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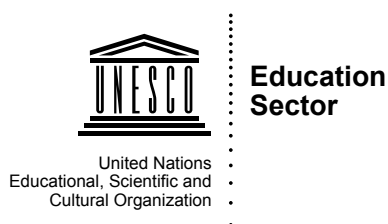
Ensuring effective distance learning during COVID-19 disruption

Guidance for teachers



UNESCO Education Sector

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Objectives and scope of the Guidance

School closures were mandated as part of public health efforts to contain the spread of COVID-19 from February to May 2020 in most countries. Education systems around the world are facing an unprecedented challenge. Governmental agencies are working with international organizations, private sector partners and civil society to deliver education remotely through a mix of technologies in order to ensure continuity of curriculum-based study and learning for all.

The planning of distance learning programmes should be aligned with sector-wide strategies to respond to the sudden interruption of education. The planning should be guided by a concern for equity and inclusion and the need to design and deliver distance learning in ways that do not exacerbate existing educational and social inequalities. The planning of more comprehensive distance learning strategies should, however, be guided by both immediate mitigation needs and long-term goals. Beyond the response to the crisis, the efforts to deploy distance learning at scale across all levels of education provide valuable lessons and may lay the foundation for the longer-term goals of building more open, inclusive, and flexible education systems after the COVID-19 pandemic.

The effectiveness of distance learning strategies is conditioned by various types of preparedness. These include the technological readiness of national distance learning programmes, the readiness of curricular courses and supporting content, pedagogical and home-based learning support readiness, and readiness for monitoring and assessment. After curricular courses and delivery technologies are in place, teachers are in the frontline to design and facilitate learning activities, monitor and evaluate students' home-based distance learning processes, adjust their learning management accordingly, and assess students' achievement of learning outcomes. When students are confined at home, effective home-based distance learning also requires parents or caregivers to manage daily learning activities and provide monitoring and facilitation, acting as teachers.

According to UNESCO, education from the early years should focus on the holistic development of the human personality and to the spiritual, moral, social, cultural and economic progress of the community. It should also attend to the inculcation of respect for human rights and fundamental freedoms. Within the framework of these values, the utmost importance should be attached to the contribution of education to peace, understanding, tolerance, and friendship among nations and racial and religious groups. Teachers of different age groups need differentiated guidance.¹ While older students do not need as much support as younger ones, younger children need support to self-regulate. Students with disabilities will also have specific needs. Furthermore, home-confined teachers often do not have the types of teaching facilities and settings that are readily available at schools. Moreover, some teachers lack the skills necessary to design, facilitate, and monitor distance-learning activities.

This Guidance aims to help teachers understand key issues related to home-based distance learning during COVID-19 school closures and design and facilitate effective learning activities. While we fully recognize the complementary relationship between formal and non-formal education, and continuity of studies across education and training levels throughout lifelong learning pathways, this Guidance includes resources, examples and tips for teachers and educators from pre-primary to upper-secondary level.

1 UNESCO. 2019. Recommendation concerning the Status of Teachers. <https://unesdoc.unesco.org/ark:/48223/pf0000259299?posInSet=1&queryId=f9d4bf3e-e911-4299-939d-33ea957a3000>

1. Teachers' roles, working conditions, and rights under COVID-19 school closures

As a result of COVID-19 school closures, governments have adopted alternative distance-learning solutions to ensure the continuity of quality education. Teachers and other education personnel are on the front lines of ensuring the continuity of learning. Teachers may need to adjust their roles in order to ensure the effectiveness of distance learning solutions.

(1) Teachers' multiple roles in supporting home-based distance learning

During periods of national lockdown, teachers often need to play multiple social roles as home-based providers of education. This includes roles as designers and implementers of teaching, facilitators of learning activities, peers of learners, family members, and agents of connection with parents and schools as well as communities. It is important to support teachers' well-being, social-emotional competencies and resilience before, during, and after the crisis.²

(2) Shifting of responsibilities of teachers as home-based education service providers

Without face-to-face communication and the ability to leave home, teachers have to adjust themselves and their practices as home-based education service providers. The lack of physical interaction and physical school settings are major limitations. To mitigate these limitations, teachers should consider how to make effective use of existing resources and transform themselves into designers and facilitators of home-based learning settings that span across time and physical space. While maintaining social interactions with students, they now need to coach students remotely, bridge the physical distance, and curate different types of curricular resources.

With support, teachers can play multiple roles in the process of distance learning during the pandemic crisis. They can become value leaders, resource integrators, and designers of learning settings. To ensure the quality of distance learning, teachers also need to reformulate the classroom experience, pay attention to the emotional state of students who are situated remotely, and provide guidance to parents (Wang, 2020). Their specific roles are as follows:

- **Distance learning settings builder:** To deliver distance teaching, teachers should design activities to help learners actively explore and construct their understanding of a topic; plan flexible learning tasks and provide feedback so that learners can progress at their own pace; provide learners with opportunities to stay connected with peers, learn through discussion and communication, and feel empowered. Teachers must also assist students in managing their learning by setting personal goals and monitoring progress.
- **Emotional caregiver and learning partner:** The physical separation and distance caused by COVID-19 school closures has restricted social interaction between teachers and students, and among students. In this situation, it is easy to feel isolated and helpless. By providing emotional support and encouragement, teachers can help learners overcome feelings of isolation.

² UNESCO. 2020. *COVID-19 Education Response, Issue note no. 2.2: Supporting teachers and education personnel during times of crisis*. <https://unesdoc.unesco.org/ark:/48223/pf0000373338?posInSet=1&queryId=e32ea6f3-59fa-4fce-892b-129c32832194>

- **Micro-curriculum planner:** Teachers have to plan curricular objectives and structure subject-specific knowledge, managing the timetable as well as the curricular resources and activities.
- **Instructional designer:** Teachers need to produce scripts for live or recorded programmes, design learning activities and formative assessment tasks, and administer formative and summative assessment.
- **Tutor:** Teachers must deliver as tutors of live-streaming or asynchronous video-based lessons. They need to facilitate learners' knowledge acquisition and advancement by encouraging higher-order thinking through question-based learning. Where appropriate, teachers can also help learners actualize their creativity.

(3) Teachers' home-based working conditions

During the pandemic, teachers are engaged in teaching and learning at home, but many have not had adequate preparation for this. Education authorities need to help teachers prepare the required facilities for delivering lessons and monitoring learning remotely.

Teachers' main challenges can be summarized as follows:

- 1 Juggling housekeeping, family responsibilities and their own well-being during the lockdown. Family members and their demands can interfere with teaching remotely.
- 2 Infrastructure and equipment. Teachers do not necessarily own distance-learning equipment. In some rural areas, distance education and digitalization represent challenges for teachers additional to the limited availability of teacher training and learner-centred pedagogies, poor ICT capacity, overcrowded and multi-grade classes, and significant numbers of pupils lacking the prerequisite skills for their grade.³

3 UNESCO. 2020. *COVID-19 Education Response Webinar: Supporting teachers to maintain continuity of learning during school closures – Synthesis report*. <https://unesdoc.unesco.org/ark:/48223/pf0000373248?posInSet=1&queryId=ae985593-e17d-4324-8e8c-8b2a7a2e1701>

- 3 Preparing teaching materials in distance-learning-appropriate formats at short notice. For teachers without strong digital and ICT skills, this may prove difficult, and professional development courses that could help them are often not available. Even in more stable contexts with adequate infrastructure and connectivity, many educators lack basic ICT skills, causing problems for their own ongoing professional development, as well as for the delivery of distance learning.⁴

(4) Teacher's rights

Teachers are personally, practically and emotionally affected by the pandemic, just like everyone else in society. The expectation for teachers to transform students' learning in this context should be accompanied by fundamental support for and safeguarding of teachers' rights, which include the following:

- **The right to quality professional development and support.** Shifting to distance learning is challenging and many teachers are unprepared. They need professional development which can be delivered online, and where internet connectivity is problematic, through public television and radio. Such initiatives would also give teachers a first-hand understanding of how remote teaching and learning happens. Professional development can also support teachers to generate more learner-centred practices, develop their digital literacy, and explore how student data might be used to support curriculum differentiation and more individualized learning.⁵
- **The right to job security and timely, adequate compensation.** For teachers to maintain their motivation and well-being during the crisis, educational authorities and governments should preserve their employment and wages. Special

4 UNESCO. 2020. *COVID-19 Education Response Webinar: Supporting teachers to maintain continuity of learning during school closures – Synthesis report*. <https://unesdoc.unesco.org/ark:/48223/pf0000373248?posInSet=1&queryId=ae985593-e17d-4324-8e8c-8b2a7a2e1701>

5 UNESCO. 2020. *COVID-19 Education Response. Issue note no. 2.2: Supporting teachers and education personnel during times of crisis*. <https://unesdoc.unesco.org/ark:/48223/pf0000373338?posInSet=1&queryId=e32ea6f3-59fa-4fce-892b-129c32832194>

consideration should also be given to how best to retain female teachers, who tend to be the most vulnerable due to their own family commitments. The continued engagement of female teachers is critical in ensuring that girls engage with learning and return to school after the crisis.

- **The right to well-being and mental and emotional health.** In the classroom, teachers respond to children's social and emotional needs. For teachers to adequately respond in a time of crisis, they need to receive extra socio-emotional support so that they can navigate the uncertainty and anxiety. Those who have built up their own psycho-social skills and have access to regular professional debriefing and counselling are better equipped to provide emotional support to their students.
- **The right to academic freedom in the discharge of professional duties.** Since teachers are particularly qualified to judge which teaching aids and methods are most suitable for their pupils, they should be given the freedom to make choices, adapt teaching material, select teaching content, apply teaching methods, and decide on the modalities of delivery and assessment. Educational authorities should allow teachers the academic freedom to implement their duties within the framework of their country's curriculum.

2. Understanding home-based distance learning under COVID-19 school closures

2.1 Distance learning

In a broad sense, distance learning is often synonymous with online learning, e-learning, correspondence education, remote studies, flexible learning, and massive open online courses (MOOCs). Common features of distance learning are spatial and/or temporal separation, and the use of media and technology to enable communication and exchange during the learning process. This may be achieved through print-based learning, one-way broadcasting (TV and radio programmes), or the web (social media and learning platforms). Distance learning tends to require high levels of self-direction on the part of the students, and study skills that have to be supported through new teaching, learning and guidance strategies.⁶

2.2 Defining objectives of distance learning to respond to the COVID-19 crisis

The planning and implementation of distance learning programmes to respond to school closures usually involve three phases. Phase 1 is the rapid response; phase 2 is comprised of the daily routine of distance learning practices; and phase 3 is the new normal of school education after the crisis. Policymakers and school administrators must ensure that teachers are well prepared for the situation, including understanding the main curricular objectives of the programmes at the different phases:⁷

Objectives of phase 1 – rapid response

- Providing mental health and psycho-social support (MHPSS) for children, parents, and teachers (e.g. UNESCO issue note on health & nutrition during home learning⁸; and the WHO guidelines on psychosocial support in emergency settings adapted for COVID-19⁹)
- Enabling the continuation of learning across subjects
- Teaching to focus on prior knowledge reinforcement or on new curricular knowledge

Objectives of phase 2 – daily routine of distance learning

- Keeping learners engaged and motivated to learn
- Providing well-designed teaching and learning activities, parental guidance, and increased use of formative assessment
- Ensuring students' continuous participation in distance learning programmes
- Maintaining the quality of learning
- Facilitating extra-curricular learning, e.g. digital skills

Objectives of phase 3 – transition to the new normal

- Sustaining improved distance learning and digital skills of teachers and learners

6 UNESCO.2020. Distance learning strategies in response to COVID-19 school closures. <https://unesdoc.unesco.org/ark:/48223/pf0000373305?posInSet=1&queryId=dc3a3e51-4811-46a3-a1b4-b47dfd80f875>

7 UNESCO. 2020. *COVID-19 Education Response Webinar: Distance learning strategies – What do we know about effectiveness? – Synthesis report*. <https://unesdoc.unesco.org/ark:/48223/pf0000373350?posInSet=1&queryId=1474b0d7-afe5-4251-93b9-70d7eceb3b>

8 UNESCO. 2020. *COVID-19 Education Response*. Education sector issue notes: Health & nutrition during home learning. <https://unesdoc.unesco.org/ark:/48223/pf0000373277?posInSet=1&queryId=f1435737-46e8-437a-b284-b117af148c3b>

9 IASC. 2007. *The IASC Guidelines on Mental Health and Psychosocial Support in Emergency Settings*. https://www.who.int/hac/network/interagency/news/iasc_guidelines_mental_health_psychosocial.pdf

- Identifying and sustaining effective pedagogical methodologies, especially technology-enhanced innovations
- Evaluating distance learning courses and platforms that could be integrated into more open and resilient school systems

including online, TV-based, radio-based, and print-based learning. The first round of data collection from 122 countries has revealed that, the selections of distance learning solutions vary according to region and income level. While online learning tends to be the most widely adopted distance learning solution in upper-middle and high income countries, low income countries relied relatively more on TV and radio.

