unrwa strategy on information and communication technologies for education (ICT4E) 2022

unrwa strategy on information and communication technologies for education (ICT4E)
2022

acknowledgements

table of contents

1. acronyms and abbreviations

AI	Artificial Intelligence
AVAC	Addressing Violence Affecting, and Involving, Children in UNRWA Installations and Services
CMS	Content Management System
COS	Classroom Observation Study
DLP	Digital Learning Platform
DTS	Digital Transformation Strategy
ED	Department of Education
Ed-DQAF	Education Data Quality Assessment Framework
EdTech	Education Technology
EiE	Education in Emergencies
EMIS	Education Management Information System
ESF	Educational Science Faculty
FESA	Faculty of Educational Sciences and Art
GEC	Global Education Coalition
HRCRT	Human Rights, Conflict Resolution and Tolerance (HRCRT) programme
ICT	Information and Communication Technologies
ICT4E	Information and Communication Technologies for Education
IMTD	Information Management and Technology Department

LMS	Learning Management System
LfTF	Leading for the Future programme
MDM	Mobile Device Management
M&E	Monitoring and Evaluation
MIL	Media and Information Literacy
MLA	Monitoring of Learning Achievement
MOOCs	Massive Open Online Courses
MOPAN	Multilateral Organisation Performance Assessment Network
NAT	Newly Appointed Teacher programme
NGOs	Non-Governmental Organisations
OERs	Open Educational Resources
PLCs	Professional Learning Communities
PSS	Psychosocial Support
RCTs	Randomised Controlled Trials
RFID	Radio Frequency Identification
SBTD	School Based Teacher Development programme
SDG	Sustainable Development Goal
e-SRS	Electronic Student Registration System
SLM	Self-Learning Materials
SSU	Strategic Support Unit
TVET	Technical and Vocational Education and Training
UNICC	UN International Computing Centre

2. foreword

Over the last few decades, Information and Communication Technologies (ICT) have become intrinsically linked to human advancement and development, connecting individuals to a global network, enabling wide-spread information sharing, digitalizing service sectors and enhancing access to, and the quality of, education and job opportunities. UNRWA believes that its over 550,000 Palestine refugee students who attend Agency schools and vocational training centres, across the five Fields of operation, deserve the opportunity to access ICT and become independent actors who can actively and critically engage with digital technology. In today's context, and looking to the future, new competencies such as media and information literacy are vital if students are to interact with the new digital reality in a way that is analytical, questioning and reflective. In parallel, technical skill sets such as coding and programming can provide vital foundations in preparing students for current and future labour market needs and enhance their livelihood opportunities.

Aiming to address these needs holistically, this strategy outlines the vision that Agency's Education Programme has for the coming three years (January 2022 – December 2024): to enhance and strengthen ICT in UNRWA schools and vocational training centres, and hence to give UNRWA students the best possible chances to excel both academically and in their future life.

Moritz Bilagher
Acting Director of Education
UNRWA Headquarters, Amman

3. executive summary

This UNRWA Strategy on Information and Communication Technologies for Education (ICT4E) offers a vision of how the UNRWA Education Programme, serving over 540,000 school students, 8,000 Technical and Vocational Education and Training (TVET) students, around 2,000 teacher training students and close to 20,000 staff in Gaza, West Bank, Jordan, Syria and Lebanon, will engage with technology in the years to come. This will support quality education that is relevant, effective, efficient and supports student and teacher wellbeing and inclusion. The strategy covers a three-year period (January 2022 to December 2024) but its impact will continue beyond this time-span. It seeks to address how technology can serve three main educational functions: (i) student learning, as well as wellbeing, (ii) teaching, and student support, including staff wellbeing, and (iii) management and administration. These functions are supported by four, fully interdependent, enablers: devices, internet connectivity, software and digital resources, and capacities. While the functions are ends in themselves, the enablers are there to make them possible.

While technology can play a significant role in supporting the continuity of education during emergencies such as COVID-19 and conflicts, for the UNRWA Education programme, this is not its only or even its main function. The main purpose of this strategy is to increase the use of technology to support the quality and inclusiveness of education, in line with UN Sustainable Development Goal (SDG) 4 and to ensure that no one is left behind. For UNRWA, as per the Agency's Strategic Blueprint underpinning the 2023 – 2028 medium-term strategy, quality education encompasses: relevance, i.e. ensuring that education serves the development needs of the community; effectiveness, i.e. ensuring that educational goals, such as access and learning, are achieved; efficiency, i.e. limiting or even eliminating wastage; and wellbeing and inclusion, both as intrinsic values and principles supporting learning.

Technology can help place a student at the centre of their education. It makes it easier for students to take charge of their learning, by enabling a more personalised, adaptive and asynchronous approach. If students have the skills to use it safely and effectively, technology enables them to see beyond their classroom walls to the broader world, offering a richer, more interactive learning experience and preparing them as global citizens to address societal challenges and uphold human rights and democratic values.

The **chapter on student learning and wellbeing** lays out the ambitions of the Agency to make devices and internet connectivity for learning available to students across the Agency's five Fields of operation. This will enable students to have access to learning resources such as educational games, Massive Open Online Courses (MOOCs), well-designed online tutorials and personalised / adaptive applications. Such resources may benefit from Artificial Intelligence (AI) to ensure students have content available that is sufficiently challenging and scaffolded by prerequisite concepts. These materials will be channelled to the learners through the existing Digital Learning Platform (DLP) and, later, an interactive Learning Management System (LMS). The mentioned resources will help develop students' Media and Information Literacy (MIL), including digital literacy and online safety, as well as their general educational achievement, including during emergencies.

The **chapter on teaching, student support and staff wellbeing** describes how the UNRWA Education Programme will make devices available for its teachers, improve school internet access and ensure staff are appropriately trained to benefit from and take advantage of technologies for teaching. Several resources for teachers will be integrated into the above-mentioned LMS to ensure continued and enhanced affordances for teaching and student support. Teacher capacities will be further developed through the existing training courses – i.e. the Newly Appointed Teacher programme (NAT) and the School Based Teacher Development programmes (SBTD) I and SBDT II – as well as further specialised training based on UNESCO's ICT Teacher Competency Framework. Moreover, a Digital Pedagogy Handbook will be developed to give teacher concrete, modular ideas for using technology in support of teaching.

The **chapter on management and administration** explains the Agency's intentions to harness technological resources for improved management of the UNRWA Education Programme. This focuses, first and foremost, on Agency's Education Management Information System (EMIS) and the TVET electronic student registration system (e-SRS), and their integration with the mentioned LMS. In terms of capacity-building, the chapter lays out the requirements for facilitating a change in culture to embrace the benefits of technology for UNRWA Education services and, hence, harness its potential.

4. introduction: the technology imperative in unrwa education

4.1 The ICT4E Environment in UNRWA

This UNRWA Strategy on Information and Communication Technologies for Education (ICT4E) outlines how and why the Agency's Education Programme will interact with technology for learning, teaching and management over the years to come, through the four enablers of devices, internet connectivity, software and digital resources and capacity. These functions and enablers, outlined in greater detail in the sections below, are the foundation of the Strategy and provide an aligned Agency-wide vision that takes into consideration the benefits, challenges and potential risks that go hand-in-hand with ICT4E. As implementation of the Strategy commences, UNRWA students and teachers will not only have increased access to devices such as tablets and online resources during periods of remote learning, but will also integrate technology into everyday teaching and learning, enhance their digital literacy and gain skills needed to be active citizens in today's world.

During the course of the Strategy's implementation, the Agency's ICT4E approach will be further developed as UNRWA reflects on progress made and adjusts activities in light of lessons learned and evolving best practices. This will ensure the Education Programme's agility and relevance of its activities during rapidly shifting times and in the different contexts in which UNRWA operates.

The UNRWA Education Programme and its Education in Emergencies (EiE) Approach have been praised by the World Bank and UNHCR[1] as well as the Multilateral Organisation Performance Assessment Network (MOPAN)[2] for their effectiveness and efficiency. Still, the programme faces a number of complex challenges. Teaching and learning are disrupted by continual crises due to conflict, political and economic upheaval and, most recently, the COVID-19 pandemic leading to learning loss, student dropout and increasingly urgent psychosocial needs among UNRWA students. In addition, UNRWA continues to face unstable funding, leading to larger class sizes and limited human resources.

