toolkit[32] for teachers to help them properly use the Kolibri platform to support students.

Current collections are primarily oriented to students, including many OER collections described elsewhere in this report. Currently, there are very few resources dedicated to teachers and TPD on Kolibri. At the time of this report development, only two TPD collections were identified on Kolibri: the first is a portable version of TESSA materials (described elsewhere in this report) and the second is a version of "A Guide to Becoming a 21st Century Teacher" from PointB.[33]

Beekee Box

Beekee Box[34] is a comprehensive solution providing affordable and portable hardware to create a local network even where the internet is not available, providing access to content through platforms like Moodle and Kolibri (see below), in addition to collaboration and communication

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[27] "Course Topics". Kaya. Accessed November 3, 2022. https://kayaconnect.org

[28] "Catalogue". Kaya. Accessed November 3, 2022. https://kayaconnect.org/local/catalogue/index.php?query=teacher

[29] "Get Started". Kolibri. Accessed November 3, 2022. https://learningequality.org/kolibri/

[30] "Kolibri Studio". Kolibri. Accessed November 3, 2022. https://studio.learningequality.org/en/channels/#/public

[31] "UNHCR Education Report 2021. Staying the Course. The Challenges Facing Refugee Education". 2021. Geneva, Switzerland: UNHCR.

[32] "Kolibri EdTech Toolkit". 2021. San Francisco, CA: Learning Equality. Kolibri EdTech Toolkit Google Folder

[33] "A Guide to Becoming a 21st Century Teacher". Pointb. Accessed November 3, 2022. http://www.pointb.is/21csguide#introduction

[34] "What Is the Beekee Box?". Beekee Box. Accessed November 3, 2022. https://beekee.ch/beekeebox/

apps that can be used to promote engagement and interaction. On its website, Beekee Box developers describe it as a digital classroom or portable device that supports blended and collaborative learning using digital content and allowing interactive face-to-face training sessions anywhere and without Internet connection.

RACHEL

RACHEL stands for Remote Area Community Hotspot for Education and Learning. It is a server/router that hosts offline OERs, such as Khan Academy, Wikipedia, Project Gutenberg, and others, via Wi-Fi. RACHEL allows learners to use their devices to access educational content via the RACHEL server,[35] including many OER repositories described elsewhere in this report.

OER Commons

OER Commons[36] is a public digital library with over 56,000 searchable OERs that support teaching and learning. Resources are housed in institutional hubs, microsites, and thematic collections and made available through the OER Commons. Most of the hubs are managed by institutions in the USA, with a few hubs oriented to other regions around the world. At the time of writing this report, we only identified the UNESCO ICT Competency Framework for Teachers (ICT CFT)[37] hub as serving educators from Sub-Saharan Africa and the MENA region. A fine-tuned search tool allows one to search for resources to support TPD on diverse topics, including ICT for education, STEM, literacy, language teaching, classroom management, and much more. It does offer content in languages other than English, but much of the current content is in English.

Arabic OER Commons

A dedicated microsite for Arabic resources is available.[38] The number of resources is limited (440 at the time of writing this report) and many of the explored examples only had Arabic titles while the resources themselves were in English. Additionally, there is a separate hub for ALECSO, the Arabic body coordinating UNESCO actions in the Arab League countries. Very few resources are available through this hub, mainly training materials from the UNESCO ICT CFT initiative.[39]

OER Africa

The OER Africa[40] initiative was established in 2008 to bring together African OER practitioners and institutions to promote the use of OER in improving teaching and learning across the African continent. Although the network's website doesn't offer a large OER repository, a number of courses on the website are of interest in Africa, as are some useful research publications. OER Africa focuses on higher education, and it offers a number of resources and

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[35] "RACHELI". WorldPossible. Accessed November 3, 2022. https://rachel.worldpossible.org/

[36] "Explore, Create, Collaborate." OER Commons. Accessed November 3, 2022. https://www.oercommons.org/

[37] "UNESCO ICT Competency Framework for Teachers". OER Commons. Accessed November 3, 2022. https://www.oercommons.org/hubs/unesco

[38] "Welcome to OER Commons Arabic". OER Commons. Accessed November 3, 2022. https://arabic.oercommons.org/

[39] "Republic of Tunisia". OER Commons. Accessed November 3, 2022. https://www.oercommons.org/groups/republic-of-tunisia/1563/

[40] "About Us". OER Africa. Accessed November 3, 2022. https://www.oerafrica.org/

courses in teacher education.[41] Additionally, since 2018, OER Africa has been hosting open courses developed in the Partnership for Enhanced and Blended Learning (PEBL) Project, a collaborative project to develop blended learning courses with university partners in English-speaking countries across East and West Africa.[42]

OpenLearn Create - Africa

OpenLearn Create[43] is an open educational platform where individuals and organisations can publish their open content, courses, and other OERs. The platform uses Moodle and has tools for collaboration, reuse, and remixing. It also supports Open Badges.

OpenLearn Create is managed by the Open University in the UK. The site indicates that approximately 3.4 million visitors a year access it.[44] We note that the largest collection at OpenLearn Create Africa, TESSA (described below), supports research and reporting, with reports going back more than a decade.[45] Most of the courses on OpenLearn Create are organised as part of public collections, which appear to be updated from time to time. Here are three examples, in brief:

- **Teacher Education in Sub-Saharan Africa (TESSA)**[46] is an international research and development initiative that brings together teachers and teacher educators from across Sub-Saharan Africa. It offers a range of OER materials in four languages, contextualised for different countries, to support school-based teacher education and training.

- **Teacher Training Education in Uganda**[47] is a recent collection that, at present, contains two introductory-level courses: General Teaching Methods and Technology Enhanced Learning.

- **Teacher Educator Programme: Skills for 21st century teaching and learning**[48] is a course designed to help teacher educators guide teachers on how to use ICT to support learning and develop new teaching and learning approaches that are 21st century relevant.

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[41] https://www.oerafrica.org/african-teacher-education-network

[42] "Partnership for Advanced and Blended Learning". OER Africa. Accessed November 3, 2022. https://www.oerafrica.org/partnership-enhanced-and-blended-learning-pebl

[43] "Open, Learn, Create". The Open University. Accessed November 3, 2022. https://www.open.edu/openlearncreate/

[44] "Open Educational Resources at the Open Library." The Open University. Accessed November 3, 2022. https://www.open.ac.uk/about/open-educational-resources/openlearn-create

[45] "Research". Teacher Education in Sub-Saharan Africa. Accessed November 3, 2022. https://www.tessafrica.net/research

[46] "Teacher Education in Sub-Saharan Africa". The Open University. Accessed November 3, 2022. https://www.open.edu/openlearncreate/course/index.php?categoryid=47

[47] "Teacher Training Education Project Courses." The Open University. Accessed November 3, 2022. https://www.open.edu/openlearncreate/course/index.php?categoryid=515

[48] "Teacher Educator Programme: Skills for 21st Century Teaching and Learning". The Open University. Accessed November 3, 2022. https://www.open.edu/openlearncreate/course/view.php?id=5757

French-language TPD & OER Platforms

Large OER repositories in French don't seem to exist like they do in English. Many French-speaking institutions offer OERs, but it is not easy to identify them as such and it is not always clear if they can be used in lower-resourced contexts.[49] [50] For instance, La FabriqueREL is a joint project between three Canadian universities with the objective to support educators in the creation of OERs. The website provides links to 128 resources that were created under the guidance of FabriqueREL and that address diverse topics in a variety of formats.[51]

IFADEM

L'Initiative Francophone pour la Formation à Distance des Maîtres (IFADEM) is a joint initiative of OIF and the Agence Universitaire de la Francophonie (AUF) that works with local educators in countries seeking the support of the initiative to create remote TPD in French. All IFADEM resources are available online for download as booklets and on a Moodle platform with additional audio resources. Most of the training modules were published in 2012.[52] During the pandemic, IFADEM launched a number of online facilitated trainings based on existing training programs in four countries, including Niger.[53] As IFADEM generally works in countries with low connectivity, the resources are designed to be accessible on mobile phones.