2.3 Main distance learning models

According to the UNESCO-UNICEF-World Bank Survey on National Education Responses to COVID-19 School Closures¹⁰, multiple solutions have been used to ensure that learning can continue offsite during the pandemic,

Table 1 provides a matrix listing various distance learning scenarios alongside key elements of teaching and learning practices. By reviewing the potentials and limitations of the technology in each model, teachers can identify gaps in the solutions they are using, better understand the human facilitation that is needed, and optimize their planning and delivery.

10 UNESCO, UNICEF, and the World Bank. 2020. Survey on National Education Responses to COVID-19 School Closures. tcg.uis.unesco.org/survey-education-covid-school-closures/

Table 1. Matrix analysing potentials and limitations of major distance learning models

Key elements of teaching and learning practices	Categories of distance learning	Online			TV-based		Radio-based		Print-based
		Platform-based online learning	Teacher-directed live streaming lessons	Video-based flipped learning	Digital TV	Analogue TV	Interactive Radio	One-way Radio	
Main media and technology tools	Sub-categories of distance learning								
	Supporting videos	✓	✓	✓	✓	✓			
	Supporting multimedia demonstration	✓	✓	✓	✓				
	Supporting audio	✓	✓	✓	✓	✓	✓	✓	
	Supporting text	✓	✓	✓					✓
Formats of content	Computers (desktop, laptops, or tablets)	✓	✓	✓	✓				
	Smartphones	✓	✓	✓			✓	✓	
	Feature phones								
	Other digital devices, e.g. Kindle	✓	✓	✓					
	TV			✓ (digital TV)	✓	✓			
	Radio	✓	✓	✓			✓	✓	
	Paper		✓						✓
Devices to access content									

Key elements of teaching and learning practices	Categories of distance learning	Online			TV-based		Radio-based		Print-based
		Platform-based online learning	Teacher-directed live streaming lessons	Video-based flipped learning	Digital TV	Analogue TV	Interactive Radio	One-way Radio	
Main media and technology tools	Sub-categories of distance learning	Platform-based online learning	Teacher-directed live streaming lessons	Video-based flipped learning	Digital TV	Analogue TV	Interactive Radio	One-way Radio	Textbooks and print material packages
Accessibility	People with visual disability	✓(possible)	✓						
	People with hearing disability	✓(possible)	✓	✓(possible)					
	Other disabilities	✓(possible)	✓(possible)	✓(possible)					
Courses and content management	Automatically searchable by topic and grade	✓		✓					
	Editable and re-usable	✓		✓					
	Open-source and extended resources	✓	✓	✓					
	Spaces to store, manage, and share resources	✓							
	Tools to support resource development	✓							
Management of curricular calendars	Adaptive learning calendars based on different learners and their paces of learning	✓		✓					
	Online learning calendars accessible anytime and anywhere	✓		✓					
	Fixed calendar or programmes		✓		✓	✓	✓	✓	✓

Key elements of teaching and learning practices	Categories of distance learning	Online			TV-based		Radio-based		Print-based
		Platform-based online learning	Teacher-directed live streaming lessons	Video-based flipped learning	Digital TV	Analogue TV	Interactive Radio	One-way Radio	
Main media and technology tools	Sub-categories of distance learning	Platform-based online learning	Teacher-directed live streaming lessons	Video-based flipped learning	Digital TV	Analogue TV	Interactive Radio	One-way Radio	Textbooks and print material packages
Teaching activities	Synchronous live-streamed interactive lessons	✓(possible)	✓						
	Asynchronous video-based lessons followed by synchronous coaching	✓		✓					
	Asynchronous video based lessons followed by asynchronous coaching	✓		✓	✓	✓			
	On-demand and controllable video/TV programmes	✓		✓	✓				
	One-way video/TV broadcasting without control of pace or replay					✓			
	On-demand and interactive radio programmes						✓		
	One-way radio programmes							✓	
	Paper-based materials								✓

Key elements of teaching and learning practices	Categories of distance learning	Online			TV-based		Radio-based		Print-based
		Platform-based online learning	Teacher-directed live streaming lessons	Video-based flipped learning	Digital TV	Analogue TV	Interactive Radio	One-way Radio	
Main media and technology tools	Sub-categories of distance learning	Platform-based online learning	Teacher-directed live streaming lessons	Video-based flipped learning	Digital TV	Analogue TV	Interactive Radio	One-way Radio	Textbooks and print material packages
Student-student interaction and collaboration	Online collaborative makers' practices or project-based learning	✓(possible)	✓	✓					
	Real-time online discussion or group work	✓	✓	✓(possible)					
	Asynchronous online discussion or group work	✓		✓					
	Sharing messages through TV or radio programmes				✓				
	Communication through mobile SMS	✓	✓	✓	✓	✓	✓	✓	✓
	Communication through paper-based letters	✓	✓	✓	✓	✓	✓	✓	✓
Assessment (formative and summative)	AI-powered formative assessment and suggested personalized learning pathways	✓(possible)		✓(possible)					
	Automatic distribution and administering of tests	✓(possible)		✓(possible)					
	Multimedia presentation of learning outcomes	✓(possible)	✓	✓(possible)					

Key elements of teaching and learning practices	Categories of distance learning	Online			TV-based		Radio-based		Print-based
		Platform-based online learning	Teacher-directed live streaming lessons	Video-based flipped learning	Digital TV	Analogue TV	Interactive Radio	One-way Radio	
Assessment (formative and summative)	Shared spaces to collect learners' submissions	✓(possible)		✓(possible)					
	Automated grading and reporting of results	✓(possible)		✓(possible)					
	Shared spaces to present outputs to facilitate peer assessment and learning	✓(possible)	✓	✓(possible)					
	SMS-based tests	✓	✓	✓	✓	✓	✓	✓	✓
	Telephone-based monitoring of learning processes	✓		✓	✓	✓	✓	✓	✓
	Paper-based test, communicated through posted letters	✓	✓	✓	✓	✓	✓	✓	✓

Online distance learning

Given the social distancing measures during the pandemic, teachers can carry out online teaching at home when there are reliable devices and connectivity. Online distance learning can be done at any time or place, provided learners have access to the internet. It can be divided into three main categories: platform-based learning, teacher-directed live streaming, and video-based flipped learning.

- Platform-based online teaching and learning is supported by integrated web-based platforms, which can be national, private or institutional and may or may not have login credentials. They usually categorise content by subject and grade level, and provide functionalities that support class management, teacher-student communication, and collaboration among students.

- Teacher-directed live-streamed lessons are carried out via live conferencing applications where teachers and learners interact synchronously. While this requires high-speed connectivity, it is relatively easy to initiate, requiring only basic digital skills.
- Video-based flipped learning involves online video lessons that are pre-recorded and uploaded by teachers, followed by interactive tutorials and live conferencing. The video lessons can be viewed at students' convenience and at their own pace. This requires students to have strong learning-management skills and the ability to maintain their focus despite distractions.
- One-way radio is ephemeral, uninterruptable, and presented at the same pace for all students. Students may find it difficult to reflect on an idea or pursue a line of thought during a fast-paced programme, or integrate broadcast material with other learning.
- In interactive radio programmes, the instructors can pause and prompt responses from the radio audience, and enable isolated students to engage in education.

TV-based learning

TV programmes can present conceptual information in concrete ways, using real-world environments. Analogue and digital TV is generally used in areas where students lack network connections and/or devices:

- One-way analogue TV programmes usually work with a fixed timetable and do not allow for real-time, synchronous interactions. They can be used to instruct a large number of students at the same time. Students do not have control over pace or replay.
- Digital TV typically produces a high-quality picture and allows students to watch on demand with control of pace and playback. Although its function is constantly improving, it still provides little in the way of student interaction and collaboration.

Radio-based learning

Radio is one of the most affordable educational technologies in many countries. Like TV, it can also reach a large share of the student population. Both interactive and one-way radio can be used to support learning:

Print-based learning

Print-based learning is an offline distance learning model making use of textbooks, guidebooks, and reading lists. This model can be useful in settings with limited technology. A key challenge is how to distribute the materials. Letters and phones can be used as supportive tools to augment print-based learning. In this kind of learning, teachers play a relatively small role, which means learners are expected to be strongly self-motivated.

2.4 Special contexts of home-based distance learning under COVID-19 school closures

Moving the educational experience from school to the home leads to physical and psychological disconnection between teachers and students, as well as among students. In this new context, learners gain autonomy, and teachers lose direct control and supervision. Parents are often entrusted with supporting and navigating children through the new forms of study, which might include the use of new technologies.

Table 2 compares home-based to classroom-based learning along five key dimensions. Teachers can adjust their methods according to the characteristics of different settings.

Table 2. Special contexts of home-based distance learning under COVID-19 school closures

	Classroom-based learning	Home-based distance learning
Learning settings	Classroom and its resources (books, equipment, facilities). Can be complemented by mobile access beyond the physical classroom and teaching hours.	Teachers need to set up classes at home if the online distance learning model is used.
Content delivery	Dominated by teacher-delivered content, assisted by technology or other media.	Dominated by content delivered through technology, assisted by teachers' facilitation.
Teacher-student social interaction	Face-to-face, synchronous social interaction supplemented by technology.	Physical face-to-face interaction blocked. Interactions rely on technology.
Learners' self-regulation and external regulation	Teachers regulate behaviours of learners when necessary.	Learners with low self-regulation skills gain autonomy, regulated by parents and remotely monitored by teachers.
Learning organization	Teachers manage and organize teacher-student and student-student collaboration.	Group learning is not supported unless an online model is used which provides tools for collaboration.

2.5 Home-based distance learners under COVID-19 school closures

Learners' self-regulation and autonomy should be taken into consideration when devising plans for distance learning and remote teaching. Pre-COVID-19 distance learning programmes mainly targeted adult learners with self-regulation skills or young learners with human facilitators. During COVID-19, however, distance learning targets learners at all stages.

Home-based distance learning programmes pose multiple challenges for students around their learning routine and self-control, motivation, relationships with their parents as well as their plans for their future. In particular, the disruption of students' daily routine might require separate study schedules for different subjects and often a slower learning pace. Electronic devices (mobile phones, tablets, etc.), frequently used as game devices in the past, require self-control skills that students may not have. For students to remain motivated without the presence of teachers, they may rely on parents to motivate and manage their learning activities on the fly, causing friction in family relationships. Furthermore, depending on the age of the students, the uncertainty of the situation overall can cause anxiety over how to move forward to the next educational level.

On the other hand, studying at home provides a good opportunity for students to improve their self-regulation skills. Understanding health and safety measures from COVID-19, becoming a self-directed and active learner, and looking after their own well-being could be some of the skills to be gained, promoting vital lifelong learning skills. Six strategies can be used during school closures to encourage this sort of learning at home:¹¹

- Scheduling times for both learning and playing, with an appropriate balance between the two;
- Choosing learning resources on demand;
- Inspiring study through play;
- Engaging in learning by self-monitoring;
- Nourishing learning ability with more frequent formative assessment;
- Being reflective on learning methods.

11 Huang, R.H., Liu, D.J., Amelina, N., Yang, J.F., Zhuang, R.X., Chang, T.W., & Cheng, W. 2020. *Guidance on Active Learning at Home During Educational Disruption: Promoting students' self-regulation skills during the COVID-19 outbreak*. Beijing: Smart Learning Institute of Beijing Normal University. <https://iite.unesco.org/wp-content/uploads/2020/04/Guidance-on-Active-Learning-at-Home-in-COVID-19-Outbreak.pdf>

Adopting these learning strategies enables students to set and control their own goals. For older students in particular, this can significantly enhance their potential. A strategy for effective distance learning should, therefore, pay particular attention to empowering learners. Teachers should help students to reflect on and adjust their own learning strategies. They can do this by setting regular assignments, providing rapid feedback, and showing students their progress towards their goals.¹²

For learners with no internet access, teachers should plan special measures to ensure inclusive, personalized support, particularly for students with disabilities and those whose parents are working full time outside the home.