Technology can be a part of the solution for these challenges. This notion has been amplified through the COVID-19 pandemic. While the pandemic presented challenges at a greater scale than in any past emergency, as all five Fields were affected, it also provided opportunities for improving education quality through the use of technology for learning. The COVID-19 experience showed that remote, self-directed learning is possible for large numbers of UNRWA students. In early 2020, an Education Technology (EdTech) Taskforce was established to accompany this internal learning process. By way of rapid response, representatives from the Department of Education (ED), Information Management and Technology Department (IMTD) and UNRWA Field Offices developed an Agency-wide online Digital Learning Platform (DLP), which was launched formally in April 2021. This centralised, publicly accessible website provides a safe, user-friendly way of disseminating self-learning materials (SLM) to school students. Through the DLP, students and staff are exposed to new types of tech-supported learning approaches, such as interactive online quizzes and audio recordings for language learning.

In parallel, the UNRWA TVET programme enhanced its use of technology in response to the COVID-19 pandemic. The pre-existing Moodle-based UNWRA iLearn Platform, originally developed in 2017, was used to host a new TVET resource library, which allowed instructors across the five Fields to upload and share remote learning materials with one another. iLearn was also successfully used as an asynchronous online learning platform for TVET students in Jordan. The TVET programme engaged an expert in online pedagogy and course development to train instructors in how to more effectively use technology to deliver their courses remotely.

While the Agency made some progress in developing and using online platforms to support learning over the course of the pandemic, expanding access to devices and internet connectivity has proved challenging: the majority of students and their families have limited device and internet access at home and at school. Data from the COVID-19 Student Survey (conducted June 2021) indicate that, while around 88 per cent of students had access to the internet at home, less than a third of students had good enough internet access to watch videos. Based on the same survey, an estimated 83 per cent of Grade 4 students and 85 per cent of

Grade 8 students reported using a smartphone at home at least occasionally, leaving an estimated 15-17 per cent of students without any access to a device for remote learning.

Overall, the COVID-19 pandemic has been a 'crash course' in the use of technology for the UNRWA Education programme, highlighting the need for a comprehensive, Agency-wide strategic approach to the use of technologies in education. An ICT for Education Strategy was previously commissioned in 2015, as part of the Education Reform (2011-2015), but was never finalised; meanwhile the educational context and the potential of technology have evolved considerably.

To ensure that this Strategy is full in line with the Agency's approach to technology, it was developed in close alignment with the Agency-wide Digital Transformation Strategy (DTS). This was recently launched, with a view to modernising services and improve beneficiary experiences across UNRWA Programmes through five pillars, which are also reflected in the ICT4E Strategy:

Pillar 1 - Digital Services: 'Digital Services for Palestine Refugees'

Pillar 2 - Operational Excellence: 'Systems, Processes, Structures and People'

Pillar 3 - Digital Partnerships & Advocacy: 'Creating an enabling environment to attract political and financial support to enable UNRWA to fulfil its mandate of service delivery for Palestine refugees'

Pillar 4 - Risk Management: 'Identify and address risks of Digital Transformation'

Pillar 5 - Championing & Managing Change: 'Towards transparency, diversity, inclusion, wellbeing and digital generation'

The conceptualisation of the DTS is represented visually[3] below:

As stated in the UNRWA Strategic Blueprint which outlines the way ahead for coming years for the Agency, Agency's vision for the Education Programme is "ensuring that the beneficiaries have the skills, knowledge, values and creativity to realise their potential and seize opportunities, including as active participants in today's digital transformation." This ICT4E Strategy works towards this vision for student learning in multiple ways, for example: facilitating continuous and equitable educational access during emergencies; driving change in the nature of education to better prepare students for the evolving and increasingly technologically integrated world; and enhancing psychosocial support (PSS) for student wellbeing. In doing so, the ICT4E strategy advances the DTS vision of high-quality and inclusive digital services (Objectives 1.1 and 1.2) and contributes to the growth of Digital Generation of Palestine Refugees (Objective 5.4). Through these efforts, the Agency will realise its contribution to SDG 4 on quality education for all and the broader Education 2030 Agenda in the spirit of leaving no one behind. As touched upon above, the UNRWA Education Programme concept of quality education can be outlined as in the figure below:
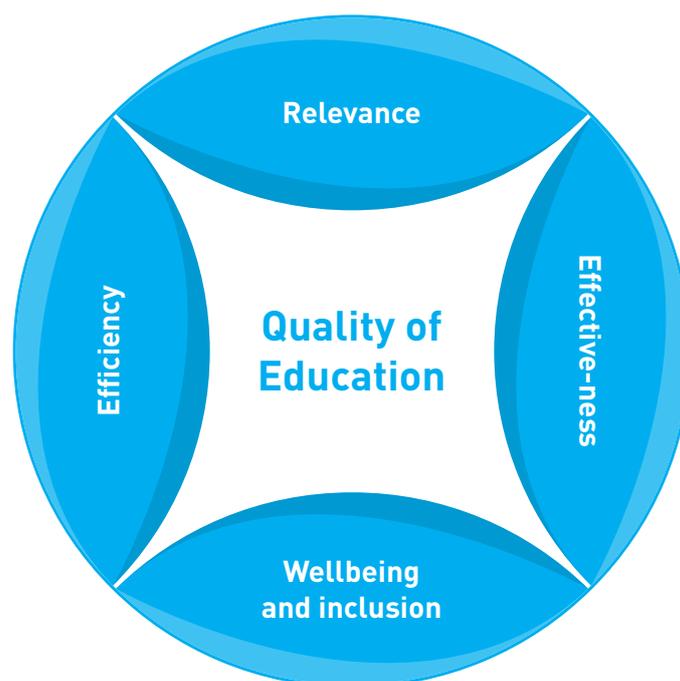
This present ICT4E Strategy marks the launch of an endeavour to build on the momentum of the COVID-19 experience and, in alignment with the broader Agency DTS, pave the way for an impactful and sustainable role for ICT in the UNRWA Education Programme in support of SDG 4.

4.2 The strategy matrix

Over the course of the COVID-19 pandemic, extensive discussions were held with UNRWA Education staff to define the main functions of the Education Programme, which technologies could support, bearing in mind that technologies are not, and should not be regarded as, ends in themselves. The following main functions were identified:
- Student learning (the end goal of all education) along with wellbeing, as core dimensions of quality education;
- Teaching (the main function supporting the end goal of education), enriched by student support and teacher[4] wellbeing;
- Management and administration, to support teaching in the pursuit of learning, as well as student learning itself.

Other functions were also discussed, including parenting and community support, but ultimately not included as they are not direct functions of the Education Programme per se.

The next stage was to consider how technology could support and improve the identified functions. Broad discussions highlighted the following main enablers:
- Devices;
- Internet connectivity;
- Software and digital resources (including a platform to provide access to materials);
- Capacity.

The matrix below, presented to and approved by the UNRWA SubCom on April 19-20, 2021, was developed on the basis of the above analysed and defined the guiding questions at the heart of this ICT4E strategy as follows:

Table 1: ICT4E functions and enablers		
Enabler	**Student learning and wellbeing**	**Teaching, student support, and teacher wellbeing**	**Management and administration**
Devices	Which devices support in-person and remote student learning and enable access to psychosocial support (PSS)? How should UNRWA distribute devices and ensure sustainability?	Which devices support teachers and TVET instructors to provide rich, student-centered learning experiences in both remote and in-school contexts, for providing PSS and other student support?	Which devices allow Field and school / TVET centre management to access EMIS, respond quickly during emergencies and perform other management functions?
Internet connectivity	How should UNRWA organise universal and cost-effective connectivity for students in school and for remote learning?	How should UNRWA organise universal and cost-effective internet access for remote teaching and PSS delivery, enhancing in-school teaching approaches and professional development?	How should UNRWA ensure reliable connectivity in schools, and remotely, to support management and maintain EMIS and eSRS?
Software and digital resources	How should UNRWA enable access to high quality digital resources, interactive communication and cooperation?	How should UNRWA support communication with students and colleagues, enable more interactive remote pedagogical approaches and tech-supported professional development?	How should UNRWA strengthen the functionality and use of EMIS and eSRS, and the integration into LMS?
capacity	How should UNRWA enhance students' Media and Information Literacy (MIL), including ICT skills / digital literacy and awareness of online safety?	How should UNRWA build teacher capacity to use ICT to support interactive teaching and learning, other effective pedagogical approaches and teacher wellbeing? How should UNRWA build teacher, counsellor and staff capacity to use ICT for PSS and support student wellbeing?	How should UNRWA enhance management capacity to effectively guide ICT4E initiatives, monitor and manage remote learning, use tech-supported analytics to drive decision making, and ensure high quality IT support?