Arabic-language TPD & OER Platforms

As mentioned earlier, an Arabic OER Commons website offers about 440 resources at the time of writing this report. No other Arabic-language OER repositories were identified. There are, however, a growing number of teaching and learning platforms in Arabic, some of which provide TPD. We describe three examples below.

CRDP

The Lebanese Centre for Pedagogical Research and Development (CRDP) provides a good number of training resources related to projects the centre conducts with partner organisations; however, there is no easy way to search the available resources.[54] The centre also manages a platform of curriculum-aligned educational resources to be used for teaching and learning in three languages, but the platform seems to be still under development and was not mentioned on the main CRDP website at the time of writing this report. It was, in fact, brought to our attention by one of the QHL Project Fellows in Lebanon.[55] This brings forward the question of referencing and discoverability of

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[49] "Trouver des Ressources éducatives libres (REL) en français". University of Montreal. Accessed November 3, 2022. https://bib.umontreal.ca/guides/types-documents/rel?tab=5227489

[50] "Répertoire des dépôts d'objets d'apprentissage et ressources éducatives libres (REL)." THOT Cursus. Accessed November 3, 2022. https://cursus.edu/fr/9707/repertoire-des-depots-dobjets-dapprentissage-et-ressources-educatives-libres-rel

[51] "REL Disponibles". Fabrique REL. Accessed November 3, 2022. https://fabriquerel.org/rel-disponibles/

[52] "Ressources éducatives". IFADEM. Accessed November 3, 2022. https://ifadem.org/fr/ressources-educatives and https://moodle.ifadem.org/

[53] "Bienvenue sur IFADEM 100% en ligne". IFADEM. Accessed November 3, 2022. https://www.ifademenligne.org/

[54] "Projects". CRDP. Accessed November 3, 2022. https://www.crdp.org/projects

[55] "Mawaridy". CRDP. Accessed November 3, 2022. https://mawaridy.crdp.org/

resources on the global level. Refugee teachers, learners in non-formal education centres inside Lebanon, and educators outside Lebanon might benefit from these resources if they were more accessible and had greater visibility.

Edraak

Many Arabic-speaking teachers are aware of the Jordanian MOOC Platform Edraak,[56] an initiative of the Queen Rania Foundation that offers multiple TPD courses, in both Arabic and English, tailored to the needs of teachers in the MENA region. For example, Edraak offers a specialised course on "Education Technology: Principles, Strategies, Applications"[57] and, in partnership with the University College of London, offers courses for teachers in conflict and crisis zones, such as "Educators for Change."[58] A drawback, at least for lower-resourced contexts, is that the platform requires a good connection, as the learning materials often include instructional videos.

Kodrat & Tarbiyah21

In Spring 2021, the UNESCO Beirut office launched Kodrat,[59] an online platform serving as an Arabic-language distance learning resource for teachers. Simultaneously, the office launched a community of practice for the educators in the Arab World under the name Tarbiyah21.net.[60] At the moment, the link leads to a community that is maintained by a private administrator under the name http://www.tashbeeknb.net/. This platform provides links to education-related websites and allows educators to share their own materials and resources, including TPD resources, but there is no search tool to browse the available resources, and it is not clear how these resources are vetted or by whom.

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[56] "About Us". Edraak. Accessed November 3, 2022. https://www.edraak.org/en/about-us/

[57] "Educational Technology: Principles, Strategies and Applications". Edraak. Accessed November 3, 2022. "https://www.edraak.org/programs/specialization/edtechsp-vv1/

[58] "Educators for Change". Edraak. Accessed November 3, 2022. https://www.edraak.org/en/programs/course-v1:UCL+EFC101+2020_T1/

[59]"Distance Training for Teachers and Educators in the Arab World". Kodrat-UNESCO. Accessed November 3, 2022. https://www.kodrat-unescoregional.com/

[60] "Early Childhood Care and Education". Tarbiyah. Accessed November 3, 2022. https://tarbiyah21.org/ provides a communication platform that was announced in 2021.

Global INGO Interventions

UNESCO

Across its many offices and initiatives, UNESCO addresses the use of EdTech, creation and dissemination of OERs, the changing role and place of teachers, and their professional development in seemingly separate tracks. Below are brief descriptions of some of UNESCO's contributions related to providing access to digital TPD.

Promoting Open Educational Resources

UNESCO supports OERs as part of its larger focus on Open Solutions in the communication and information domain. It advocates for implementation of the 2019 Recommendation on Open Educational Resources, and promotes the mainstreaming of OER practices into policies and strategies across the education ecosystem.[61]

UNESCO ICT Competency Framework for Teachers

The ICT CFT[62] is a framework developed by UNESCO to define the ICT competencies every school teacher should master for effective teaching and learning. The framework was first published in 2008. The current version, Version 3, was published in 2018. It identifies 18 ICT competencies organised into six aspects and three levels, across three categories:

- Using ICT to support effective teaching and learning
- Using ICT for education management and administration
- Supporting teachers' lifelong learning and continuous professional development

Ministries of education and other education stakeholders can make use of this framework to design ICT training for teachers. A few contextualised and easy-to-access ICT courses are created and hosted on a Moodle platform in partnership with UNESCO.[63] These courses are referenced and accessible through the OER Commons repository highlighted previously, as well as through UNESCO's ICT CFT website.

One example of how this framework and aligned learning materials have been used is a 2016 training on ICT integration in education delivered to teachers in Kenya by the Centre for Mathematics, Science and Technology Education in Africa (CEMASTEA). The training was composed of a face-to-face 3-day workshop in Nairobi, followed by a 3-month online training. A private partner, Airtel, provided the participating teachers and online facilitators with data bundles and modems to make sure they could fully engage online.

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[61] "Open Solutions". UNESCO. Accessed November 3, 2022.
https://www.unesco.org/en/communication-information/open-solutions?hub=370

[62] "UNESCO ICT Competency Framework for Teachers". 2018. Paris, France: UNESCO.
https://unesdoc.unesco.org/ark:/48223/pf0000265721

[63] "UNESCO ICT Competency Framework for Teachers International Courses Repository". Accessed November 3, 2022.
https://ictcft.nba.co.za/course/index.php

More recently, in 2020-2021, UNESCO's Office for the Caribbean led a project with the Blackboard Academy and other regional and international partners to first train "Master Trainers" and then conduct the training of 12,000 teachers based on the ICT CFT.[64]

UNESCO Response to the COVID-19 Pandemic & Digital TPD

As part of its response to school closures during the COVID-19 pandemic, UNESCO formed the Global Education Coalition (GEC)[65] to protect education. The organisation conducted landscape surveys to identify tools and solutions for distance education:

- National learning platforms and tools:
  https://en.unesco.org/covid19/educationresponse/nationalresponses
- Distance learning solutions:
  https://en.unesco.org/covid19/educationresponse/solutions

It also produced guidance notes on distance education (not TPD) for teachers and policymakers to ensure effective distance learning during pandemic school closures.[66] As part of the GEC's efforts, UNESCO and partners support two platforms targeting teachers in Sub-Saharan African countries: ImagineLearning.Africa for English-speaking countries and ImaginEcole.Africa for French-speaking countries.