2.6 Common guiding principles

All distance learning models should take into account the following principles:

Education as a right. For many learners, the COVID-19 crisis has severely disrupted their access to education. Such learners may fall behind their peers and miss the sense of stability and normality that schools provide. School closures may disproportionately affect learners who already experience barriers accessing education or who are at higher risk of being excluded. This may include disabled children and youth, asylum seekers, refugees, learners living in remote areas, and those whose families have are experiencing job cuts or precarious employment.¹³

Ensure equity and inclusion. Rapid-response strategies should focus on enabling continuous learning without exacerbating existing educational and social inequalities (the “do no harm” principle). Curricular courses should be made accessible for learners with disabilities and those whose primary language is not the language of instruction.¹⁴

12 UNESCO. 2020. *COVID-19 Education Response Webinar: Distance learning strategies – What do we know about effectiveness? – Synthesis report*. <https://unesdoc.unesco.org/ark:/48223/pf0000373350?posInSet=1&queryId=9029e8af-cd6b-41bc-829e-61ab3be731ea>

13 Human Rights Watch. 2020. *COVID-19 and Children's Rights*. <https://www.hrw.org/news/2020/04/09/covid-19-and-childrens-rights-0>

14 UNESCO. 2020. *COVID-19 Education Response*. Issue note no. 2.1: Distance learning strategies in response to COVID-19 school closures. <https://unesdoc.unesco.org/ark:/48223/pf0000373305?posInSet=1&queryId=84949ad4-58e5-42cb-8c8a-315f5e815a08>

Students with disabilities are particularly vulnerable to the disruptions caused by the pandemic because they often rely on in-class support that is difficult to reproduce virtually. Special education teachers and service providers should be included in the school's distance learning plan to address how individual support and services will be provided. They should get the families' input and outline to them how instruction will be delivered, share expectations with the adult supervising the student, and conduct a needs assessment to identify what resources the family has or may require to facilitate access to the instruction.¹⁵

Gender equality. Girls are twice as likely to be out of school in crisis situations and face greater barriers to education and vulnerabilities such as domestic or gender-based violence when not in school.¹⁶ Evidence from low- and middle-income countries shows that parents give girls access to digital technology at a later age than their male peers and that their access is more curtailed and monitored. Teachers can address gender equality in the design of online distance learning by removing barriers to knowledge, developing capabilities and providing support around online safety. Providing knowledge about sexual and reproductive health services and access to modern contraception, for example, can reduce young women's vulnerability to early and unintended pregnancy, HIV, and gender-based violence, and increase rates of re-enrolment and retention.¹⁷

2.7 Three-fold effectiveness of distance learning

The effectiveness of distance learning amid the pandemic should be assessed based on three criteria: access, engagement, and assessment of learning outcomes.

The first aspect of effectiveness is to ensure inclusive access to distance learning opportunities for all learners, especially for the most vulnerable groups.

15 National Center for Special Education in Charter Schools. 2020. *COVID-19 and Students with Disabilities: FAQs for schools and practitioners*. <https://www.ncsecs.org/covid-19/covid-19-and-students-with-disabilities-faqs-for-schools-and-practitioners/#1585761333365-aaaed509-b5ca>

16 Education Cannot Wait. 2020. *COVID-19 and Education in Emergencies*. <https://www.educationcannotwait.org/covid-19/>

17 UNESCO. 2020. *COVID-19 Education Response*. Issue note no. 3.1: Addressing the gender dimensions of COVID-related school closures. <https://unesdoc.unesco.org/ark:/48223/pf0000373379>

Teachers are at the forefront of assessing whether Universal Design for Learning (UDL) principles are adopted to guarantee feedback on their accessibility for learners with disabilities or learning difficulties, and those whose mother tongue is not the language of instruction. Teachers can also facilitate the quick estimate or survey on learners from the poorest households and support the temporary decentralization of digital devices to students from low-income families. Special support should be provided to teachers who are working with refugee, displaced and migrant students.

Second, the engagement of learners involves minimizing the interference of non-learning tasks such as logging in or waiting for an upload, and maximizing time spent in active learning. Useful pedagogical approaches include group discussions, peer assistance and assessment, and formative quizzes. While teachers should invite students' and parents' feedback on engagement, overloading them by requesting scanned forms should be avoided.

Assessment is vital for helping teachers determine whether students have achieved the learning objectives, but it needs to be redefined in distance learning. Rather than grading, it is more important to help learners identify their strengths and weaknesses and work towards overcoming challenges. As the teaching process is complex and shaped by a mix of relationships (social, academic, and cultural), teachers are required to use more formative assessment. They can also invite students to become more involved through the use of self- and peer assessment.

3. Online distance learning

Online learning has become more prevalent in recent years. There is a variety of online teaching and learning models, e.g. platform-based, live-streaming, video lessons, and a variety of methods to accompany them, including webinars and flipped learning.

3.1 Online platform-based teaching and learning

3.1.1 Understanding key features of online platform-based learning

Learning platforms can be developed and managed by governments, public agencies or private companies and provide functionalities such as lesson delivery, hosting and management of learning materials, and communication support. Teachers and students can sometimes customize and adjust courses and content according to their individual needs.

The three most commonly used types of platforms are as follows:

- **National platforms** that have functionalities to support online teaching and learning such as those in Korea and Malaysia.

- **Platforms developed by NGOs**, such as the US-based Khan Academy, that focus on curricular resources mainly for STEM subjects, with some functionalities to support online teaching and learning.
- **Platforms developed by private companies**, such as Edmodo, which is also based in the US, that often host structured courses with resources, timetabled lessons, online tutors to conduct live streaming and asynchronous lessons, exercises and tests, summative examinations, and certification.

Table 3 categorises the needs that online platforms are expected to address, providing a taxonomy so that teachers can assess functionalities, identify gaps, and plan strategies accordingly.

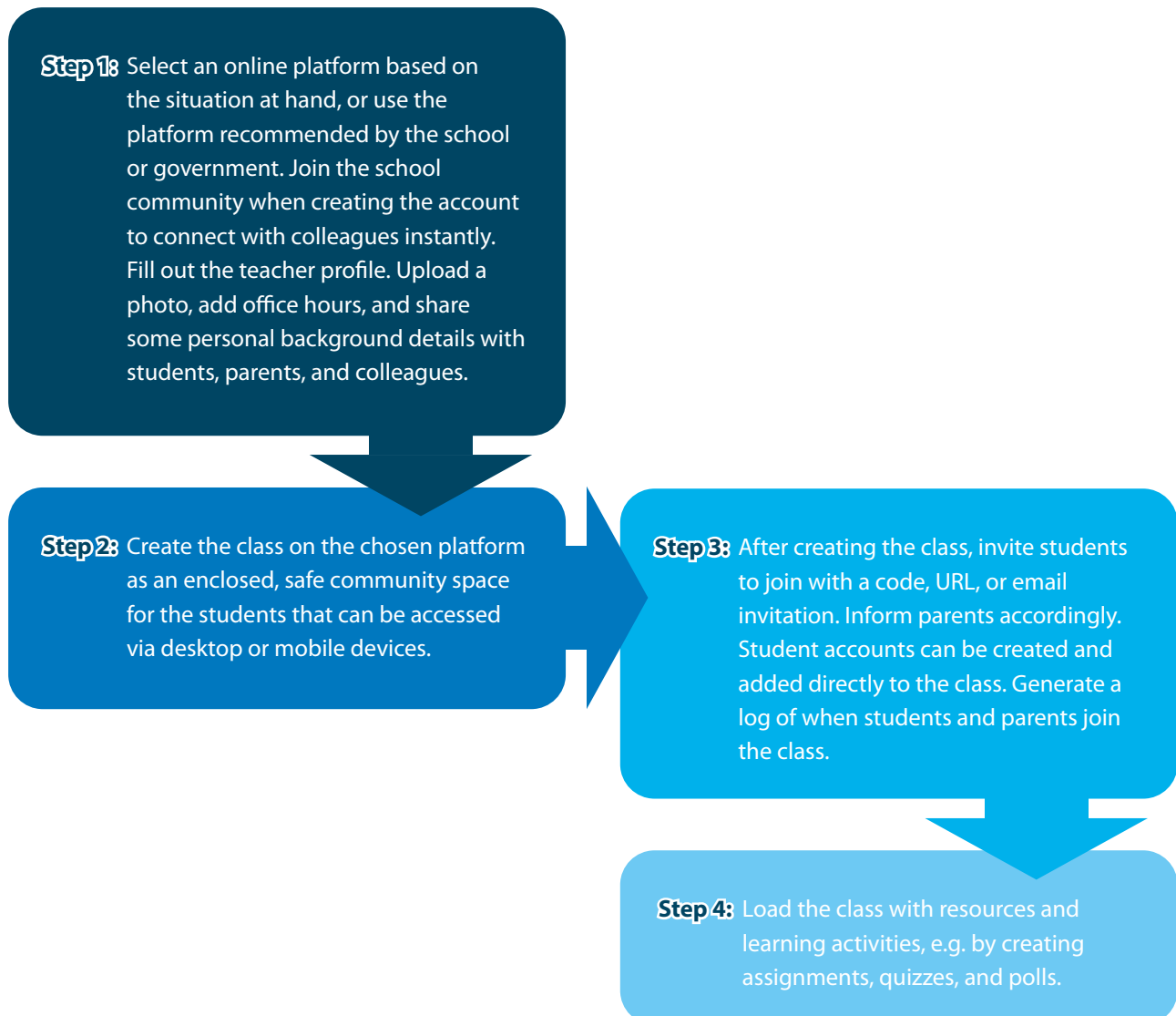
Table 3. A learner-centred taxonomy to assess functionalities of online platforms

Possible functionalities	Functionalities available in the platforms you or your schools are using	Any gaps? How can teachers fill in the gaps?
Supporting curricular courses	1. only a webspace presenting ad hoc content collections	
	2. covering all subjects	
	3. covering all grade levels	
	4. searchable by subject, topic and grade level	
	5. supporting different distance learning models (online, TV/ radio-based)	
	6. accessible for learners with visual disability	
	7. under open licence	

Possible functionalities	Functionalities available in the platforms you or your schools are using	Any gaps? How can teachers fill in the gaps?
Data management	1. protecting learners’ data privacy and security	
	2. supporting unique user identifiers (UUID) for logins and records of learning progress	
	3. supporting learning analytics and periodic reporting	
	4. integrating with existing education management information systems (EMIS)	
	5. linking and/or cross-reference to external sources of big data	
Supporting teachers’ online collaboration	1. sharing resources that are dynamically updated, quality-assured and teacher-generated	
	2. supporting moderated online forums for educators	
	3. adopting certified and/or quality assurance standards	
	4. providing recommendations for teachers based on learning analytics	
Supporting learners’ online collaboration	1. sharing resources that are dynamically updated, quality-assured and student-generated	
	2. supporting moderated online collaborative learning and/or project-based learning activities	
	3. supporting online makers’ spaces	
Supporting online teaching	1. providing online classrooms to enable live-streaming lessons	
	2. supporting asynchronous video-based lessons (such as MOOCs) followed by two-way interactive tutorials and teacher-student discussions	
	3. supporting asynchronous video-based lessons followed by asynchronous coaching	
Supporting formative assessment	1. providing free shared spaces to collect learners’ submissions and present outputs to facilitate peer assessment and peer learning	
	2. supporting automated grading and reporting of assessment results	
	3. supporting automatic distribution and administering of tests	
	4. integrating AI-powered formative assessment and suggested personalized learning pathways	

3.1.2 Designing and facilitating online platform-based distance learning

Teachers can use technology to deliver instruction and efficiently assess student learning. There are many tools they can use to send information, assign work, and give students opportunities to collaborate. The general steps can be summarized as follows:





Case 1: Using Tencent Meeting to support synchronized online teaching

Many schools in China adopted Tencent Meeting as the live-chatting platform to support online teaching during COVID-19 disruptions? DingTalk is another similar platform (please find the link to DingTalk on page 30). Both are internationally available. The screenshots below show the user interface of the Tencent Meeting application.