As reflected in the matrix above, the ICT4E Strategy aims to be holistic and in line with the objectives of the broader Education Programme and Agency policies and strategies for both basic education and TVET. It seeks not just to be in line with, but to further all four dimensions of quality of education as mentioned above (relevance, effectiveness, efficiency and wellbeing and inclusion). The remainder of this document will focus on how UNRWA Education foresees that each of the identified functions will be supported by each of the main enablers. It should be noted that the questions in the matrix written in blue font are not extensively discussed in this Strategy as, after detailed consideration, the team considered these not to be within the realm of the Education Programme, but within IMTD.

5. student learning and wellbeing

» *Increasing access to devices and connectivity for students*
» *Developing and integrating the Learning Management System with existing platforms*
» *Enhancing Media and Information Literacy skills for students*

In essence, technology can contribute to learning in two ways: as a means of learning and as a subject of learning. With a view to harnessing technology as a means of learning, the Agency will undertake a variety of actions such as developing an interactive platform, or Learning Management System, on which students can not only locate learning resources but also interact with peers and teachers. Technology as a subject of learning, will help ensure that Palestine refugee students will not only be consumers of technological innovation, adapting to the future, but also co-creators of it, both now and in the future. In this context, media and information literacy (MIL) will play a central role. Finally, technology and digital tools will also be utilised to enhance student wellbeing, a key UNRWA dimension of quality of education.

5.1 Devices

Inclusive and equitable education are key objectives of the UNRWA Education Programme and for SDG 4 in general. However, achieving this can be challenging when conflict, infectious disease or political upheaval force school closures. It has been widely recognised, particularly in the wake of the COVID-19 pandemic, that ICTs are a critical factor in enabling continuity of learning during emergencies. In March and April of 2020, UNRWA was able to move quickly to the use of social messaging and other digital technologies to provide support and materials to students following school closures. However, it became clear that absence of devices and reliable internet connectivity is a challenging barrier to technology-supported remote learning. According to an UNRWA parent survey conducted in May / June 2020, although 83 per cent of students lived in households with some degree of internet access, the majority faced major barriers due to irregular electricity, poor connection quality and high data costs.

Other surveys conducted during the COVID-19 pandemic confirmed this digital divide within the UNRWA community, with disparities in learning experiences during the periods of school closures due to varying degrees of access to digital technologies.

While some students had internet-enabled devices to benefit from the digital learning resources provided by the Agency, many others had to rely on their textbooks, printed worksheets and supportive phone calls from UNRWA staff. Student access to technology is similarly limited in the non-emergency classroom context. While most schools serving preparatory grades have computer labs, the majority of devices are at least 5-10 years old and resources for maintenance, technological support and device replacement are very limited. Currently, most students only use such devices during their formal computer courses and even then many computer labs are not connected to the internet.

To ensure digital inclusion in the remote learning context and expand student access to technology for learning at school, several strategic investments will be made:

Increased availability and use of devices in schools, including appropriate access for students with additional needs. In order to bring technology out of the computer lab and into everyday classrooms, devices will be purchased for every UNRWA school at a ratio of 1 tablet for every 5 students, to be accessible for students at Grade 3 and above. Preference will be given to easy-to-use devices (e.g. zero-client devices) such as tablets that may be accompanied by supplementary equipment including keyboards and tablet carts / charging stations. Teachers will bring these devices into all subject classes, on a rotating basis. Schools will experiment with different approaches for deploying devices, including for individual work, pair work or group work (e.g. where one student plays the role of online researcher for a group project). In addition, UNRWA will identify specific models of tablets, or other devices, for students with disabilities or learning difficulties. For example, certain touch-screen devices have been found to be helpful for students with particular physical or intellectual disabilities[5]. By investing in these devices, technology will enhance the learning experience for many children and support the UNRWA Inclusive Education Strategy[6].

Loan of devices to vulnerable students and appropriate access for students with additional needs. To ensure that the most vulnerable students have access to technology at home during emergencies, each Field will implement a priority loan scheme, where the aforementioned devices are loaned out to the students at highest risk to not have access to devices, and those living in households with no access

to devices. The tablets will have a clear UNWRA logo plus radio-frequency identification (RFID) to reduce risk of loss when loaned. During an initial pilot phase, Fields will test and refine appropriate and transparent criteria for allocating such tablets as well as systems for distributing and collecting them.

Piloting of long-term sustainability solutions. Since purchasing, maintaining and replacing devices can be very expensive for a system as large as Agency's, a sustainable device purchase hire programme will be piloted. By offering affordable devices to families under reasonable payment plans, such programmes can expand the proportion of students who have access to personal devices. Such models can be scaled at a significantly lower cost than direct purchasing, as families' payments feed back into the funding pool for purchasing more devices. While UNRWA will still need funds to provide devices for the most vulnerable students, a purchase hire scheme would reduce the number of students needing such support. The purchase hire programme may provide a path to long-term sustainability with regards to devices and will allow UNRWA to gain maximum benefit of Agency devices for student learning.

UNRWA will mobilise funding and partnership opportunities in order to find additional resources for devices. This may include specific financial support or direct partnerships with private sector companies, for example under the umbrella of corporate social responsibility   schemes.

5.2 Internet Connectivity

Students need to be able to access the broader digital world. However, the realisation of this for Palestine refugees will require investments in internet connectivity, both in and out of school. As part of this strategy, UNRWA will negotiate **zero-rating agreements** with internet service providers for each of its platforms (the DLP and LMS). These agreements will allow students to access all content hosted on the platforms without incurring data charges. The Agency will, also, in partnership with internet providers, set up **wifi hotspots** in camps and other Palestine refugee community centres where students live. After school, and in the event of emergencies, students will be able to bring devices to these locations to download learning materials and submit assignments as needed. Finally, UNRWA will **upgrade internet in schools** so that online learning can occur in computer labs and regular classroom settings. Students should be able to access the rich world of digital learning from anywhere in their school. In some Fields, solar power sources may be deployed to mitigate disruptions due to electricity cuts.

5.3 Software and Digital Resources

The UNRWA Education Programme has been working for more than a decade on increasing the use of student-centred learning approaches in its schools. Ongoing teacher capacity-building, via the Newly Appointed Teacher (NAT) programme and School-Based Teacher Development (SBTD) I and II programmes, helped introduce and train teachers to facilitate interactive teaching and learning in their classrooms. Interactive learning positions students at the heart of the learning experience, enabling them to better engage with their own learning and to achieve a far deeper understanding of a topic than by simply listening to teachers or reading textbooks. However, results from the most recent Monitoring of Learning Achievement (MLA) study (2016) showed that progress with students' higher order thinking skills (HOTS) has been slow at best,[7] signalling that even more intensive efforts to engage students in deep and interactive learning are needed. Digital technology can play a key role in stimulating HOTS-related competencies such as analysing, evaluating and critically engaging with information and concepts by providing additional opportunities for students to collaborate, create and reflect while learning.

While changing pedagogical approaches can be slow and incremental work, the forced reliance on student self-learning due to the COVID-19 pandemic has shown how, by putting information and tools to learn at students' fingertips, and placing teachers in a facilitator or support role, ICT can accelerate shifts in teaching and learning modalities to improve the quality of education. Rigorous global research, including Randomized Controlled Trials (RCTs) in low-income countries, have suggested that software that deploys psychology research on gamification and Artificial Intelligence (AI) can provide personalised, adaptive learning experiences and thus significantly improve student skills in areas such as maths.[8] In settings where class sizes are simply too large to afford such in-person personalisation, such software can be an invaluable addition to the teaching and learning approach.

Access to technology means that students can also access the growing world of Open Educational Resources (OERs) which are increasingly available, even in Arabic, for tutorials on complicated concepts or to explore personal topics of interest. Massive Open Online Courses (MOOCs), which are provided with free access options by universities and non-governmental organisations (NGOs), can offer supplementary supportive content, particularly for TVET students. Centralised resource depositories (such as the DLP) will be used to curate and organise the dissemination

of high-quality online learning resources, which will allow students to learn asynchronously, giving them the agency to take the time they need to understand or practice topics and to explore issues they are personally interested in. This enhances students' engagement and motivation for learning and is aligned with the educational ideal of constructivism. However, going forward, UNRWA Education intends to go further and set up a **Learning Management Systems** (LMS), through which students will be able to interact with peers and their teachers.