UNESCO Global Teacher Campus

Global Teacher Campus[67] is the most recent program launched by UNESCO's Global Education Coalition. It specifically targets teachers and educators, offering a wide selection of TPD courses through a curated online catalogue of self-paced and facilitated courses by a variety of organisations and partners.

UNICEF

UNICEF focuses on children, not teachers per se, and we were not able to easily identify digital TPD resources through the different UNICEF-supported websites and platforms, though it periodically issues reports and guides to support teacher good practices[68] and is frequently involved in education responses in displacement and crisis contexts. UNICEF does lead on a number of projects that support a comprehensive educational ecosystem solution to ensure TPD is accessible to teachers wherever they are located. Three of their projects are briefly presented here.

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[64] "Distance Learning and Teacher Training Strategies Lessons from the Caribbean". 2022. Paris, France: International Task Force on Teachers for Education 2030.
https://teachertaskforce.org/knowledge-hub/distance-learning-and-teacher-training-strategies-lessons-caribbean

[65] "Global Education Coalition". UNESCO. Accessed November 3, 2022. https://globaleducationcoalition.unesco.org/

[66] "Guidance on Distance Learning". UNESCO. Accessed November 3, 2022.
https://www.unesco.org/en/education/digital/distance-learning-guidance

[67] "Global Teacher Campus". UNESCO. Accessed November 3, 2022.
https://globaleducationcoalition.unesco.org/global-teacher-campus

[68] "Teachers". UNICEF. Accessed November 3, 2022. https://www.unicef.org/topics/teachers

Agora

UNICEF manages the Agora learning platform, a free portal offering learning activities tailored to UNICEF's staff and partners, but also open to the public. Most of the learning activities are covering UNICEF areas of focus, though we identified at least two courses that may be of interest to teachers focused on child rights.

Giga Initiative

As mentioned earlier in this report, UNICEF leads, with key partners, such as ITU, on this global initiative[69] to connect every school in the world to the internet by 2030.

Learning Passport

UNICEF, in partnership with Microsoft, supports the adoption of The Learning Passport (LP)[70] as a national LMS in interested countries. LP is an online/offline and mobile platform that enables continuous access to flexible and adaptable learning content that can be contextualised and aligned to national curricula. It is also able to host and share global supplementary and complementary resources. The platform provides a set of short modules to support teachers in adapting to digital and distance learning and teaching.[71]

The World Bank

Although the World Bank doesn't directly support TPD within its beneficiary countries, it has multiple focus areas of support in education, two of which relate directly to digital TPD: (1) **Teachers** and (2) **Digital Technologies in Education**. From an external perspective, the actions and projects in each of these initiatives or focal areas do not seem to be directly interconnected or harmonised, though they obviously have overlapping relevance with regard to digital TPD.

The Teachers Focus Area

Even before the pandemic, the World Bank was tackling education inequities globally and working to meet needs for quality pre- and in-service training for millions of teachers. The Global Platform for Successful Teachers was launched in January 2019 to help countries enhance their teacher policies to improve teaching and learning.[72] This platform addresses various dimensions of the teaching profession at different levels within national education ecosystems:

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[69] "Giga at UNGA 2022". Giga. Accessed November 3, 2022. https://giga.global/

[70] "Our Mission". The Learning Passport. Accessed November 3, 2022. https://www.learningpassport.org/

[71] "Welcome to the Learning Digital Library". The Learning Passport. Accessed November 3, 2022. https://unictmob.azurewebsites.net/#/

[72] "Teachers". The World Bank. Accessed November 3, 2022. https://www.worldbank.org/en/topic/teachers#2

- **In the classroom:** In 2019, the World Bank launched **Teach**,[73] an open-access, adaptable, classroom observation tool that measures teaching practices inside the classroom and identifies teachers' professional development strengths and needs.

- **Professional development:** The World Bank has developed **Coach**[74] to help design TPD programs tailored to the specific needs of in-service teachers, focused on practice with other teachers and in their own classrooms.

- **Teacher working conditions:** The World Bank developed a guidance note on how countries can build **Grievance Redress Mechanisms**[75] to reduce the non-teaching daily challenges faced by teachers, freeing them to operate as professionals and increasing the appeal of the career.

- **Technology-based TPD:** In late 2020, the World Bank partnered with HundrED to identify innovative projects that support TPD.[76] The spotlighted projects provide evidence on which EdTech interventions work for improving teacher in-service professional development to support policymakers and funders in making use of effective EdTech tools for TPD.

[73] "Teach Primary: Helping Countries Track and Improve Teacher Quality". The World Bank. Accessed November 3, 2022. http://worldbank.org/education/teach

[74] "Coach: Helping Countries Accelerate Learning by Improving In-Service Teacher Professional Development". The World Bank. https://www.worldbank.org/en/topic/teachers/brief/coach-helping-countries-accelerate-learning-by-improving-in-service-teacher-professional-development

[75] "Investing in Teacher Grievance Redress Mechanisms,".2019. Washington, DC: The World Bank. https://documents1.worldbank.org/curated/en/597301619588703907/pdf/Making-Teaching-Attractive-Investing-in-Teacher-Grievance-Redress-Mechanisms.pdf

[76] "Teachers for a Changing World". HundrED. Accessed November 3, 2022. https://hundred.org/en/collections/teachers-for-a-changing-world

The EdTech Focus Area

A focus on digital technologies for education, or EdTech, was accelerated as the need for at-distance solutions in education became essential during the COVID-19 pandemic. The World Bank, as a leader in education for development, recommends that its beneficiary countries apply the following five principles for the design and implementation of EdTech solutions:[77]

1. ASK WHY: EdTech policies need to be developed with a clear purpose, strategy and vision of the intended education change to address the learning crisis.

2. DESIGN FOR SCALE: EdTech design should be flexible and user-centered with equity and inclusion at its heart in order to realize scale and sustainability for all.

3. EMPOWER TEACHERS: Technology should enhance teacher engagement with students through access to content, data and networks allowing them to focus on personalized student learning. EdTech cannot replace teachers, it can only augment teaching.

4. ENGAGE THE ECOSYSTEM: Education systems should take a whole of government and multi-stakeholder approach to engage and incorporate the most innovative ideas to support student learning.

5. DATA DRIVEN: Transparent standards and interoperable data architecture supports evidence-based decision making and a culture of learning and experimentation.

The World Bank indicates that these principles can go through a process of **discovery**, **diffusion,** and **deployment** for each new technology. It also provides many publications that chiefly target policymakers and discuss themes related to the changing role of teachers and technology and innovation in education. In this way, and through both online and offline guidance tools, the World Bank is influencing the digital TPD landscape globally, especially in areas of investment for development or lower-resourced settings.

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[77] "Digital Technologies in Education". The World Bank. Accessed November 3, 2022.
https://www.worldbank.org/en/topic/edutech#2

The EdTech Toolkit for Remote Learning

In June 2022, as part of its strategic guidance to countries, the World Bank launched, in partnership with UNICEF, a new toolkit on distance learning delivery models. The toolkit aims to support policymakers and researchers in the planning and medium- to long-term design of multi-faceted distance/hybrid learning strategies in low-resource environments. The toolkit provides a large set of Resource Packs and Knowledge Packs covering all the media that can be used for distance learning, including digital learning and mobile learning through radio, TV, mobile devices, cloud-based services, and more.[78]

Other Global EdTech Repositories

As the pandemic confirmed the need to deliver education at distance, technologies such as radio, TV, mobile devices, and computers were used.[79] Many international and national organisations increasingly dedicate resources to develop technology-based solutions to education needs in fragile contexts. Often, the tools are deployed and their usage is supported for a short period of time with no clear sustainability plans. Some entities have aimed to capture efforts around EdTech and we highlight just a few such repositories below.