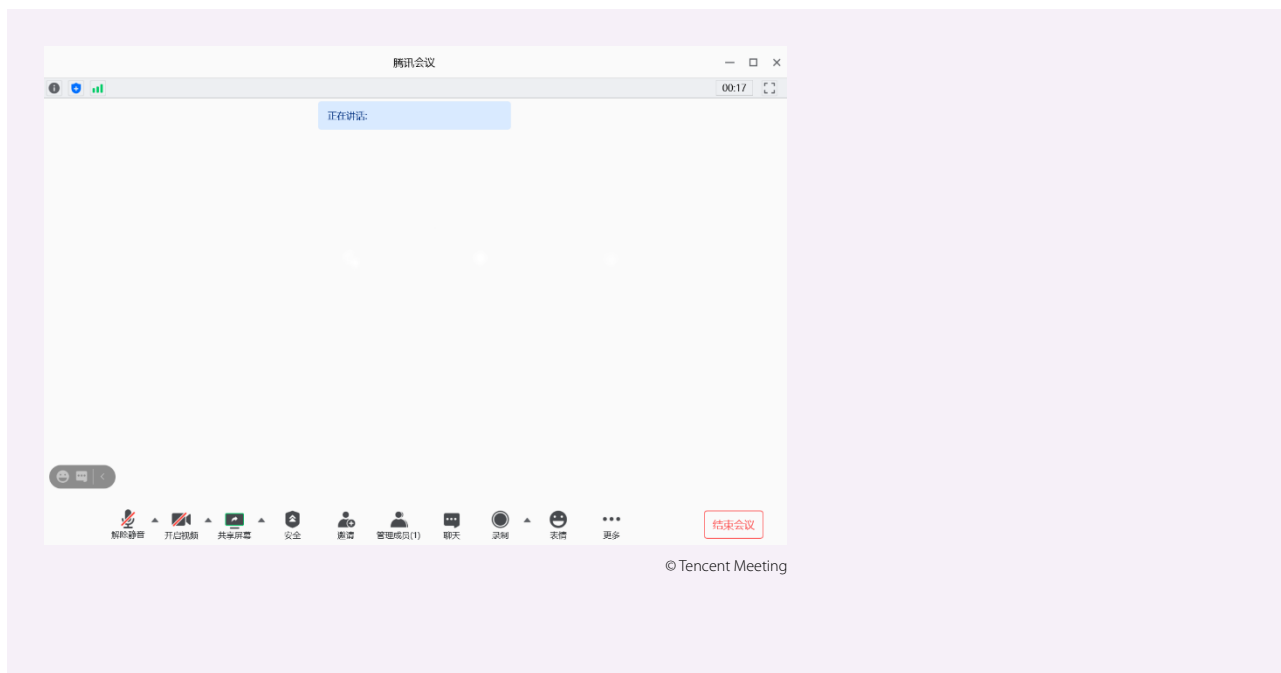
Open the platform. Create a new account or use an existing one to log in. Start the course. Once logged in, teachers can initiate a class or meeting.

Deliver the live-streaming lessons. Teachers can kick off the lesson with a motivating introduction? to attract students' attention and stimulate them to think. Then, teachers can present new content or organize interactive activities, including asking questions or holding group discussions using the chat function of the platform. Teachers can monitor and engage students with eye contact through the device camera.

Tencent Meeting application: <https://meeting.tencent.com/>

Tencent Meeting user interface





3.1.3 Organizing and monitoring online platform-based learning

Many online platforms have integrated learning management systems to monitor students' engagement and progress over time. Teachers need the skills to master such functionalities as well as the ability to design platform-independent strategies and assess the effectiveness of the learning activities.

3.1.4 Formative assessment for online platform-based learning

Advice on how to monitor students' engagement and progress over time include the following:

- **Assess student learning.** Create assignments, quizzes, polls, and snapshots in classes to track students' progress.
- **Personalize learning experiences.** Create small groups within classes to foster student collaboration and discussion.
- **Find lesson plans and resources.** Use the internet to find new learning resources.
- **Build a professional learning community (PLC).** Follow topics of interest with colleagues and teachers from around the world.
- **Reward positive student behaviour.** Create personalized badges online and award them to students to post on their profiles so that they can become more motivated by seeing and displaying these rewards.
- **Make the most of teacher dashboards.** Make sure to allow the platform to show cumulative personal and class-level data. Examples of class level information include class summaries and lists of exercises per class and per subject. Examples of personal-level information include exercises completed per student, mastery level, and time taken to finish the exercise. The data shown automatically on the dashboard can be filtered by time and subject.



Case 2: Using Edmodo to organize and monitor learning processes

Edmodo is an online learning platform in which teachers can set up a virtual class and organize learning activities. In a virtual class, teachers can design both synchronous and asynchronous online learning experience for their students. Specifically, there are five types of activities teachers can create on this platform: 1) notes for announcements, agendas, materials and class discussions, 2) a poll or wellness check for a quick class check-in, 3) a quiz to check understanding, 4) the directions for an assignment to clarify the learning content and outcome of the lesson and to capture student learning, and 5) small groups for unit instruction or group work. With these functions, teachers can create activities to monitor students' learning processes and provide immediate feedback to students' learning outcomes.

For more information: Baker, K. 2020. Setting Up Edmodo Classes for Distance Learning. <https://go.edmodo.com/setting-up-edmodo-classes-for-distance-learning/>

3.1.5 Mobilizing parents and caregivers to facilitate online platform-based learning

Parents are key in supporting and monitoring children's learning on national platforms.

- Create or log into the parent account.
- Support parents to view their dashboards and filter their child's activities by time, content, and type (e.g. exercises, videos, articles, and quizzes). They can see the name of the activity their child worked on, when they started it, and how long it took them.
- Create or add the child's account; children under 13 have a 'restricted account', and parents have to create and manage it. Parents can choose whether to allow their child to add other coaches (e.g. their teacher or another parent or guardian). Young people over 13 can manage their own account, but there are options for parents to create an account for them or send them an email so they can connect their account to their parent's.
- Parents can use the 'mastery system' or a 'course challenge card' to learn more about online courses and track their child's learning progress.

Case 3: The 'Edmodo for parents' mobile application

According to the parents' need to stay closer to students' learning situation, the mobile application, "Edmodo for parents," allows parents to sign in and monitor their children's online class with permitted accounts. Rather than only obtain information about students' performance only from teachers, parents can use the following functions to know and assist students' learning both online and at home:

First, parents can access information and materials students need to support their learning process with those resources and tools to keep track of students' performance. Moreover, this app provides the synchronized information about the assessment result, scores of assignments, and quizzes once they are graded by teachers on the other end of the Internet. Besides, class notifications and communications among parents and teachers are also achieved through this app's notification and message functions.

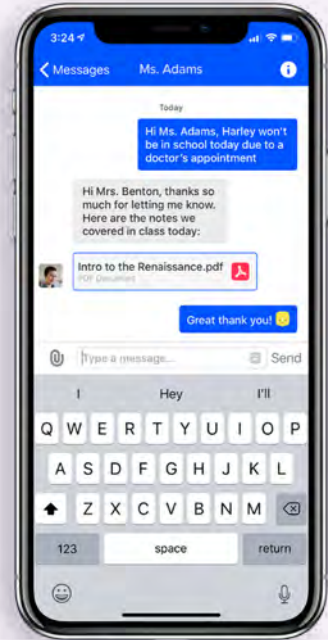
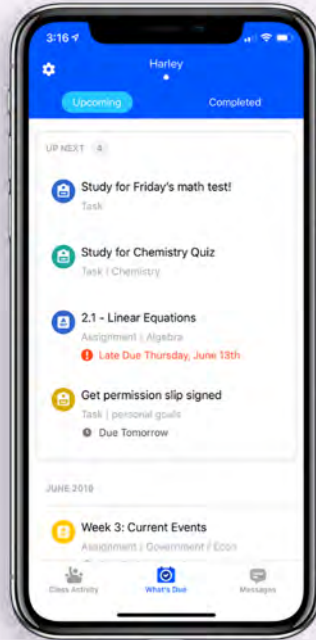
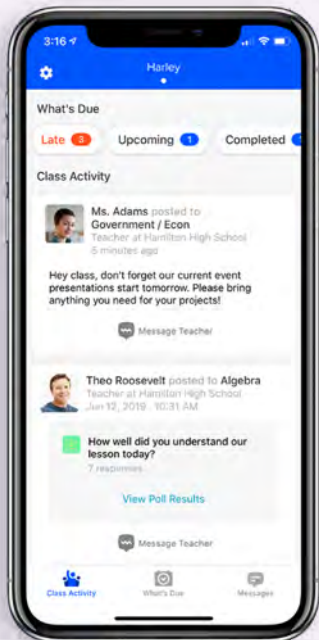
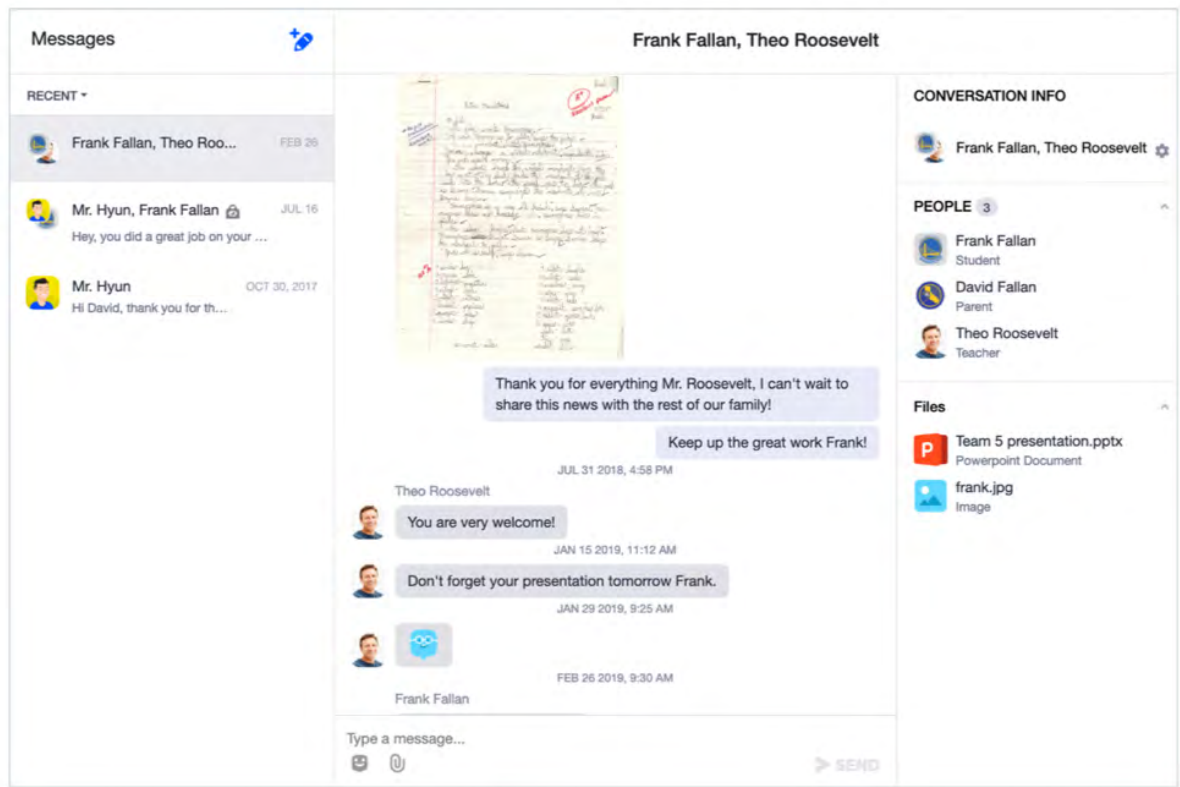
For more information: Edmodo. 2020. Your window into the classroom. <https://go.edmodo.com/parents/>

Edmodo for parents user interface

The screenshot displays the Edmodo for parents user interface. At the top, there are navigation links for Home, What's Due, and Messages. The main content area is divided into several sections:

- User Profile:** Shows Jewelisa Benton (Parent) and Harley Benton (Teacher) with their respective avatars and names.
- Your Students:** Lists the classes Harley Benton is teaching: Academic League, Geometry, Algebra, Chemistry, Computer Science, and P3 - Government / Econ.
- Post:** A post from Ms. Adams (Teacher) at High School, dated 2 days ago, with the text: "Hey class, don't forget our current event presentations start tomorrow. Please bring anything you need for your projects!".
- Poll:** A poll from Theo Roosevelt (Teacher) at High School, dated Jun 12, 10:31 AM, with the text: "How well did you understand our lesson today?". The poll results are:

Response	Percentage
I understood everything!	57%
I understood most of it, but need practice.	14%
I didn't understand the lesson, I need additional help.	29%
- Footer:** Includes the Edmodo logo and navigation links: Home, What's Due, Messages.