To support students Agency-wide and encourage more interactive learning both in the classroom and during times of emergencies and remote learning, UNRWA will take a number of approaches:

Improved range of digital learning materials available to students. UNRWA will draw on a combination of in-house and external educational resources. For the latter, UNRWA will particularly benefit from its membership of the UNESCO-led Global Education Coalition (GEC) and Global Learning House. The GEC was established by UNESCO to facilitate a global exchange of technical expertise and educational resources with the purpose of enhancing the quality and the accessibility of education to all children, including the most vulnerable and marginalised ones during and after the COVID-19 pandemic. Field Offices will need to continue to develop SLM in-house. Going forward, UNRWA seeks a gradual transition to digital, comprehensive and self-contained teaching-learning materials (TLM), developed by the Agency and in alignment with Host country curricula.

Increased use of interactive digital learning approaches. In updating existing SLM for subsequent school years, UNRWA teachers will be trained to take further advantage of interactive digital learning approaches which support active, student-centred and experiential learning. For example, online quizzes can provide students with immediate feedback on their learning progress and multimedia visualisations can bring concepts alive or encourage students to conduct their own online research as part of a home-based learning task. A greater proportion of externally produced materials will also be integrated into these SLM or offered as distinct learning resources. Identifying, and rigorously reviewing, sources by trusted non-governmental organisations (NGOs) or educational institutions with a potential in partnering with them may eventually relieve pressure on UNRWA to produce and review high volumes of content in the future. Some potentially high-value types of external resources would include **educational games, MOOCs, well-designed online tutorials** and personalized / **adaptive learning applications,** to ensure students are presented with content that is sufficiently challenging and scaffolded by prerequisite concepts. Fields will be encouraged to suggest further resources. All additional resources will be reviewed for safety, neutrality and security, so that a list of pre-approved teaching and learning applications can be developed and updated on an ongoing basis.

To organise and distribute these high-quality digital resources to students and teachers, UNRWA will rely on several key platforms:

Table 2: Key Platforms for the UNRWA Education Programme		
Platform	**Targeted users and reach**	**Description**
Digital Learning Platform	Basic education students across the five Fields. There were 550,000 unique visitors[9] to the DLP in the first 3 months following launch.	A centralized platform for reviewing and hosting high quality digital learning materials. This simple yet useful tool will continue to play an important role in the years to come. It is important to note that the back-end Content Management System (CMS) provides a critical quality assurance function by supporting a transparent and rigorous process for review of all remote learning materials by UNRWA ED-HQ, IMTD and Neutrality teams.
Learning Management System	Basic education students across the five Fields.	During the COVID-19 pandemic, many students, parents and teachers asked for a more interactive learning platform, which will include following functions: EMIS integration, allowing teachers to track individual student, and Fields and HQ to monitor higher-level trends among students; Interactive online student assessment, asynchronous posting, submission and grading of assignments (so students can learn at their own pace and submit when they have technological access); Direct and secure communication between students and teachers[10]; Group assignments and notebooks to encourage collaboration; Accessing resources from the DLP as a tab within the LMS; Live or recorded video lessons.

5.4 Enhanced psychosocial support (PSS) for students

Many of the same tech-supported tools which will support student learning can also be deployed to support student wellbeing, especially during times of emergencies. Through plug-ins added to the LMS, digital tools can be used to collect human data through online emotional check-ins and wellbeing surveys. In the short-term, these tools can be used for early intervention, and in the long-term can contribute to informed and evidence-based policymaking and ensuring meaningful interventions based on data. Analytics from the LMS will provide important data on student participation and engagement in remote learning, to identify students who may be demotivated or otherwise at risk of falling behind and to ensure Counsellors and PSS programming are activated to provide them with extra support. The LMS will support secure and private video chats between students and Counsellors, while the parent portal / app will provide a tool for ensuring follow-up with these students' parents.

5.5 Capacity

As mentioned, technology is both a means and a subject of education, and supporting a Digital Generation of Palestine refugees is a key objective of the UNRWA DTS (Objective 5.4). While a wide range of ICT concepts are covered in national curricula, UNRWA will enrich the curricula[11] in several ways to prepare students with a comprehensive set of digital skills to succeed in the labour market and engage effectively as citizens of their community and the world.

Basic ICT Skills and Coding: Integrating technology in all subjects of Basic Education and TVET (and ensuring internet, device and digital resource access for this purpose) will provide opportunities for students with hands-on opportunities to use ICT and strengthen their **basic ICT skills**. While **computer programming** is already included in Host government curricula, UNRWA will increase student exposure to coding through extracurricular activities, since this allows students to practice problem solving and critical thinking skills, as well as understand the inner workings of the most frequently used digital applications. These activities will draw from the wealth of free and interactive online coding courses available or be deployed in partnership with EdTech NGOs. Coding is already addressed in a number of TVET courses, but the integration of ICT skills development across all TVET courses will be reviewed, given the benefit of these skills across the labour market.

Media and Information Literacy. In addition to basic ICT skills, understanding and leveraging the complex role that ICTs play in enhancing digital citizenship[12] is fundamental in strengthening students' abilities to interact with, analyse and create media and information in the digital sphere. The UNESCO **Media and Information Literacy (MIL)** Policy and Strategy Guidelines finds linkages and synergies in different literacies (e.g. news literacy, internet literacy and games literacy) and focusing on the main elements associated with media and information. For students, this includes locating, critically assessing and analysing information and content, utilising ICT skills to create and share information and content, and engaging "with media and other information providers, including those on the internet, for self-expression, intercultural dialogue and democratic participation." [13]

UNRWA already addresses some key MIL aspects, for example, through the Human Rights, Conflict Resolution and Tolerance (HRCRT) Education programme, which promotes non-violence, healthy communication skills, peaceful conflict-resolution, human rights, tolerance and good citizenship. Other key MIL skills may be incorporated into the HRCRT Education programme or developed through partnerships with UNESCO initiatives or other projects. By further strengthening students' capacities to think critically about the information they have available, both digitally / non-digitally and inside/outside the classroom, the Agency can support UNRWA Basic Education and TVET students in becoming inquisitive adults who can interact with different opinions in a critical yet constructive way.

Online Safety. Effective use of ICT requires that students have strong awareness of **online safety**, including cybersecurity. To this end, and in alignment with the UNRWA Addressing Violence Affecting, and Involving Children in UNRWA Installations and Services (AVAC) initiative, as well as IMTD-led cybersecurity initiatives (under Objective 4.4 of the DTS), students will learn how to navigate the online world safely. To achieve this, the alliance with AVAC will be strengthened further in order to combat online bullying and other online safety risks. UNRWA Education's engagement with UNESCO's Safer Internet Day (February 8 2022), through AVAC, will continue to be a manifestation of the Agency's resolve to ensure online safety for Palestine refugee students.

6. teaching, student support and teacher wellbeing

» *Developing the Digital Pedagogy Handbook to teachers and communities of practice*
» *Using digital tools for staff wellbeing*
» *Engaging and strengthening the role of ICT teachers to be champions for change*

The DTS envisions ICT as supportive of a positive work culture among Agency staff, where transparency, communication and information-sharing are values which are manifested in their daily work. As results from the Agency-wide Classroom Observation Study 2016 have shown, shifting teaching practices to better support interactive learning processes is slow and challenging work. If deployed thoughtfully, ICT can drive positive cultural change with regards to the important daily interactions between staff and students that constitute and support educational processes.

6.1 Supporting effective teaching practices

ICT4E projects implemented without a clear pedagogical vision can simply recreate and perpetuate status quo teaching practices, for example, with lecture-style teaching conducted on virtual video classes rather than in a classroom. However, a proactive approach, which uses ICT to reinforce and even accelerate use of more constructivist pedagogical practices will facilitate a truly transformative educational intervention. Existing UNRWA policies, strategies and teacher training initiatives for Inclusive Education, HRCRT and Agency-wide teacher training programmes (NAT and SBTD I and II) promote a number of effective teaching methods which can be further encouraged and reinforced through ICT. Some examples of how this can be done are highlighted in the table below:

Table 3: UNRWA Teacher Training Programmes	
Encouraged pedagogical practice	**Examples of how ICT could support this practice**
Group work (SBTD I and II, NAT)	Students assigned to work in remote teams (facilitated through the LMS) on an online research project during remote learning
Formative assessment (SBTD I and II, NAT)	Interactive online quizzes followed by constructive feedback, integrated in the LMS
Personalisation (NAT)	Adaptive (AI-based) learning software

In order for ICT to effectively act as a driver of positive shifts in pedagogical practices, teachers will be supported with each of the four ICT4E enablers: devices, internet connectivity, software and digital resources (including curriculum, learning resources and communication) and capacity-building.