- **The EdTech Open Atlas** is a crowdsourced repository of information on EdTech projects and solutions from around the world. It is to be noted that the information in the atlas is entered by users directly and is not always reviewed before posting.[80] Also, although the Atlas is supported by the International Rescue Committee (IRC), the Atlas projects are not necessarily adapted for lower-resourced contexts.

- **EdTech**[Hub][81] is a global non-profit research partnership that aims to produce quality evidence to help introduce relevant and adapted EdTech tools. The hub is funded by UKAid and the World Bank and has curated one of the most up-to-date databases,[82] with 211 educational and skills development tools that can be filtered by multiple features, including connectivity and type of equipment required. EdTech[Hub] repository dedicates a specific category for EdTech tools supporting TPD.[83]

- **HundrED** is an INGO that partners with other large organisations to identify innovative solutions to support primary and secondary school practices. The solutions are not necessarily digital, and they can be designed for different countries and different contexts. Every year, HundrED conducts research and evaluation on a competitive selection of educational programs and provides a brief analysis on its site. For instance, Kolibri was

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[78] "EdTech Toolkit for Remote Learning". The World Bank. Accessed November 3, 2022.
https://www.worldbank.org/en/topic/edutech/brief/edtech-toolkit-for-remote-learning

[79] "Promising Practices for Equitable Remote Learning Emerging Lessons from COVID-19 Education Responses in 127 Countries: Innocenti Research Briefs, no. 2020-10". 2020. Innocenti, Florence, Italy: UNICEF Office of Research.

[80] "EdTech Open Atlas". EdTech Open Atlas. Accessed November 3, 2022. https://edtechopenatlas.org/

[81] "EdTech Hub". EdTech Hub. Accessed November 3, 2022. https://edtechhub.org/

[82] "EdTech Tools." EdTech. Accessed November 3, 2022. https://database.edtechhub.org/tools/

[83] "Curated Tools for Teacher Continuous Professional Development". EdTech. Accessed November 3, 2022.
https://edtechhub.org/edtech-tools/curated-tools-tcpd/

spotlighted in the 2021 list of innovative solutions.[84] Other TPD solutions are spotlighted this year, such as LeadNow![85] and Teach2030[86].

- Finally, the **INEE Distance Education in Emergencies Background Paper** presents more than 300 tools and solutions, but they are not all necessarily digital.[87]

- **UNHCR** helped to create a Digital Learning Resources List via Google Sheets during the pandemic and it now contains over 640 distance learning solutions, including tools for learners at different levels as well as for teachers.[88] The items on this list have not been vetted, although tools that work well in lower-resourced settings have been highlighted in yellow.

- Finally, it is worth mentioning again the previously presented **World Bank-UNICEF EdTech toolkit resource packs**, which include two packs dedicated to digital learning and mobile learning resources and case studies. The packs reference many products and initiatives, not necessarily with open or free access.[89]

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[84] "Kolibri". HundrED. Accessed November 3, 2022 .https://hundred.org/en/innovations/kolibri

[85] "Lead Now!". HundrED. Accessed November 3, 2022. https://hundred.org/en/innovations/leadnow

[86] "Teach2030". HundrED. Accessed November 3, 2022. https://hundred.org/en/innovations/9-teach2030

[87] "Distance Education in Emergencies Background Paper". 2022. New York, NY: Inter-agency Network for Education in Emergencies (INEE). https://inee.org/resources/distance-education-emergencies-background-paper

[88] "Digital Learning Resources List". Accessed November 11, 2022.

[89] "EdTech Toolkit for Remote". The World Bank. Accessed November 3, 2022. https://www.worldbank.org/en/topic/edutech/brief/edtech-toolkit-for-remote-learning

Access, Use, and Impact of OERs

Evidence about the use and impact of OERs is sparse and mostly anecdotal, especially in EiD contexts.[90] This is partially due to the open nature of these resources; users can simply download and use them while never reporting back on their use or impact to the repository or OER authors. Most of the OER assessments available online relate to specific and controlled environments, and many are conducted over short evaluation periods. Additionally, many uptake, use, and impact studies about OERs are situated in higher education and in wealthier settings.[91] Many articles focus on the impact of OER textbooks on learning among college and university students, for example.[92] Some of the literature points to slower uptake in primary and secondary school settings than in higher education.[93]

There seems to be an evidence gap around how OERs are impacting teaching and learning in lower-resourced and EiD settings, particularly at pre-primary, primary, and secondary school levels. Still, there is recognition of the potential of OERs to address education inequities, especially as tied to education in refugee, crisis, and displacement contexts.[94]

HundrED[95] and EduTech[Hub] are two initiatives that specialise in conducting research and evaluation of projects that can involve EdTech and, in some cases, OERs. These initiatives look at solutions to education challenges in a variety of contexts, including in EiD contexts. For instance, in 2021, HundrED partnered with the World Bank on the project **Teachers for a Changing World** and made a selection of 10 solutions from around the world that are helping teachers to cope in ever-changing classrooms.[96] The projects may provide freely accessible materials, but not necessarily OERs. For each evaluated project, HundrED provides a graphic summarising how impactful and how scalable a project is according to the expert reviewers.

EduTech[Hub], launched in March 2022, shares a **Research Portfolio** involving primary research around EdTech evidence in low- and middle-income countries. The portfolio intends to fill an evidence gap decision-makers face when choosing EdTech solutions to support children, teachers, and school communities. The portfolio includes nine projects from countries across

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[90] "ICT Integration in Education in Kenya: Roll-out of the Digital Literacy Programme". UNESCO. Accessed November 3, 2022. https://www.unesco.org/en/articles/ict-integration-education-kenya-roll-out-digital-literacy-programme

[91] "Ed Tech Global Landscape Analysis: Trends from the Present and Near Future of Technology-Enabled Learning". 2021. New York, NY: International Rescue Committee Airbel Impact Lab. https://www.oecd.org/education/ceri/37351085.pdf

[92] "Impact of OER in Teacher Education". 2020. New York, NY: Open Praxis City University of New York (CUNY). https://openpraxis.org/articles/10.5944/openpraxis.12.4.1112/

[93] "Open Educational Resources Haven't Upended the Way That K-12 Schools Get Course Materials – Yet". 2017. The Hechinger Report. https://hechingerreport.org/open-educational-resources-havent-upended-way-k-12-schools-get-course-materials-yet/

[94] "Supported Mobile Learning in the "Third Spaces" Between Non-formal and Formal Education for Displaced People." 2020. New York: Routledge.

[95] "HundrED Research". HundrED. Accessed November 3, 2022. https://hundred.org/en/research

[96] "How Can We Enhance Teacher Professional Development Globally? 10 Innovation Supporting Teachers." HundrED. Accessed November 3, 2022. https://hundred.org/en/articles/how-can-we-enhance-teacher-professional-development-globally-10-innovations-supporting-teachers

the world.[97] The hub website provides a library of evidence with almost 6000 entries that can be effectively searched and filtered.