3.1.6 Designing learning activities to provoke higher-order and critical thinking

Teachers can use technology to provoke higher-order thinking, which goes beyond the memorisation and observation of facts. Critical thinking, as an example of higher-order thinking, could involve distinguishing fact from fiction or synthesizing and evaluating information. This could be achieved through various online activities, three of which are described as follows:

Activity 1: Digital scavenger hunt

A digital scavenger hunt is a fun activity where teams or individual players try to find objects, reach conclusions and/or solve riddles on a list provided by the teacher. Students follow clues and search for information online leading to a final document or product. Scavenger hunts may be inspired by the learning objectives and performance goals for a study unit. Each objective should align with an 'object' to be found. When creating the guide for this activity, the teacher decides the difficulty level, and which resources they will explore, including websites, videos, and ebooks. The goal is to "skim read" digital resources to complete the task. The teacher creates a map that keeps students on task. Giving students specific links for their hunt will provide structure as they learn how to scan resources. The completed scavenger hunt is the final product to be assessed. The activity is suitable for all K-12 students.

Activity 2: Digital resource comparison

Students use a graphic organizer to compare three different resources, such as a website, digital textbook, and YouTube video on the same topic. The product to be assessed is the completed graphic organizer, in which they outline their

findings. An extended learning opportunity would be for students to use the information gathered to write a report, essay, or opinion piece. The activity is suitable for middle and high school students.

The graphic organizer might include the following information:

- Column 1: Format (video, website, eBook, textbook, etc.)
- Column 2: Audience (children, adults, students, etc.)
- Column 3: Key knowledge points (based on the learning goals)
- Column 4: (Add any other column to meet content-specific needs)

The teacher may create a content-specific list of topics. Students can then choose one topic to compare how different digital resources present information. A list of digital resources with hyperlinks can be provided to students so they can choose three to compare (video, website, ebook, etc.).

Activity 3: Digital presentation piece

Students choose from a list of content-specific topics (designed by the teacher) and create a presentation of their findings using PowerPoint, video, or other digital creation. The activity is suitable for middle school students. The teacher can create a list of digital resources and topics for students to choose from. Creating a rubric is useful for the teacher's evaluation of the presentations, and to share with students when the project guidelines are explained. Basic rubrics can include organization, content information, graphics, background, and spelling/grammar.

3.1.7 Free online learning platforms hosting curriculum-aligned content

Table 4. A comparison of five free online learning platforms hosting curriculum-aligned content

Name	Description	Website link	QR code
Edmodo	Tools and resources to manage classrooms and engage students remotely. During the COVID-19 crisis, it provides toolkits to support teachers, students, and parents to communicate and continue education. Available in Bahasa Indonesian, Chinese, Croatian, Danish, English, French, Georgian, Hungarian, Italian, Korean, Japanese, Portuguese (Brazilian), Russian, Spanish, Thai, Turkish, and Ukrainian.	https://new.edmodo.com/?go2url=%252Fhome	
Khan Academy	Platform with free online lessons, mainly in STEM. Available in Armenian, Azerbaijani, Bangla, Bulgarian, Burmese, Chinese, Czech, Danish, Dutch, English, French, Georgian, German, Gujrati, Hindi, Hungarian, Indonesian, Italian, Japanese, Kannada, Korean, Mongolian, Norwegian Bokmal, Polish, Portuguese, Russian, Serbian, Spanish, Swedish, Tamil, Turkish, and Uzbek.	https://www.khanacademy.org/	
Edraak	Arabic platform with resources for learners and teachers. Some classes are available in English.	https://www.edraak.org/	
EkStep	Open learning platform with a collection of learning resources to support English literacy and numeracy.	https://ekstep.in/	
Siyavula	An open English -based resource offering online mathematics and physical sciences education aligned with the South African curriculum.	https://www.siyavula.com/	
Ideasgym Academy	Online training and support for teachers and students in STEM, available in Arabic and English.	https://ideasgym.com/	






3.2 Teacher-directed live-streaming lessons and flexible learning

3.2.1 Understanding key features of teacher-directed live-streaming lessons and flexible learning

In many contexts, the structured online courses are not completely adequate for teachers' need to flexibly

adjust learning objectives and content, adapt teaching sequences, and mix teaching methods. Many teachers with stable access to the internet and digital devices prefer to organize live-streaming sessions of their own so they can facilitate students' flexible learning and avoid being bound to a fixed sequence of events. Live streaming is based on video conferencing applications, especially those that offer free versions such as Microsoft Teams, Zoom, Lark and Google Meet.

Table 5. Functionalities of live-streaming applications (free versions)

Tool	Description	Time limit of a conference call	Number of online participants	Website link	QR code
Lark	Collaboration suite with a chat, calendar, and cloud storage. It can host meetings without limits on their duration. It provides 200GB of free storage space. Available in English, Italian, Japanese, and Korean.	No limit	100	https://www.larksuite.com/	
Dingtalk	Communication platform that supports video conferencing, task and calendar management, attendance tracking and instant messaging. Available in Chinese, English.	No limit	300	https://www.dingtalk.com/en	
Zoom	Cloud platform that supports video and audio conferencing, chat and webinars. It is free for hosting up to 100 participants and unlimited numbers of meetings, and each meeting can last for up to 40 minutes.	40 minutes	300	https://zoom.us/	
Teams	Chatting, meeting, calling, and collaboration features integrated with Microsoft Office software, free for hosting up to 250 participants.	No limit	250	https://www.microsoft.com/en-us/education/products/teams	
Google Meet	Conference system	No limit	30	https://google.oit.ncsu.edu	

3.2.2 Design and delivery of teacher-directed live-streaming lessons

(1) Planning the schedule of live streaming lessons

Teachers' timetabling of live-streaming sessions, and how many learning objectives they will need to cover, depends on the duration of COVID-19 school closures. In some districts, morning-only sessions are planned for primary school students. Other schools offer a balanced mix of academic studies and physical activities by scheduling an hour of home-based physical exercise every day. Some schools have even managed to organize home-based 'mini-Olympics' featuring videos and photos of students' games and exercises.

Because of the need for students to self-regulate, it is critical to specify the duration of live sessions and ensure they do not exceed the time limits of the software. Teachers need to keep a coherent timetable according to students' ability levels. Preferably, for primary school students, sessions should be no longer than 20 minutes, and for secondary school students, no longer than 40.

(2) Improving live-streaming teaching by appropriate teaching methods and technology

Teachers must select and tailor teaching methodologies according to the needs of homebased distance learning. Long, one-way live streaming sessions tend to disengage students within 10-15 minutes. Teaching is about building relationships that allow content and skills to be transferred from the teacher to the students, and vice versa. Therefore, teachers need to organize the session into short time slots of e.g. 10 minutes and include a range of activities. Here are some of the most coherent and effective strategies that teachers can quickly get started in their live-streaming courses.

- Create multisensory and comprehensive connections with students

Unlike in-campus classrooms where students are instructed visually and audibly with other senses in an immersed environment, live-streaming lessons seem to limit teachers in the small screen that leads students to detach from the learning content. Physical interaction constraints can be supplemented by various communication technology tools that have already stretched to every corner of daily lives. Texts, emails,

real-time phone calls, and video calls enable teaching and feedback to connect with students in various scenarios by visible, audio, readable, and interactive personae of teachers. In this way, the scale of teaching and learning can extend, and the lines between physical and virtual teachers are blurred.

- Prepare clear and organized instructional design and planning

Live-streaming teaching needs another system of logistics for organizing teaching and learning activities. Teachers who lack experience may feel overwhelming by the various new technological tools and preparation. Therefore, it is significant to leave enough time to get familiar with the live-streaming lesson platform and communication tools, and put them in use. Listing works and their timeline in a workable plan can ensure curriculum design and live-streaming course organization running fluently and allow for unforeseen difficulties.

- Set a supportive environment and build positive relationships with students

Live-streaming teaching means limited resources and access to learning into the countable origin, e.g., students can only learn from the online learning platform or links that teachers provide. Also, students may find themselves lost when surrounded by technical tools and information. Teachers should set straightforward communication methods, tools for learning, and learning content clear for students from the beginning of the course with accessible resources. Moreover, due to teachers' and students' physical and mental distance, providing timely feedback is essential to keep students on the same channel with their teachers and learning content throughout the semester. Another dispensable component of a supportive learning environment is the human connections among teachers and students. When a comfortable community is set up, more effective learning and diverse learning forms are allowed based on Social Learning Theory.

- Utilize various technology as an adequate substitute and extension of traditional classroom activities

Technologies that teachers encountered during live-streaming teaching can also save teachers' energy and time other than being burdens. Tools like quiz and homework correction platforms empower teachers

to focus more on curriculum content and teaching methods. On the other side, technologies enrich learning activities, such as timely discussion boards and online posts, allowing more flexible teaching and learning forms (including collaborative learning). Thus, Teachers can play the role of active leaders and instructional observers in the live-streaming curriculum.

(3) Check and test technology tools before delivering live streaming

Before the session, teachers should check whether digital devices, applications, and internet connections work properly, to avoid interrupting the teaching process. Teachers should try to avoid shifting across multiple applications during a live-streaming session. A short live-streaming trial session should be held before going live to a class of students, so that the teacher can identify and mitigate problems.

3.2.3 Organizing and monitoring live-streaming lessons

Synchronous live-streaming lessons may be carried out through various devices and applications. It is necessary therefore for teachers to redesign strategies and activities in order to monitor the teaching and learning process. The following four recommendations may be helpful toward this end:

Teachers should ask questions frequently during the live streaming lessons in order to find out whether students have mastered the content.

Teachers could use a survey website to administer bespoke questionnaires for each class, which can provide a picture of the students' progress and satisfaction with the learning.

Teachers should devote time to discussing students' emotional and psychological state. Their ability to maintain positive, compassionate, and meaningful relationships with their students may help students deal with COVID-19-related stress and trauma. Students can be guided to express their feelings in different ways, e.g. through writing, art, and music.

Teachers can help students check their understanding by creating a checklist with the learning objectives of the session or unit, and then prompting students to indicate the extent to which they have met each objective, e.g. using Likert scales.

3.3 Asynchronous video-based flipped learning

3.3.1 Understanding key features of asynchronous video-based flipped learning

When many students join live streaming sessions at the same time, it can be challenging for teachers. In such situations, teachers can pre-record video clips and request that students watch them online or download them to view later (within the study schedule). Teachers can also record their live-streaming sessions as video-based learning resources. If the video lessons are used appropriately by teachers, they can cater for students' need for flexibility and become a useful approach to distance learning.

With pre-recorded videos, teachers can implement video-based flipped learning. Teachers may provide students with guiding questions and ask them to watch the videos before the lesson. During the lesson, teachers might organize a synchronous discussion, usually in groups, based on the guiding questions. This video-based flipped learning can help students actively learn by using live-streaming time for peer discussions and group collaboration.¹⁸ It deliberately shifts instruction to a learner-centred approach, where lesson time is used to explore topics in greater depth. It is also an instructional method that supports differentiated instruction since the teacher can spend time supporting struggling students while more advanced students can work independently.

3.3.2 Designing and delivering video-based lessons

This section offers guidance on how to record sessions and upload existing videos to an online space or media library.

¹⁸ Lesley University.2020.An Introduction to Flipped Learning. <https://lesley.edu/article/an-introduction-to-flipped-learning>

First, teachers should draft a script or outline of ideas for the session.

Each video should be no more than 15 minutes long, so that learners can maintain focus and retain key information.

The following tips may be helpful when drafting a script or outlining ideas prior to recording lessons¹⁹:

- Write the script like an explanation given to a friend, with plain language. Go over the script with an eye for detail to check for errors.
- Show your actions on screen (e.g. clicking a button, opening a new page) and take time to say what you are doing and why you are doing it.
- Read the script aloud and see how it flows. Change the wording where necessary.
- Send the script to a trusted colleague for feedback. This might seem scary at first, but eventually it becomes an essential part of the scripting process.

19 Techsmith.2020.The Ultimate Guide to Easily Make Instructional Videos. <https://www.techsmith.com/blog/instructional-videos/>

The next step is to record the lecture using digital tools, with attention to framing, lighting, setting, and audio.