6.1.1 Devices

Most teachers currently have access to a personal smartphone or PC. However, for the minority who do not, a small set of **teacher devices** (one laptop or tablet with keyboard per every 5-10 teachers) will be deployed in every school. Teachers may use these devices in the teachers' room or computer lab to create classroom learning content, explore external learning resources or collaborate with other teachers. For times of emergency, a **priority loan scheme** will be implemented to ensure that no teacher is left without a device to support remote teaching. Teachers will also benefit from the greater availability of devices for students in school, as this will enhance opportunities

for classroom activities such as project-based learning, or pair and group work. In addition, some classrooms will be provided with large **digital displays** (TV screens or interactive whiteboards), to allow for richer media to be integrated in classroom learning.

6.1.2 Internet connectivity

Upgrading school internet connections will ensure teachers are able to continuously access online teaching and learning materials, communicate with parents, connect and collaborate with colleagues and receive more continuous support from Education Specialists and other education support cadre. Teachers will also benefit from the internet access initiatives described above in Chapter 5, such as **zero-rating agreements** and **community wifi hotspots.**

6.1.3 Software and digital resources

UNRWA teachers will be supported in their work by new or enhanced digital platforms and resources such as the following:

Table 4: Platforms and Resources for Teacher Support	
Digital Learning Platform	The DLP will be maintained as a trusted repository of high-quality, rigorously reviewed remote learning materials. Pre-existing SLM will be updated, along with links to further interactive online learning resources.
Learning Management System	The LMS will allow teachers to provide and manage more interactive remote learning experiences for students, through asynchronous classroom-level and personal messages, quizzes, and the integration of content from the DLP.
Parent Portal or mobile app	Another key platform will enable parent communication, including with teachers and other relevant education staff. A parent portal or mobile app will be integrated with EMIS and will ensure parents are regularly informed of their children's participation and progress in their education, receive important information in a clear and timely manner (particularly during emergencies), and can communicate directly with school staff.

6.1.4 Capacity

Teachers will be provided with a **Digital Pedagogy Handbook,** which will offer, actionable and rich capacity-building materials, including ideas for using ICT in their current classroom or remote/hybrid learning context to accelerate student learning. The Handbook will draw from ideas generated in workshops with UNRWA staff across the Fields, as well as from global resources such as the UNESCO ICT Competency Framework[14] and The Digital Teacher training course developed by the UNESCO Mahatma Gandhi Institute of Education for Peace and Global Development. The UNRWA Digital Pedagogy Handbook will be updated regularly as the technology itself evolves. It will contain clear descriptions of how to use these tech-supported teaching methods, along with links to further resources on the pedagogical approaches or training materials on how to use specific technologies. The Handbook will also highlight the interconnections between the tech-supported teaching methods and the concepts teachers have engaged with through prior UNRWA training. In addition to the Handbook, the introduction of new platforms and devices will be accompanied by training and guidance materials on the 'nuts and bolts' of these tools.

6.1.5 TVET

A similar approach to that described above will be used within TVET, including increased availability of devices for instructors, improved internet connectivity, and access to an LMS and content repository. The UNRWA teacher training institutes (ESF and FESA) will promote tech-supported effective pedagogies by teaching them within their courses as well as modelling them through further integration of ICT in all courses. The investment in TVET instructor capacity with regards to technology-supported pedagogy, as undertaken during the COVID-19 pandemic, will be consolidated through enhancement and regular refresher sessions based on the initial online pedagogies module. For both TVET instructors and Basic Education teachers,

capacity building on ICT-supported teaching will be supported and enriched by ICT itself, through learning by doing.

6.2 Enhanced psychosocial support (PSS) for staff

As touched up in Chapter 5, student and teacher wellbeing go hand-in-hand and digital tools can also contribute to staff-wellbeing, particularly in an environment in which teachers are experiencing the same emergency contexts as their students. This can include access to online wellbeing self-help resources, online-check-ins and teacher support groups.

6.3 Enabling continuous professional learning

6.3.1 Capacity

Teacher, School Counsellor and other staff training initiatives in UNRWA use a combination of workshops and school-based in situ training and support, mostly conducted face-to-face. While these are strong and effective models, the integration of ICT can make these training programmes even stronger and provide a vehicle for their continuation during emergencies. For example, many workshop sessions shifted during the pandemic to online video conferences, with the added benefits of reduced costs and the potential to collapse cascade training models so that staff members can learn directly from a lead expert in a particular training topic, rather than indirectly, from someone who has been trained by the lead trainer.[15]

The participation of UNRWA educators in online **Professional Learning Communities** (PLCs) will be encouraged and facilitated.[16] PLCs will typically be organised at the Field or Area-level according to students' grades and subject area, so that teachers can connect and learn from peers teaching the same

subjects within the same grade level range. In addition, Education Specialists working with relevant subjects or schools will be present in these PLCs to provide support. School Counsellors and other PSS staff will also have Field or Area-level PLCs to discuss their collective professional challenges.

These PLCs will advance the DTS objective of culture change by encouraging transparent discussion and information-sharing among Education staff through enhanced professional learning by **extending the reach** of training programmes. For example, staff will be able to continue to discuss and explore topics from a training programme after it has formally ended by sharing their implementation experiences or asking for help with respect to challenges they face. PLCs will also provide a mechanism for **teacher collaboration** and encourage **innovation in teaching and student support** approaches, as good ideas shared by individual teachers and counsellors will become visible to their peers as well as to Strategic Support Unit (SSU) staff. This will allow the best ideas to be disseminated widely and means they can be incorporated into formal training materials. The opportunity to share their ideas may promote **staff motivation** and sense of professional pride.

During times of emergencies, or when teachers and counsellors are facing major challenges, the PLCs will enable teachers to easily share potential solutions to challenges or to receive support from Education Specialists and other staff.

6.4 Strengthening the role of ICT/ Computer Subject Teachers and Instructors

6.4.1 Capacity

As mentioned in Section 5.4, students will need to learn new skills to thrive in an increasingly digital world. While some ICT skills will be strengthened by the increasing integration of technological devices and applications throughout the student learning experience, ICT / Computer classes offer a space for more in-depth learning on these topics. To facilitate this, ICT and Computer teachers across the Fields will receive training to update their knowledge and build their confidence in teaching key topics, including recent technological developments, online safety, MIL and computer programming.

Given their educational background in technology and computing, ICT and Computer teachers will play an important role as champions of the ICT4E Strategy and will provide a first line of support to their colleagues in

its practical implementation. These ICT and Computer teachers (along with Education Specialists who focus on these subjects) will receive earlier and more in-depth training on new devices, systems and platforms so that every school will have one on-site staff member who can help resolve the more easily addressed challenges and issues. This will reduce costs related to formal IT support and help ensure teachers and students receive responses to challenges more quickly, particularly for problems that are more easily solved by someone who is physically present. ICT and Computer teachers can also play a leading role in the management of new student and teacher devices, and in the organisation and implementation of priority loan schemes during emergencies.

Within TVET, ICT-related course offerings are currently under review and will be updated and expanded to maximise alignment with labour market needs. Updates to technology-related course offerings will necessarily be accompanied by capacity-building for instructors as needed. As in basic education, instructors in ICT-related courses will serve as champions of the broader ICT4E Strategy and will be trained to support colleagues and students at their respective VTCs with new devices and platforms.

7. management and administration

» *Expanding and modernizing the Education Management Information System (EMIS)*
» *Using ICT resources for better monitoring and evaluation*
» *Providing improved training for school principals and other education staff*

The UNRWA DTS aims to increase operational effectiveness through digitalization (Objective 2.1) and transform data into information for decision making (Objective 2.2). As part of this, the ICT4E Strategy will increase the quality and quantity of relevant and reliable data in order to support decision-making at all levels.