In 2016, prior to EdTech[Hub] releasing its research portfolio, Jigsaw, one of the founding partners, produced a first Education Technology Evidence Map comprising 400 publications. An Excel sheet, including the analysis, can be downloaded with a guide that explains how to make use of it.[98]

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[97] "EdTech Hub Research Portfolio." EdTech. Accessed November 3, 2022.
https://edtechhub.org/evidence/edtech-hub-research-portfolio/

[98] "Education Technology Map: Guidance Document". 2016. United Kingdom: Jigsaw Consult.
https://www.gov.uk/research-for-development-outputs/education-technology-evidence-map

Challenges & Opportunities

Researching and writing this report—in the form of a case study from our digital TPD work in EiD contexts coupled with a brief OER, for TPD and in EiD settings, landscape review—has helped us identify multiple challenges we face in our own work and that the EiD sector faces more broadly when it comes to digital TPD in EiD contexts. It also has helped us to more clearly see the untapped potential and the many great efforts underway to realise that potential of providing high-quality, pre-service and ongoing, holistic professional learning resources and opportunities for teachers regardless of their location or circumstances. Below, we outline challenges and opportunities, looking at both systems-level factors and localised, unique influences on digital TPD.

Challenges to Address in Digital TPD Design and Implementation for EiD Contexts

Research and data gaps. There is limited research on OERs, on digital TPD, and on teacher professional learning in EiD settings. There is even less data available about their impact on students' learning and wellbeing outcomes. It is hard to know how digital TPD and OERs are used and what their impact is, beyond anecdotal reports and small qualitative studies. There are organisations and researchers currently working to address these evidence gaps, but their efforts are hampered by a lack of available data on refugee teachers' and learners' performance outcomes within national systems (due to a lack of easily trackable refugee education data[99]), by inadequate funding for education research (particularly in EiD settings), and by limited understanding of what constitutes evidence and who the many active knowledge producers are within EiD settings. Calls for more research from the Global South and for research that centres students, family members, community members, and teachers are an important aspect of addressing inequities in knowledge production and knowledge sharing. When INGO, national government organisations, local education leaders, and teachers look to start a digital TPD initiative, they often face a lack of relevant, accessible research and data to guide their early project planning and larger design, implementation, and evaluation efforts.

Siloed initiatives, even within the same organisation or location. This is evident, for example, in the different initiatives and projects led by the World Bank and UNESCO, which, as discussed earlier, have programmes focusing on teachers and on EdTech, with no apparent or limited direct linkages between these divisions and their respective initiatives. This lack of cohesion and harmonisation is evident at local, national, regional, and global levels as well.

Lack of consistency and sustainability in TPD programme design. Some digital TPD in EiD initiatives focus on specific aspects of TPD, such as creating content and piloting its usage for a fixed period of time, without connecting it to larger efforts or creating sustainable plans for its continued use and impact. There exist some guidelines[100] for TPD in emergency or crisis

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[99] "Education Statistics: Issues and Recommendations: UNESCO Institute for Statistics and UNHCR". 2021. Montreal, Quebec, Canada: UNESCO. https://www.unhcr.org/afr/61e18c7b4.pdf

[100] "Standard 2: Training Professional Development and Support". Inter-agency Network for Education in Emergencies. Accessed November 8, 2022.
https://inee.org/minimum-standards/domain-3-teaching-and-learning/standard-2-training-professional-development-and-support

contexts; however, many actors in the field fail to consider local needs and wishes prior to deployment of the programmes, such as specific language demands, connectivity challenges, digital fluency, or educators' interests and needs.

Limited development of local ownership and leadership. Digital TPD efforts often lack clear plans to develop local expertise, leadership, and ownership to support the sustainability of projects, such as allowing for more contextualised solutions to arising challenges. Training of trainer models remain popular, but generally taper off as external support, financial or otherwise, dissipates. They also lack a co-creative or participatory design approach aligned with more distributed, democratic, and liberatory notions of knowledge sharing and knowledge production, two keys to localisation, contextualisation, and sustainability.

Missed opportunities to recognize teacher expertise, agency, and resiliency. As briefly mentioned above, in addition to the often untapped leadership potential among teachers and other educators, teacher experience, knowledge, advocacy, and action is often overlooked in TPD. Teachers can be co-creative partners in developing digital TPD materials. They can serve as co-designers and as facilitators for communities of practice. They can help to disseminate and support uptake of resources, including through introducing new technologies and tools to their colleagues. As noted in a 2018 study (Mendenhall, Gomez, & Varni)[101]: "all teachers working amidst displacement and/or with displaced learners in their classrooms must be extended meaningful opportunities to participate in the decision-making processes around both policies and practices that directly impact their and their students' lives and livelihoods."[102]

Insufficient time for deep participation and co-creation. When collaborating with actors situated in challenging contexts, it is necessary to allocate enough time for teams to be formed and for participants to complete tasks, accounting for limited access to a connection or electricity shortages and other limitations. It is also necessary to dedicate time and resources to provide guidance and orientation on digital (and other) tools-in-use that may be unfamiliar. Most importantly, it is vital to make time to get to know each other as holistic beings and as co-creative equals in a community of practice. These specific needs are not always taken into account when designing and planning for collaborative and participatory projects and can lead to limitations in participation and exclusion of local wisdom in order to respect timelines and requirements of funders or backbone agencies or organisations.

Cost. Programme designers and funders should not underestimate the cost of using even basic technologies in lower-resourced contexts. It is more expensive in these settings (as compared to higher-income countries with more extensive infrastructure and resource banks) to provide even the most basic support, such as printed handouts for offline workshops or Wi-Fi access through modems or data bundles. We experienced this when organising workshops in Niger and Chad; ITU data confirm our experience. The ITU data hub[103] indicates that the cost of "mobile data and voice low-consumption basket," a common solution available in lower-resourced and displacement contexts, was 38% of the GNI (growth national income) per

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[101] Mendenhall, M., Gomez, S., & Varni, E. (2018). Teaching Amidst Conflict and Displacement: Persistent Challenges and Promising Practices for Refugee, Internally Displaced and National Teachers. Paris, France: UNESCO.

[102] "Teaching Amidst Conflict and Displacement: Persistent Challenges and Promising Practices for Refugee, Internally Displaced and National Teachers". 2018. Paris, France: UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000266060

[103] "Standard 2: Training Professional Development and Support". Inter-agency Network for Education in Emergencies. Accessed November 8, 2022. https://datahub.itu.int/data/?e=KEN&c=1&i=34618

capita in Niger in 2021, 25% in Chad, 4.5% in Kenya, 3.9% in Lebanon, and below 1% among wealthier nations.

Lack of easy discoverability and usability of open resources. There are no clear or shared strategies for sharing and disseminating OERs to potential users. Additionally, potential users may need guidance and support to benefit from OERs once they do find them. One of the QHL Project Teacher Fellows in Niger, for example, expressed that IFADEM, which is using the Moodle platform, was challenging and "complicated" in her eyes. It is not enough to share URLs of resources; in many cases, teachers need further support to familiarise themselves with resources, evaluate and adapt those resources to meet their local needs, and, ultimately, feel confident and competent in using new resources or tools. Thus, there are sustainability and impact issues for OERs and digital TPD as related to visibility, accessibility, and usability of resources within EiD contexts.

Scarcity of resources in languages other than English. The majority of digital TPD resources, programmes, and evidence are provided solely in English, deepening accessibility concerns and inequities between countries, between communities within a country, and between individuals within a shared community. UNESCO confirms that education in the mother tongue is a key factor for inclusion and quality learning, which improves learning outcomes and academic performance.[104] This is true for learners across the lifespan, so naturally should guide work at the professional development level as well.