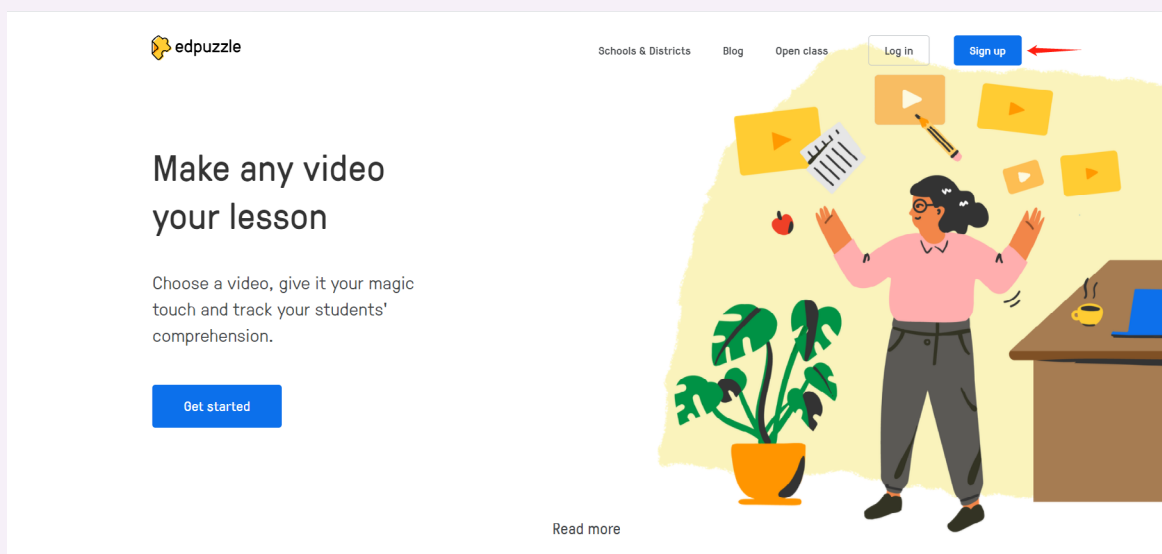
Recording lectures is the next step. Framing, lighting, setting, and audio are four main aspects teachers should notice when using technology tools.

When students watch a lecture video, visual and audio senses greatly influence their learning effectiveness. Hence, teachers' appropriate actions and settings of the lecture video quality are significant to provide a comfortable and concentrated learning environment. Teachers have to decide the pictures with the teacher's right position and other devices to frame their personae. The suitable lighting level, source, and clear background of the picture should be set in advance. Finally, to deliver the exact sound of teachers through lecture videos, teachers should prepare digital devices to ensure the quality of sounds. There are some useful tips in the reference.²⁰

There are many free digital tools available online to support the recording of lessons. Among others, Edpuzzle is a video creation software, free for teachers and students. The screenshots below demonstrate key steps on how to use Edpuzzle to create a class, create videos, and generate assignments.

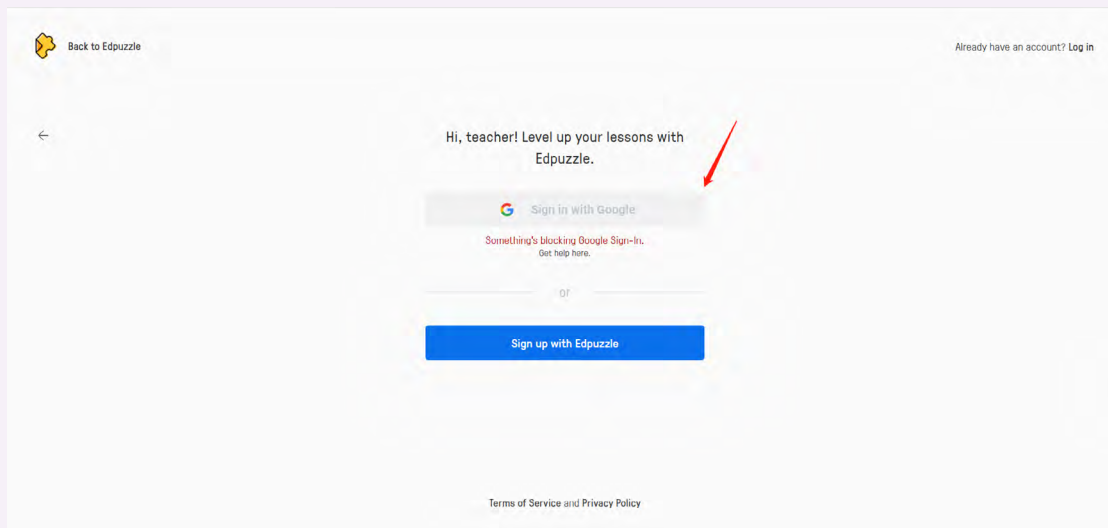
20 Brown University. 2020. Introduction to Creating Course Videos. <https://dld.brown.edu/guides/online-teaching/introduction-creating-course-videos>

1. Go to [Edpuzzle.com](https://edpuzzle.com) and 'sign up' as a teacher.



© EDpuzzle

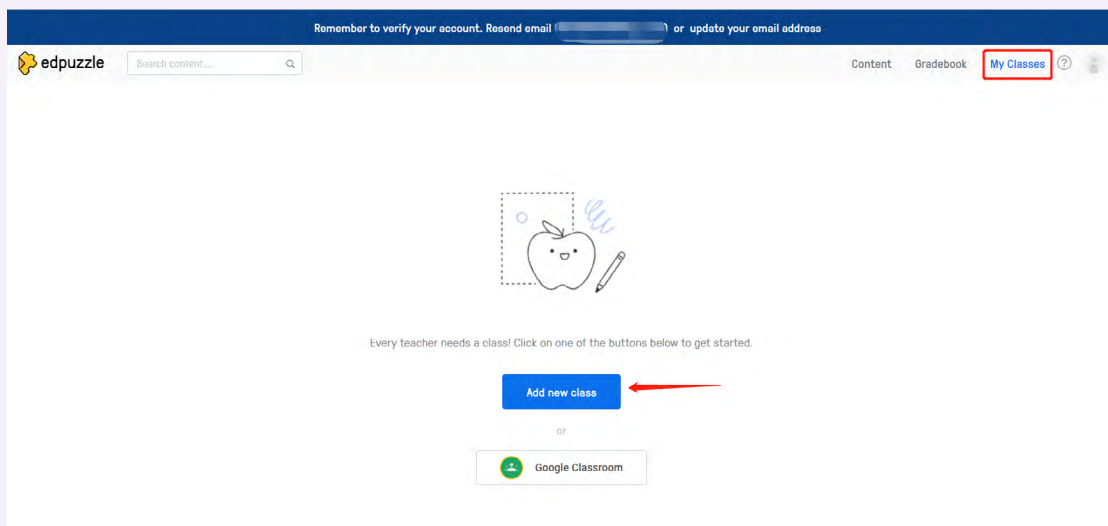
2. Sign in to your school Google account.



The screenshot shows the Edpuzzle sign-in page. At the top left is a 'Back to Edpuzzle' link with a puzzle icon. At the top right is the text 'Already have an account? Log in'. The main heading says 'Hi, teacher! Level up your lessons with Edpuzzle.' Below this is a 'Sign in with Google' button with a red arrow pointing to it. Underneath the button is a red error message: 'Something's blocking Google Sign-In. Get help here.' Below that is an 'OR' separator and a blue 'Sign up with Edpuzzle' button. At the bottom center is a link for 'Terms of Service and Privacy Policy'.

© EDpuzzle

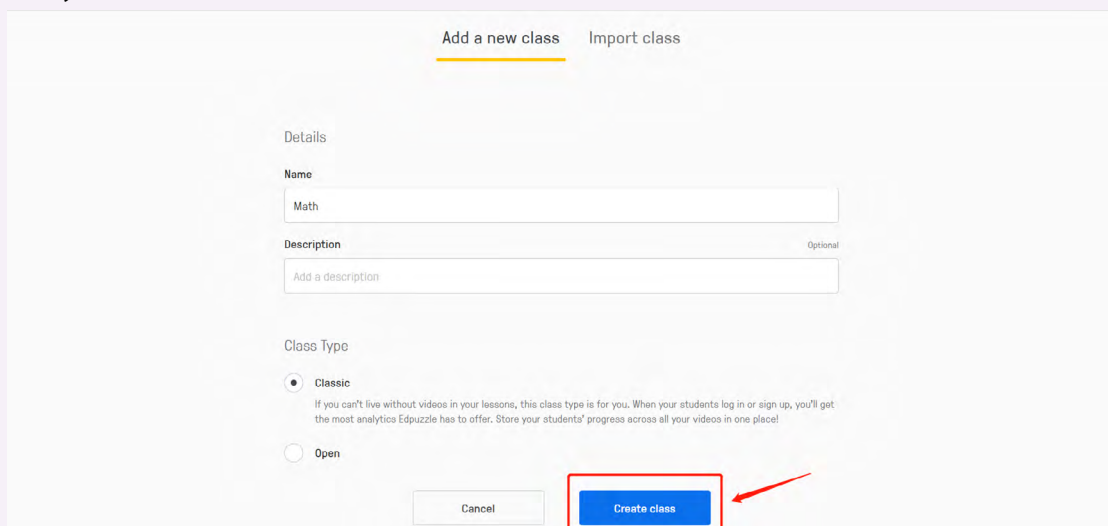
3. Once logged in, you can create new Classes in "My Classes", enroll your students in different Classes.



The screenshot shows the Edpuzzle dashboard. At the top, a blue banner contains the text 'Remember to verify your account. Resend email [redacted] or update your email address'. Below the banner is the Edpuzzle logo and a search bar. On the right side of the dashboard, there are links for 'Content', 'Gradebook', and 'My Classes', with 'My Classes' highlighted by a red box. In the center of the page is a cartoon apple character with a pencil and a dashed box around it. Below the character is the text 'Every teacher needs a class! Click on one of the buttons below to get started.' There are two buttons: a blue 'Add new class' button with a red arrow pointing to it, and a 'Google Classroom' button with a green icon.

© EDpuzzle

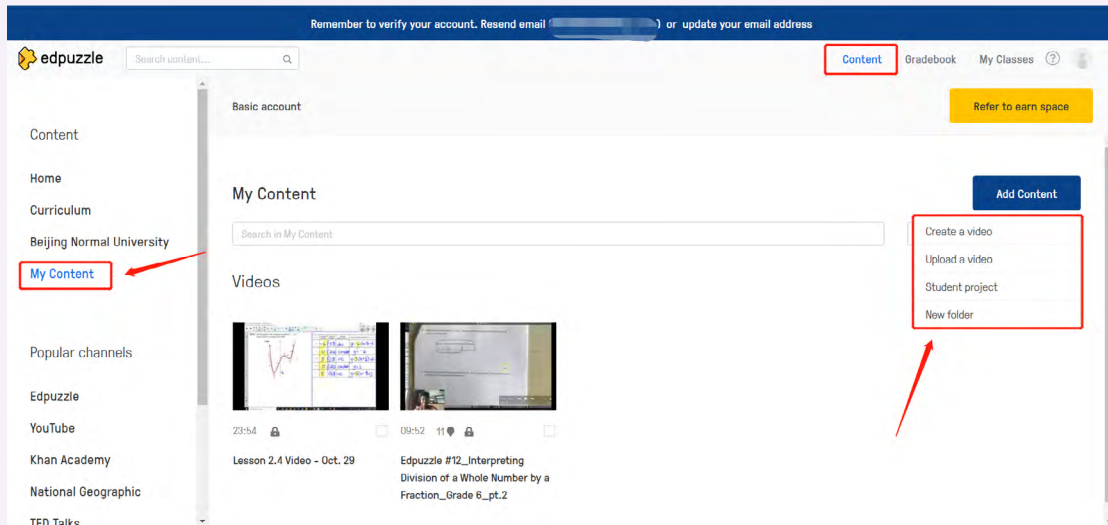
4. Add your class information and click 'Create Class'.



The screenshot shows the 'Add a new class' form. At the top, there are two tabs: 'Add a new class' (which is underlined) and 'Import class'. The form is divided into two sections: 'Details' and 'Class Type'. Under 'Details', there is a 'Name' field with 'Math' entered, and a 'Description' field with the placeholder text 'Add a description'. Under 'Class Type', there are two radio buttons: 'Classic' (which is selected) and 'Open'. Below the radio buttons is a small text block: 'If you can't live without videos in your lessons, this class type is for you. When your students log in or sign up, you'll get the most analytics Edpuzzle has to offer. Store your students' progress across all your videos in one place!'. At the bottom of the form are two buttons: 'Cancel' and 'Create class', with the 'Create class' button highlighted by a red box and a red arrow pointing to it.