7.1 Devices and internet connectivity

In addition to the major investments to platforms and resources described above, and in accordance with the principle that all four ICT4E enablers should be in place to support the management function, every UNRWA school and VTC will have a working, up-to-date administration device for inputting, updating and accessing data in the Agency-wide EMIS and e-SRS systems. If a secure, relevant device and connection is unavailable at home for the school staff responsible for EMIS/eSRS data entry, the staff member will be loaned a device and provided with internet connectivity support during emergencies.

7.2 Software and digital resources

EMIS plays a crucial role in the collection and use of data for Education Programme planning and management. For example, EMIS can help support key management tasks within the programme, such as the yearly workforce planning (Class Formation) process, human resource management processes, neutrality checks and resource mobilisation.

Improved EMIS. The Education Department will review the EMIS using the Education Data Quality Assessment Framework (Ed-DQAF) developed by UNESCO Institute for Statistics and the World Bank and, in this way, develop a plan to strengthen the role of EMIS in Education Programme operations. This plan will include **expanding EMIS modules** to link student data to important socioeconomic indicators, such as SSNP status, as well as including additional data on

school ICT resources to support implementation of the ICT4E Strategy. Indicators related to remote learning or student academic records generated from the LMS may also feed back into EMIS, as the two systems become fully integrated. **Automating calculation of the key education indicators** in the EMIS will facilitate greater transparency and efficiency in education data. The plan will also address issues related to the use of the EMIS, such as the **regularity of data entry** at the school-level and expanding school and Field Office staff access to **reports and interactive Power Bi dashboards.** Crucially, the use of the **EMIS for educational planning** will be enhanced, bringing more of the Class Formation process onto the system, and enabling more analytics to identify opportunities for increased efficiencies.

Increased use of DLP and LMS. The EMIS is not the only digital resource which will support management functions. The DLP also supports Field, ED-HQA and Neutrality staff involved in the management of SLM development and review via its Content Management System (CMS), and both the DLP and LMS will provide site usage analytics for monitoring and evaluation purposes. School Principals and SSU staff will be able to quickly and effectively monitor and support teaching and learning processes on the LMS during emergencies. This will increasingly become possible during times of stability as well, as device and internet investments in schools allow for a greater proportion of day-to-day teaching and learning to be facilitated and tracked by the LMS. For teachers, the LMS will support operational effectiveness by streamlining functions such as attendance and grading; data from these functions can then be stored in students' long-term records in the EMIS. The parent portal/app mentioned in 6.1 will also facilitate secure online registration, certification and other key processes.

Improved device security and support. In order to ensure the effective management of ICT resources, a **Mobile Device Management (MDM) system** will be installed on all devices purchased by UNRWA. This system will monitor usage, enable content to be added remotely by IMTD, ensure access to non-educational content is restricted where necessary, and help track lost and stolen devices. RFID cards will be installed on devices, especially those intended for loan during emergencies. Over time, the potential of ICT to

support management decisions within the Education Programme will grow in tandem with the broader EdTech sector. In particular, the use of **AI for education** is growing – for example it can be used to enhance tech support (e.g. chatbots), detect online bullying, or identify trends related to students' online engagement (e.g. through tools such as Microsoft Class Insight).

Cybersecurity. In collaboration with IMTD, the Education Programme will also invest in **cybersecurity** and ensure system resilience during emergencies. Both the **EMIS and eSRS will be transitioned to the cloud** in the UNICC data centre in Valencia, Spain and Geneva, Switzerland, to ensure recovery protection and service continuity. Other key investments will include **Azure Active Directory Authentication** to enhance and integrate user access to EMIS, enhancement of Web Application Firewall protection to cover the most critical education sites and systems (including TVET's iLearn, LMS and the DLP) and upgrading infrastructure to improve service availability (MPLS backup, Cisco Prime, WiFi, PBX).

7.3 Capacity

With regards to **capacity-building,** School Principals, SSU staff and Field and HQ leadership will be engaged early on to ensure there is an aligned high-level vision in place. For the Field support cadre and School Principals, it is important to enhance their capacities on using the EMIS, DLP, LMS, and other key learning resources. In particular, they will receive training in how to use Microsoft for Education to communicate with teachers, parents and Education colleagues in the Field. Monitoring and Evaluation (M&E) staff, both in HQ and the Fields, will receive training on how to benefit from the analytics available in Microsoft for Education and other platforms. Where possible, this training will refer back to, and be incorporated into, existing professional development programmes for staff with management roles, such as the Leading

for the Future (LTF) programme. Similar to teachers, School Principals and TVET management staff will also be part of PLCs to support their ongoing professional learning related to ICT4E as well as broader education leadership and management issues.

The final requirement for the management function within this Strategy is to promote a cultural change towards digitalization in the Education Programme and the implementation of this ICT4E Strategy in addition to the overall Digital Transformation Strategy. This should include modelling the willingness to draw on the benefits that technology can provide to improve the three main functions of education (learning, teaching and management) with a commitment to both effective and ethical use of ICT.

In a context that is willing to embrace change for the better, ICTs can become a highly effective set of tools to further strengthen the Agency's commitment to quality education for all. After all: all means all, including Palestine refugee students.

8. annexes

Annex A: Risks and Mitigations

Risks	Mitigating Measures
Inadequate security with regards to cyber security, securing software and hardware, and child safeguarding.	IMTD to ensure that all operational safety practices are met, and that devices are ruggedized, equipped with RFID cards, and are brightly coloured with UNRWA logos to discourage theft. The AVAC initiative will include activities related to online safety and is developing Safeguarding Guidelines together with the EdTech taskforce, which also includes components on student wellbeing. IMTD is also planning several cybersecurity efforts in the coming years which will address security of all platforms as well as awareness of cybersecurity among staff, students and parents.
Insufficient technical support for device maintenance and troubleshooting, since there will be a major shift in the number of IT devices accessible in UNRWA operation in the Fields	Contracts for devices will be negotiated to include as much vendor-provided support / device warrantees as possible. Temporary IT support staff will be engaged in the first 1-2 years of the Strategy to ensure that technical issues do not jeopardise rollout, while in the long-term the technical vendor will support UNRWA in developing a more sustainable tech support model which will include: as much automation as possible (e.g. support chatbots), central management of devices via remote device management (RDM) system, and training of school-level staff (mainly ICT/computer teachers) to serve as a first line of support. Easy to access tech support channels will also be set up in in the LMS. When devices are loaned to families they will receive clear and simple guidance materials as to how they can prevent issues with their devices and what to do if they do have any technical challenges.
Low teacher confidence / competence in using technology for teaching and learning in the classroom.	Ensure the availability of teacher training programs that are relevant through training needs analysis and ensuring training is "just-in-time" (neither too early or too late) to ensure acceptance of the need. Training programs related to the utilization of technology in learning will be integrated in the current Agency-wide unified professional development for teachers and School Principals, and new training materials will include references to pre-existing programs and initiatives to reinforce their relevance and help staff make connections to past learning. Online guidance materials will remain available for teachers to revisit as needed, or to be redeployed in the event that an emergency makes certain skills urgently relevant. LMS tech support channels will be set up before the first teacher logs into the platform, and making active use of these channels will be one of the first skills teachers are trained in. Education Specialists as well as IT personnel will be on the channels to provide instant support.
Insufficient interactive, rich digital content and learning resources to support learning objectives. / UNRWA standards, policies and guidelines insufficiently maintained in any additional digital content developed by teachers.	Senior staff in Fields and HQ, with support from an expert consultant, will proactively identify a number of high-quality and relevant online content sources (both apps and digital materials), and work to establish agreements with these organisations to ensure UNRWA can legally use them. Fields will then be able to use these sources freely without further review. The existing DLP review process will be maintained, and over time, streamlined to ensure fast turnaround in vetting new and reusable content. Moving to the LMS (and moving the DLP within this) will allow UNRWA content to remain out of the public eye, which will allow HQ ED and Neutrality teams to revert to reviewing a random selection of content rather than every single individual material. In addition to the existing review process, a new content rating feature may be activated to support continuous enhancement of content and promote new content as it is loaded.