Teacher demotivation and/or demoralisation. Motivating participation in and sustaining participation throughout digital TPD is a significant challenge to be overcome to ensure success of initiatives and positive, lasting impact. In displacement contexts, teachers of the most disadvantaged and marginalised children are often themselves disadvantaged, on both personal and professional levels. Refugee teachers we connected with in Chad, for example, complained that they had no access to modern tools to improve their teaching and learning practices and that the TPD available to them often takes the format of "Chalk & Talk" in the same classrooms where they teach their students. This is not inspiring or motivating. In Lebanon, teachers have experienced disruptions in their salaries or compensation, going months without an income, which is both demotivating and demoralising. Structural factors that limit teachers' motivation to engage in professional development must be considered in planning digital TPD and must be addressed through collective effort[105].

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[104] "Why mother language-based education is essential". UNESCO. Accessed November 8, 2022. https://www.unesco.org/en/articles/why-mother-language-based-education-essential

[105] "International Task force on Teachers for Education 2030". Teacher Task Force. Accessed November 8, 2022. https://teachertaskforce.org/

Safety and wellbeing are not always prioritised. Just as research shows students must experience feelings of safety and belonging to be ready to learn, educators also need conditions in which they feel included, supported, and at least minimally safe and well before asking them to take on additional learning (and teaching) challenges. A teacher who participated in the QHL Project pilot activity in Chad posed this question: "How can we create a safe learning space if we are not feeling safe ourselves and we are not sure we will be able to feed our families?" Additionally, teacher remuneration is very low in most displacement and crisis contexts,[106] meaning that teachers are not able to invest in their own professional development and may need financial support to cover expenses related to transportation, meals, data or Wi-Fi costs, and other basic safety and wellbeing needs tied to participation in TPD workshops or courses. TPD projects vary in their attention to holistic dimensions of wellbeing[107] and learning; thus, a shift is needed toward more holistic professional development practices.

Lack of meaningful pathways to recognition, certification, and full employment.
Educators in EiD contexts are in need of recognition, certification, and on-ramps to degree or accreditation programs, especially if they are displaced without prior professional experience in the education field, do not have documents indicating their prior experience or learning, or have credentials that are not recognized in their displacement setting. Many refugees, for example, are not able to be fully employed in national education systems due to lack of necessary credentials and/or national employment regulations. These educators must receive recognition for their efforts in the form of stipends when available, certificates of participation and completion where possible, and, ideally, certifications of knowledge and skills such as competency-based micro-credentials, university program credits or formal certifications, or national ministry accreditation schemes. Educators in EiD have the hope and desire to grow professionally and become experts and leaders in their profession. TPD providers must provide certificates that value the efforts and time of teachers, at a minimum, and work with sector leaders and national programs to create certification pathways and to improve working conditions for educators in displacement.

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[106] "Teaching Amidst Conflict and Displacement: Persistent Challenges and Promising Practices for Refugee, Internally Displaced and National Teachers". 2018. Paris, France: UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000266060

[107] "Guidance Note for Teacher Well-Being in Emergency Settings". Inter-agency Network for Education Emergency. Accessed November 8, 2022. https://inee.org/resources/guidance-note-teacher-wellbeing-emergency-settings

Opportunities for Digital TPD in EiD Settings

Distance education is now an integral part of global education. The importance and ubiquity of distance education became undeniable with the global COVID-19 pandemic lockdowns and the associated closure of schools and other learning institutions worldwide. Since then, many initiatives and efforts[108] have contributed to shaping this teaching and learning paradigm in wealthy countries as well as in lower-resourced, crisis, emergency, and displacement contexts. Hence, there is a keen interest within the global education ecosystem to effectively and equitably use digital learning materials and tools, including OERs. The proliferation of interest, funding, and resources in relation to EdTech and distance education offer the potential to make digital TPD more accessible, equitable, engaging, and impactful.

Awareness of the digital learning gap and related equity issues has increased. Digital access and digital literacy and digital fluency gaps, induced by many challenges, including lacking or limited infrastructure, have grown over the last few years. Increasingly, instructional designers, alongside education, development, and humanitarian sector actors, are designing and/or utilising options to provide offline access to digital materials. Some of these were noted in previous sections of this report. Simultaneously, new private-public partnerships were forged during the COVID-19 pandemic[109] and in relation to conflict or acute crises around the world in recent years to specifically address access to electricity, Wi-Fi, devices, and digital literacy. While much of this work is focused on ensuring children have access to online and offline digital resources, teachers are necessarily also gaining exposure and access through these initiatives. There is an increased recognition of the need for teachers to have rich learning opportunities to build their digital literacy and fluency[110] and to have increased access to online tools, communities of practice, and professional development resources. These shifts, along with teachers' growing interests and needs, mean that, despite the challenges, there is a growing desire for digital TPD and a slowly growing infrastructure to support it.

Mobile devices are (more or less) ubiquitous. Global statistics indicate that there are over 6.5 billion smartphone users in the world.[111] Our experience working with teachers across four very different digital landscapes in Lebanon, Kenya, Niger, and Chad indicates that the majority of teachers, even in the most remote areas, have smartphones, even if not the latest generation and even if they are not always able to charge and connect due to limited electricity and/or Wi-Fi infrastructure. Educators use mobile devices to connect intermittently, as they are able. They rely extensively on social networking apps, variable by country, with WhatsApp being

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[108] "UNESCO Response and Recovery Actions". UNESCO. Accessed November 8, 2022. https://www.unesco.org/en/covid-19

[109] "Past Events Public-Private Partnerships in Education at a Time of Crisis: Lessons from Liberia and Around the Globe". Brookings. Accessed November 8, 2022.
https://www.brookings.edu/events/public-private-partnerships-in-education-at-a-time-of-crisis-lessons-from-liberia-and-around-the-globe/

[110] "The Digital Teacher". UNESCO. Accessed November 8, 2022. https://mgiep.unesco.org/the-digital-teacher

[111] "Number of Smartphone Subscriptions Worldwide from 2016 to 2021, with Forecasts from 2022 to 2027". Statista. Accessed November 8, 2022. https://www.statista.com/statistics/330695/number-of-smartphone-users-worldwide/

particularly well-used in many regions. In this way, teachers are finding their way online and are primed for digital TPD in many parts of the world.[112]

Creative and responsive solutions to scaling TPD are being found. Awareness is growing about the need to find and use the most convenient technologies for each context. Technology will surely be part of any digital TPD offer, but it can work online, offline, and in blended formats. Our work with teacher teams in different contexts proved how key it is to adapt the selected tools and technologies with educators to best meet their needs and desires. This awareness is spreading across the ecosystem, as was mentioned in the low-tech digital TPD resource section of this report. A 2022 roundtable discussion report on the role of technology in refugee education[113] outlines solutions used in refugee education during the pandemic and points to resources and approaches that may be relevant in digital TPD in EiD.

Teachers are in the spotlight. At the September 2022 UNESCO Transforming Education Summit,[114] a cross-cutting theme was the critical importance of teachers in the education ecosystem and the need to attract, retain, and sustain teachers through a global revaluation of the teaching profession. For instance, following the summit, UNESCO published a blog expanding on what needs to be done across the ecosystem with the title: "The transformation of education begins with teachers."[115] This signals a centering of teachers and, thus, of teacher (or educator, writ large) professional development.

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[112] As a reminder, Table 1 indicates that about 40% of the population in Niger and near 50% of the population in Chad don't have mobile phone subscriptions.