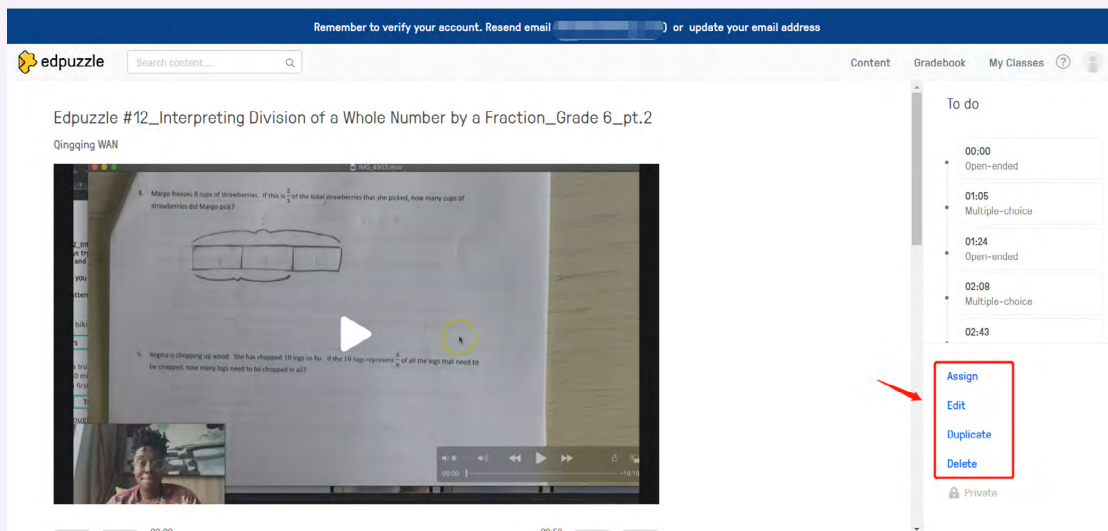
© EDpuzzle

5. You can create your flip videos in “My Content”. In addition to allowing you to upload your own video files, Edpuzzle also allows you to embed the puzzle from popular video sites like YouTube, Khan Academy, and TED Talk. You can search for the content you want in the search box.



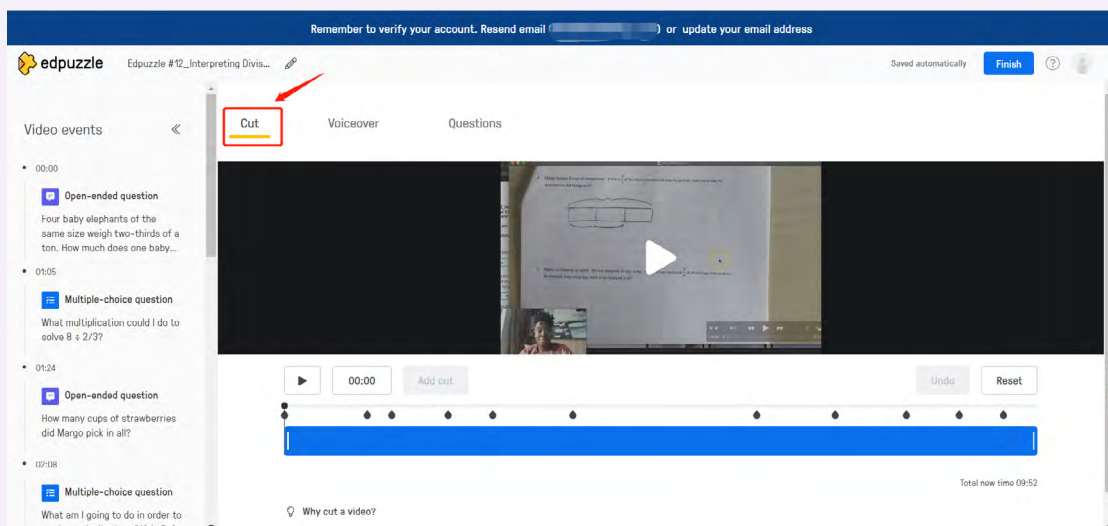
© Edpuzzle

6. Whether you upload your own video or find a video in Edpuzzle, you can edit the video:



© Edpuzzle

(1) Cut: Save time by cutting any sections from the video that aren't relevant for your students.



© Edpuzzle

(2) Voiceover: Replace the video's existing audio with an explanation in your own words or language.

Remember to verify your account. Resend email () or update your email address

edpuzzle Edpuzzle #12_Interpreting Divis... Saved automatically Finish

Video events <<

- 00:00 Open-ended question Four baby elephants of the same size weigh two-thirds of a ton. How much does one baby...
- 01:05 Multiple-choice question What multiplication could I do to solve $8 \div 2/3$?
- 01:24 Open-ended question How many cups of strawberries did Margo pick in all?
- 02:18 Multiple-choice question What am I going to do in order to mathematically show " 10 is $5/8$ "

Cut **Voiceover** Questions

Start recording

Why add a voiceover?
Replace the video's existing audio with an explanation in your own words or language.

© Edpuzzle

(3) Questions: Create questions to see which students understood the lesson, and add notes to give more information or get students' attention with a quick audio note.

Remember to verify your account. Resend email () or update your email address

edpuzzle Edpuzzle #12_Interpreting Divis... Saved automatically Finish

Video events <<

- 00:00 Open-ended question Four baby elephants of the same size weigh two-thirds of a ton. How much does one baby...
- 01:05 Multiple-choice question What multiplication could I do to solve $8 \div 2/3$?
- 01:24 Open-ended question How many cups of strawberries did Margo pick in all?
- 02:18 Multiple-choice question What am I going to do in order to mathematically show " 10 is $5/8$ "

Cut Voiceover **Questions**

- Multiple-choice question
- Open-ended question
- Note

Why add these?
Create questions to see which students understood the lesson, and add notes to give more information or get students' attention with a quick audio note!

© Edpuzzle

7. Assign the edited video to specific classes, decide whether to allow students to skip questions, and specify a due date.

Assign to a class

History

- Math
- Physics

Assign all

+ Add new class

Later Assign

Start Date: Today 12:00am

Due Date: No due date

Prevent Skipping

© Edpuzzle

8. While students watch the assigned video, Edpuzzle designed the following features to make sure the video-based flipped learning works:

- (1) Students can't fast forward the video;
- (2) When encountering the questions set by teacher, the video will be suspended automatically;
- (3) Students can watch videos from any node repeatedly.







Thirdly, integrate supporting materials to enrich the video sessions.

They can include questions or mini-quizzes throughout the session to engage learners and allow them to check their understanding. Presentation slides, websites and media that support the content of the session can be uploaded to provide a comprehensive and immersive learning experience.

Another approach to video-based learning is to direct students to video resources that are already available online. Performing a simple Google search may lead to a wealth of material. Video files can be organized by topic, idea, or skill.

3.3.3 Free tools and resources to support teachers to create video lessons

Table 6. Free tools for teachers to create video lessons and resources

Tool	Description	Website link	QR code
Edpuzzle	Video creation software that is free for teachers and students (hosts more than 8 million lessons and more than 20 million students). Available in English .	https://edpuzzle.com/	
Nafham	Online platform hosting educational video lessons that correspond to Egyptian and Syrian curricula. Available in Arabic .	https://www.nafham.com/	
SDG Academy Library	Searchable library of more than 1,200 educational videos on sustainable development and related topics.	http://sdgacademylibrary.mediaspace.kaltura.com/	
Alison	Free online courses. Available in English, French, Italian, Portuguese (Brazilian), and Spanish .	https://alison.com/	
Thinglink	Tools to create interactive images, videos, and other multimedia resources.	https://www.thinglink.com/	
YouTube	Repository of educational videos and learning channels.	https://www.google.com/search?client=firefox-b-d&q=youtube	

3.3.4 Organizing and monitoring video-based flipped learning

Asynchronous flipped learning is a blended strategy in which teachers can use online class time to use student-centred teaching strategies such as debates, group work, projects, question- or problem-based learning, case studies, experiential learning, and field-based instruction.





Teachers' videos can be supported by documents, text, photos, and slides for a full presentation. They can demonstrate processes and key steps through interactive animations. Discussion boards can support students' interaction while not requiring them to be online at the same time.

Tactics for administering effective online discussions include the following:

- Communication of clear guidelines that establish expectations for students' contributions;
- Creation of questions and prompts that require complex thinking and application of ideas;
- Contributions to the discussion by teachers, including feedback and coaching;

Students will also benefit from collaborative group projects, which are relevant to all online distance learning models. Many tools for online collaboration and video conferencing can be used to help facilitate group dynamics (Lark, Google Hangouts, Microsoft Teams and Zoom), and/or brainstorming ideas (Mind42, Wisemapping).

Table 7. Online tools to help with group work

Tool	Description	Website link	QR code
Lark	A free collaboration platform with instant messaging, a smart calendar, and cloud creation.	https://www.larksuite.com/	
Google Hangouts	A communication software for free video or voice calls, messaging, and group conversations.	https://hangouts.google.com/	
Mind42	A free social and collaborative online mind mapping software.	https://mind42.com/	
Wisemapping	A free online mind mapping editor for individuals and businesses.	http://www.wisemapping.com/	

Teachers should design open-ended tasks to test students' understanding and present learning outcomes. Open-ended quizzes and activities require students to demonstrate their understanding of the video lesson and give students opportunities to practise their skills and receive feedback. Such tasks include the following:

- **Student presentations:** Both formal and informal presentations are invaluable learning experiences, and show teachers how much students have learned.

- **Case studies:** Teachers could ask students to study a specific, real-world problem. By applying what they learned in the video lessons, students can discuss how they would tackle the problem.
- **Three-step interview:** Pairs of students interview each other for a few minutes about the material they read online. Each student then summarizes their partner’s responses and shares them with another pair of students.
- **Role play** can demonstrate varying perspectives on a topic (such as a controversial topic in the media). Students assume different roles in small groups and act out the parts with the varying perspectives they would have.
- **Critical debate:** Choose a controversial topic and determine what side of the argument the students would be in favour of. Put the students into groups and have them argue for their position. This activity can improve students’ debating and logical thinking skills and give them a deeper understanding of the topic.

Table 8. Free tools to support online monitoring and assessment of learning

Tool	Introduction	Website link	QR code
ClassDojo	Connects teachers with students and parents to build classroom communities. Supports parents’ monitoring by sharing photos, videos, and instant messages. Available in more than 20 languages, including Arabic, Chinese, English, French, Japanese, Italian, and Korean.	https://www.classdojo.com/	
Seesaw	A digital portfolio for students to store their work and for teachers and parents to monitor their progress. Available in over 55 languages.	https://web.seesaw.me/	

3.3.5 Designing and conducting formative assessment for live-streaming lessons or video-based learning

Formative assessment is designed for the complex realities of the learning environment and the mix of relationships (social, academic, and cultural) that shape teaching and learning. As teachers participate in these relationships, they observe and interpret information in real time to make hundreds of decisions that no scripted curriculum can anticipate.

At present, there are many digital tools available for formative assessment in online distance learning. Teachers can choose appropriate digital tools according to their teaching needs and students’ learning needs. As schools move to online distance learning, how can teachers collect and act on this kind of ‘in-the-moment’ information? The following four strategies can help teachers design and conduct

formative assessment for live-streaming and video-based lessons.²¹

- **Substitute performance tasks for traditional assessments**

To mitigate concerns around technological limitations and potential cheating in a remote environment, consider replacing end-of-unit assessments with performance tasks. Performance tasks reflect the foundational standards of a unit and require students to demonstrate their thought processes as they solve problems or respond to prompts.

21 Maja Wilson.2020.Formative Assessment During Distance Learning: Recapturing “In-the-Moment” Observations that Inform Instruction. <https://www.k12.wa.us/sites/default/files/public/ela/assessment/pubdocs/Formative%20Assessment%20During%20Distance%20Learning.pdf>

Performance tasks ensure that students do not cheat, and allow teachers to guide students toward mastery of essential course concepts.

- **Collect data over time**

Formative assessment is an ongoing process, enabling teachers to collect evidence of learning over time. Teachers can ask students to submit reflective videos and photos of their progress to a local web space or safe cloud space.