Resistance to having more technology in learning by some teachers, students and parents	Engaging students and parents in the pilot phase in each Field will help ensure the approaches address their concerns and needs as far as possible. Along with this, there will be a communications campaign to help remind all stakeholders about the purpose of this initiative, i.e. students' right to safely access the online world and to continue their education even during an emergency, and to increase the labour market opportunities available to them. The campaign will highlight success stories from peers and offer symbolic incentives for students and teachers who demonstrate what is possible with these new tools. The AVAC-linked online safety activities should alleviate concerns about safety.
Limited exchange of lessons learnt between teachers, schools and Fields related to technology in learning	Microsoft Teams will be used to build online communities of practice across all 5 Fields for technology in learning champions and encourage the exchange of lessons learnt and good practices. The two Strategy revision stages will include exchange of ideas and lessons learned across Fields, and the results of these will be disseminated Agency-wide.
Insufficient future funds for UNRWA to expand the digital transformation process across the Fields, and upgrade and maintain the devices and internet solutions	Current funding proposals include M&E resources for the pilots - collecting data, defining success stories, producing recommendations and disseminating this information to new potential donors. Successful pilots, with clear lessons learned, will lead to new funding. The Strategy itself will be used to seek and mobilise funding and partnerships opportunities, including finding additional resources for devices, either through additional financial support or through potential direct partnerships with private sector companies, for example through corporate social responsibility schemes. A major conference could also be organised after the pilot stage, to celebrate and present the results and the potential impact of the digital transformation strategy on learning in UNRWA.
Lack of long-term sustainability, given the high cost of ICT resources (devices, internet, trainings, platforms and cloud storage, IT support etc)	The Strategy includes several approaches to minimise costs: Exploring a device hire purchase scheme, which has the potential to become a nearly cost-neutral solution to expanding student device access at home. Once this is scaled, student device ownership might be widespread enough to support a BYOD (Bring your own device) model. Development of a low-cost tech support model (see risk mitigation measure described above) Zero-rating agreements with internet service providers to achieve free access to UNRWA platforms Since the Strategy will not be totally cost-neutral, ED will work with Finance and Planning Departments to discuss how to adjust the long-term Programme Budget to sustain the ICT4E Strategy.
Rejection and/or infeasibility of the hire purchase scheme for students' devices.	An initial trial will identify any barriers to acceptance and design an awareness campaign around this. The awareness campaign will accompany rollout of the scheme across the Fields. It should be clear that this is a voluntary scheme for families to use the devices as they see fit, to ensure there is no confusion and that Basic Education services remain free. Procurement of the devices should be very focused on ensuring attractiveness of the proposed scheme in terms of price, maintenance and quality of device offered – but with an emphasis on price.
Digital exclusion if platforms are rolled out before all students have device and internet access	Fields will develop plans to ensure the inclusion of all students in remote learning during rollout of new platforms – whether by distribution of new devices or continuation of non-digital forms of support such as printed worksheets and phone calls. Rollout should be carefully planned with all 4 enablers in place. M&E tools (surveys and platform analytics) will be deployed by Phase 2 to identify and address any negative equity implications early on.

Annex B. Monitoring and Evaluation

The ICT4E Strategy will not be successful without a clear vision for what it aims to accomplish and how this should be measured. For Basic Education, Strategic Outcome 3 of the current MTS, the aim is that school-aged children complete quality, inclusive and equitable education; for TVET (Strategic Outcome 4), the aim is that refugee capabilities are strengthened for increased livelihood opportunities. If deployed thoughtfully and with the adequate resources, ICT4E can play a key role in: 1) expanding access to digital learning during emergencies, 2) improving the quality of classroom teaching and 3) ensuring students have MIL and other ICT-related skills, which will improve their livelihood opportunities in the long-term. These relationships and the key inputs and outcomes involved are described in the Theory of Change below:

UNRWA ICT4E Strategy:
Proposed Theory of Change

Assumptions and external factors:
• Commitment of UNRWA leadership to Digital Transformation;
• Donors support an adaptable, contextualised, well-resourced and sustainable ICT4E Strategy;
• Ongoing health- or conflict-related emergencies will occur, at least in some Fields;
• Most students will have some access to smartphones at home, but other devices and internet will
   remain unaffordable for many families;
• Ongoing electricity challenges in Gaza, Syria and Lebanon;
• Internet providers open to partnering with UNRWA to expand access to online learning;
• Other UN agencies and NGOs open to supporting UNRWA to improve digital learning approaches,
   infrastructure, etc.

ICT for high quality student learning and support:
• All students are able to access some degree of online learning from home during
   emergencies (improved internet and device access)
• All students are using internet at school or in TVET centres on a regular basis
• Students are using technology to support learning across subjects

ICT for improved teaching, student support and professional learning:
• Teachers are using ICT4E to facilitate interactive learning and other effective pedagogical
   approaches
• Education staff participate in PLCs, which drive professional learning
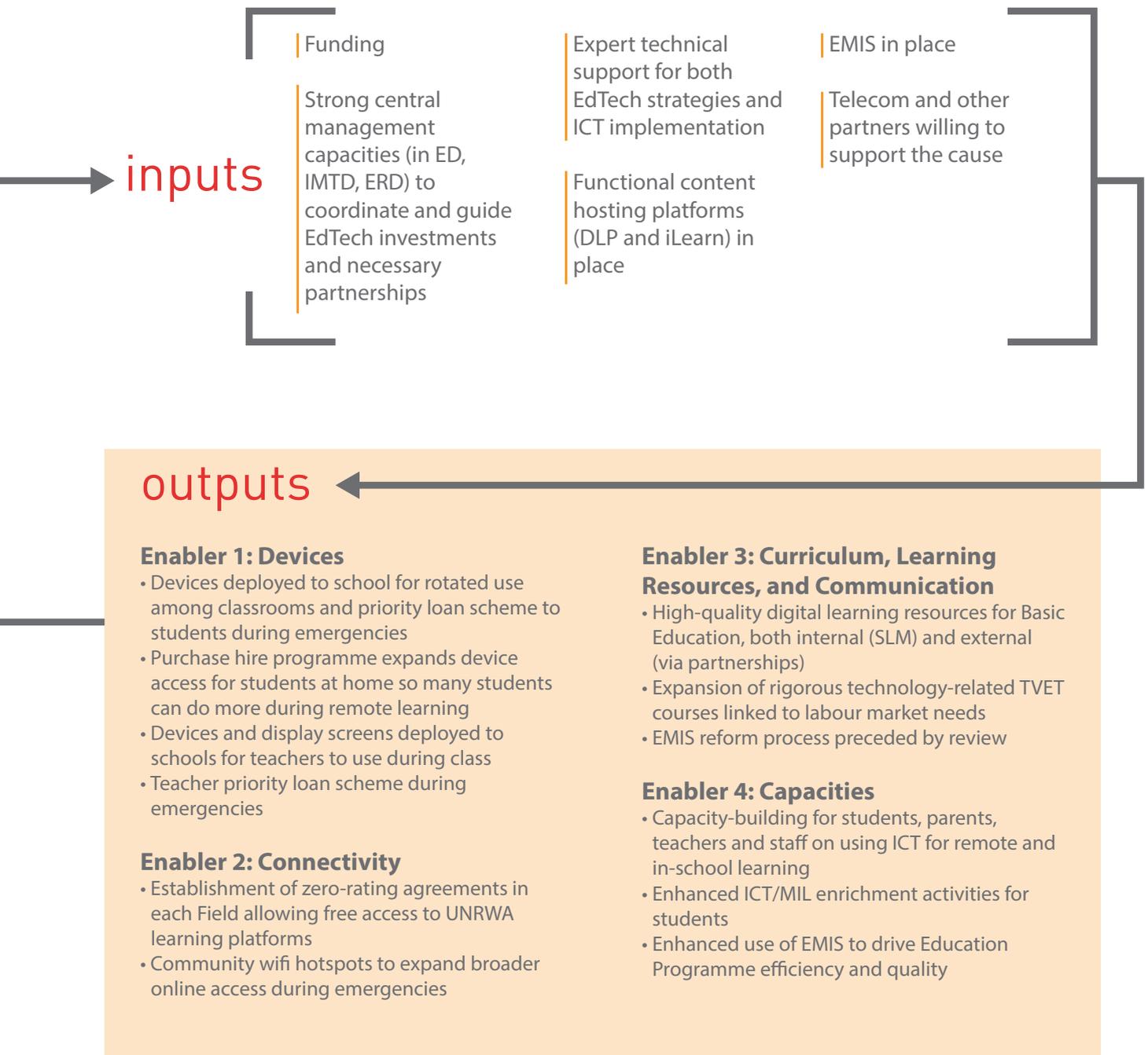
ICT for efficient and effective education planning and management:
• EMIS is improved and data updated regularly and used to inform decision-making by
   school-level, Field-level and HQ staff

outcomes

impact ▶ **Ongoing improvement in educational attainment and learning outcomes for Basic Education (despite emergencies) as well as student wellbeing**

inputs

Funding

Strong central management capacities (in ED, IMTD, ERD) to coordinate and guide EdTech investments and necessary partnerships