[113] "High, Low, or No Tech? A Roundtable Discussion on the Role of Technology in Refugee Education". 2022. London, England: Save the Children. https://resourcecentre.savethechildren.net/document/high-low-or-no-tech-a-roundtable-discussion-on-the-role-of-technology-in-refugee-education/#_edn1

[114] "The Transformation of Education Begins with Teachers". UNESCO. Accessed November 8, 2022. https://www.unesco.org/en/articles/transformation-education-begins-teachers

[115] "The Transformation of Education Begins with Teachers". UNESCO. Accessed November 8, 2022. https://www.unesco.org/en/articles/transformation-education-begins-teachers

Digital Teacher Professional Development Recommendations

A constantly changing, uncertain, and challenging global education context, especially in relation to EiD, demands informed, flexible, responsive, creative, and innovative solutions. Digital TPD programmes can be part of a wider ecosystem approach to creating and sustaining accessible, equitable, and continuous professional development opportunities across an educator's lifetime and throughout their career. For this potential to be realised, though, there is a need to tackle the already existing digital divide between nations, across regions within the same country, and even between members of communities who are differently, and often inequitably, situated locally, such as refugee, migrant, and displaced educators.

The following recommendations integrate the good practices inspired by the teachers in displacement and lower-resourced contexts we have the honour and pleasure of learning from as QHL Project Fellows and pilot activity participants. These recommendations also draw upon the evidence and learnings identified through the landscape review conducted for this report and the growing body of research in EiD and TPD fields.

Design Considerations for Digital TPD

Research suggests that TPD programmes for in-service teachers are most effective when they are continuous and sustained over time, participatory, school-based, and collaborative. Also, linking the professional development to teachers' needs and to the professional promotion system in place or to local systems of recognition and credentialing are essential to boost teacher motivation and participation.[116]

Digital TPD structured in ways that are flexible and adaptive enough to respond well to the needs and the challenges in lower-resourced and in displacement contexts is also vital. **A blended format using technologies adapted for online and offline use** is a solution that offers agility necessary to create sustained and collaborative digital TPD. Where this is possible, it may allow for adjustments to meet requirements and needs of specific contexts through a localised design that makes effective use of online, digital synchronous and asynchronous workspaces and tools, and, where possible or necessary, face-to-face meetings and workshops, either in-person or with conferencing software or apps.

The use and adaptation of existing OERs can accelerate the TPD design process and is recommended. Most importantly, any new or adapted materials designed for specific TPD programmes should then be shared as OERs upon their completion to contribute to a growing resource bank, which creates increased equitable and contextualised access to meaningful digital TPD.

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[116] "Thematic Action Track 3: Teachers, Teaching and the Teaching Profession Discussion Paper". 2014. Paris, France: UNESCO.

Building Sustainable Digital TPD Ecosystems in EiD Settings

In order to design and implement accessible, sustainable, and impactful digital TPD programmes, the following orientations and actions should be taken into consideration. These are offered in no particular order, but do reflect the Sustainable Learning Framework[117] that drives our work at the CPL and Childhood Education International, and also the work of many organisations and entities across the broader EiD ecosystem.

- **Centre teachers *as learners*.** Design professional learning resources and events with teachers *as learners* at the centre, taking into account their needs and constraints as well as their assets and talents, helping them to reflect on their own context and practices, and equipping and empowering them to adopt and effectively use and evaluate teaching and learning practices that address their professional learning goals and needs as well as the learning goals and needs of the students in their classrooms and programs.

- **Localise and contextualise.** Effective education practices are highly contextual. Teaching and learning contexts vary within a nation, within a region, and across the globe. The wide range of variability in community assets, needs, and resources cannot be accurately accounted for at the national level, let alone at the global level. It is vital to differentiate between specific types of local contexts, including: urban, rural, or suburban settings; refugee, asylee, migrant, or internally displaced learners; public or private school settings; community-based, I/NGO, or government-run programmes; and so on. Approaching each TPD experience as unique offers the opportunity to adapt resources and methods with the local community and, thus, build local ownership over the project to sustain its growth and increase its impact.

- **Update content.** Plan for periodic updates and maintenance of TPD materials. Many OERS don't benefit from such review and refresh efforts and, hence, they gradually lose relevance and credibility with time. URL links break. New research and resources are being generated but are not included in stale or static documents. Think creatively about how digital TPD content can and will be maintained and who will be responsible for doing so.

- **Prepare for digital TPD and OER dissemination** and cross-list resources to make them more visible and accessible. By carefully mapping out multi-level dissemination plans and by engaging all stakeholders in those sharing events, there is a greater chance that resources will be seen, picked up, and used. Additionally, by sharing resources across platforms—such as on one's own website, in repositories like INEE's website or UNESCO Global Teacher Campus, and on online/offline platforms that are already used in the target countries, such as Kolibri or OpenLearn Create - Africa's Moodle site—they become more easily discoverable and, thus, more useful to teachers, themselves, as well as to INGOs, ministries, community-based programmes, universities, and other education system actors.

- **Plan for acquisition (and maintenance) of digital devices.** Equipping teachers with the tools or devices they need to engage with digital TPD is obviously critical. If a hub is

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[117] "Sustainable Learning and the Development Goals". Childhood Education International. Accessed November 8, 2022. https://ceinternational1892.org/cpl/sustainable-learning/

developed, make sure there is a plan to keep devices and software updated so that they don't fall into disrepair or disuse. If devices are being purchased for shared use, it is important to make sure that all members of a learning community have equitable and consistent access. Gender equity is an important consideration in this planning. Building a computer lab in one location that only a handful of teachers can access, for example, may not be the best approach if teachers are spread out over vast distances and have transportation issues or other constraints to accessing that digital learning space. Subsidies that allow educators to acquire or upgrade their own personal devices also should be considered; this may create a sense of ownership and may motivate educators to more fully participate and carry the learning forward.

- **Design for accessibility**. Plan for online and offline use. Plan, also, for multimodalities and compatibility with assistive technologies[118]. Utilising Universal Design for Learning (UDL) and thinking about the specific contexts in which the material might be used can help to ensure every educator can access and make full use of the digital TPD OERs.

- **Ensure connectivity.** Identify sustainable solutions to guarantee access to the internet, such as data bundles, Wi-Fi subscriptions, modems or modem-like devices and platforms (Beekee Box, Kolibri on a low-cost Raspberry Pi device, etc.), or a simplified access to a connected computer lab. Build private-public partnerships and work with government leaders to build up infrastructure in the most remote or poorest regions of the world.

- **Build ICT skills.** Make sure teachers have necessary ICT skills for digital inclusion. This can happen prior to planned digital TPD activities or it can happen as part of the digital TPD activity. Either way, the plan should be explicit and intentional, not taking anything for granted or assuming knowledge or skill. Where possible, providing an induction or a full ICTE training using components of UNESCO's ICT Competency for Teachers Framework, for example, is an important part of ensuring equitable access to and impact for digital TPD.

- **Plan generously (in terms of time).** Educators working in EiD settings are under a great deal of stress. Adapt the duration and the frequency of digital TPD events and tasks to meet teachers' time constraints. Mitigate concerns related to inconsistent online connectivity by providing ample time for participants to complete tasks and engage in discussions asynchronously between synchronous sessions or collaborative learning tasks.

- **Gather and share (looped) feedback.** Collect and disseminate feedback throughout every phase of the digital TPD programme and use that information to guide subsequent plans and actions. Share progress, setbacks, questions, and innovations with transparency and in a spirit of shared learning to move the EiD sector collectively forward and to support the health of this ecosystem. Ensure that educators have access to rich formative and summative assessments through digital portfolios and tools for reflection and analysis.