Expert technical support for both EdTech strategies and ICT implementation

Functional content hosting platforms (DLP and iLearn) in place

EMIS in place

Telecom and other partners willing to support the cause

outputs

Enabler 1: Devices
• Devices deployed to school for rotated use among classrooms and priority loan scheme to students during emergencies
• Purchase hire programme expands device access for students at home so many students can do more during remote learning
• Devices and display screens deployed to schools for teachers to use during class
• Teacher priority loan scheme during emergencies

Enabler 2: Connectivity
• Establishment of zero-rating agreements in each Field allowing free access to UNRWA learning platforms
• Community wifi hotspots to expand broader online access during emergencies

Enabler 3: Curriculum, Learning Resources, and Communication
• High-quality digital learning resources for Basic Education, both internal (SLM) and external (via partnerships)
• Expansion of rigorous technology-related TVET courses linked to labour market needs
• EMIS reform process preceded by review

Enabler 4: Capacities
• Capacity-building for students, parents, teachers and staff on using ICT for remote and in-school learning
• Enhanced ICT/MIL enrichment activities for students
• Enhanced use of EMIS to drive Education Programme efficiency and quality

Improved employment rates for TVET graduates

Basic Education and TVET students have ICT / MIL skills to prepare them for 21st century life, work and citizenship

Continuous learning and pilots

The ICT4E rollout should be accompanied by mechanisms for continuous data collection, review and reflection and learning. In particular, new approaches such as distribution of tablets or introduction of the LMS should be monitored and evaluated from early on with regards to access rates, user-friendliness, suitability for remote or in-school learning, and impact on equity and inclusion. Monitoring tools should be developed for use during key stages of the ICT4E rollout in each Field, including:

- LMS – Teacher Access, Use, and Perceptions Questionnaire – to be administered within three months of rollout for teachers
- LMS - Student Access, Use, and Quality instruments:
  - Student Perception Questionnaire (paper-based)
  - Parent Perception Questionnaire (phone or paper)
  - Student Focus Group tool
  - Teacher Focus Group tool
- Device distribution monitoring tool (Form to be filled by Field Staff) – to cover # tablets distributed, to whom they are distributed, reports of loss or damage, per cent of tablets returned, etc.

In addition to the tools described above, technology itself can be utilised for M&E purposes. Site analytics from the DLP as well as the new LMS will be reviewed on a regular basis to assess equity of access as well as the nature of student and teacher engagement on these platforms, and these findings will feed into high level reflection processes and adjustment of approaches where this is merited.

Annex C. References

Abdul-Hamid, H., Patrinos, H., Reyes, J., Kelcey, J., & Diaz Varela, A. (2015). *Learning in the Face of Adversity: The UNRWA Education Program for Palestine Refugees.* World Bank. Retrieved from:
https://elibrary.worldbank.org/doi/abs/10.1596/978-1-4648-0706-0.

Deepti Samant Raja. (2016). *Bridging the Disability Divide through Digital Technologies.* World Bank. Retrieved from:
https://thedocs.worldbank.org/en/doc/123481461249337484-0050022016/original/
WDR16BPBridgingtheDisabilityDividethroughDigitalTechnologyRAJA.pdf.

The Digital Technologies Hub. (2021). *Digital Citizenship.* Retrieved from
https://www.digitaltechnologieshub.edu.au/teachers/topics/digital-citizenship.

Grizzle, A., Moore, P., Dezuanni, M., Asthana, S., Wilson, C., Banda, F., & Onumah, C. (2013). *UNESCO Media and Information Literacy Policy and Strategy Guidelines.* Paris: UNESCO. Retrieved from:
https://unesdoc.unesco.org/ark:/48223/pf0000225606.

MOPAN. (2019). *United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA) 2017-18 Performance Assessment.* Retrieved from:
https://www.mopanonline.org/assessments/unrwa2017-18/UNRWA per cent20Report.pdf.

Muralidharan, K., Singh, A., & Ganimia, A.J. (2019). *Disrupting Education? Experimental Evidence on Technology-Aided Instruction in India.* Delhi: Poverty Action Lab. Retrieved from:
https://www.povertyactionlab.org/evaluation/disrupting-education-experimental-evidence-technology-aided-instruction-india.

UNRWA. (2013). *UNRWA Inclusive Education Strategy.* Retrieved from:
https://www.unrwa.org/sites/default/files/unrwa_inclusive_education_strategy_2013.pdf.

UNRWA Department of Education. (2018). *2016 Monitoring of Learning Achievement (MLA) Student Performance Report.*
UNRWA Department of Education. (2016). *Classroom Observation Study.*
UNRWA Department of Education. (2015). *UNRWA ICT Strategy (draft).*
UNRWA Department of Education. (2020). *UNRWA Parent Phone Survey.*
UNRWA Information Management and Technology Department. (2021). *UNRWA Digital Transformation Strategy.*
World Bank and UNHCR. (2021). *The Global Cost of Inclusive Refugee Education.* Retrieved from:
https://documents1.worldbank.org/curated/en/159281614191477048/pdf/The-Global-Cost-of-Inclusive-Refugee-Education.pdf.

UNESCO. (2018). *UNESCO ICT Competency Framework for Teachers.* Retrieved from:
https://unesdoc.unesco.org/ark:/48223/pf0000265721.

endnotes

1   A 2015 World Bank study found UNRWA students in three Fields outperformed their peers in public schools by a year's worth of learning: https://elibrary.worldbank.org/doi/abs/10.1596/978-1-4648-0706-0. A 2021 report by the World Bank and UNHCR further highlighted that these outcomes have been achieved at a lower cost per unit than in peer education systems: https://documents1.worldbank.org/curated/en/159281614191477048/pdf/The-Global-Cost-of-Inclusive-Refugee-Education.pdf.

2   The 2019 MOPAN report commended the agency for its systemic reform in education and said that it is "characterised by a high technical competence," efficiency, and quality. See https://www.mopanonline.org/assessments/unrwa2017-18/UNRWA per cent20Report.pdf.

3   UNRWA Digital Transformation Strategy. IMTD. 2021.

4   Throughout this document, teachers is referring to teachers as well as VTC instructors.

5   https://pubdocs.worldbank.org/en/123481461249337484/WDR16-BP-Bridging-the-Disability-Divide-through-Digital-Technology-RAJA.pdf

6   https://www.unrwa.org/sites/default/files/unrwa_inclusive_education_strategy_2013.pdf

7   Between 2013 and 2016, the Agency-wide (excluding Syria) mean scores in HOTS increased in Grade 4 Arabic (from 49.6 per cent in 2013 to 52.5 per cent in 2016), Grade 8 Arabic (from 42.6 per cent to 48.0 per cent) and Grade 8 math (from 26.5 per cent to 34.5 per cent), but decreased from 31.3 per cent to 27.2 per cent in grade 4 math during the same period.

8   For example, the Mindspark programme in India: https://www.povertyactionlab.org/evaluation/disrupting-education-experimental-evidence-technology-aided-instruction-india

9   Including external visitors as well as UNRWA students, parents and teachers.

10 Direct communication between students will also be possible on the LMS platform, but UNRWA may decide to delay activation of this feature until systems for ensuring online safety will be in place and parents are informed about this feature.

11 Computer / ICT-related subjects are introduced in Grade 5 in Gaza, West Bank and Syria and in Grade 7 in Jordan and Lebanon.

12 The Digital Technologies Hub notes that "A digital citizen refers to a person who has the knowledge and skills to effectively use digital technologies to communicate with others, participate in society and create and consume digital content." The source is available here.

13 UNESCO Media and Information Literacy Policy and Strategy Guidelines, 2013, p. 14. Available here.

14 UNESCO ICT Competency Framework, available here.

15 That said, there are many advantages to face-to-face learning. The goal will not be to eliminate them completely but, rather, to ensure that training can continue when face-to-face sessions are not possible and to reduce some of the costs.

16 Since UNRWA has an agreement with Microsoft, these would be organized in Microsoft Teams, with channels for specific training modules or topics.