- **Capture and use data and evidence in real time.** Plan ahead and embed data collection throughout the programme cycle in order to assess impact, unintended as well as

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[118] "Accessible Open Educational Resources (OER): Briefing Paper". 2022. Paris, France: UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000380471.locale=en

expected, and outcomes. Provide TPD performance data access to teachers, themselves, as well as other stakeholders so that they can help to adjust and improve programme and TPD practices or can amend resources in response to findings.

- **Consider translanguaging and encourage multilingualism.** Provide digital TPD in languages that teachers have mastered so that they feel confident in their interactions and contributions. Building upon all of the linguistic and cultural resources of educators helps them to feel empowered, fosters a sense of belonging, and cultivates their ability to lead for change in their school, program, or community.

- **Attend to wellbeing, both for participants and facilitators.** Weave care for teachers' wellbeing into all activities and components of the TPD programme. Ensure that TPD facilitators or project leads have ample opportunity to take care of themselves. Ensuring quality education in displacement, emergency, crisis, and refugee contexts is difficult work. Holistic approaches that centre wellbeing are important for all involved in these efforts, including at the TPD level.

- **Support social learning.** Plan for regular face-to-face meetings if possible, and for virtual social learning circles through accessible tools that may differ from country to country, for instance WhatsApp, Telegram, Facebook, or Google Hangout. Cultivate peer-to-peer learning and create a dynamic, deeply connected network of practitioners who can sustain conversations and professional learning after any particular TPD initiative ends. This also supports wellbeing.

- **Nurture communities of practice.** Form and support communities of practice, such as professional learning communities or teacher learning circles. Develop and integrate components of mid- and long- term peer-support, coaching, and mentoring in TPD programmes through communities of practice.

- **Develop teacher leadership.** Form a group of program leaders and trainers among the teachers themselves to guarantee sustainability, accessibility, and, above all, relevance to contexts that evolve and change. Support these leaders to build upon their knowledge and assets to acquire any additional skills needed to facilitate communities of practice, lead TPD, and adapt or re-create learning events and resources as needed.

- **Involve local authorities and education leaders.** This includes national ministries of education, UN agencies, university teacher training programmes and partners, and other institutions involved in education and TPD in any given context. Engaging these stakeholders at the start of any programme will ensure (1) sharing of reliable background and contextual information, (2) alignment with local priorities, (3) creation of pathways for recognition of the resulting programme outcomes and certifications, and (4) support with resource/programme dissemination, implementation, and measurement.

- **Create certification, stacked micro-credentials, and other accreditation pathways.** To the extent possible, provide nationally recognised credentials that allow teachers to move their careers forward, improve their status, and increase their income. This is a great incentive for teachers to enrol in TPD and works to address concerns related to teacher work conditions across EiD settings. If possible, partner with national ministries of education so that they support and recognise the programmes and issue certificates

directly through their teacher training offices or affiliated teacher preparation university programmes.

- **Provide incentives and honour contributions.** Dedicate the necessary financial resources to pay teachers a small stipend or at least compensate them for costs associated with digital TPD, such as data bundles, transportation fees, etc. In some contexts, teachers don't voluntarily take TPD training unless there is financial compensation, and this is often justified by the low wages they receive. In addition to financial motivations, acknowledge teachers as contributors on resources they helped to co-develop and invite them (or support them in their own self-directed efforts) to author blogs, articles, and other materials related to digital TPD projects to directly share their experience, voice, and authority as education leaders in the EiD ecosystem.

These recommendations are compatible with the strategies for creating an effective education workforce generally, not just in EiD contexts, as proposed in Thematic Action Track 3 of UNESCO's Transforming Education Summit: Teachers, teaching and the teaching profession. Namely, they address the proposed strategy "to develop the digital skills to teach effectively with ICT, providing devices and the connectivity needed to produce and leverage available digital resources, share knowledge with peers, enrich and transform teaching practices."[119] They can also be embedded while adapting the USAID toolkit for Designing a Comprehensive Distance Learning Strategy[120] for the purpose of developing a comprehensive digital teacher professional development (TPD) strategy. In short, best practices for building sustainable digital TPD ecosystems in EiD contexts are aligned with efforts being made more widely to transform education in ways that ensure every learner, everywhere, and throughout their lifetime has access to high-quality, holistic, sustained, responsive, inclusive, equitable, meaningful, and joyful learning.

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[119] "Thematic Action Track 3 on Teachers, Teaching and the Teaching Profession Discussion Paper". 2022. Paris, France: Transforming Education Summit. https://transformingeducationsummit.sdg4education2030.org/AT3DiscussionPaper

[120] "Toolkit for Designing a Comprehensive Distance Learning Strategy". 2021. Washington, DC: USAID.

Conclusion

Research shows that teachers matter. Of all of the inputs in the education system, teachers have the greatest potential to impact student learning.[121] Investments in teachers are solid investments in *each and every* learner worldwide.

This report represents an intentional pause and moment of reflection for our QHL Project team, an effort to help us—alongside other actors attempting to support teachers in displacement with quality and relevant TPD—make more effective use of technologies adapted to specific EiD contexts to reach every teacher and ensure digital TPD for all educators regardless of their geographic location or current digital landscape. Every teacher deserves quality holistic professional development, and thoughtfully designed digital TPD is one way to meet this learning need.

Although the evidence on the effectiveness of EdTech for teacher professional learning is scarce, this study reveals the high interest in technology-supported solutions to education challenges that, if designed properly to overcome specific challenges faced in contexts of displacement, can be sustainable and easily scaled-up. Hollow and Jefferies (2022)[122], of the EdTech Hub, assert that "technology-supported teacher continuous professional development is most effective when co-created with teachers and linked to tangible impacts on teaching practice and student learning."

In referring to the World Bank 5 EdTech principles,[123] we note that through this study our team is endeavouring to learn how to better "design and act at scale" and how to "engage the entire Education in Displacement ecosystem." We aim to equip and empower teachers to make use of and spread practices supporting QHL for all, including across varied and ever-shifting displacement and refugee education contexts.

We believe that the QHL Project's participatory design using technology in the process, and as part of the outputs, can be replicated as part of a global answer to education challenges, particularly in displacement, lower-resourced, and challenging settings. This report—a landscape review and reflection on our work to date—reveals that there is untapped potential in digital TPD. We continue to learn greatly from our colleagues, in classrooms around the world, in ministries, in university research and teacher preparation programmes, and in international NGO and community-based leadership roles. We contend that there are robust ways to disseminate OERs and make digital TPD accessible to teachers in the least advantaged contexts, and we believe this can only be achieved through sustainable learning, knowledge sharing, engagement of teachers as learners *and* leaders, adoption of cooperative and comprehensive multi-level system action, agile innovation, and inclusive, equitable, transformative, and liberatory practice.

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[121] "Teacher quality and student achievement: Education policy". Analysis Archives, Vol. 8, No. 1, pp. 1-44, 2000, Arizona State University, Tempe, Arizona.

[122] Hollow, D., & Jefferies, K. (2022). *How EdTech Can Be Used to Help Address the Global Learning Crisis: A Challenge to the Sector for an Evidence-Driven Future* [Preprint]. Caramel, Indiana: EdTech. https://docs.edtechhub.org/lib/UUDK52LQ

[123] "Reimagining Human Connections: Technology and Innovation in Education at the World Bank". 2020. Washington, DC: The World Bank.https://documents1.worldbank.org/curated/en/829491606860379513/pdf/Reimagining-Human-Connections-Technology-and-Innovation-in-Education-at-the-World-Bank.pdf

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