- **Focus on feedback**

Teachers can provide feedback not only in writing but orally, through videos or sound recordings. Additionally, if you are doing synchronous sessions, you can put students in breakout groups to provide feedback to one another, ensuring they are equipped with clear feedback rules. Asynchronously, students can post work and exchange feedback over a longer timeframe.

- **Use digital tools wisely**

In online distance learning, teachers can use digital tools to assign homework and provide feedback, and thus have a real-time understanding of students' academic progress. An example is Quizizz, a free tool that allows K-12 teachers to conduct formative assessments and is available in English, Spanish, French, Indonesian, Dutch, Polish, and Russian. The following four steps explain how to use Quizizz:

1. Go to <https://quizizz.com> and log in, or if you are a new user, click 'Get started' and create a new account by using your school or work email address.
2. To use an existing quiz, select the 'Search for quizzes' box and browse. If you want to create your own quiz, select 'Create a new quiz', enter a name for the quiz, and choose the relevant subjects. Choose a type of question and fill in the question, as well as answers.
3. Add a title image if desired. Select the appropriate language and grade range, and add tags to make it easier to search for.

4. Either select 'Play live' or 'Assign HW' and choose the desired attributes. Then share the quiz with your students by sending them the link and 6-digit code. Students can go to <https://quizizz.com/join>, click 'Join a game', and type in the 6-digit code to participate in the live quiz or complete the homework. Once the students are finished, the teacher can refresh the page to view the results.

3.4 Planning the use of blended learning in post-pandemic times

Online education experiences during the pandemic brought forward discussions around the ways education can become available in different delivery modes and methods. Considering that teachers have been exposed to online delivery modes and methods during the crisis, as the pandemic subsides there is an opportunity to integrate virtual (online) and physical (classroom) learning spaces. We suggest that teachers promote blended forms of education to support communication, access to resources, and social distancing measures.

The idea of blended learning is that students can benefit from a digital environment while being part of a traditional school. The benefits of blended learning include the fact that some students learn best independently in their own time with digital technology, but can enhance their understanding through social interactions.

In many ways, blended learning combines the best of the online and physical worlds. It has grown over time, largely because of the increasing access to technology and ongoing interest in digital learning. Advantages of blended learning in the classroom include student-centred instruction, easy data collection, and increased engagement. As with any educational model, of course, blended learning should be used thoughtfully, to enrich student experiences.²²

One form of blended learning is the flipped classroom. Even though it can be used in distance learning situations, its true potential lies within the classroom. Having viewed online content (videos) in advance,

²² Study.com.2020.Blended Learning: A Guide for Teachers.<https://study.com/teach/blended-learning.html>

students can focus on class participation and receive feedback on their efforts during the lesson. Flipped learning turns class time into a more individualized experience with groups learning at their own pace and teachers supporting those who need it most.

"Open educational resources (OER) are learning, teaching and research materials that reside in the public domain or are under copyright and have been released under an open licence, that permits free access, re-purposing, adaptation and redistribution."²³ OER provide education stakeholders with opportunities to improve and expand access to learning content, catalyse the innovative use of content, and foster knowledge creation.²⁴ They give other people around the world the right to share, update, and build upon a work that the author has created. This helps teachers to broaden their horizons and advance the human right to access high-quality education, which was the inspiration for the worldwide OER movement. This shift in educational practice is not just about cost saving and easy access; it is also about participation and co-creation. OER offer opportunities for systemic change in teaching and learning through engaging educators in new participatory processes for learning. A wide range of international educational resources are available through the OER Commons and Open Education platform.

3.5 Working with other teachers and parents

The school's closure needs teachers to be more active in communication with other colleagues and students' parents to seek closer collaboration.

(1) Strategies to foster successful and high-quality teacher collaboration

Rather than waiting for uniform policies or rules issued by the government or school administrations, sharing practical solutions to and seeking help from other teachers first can be faster and more effective to deal with the critical situation during COVID-19 breakout. Teachers in collaboration can understand the comprehensive situation country-wide quickly and react to the change of teaching conditions by creating appropriate lesson plans and adopting new teaching methods.

23 UNESCO. 2019. *Recommendation on Open Educational Resources (OER)*. http://portal.unesco.org/en/ev.php-URL_ID=49556&URL_DO=DO_TOPIC&URL_SECTION=201.html

24 UNESCO. 2015. *Qingdao Declaration, 2015: Seize Digital Opportunities, Lead Education Transformation*. <https://unesdoc.unesco.org/ark:/48223/pf0000233352>

A firm teacher collaboration needs to be beneficial for all members to consider each others' situations. Therefore, setting norms and expectations for the community can be the first step to achieve the goal. Members should all contribute to the discussion to solve problems in a routine through various online communication tools. They should encounter positive conflicts within the community, and a rotational leader should be responsible for organizing online activities and moderate issues. Finally, a sense of community will ensure the sustainability of the collaboration, because an unstable education situation can change the aim and function of the collaboration due to the epidemic.

(2) Tips for teachers to help them work with parents

There are three aspects that teachers should notice when communicating students' parents, both online or offline.

First, teachers should follow some basic rules considering parents and being an excellent listener to parents about students' performance at home. Since teachers can not catch as many performance details and signals of learning difficulties as on-campus teaching during school closure, they need more information from parents to judge students' learning situation. Meanwhile, precisely because teachers have no chance to assist students in person, they have to guide parents to monitor and facilitate students' learning. This change must add pressure on both teachers and parents. Thus, stay polite and patient, and pay more attention to students' positive attributions would keep the connection among teachers and parents closer.

Second, although the communication would happen with parents, teachers should note the feelings of students. Both teachers and parents should avoid students being exposed to the conversation. Teachers and parents may be unwilling to tell the truth if some suggestions for or even complaints of students hurt their feelings and discourage their learning motivation. It is also better to keep the secrecy of the meeting to students to keep their attention on learning.

Last, meeting with parents regularly and keep the performance worksheet close to teachers can allow teachers to be fully prepared and calm during the meeting, resulting in more productive and efficient communication to promote students' learning.

4. TV-based distance learning

COVID-19 disruption has exposed deep digital divides between and within countries, including high-income countries. The situation is far worse for lower resource environments in middle- and low-income countries, with less than 50% of the population having access to the internet, and a large share of students without devices for online learning. Countries are, therefore, turning to television to increase access to remote learning.

4.1 Understanding TV-based distance learning

Television is one of the most efficient technologies to deliver lecture-based lessons, and facilitates multiple forms, including on-demand viewing and 'edutainment' programmes. Students can watch programmes multiple times, allowing them to review or catch up. In addition, flexible schedules can ensure coverage across time zones.

Television programmes have long been used for distance education across many countries. Television can be a powerful and effective learning tool for children, if used wisely. It can help young people discover where they fit into society, develop closer relationships with peers and family, and learn complex aspects of communication. Some television-based courses can be taken for college credit. Children's television series can also be educational, ranging from dedicated learning programmes to those that coach viewers. Some series have specific moral messages, often explained at the end of each episode.

With the development of digital technology, countries around the world are gradually transitioning from analogue to digital TV. Before digital TV, analogue signals were transmitted similarly to radio. Digital TV is transmitted as bits of data, just like computer data. The quality of the signal does not vary with distance; the viewer sees a full quality image or nothing at all.

TV-based distance learning for the K-12 population can be considered where students lack broadband internet and/or computers, and most people have access to a television and education channels and are able to purchase broadcasting rights if needed.

There are three main types of programmes that can be used for educational television: live broadcasts, pre-recorded broadcasts, and edutainment.

- **Live broadcasts** involve a teacher in a staged (classroom) setting, delivering and broadcasting a lesson. Engaging, passionate teachers with a good sense of humor should deliver these lessons. Live broadcasts can be low-cost rapid productions and are the fastest way to get started for countries with limited experience in educational television.
- **Existing pre-recorded broadcasts** are available in many countries that already had educational television and/or videos from online education providers prior to COVID-19. Educational authorities in collaboration with broadcasting channels could supply such content creatively. A staged teacher, for instance, can introduce videos and align them to the curriculum. Challenges to consider when using existing online videos are licensing, copyright, and video quality (as videos are typically compressed when hosted online).
- **Edutainment programmes** have engaging and educational elements, and many countries already have a list of private or non-profit organizations that provide them. Given their cost demands, the creation of such programmes is difficult in the short term, so existing edutainment programmes can be sourced instead, subject to obtaining intellectual property rights.

Compared to other distance learning, educational TV has its own potentials and limitations, as shown in Table 9.

Table 9. Key elements of TV-based distance learning

Key elements of teaching and learning practices	Main media and technology tools	TV-based distance learning		Notes on planning the required facilitation
		Digital TV	Analogue TV	
Supported types of content	Videos	✓	✓	
	Multimedia demonstration			
	Audio	✓	✓	
	Text			
Supported devices to access content	Computers	✓		
	Smartphones	✓		
	Feature phones			
	Other digital devices, e.g. Kindle			
	TV	✓	✓	
	Radio			
Accessibility	People with visual disability			
	People with hearing disability			
	Other disabilities			
Management of courses and content	Automatically searchable by topic and grade			
	Editable and re-usable			
	Open-source and extended resources			
	Spaces to store, manage, and share resources			
	Tools to support resource development			
Management of curricular calendars	Adaptive learning calendars based on learners' paces and learning styles			
	Online learning calendars accessible anytime and anywhere			
	Fixed calendar or programmes	✓	✓	
Teaching activities	Synchronous live-streamed interactive lessons			
	Asynchronous video-based lessons followed by interactive tutorials and teacher-student discussions			
	Asynchronous video-based lessons followed by asynchronous coaching	✓	✓	
	On-demand and controllable video/TV programmes	✓		
	One-way video/TV broadcasting without control over pace or replay			

Key elements of teaching and learning practices	Main media and technology tools	TV-based distance learning		Notes on planning the required facilitation
		Digital TV	Analogue TV	
Teaching activities	On-demand and interactive radio programmes			
	One-way radio programmes			
	Paper-based reading			
Student interaction and collaboration	Online collaborative makers' practices or project-based learning			
	Real-time online discussion or group work			
	Asynchronous online discussion or group work			
	Sharing of messages through TV or radio programmes	✓		
	Communication through mobile SMS	✓	✓	
	Communication through paper-based letters	✓	✓	
Formative and summative assessment	AI-powered formative assessment and personalized learning pathways			
	Automatic distribution and administering of tests			
	Multimedia presentation of learning outcomes			
	Shared spaces to collect learners' submissions			
	Automated grading and reporting of assessment results			
	Shared spaces to present outputs to facilitate peer assessment and learning			
	SMS based tests	✓	✓	
	Telephone-based monitoring of learning processes	✓	✓	
	Paper-based test to be communicated through posted letters	✓	✓	

4.2 Designing and facilitating TV-based distance learning

4.2.1 Conducting a rapid assessment of household access to TV sets

Teachers should contact parents, via telephone or SMS, to investigate their students' access to TV and make sure all the students have the relevant textbook or other learning materials. National educational programmes may be available, but if private providers have a greater reach, educators might consider negotiating with them for airtime, and leveraging broadcast licences due to emergency mandates and public service requirements. Live broadcasting across multiple channels may be possible, and the programme could be made available on demand.

4.2.2 Preparing schedules for TV programmes

Broadcast schedules must be advertised in advance. For a successful initiative, it is critical to develop schedules detailing when, where, and for what grade level and subject the programmes will be broadcast. Some countries provide student-friendly daily and weekly schedules on their education ministry's website (e.g. Mongolia). Other countries provide schedules on the websites of their educational television network (e.g. China, India) or institutional websites (e.g. Kenya).

4.2.3 Communicating regularly

Regular communication among teachers and between teachers and families is pivotal to the success of TV-based learning. Teachers and parents should communicate continuously and widely before the programme is launched. Schedules should be promoted using all available media, including television, radio, and text messaging. All programme-related resources should be accessible in one place, since this facilitates access and increases uptake. This can be done on the education ministry's website and/or the national television network's website.

4.3 Organizing and monitoring TV-based learning

4.3.1 Tell students to prepare before watching the programme

Teachers can inform students of the programme in advance and indicate the relevant textbook sections or other related materials to be consulted.

4.3.2 Watch TV programmes together with the students

When the course is broadcasted, teachers should also watch the programmes so that they gain an understanding of what their students have been experiencing. They can then make references to these programmes after.

4.3.3 Collect feedback from parents or caregivers

To gain real-time understanding and continuously improve the effectiveness and uptake of TV programmes, it is important to enable two-way communication and receive feedback and insights from parents. Occasional text messages can be used to remind parents, caregivers, students and teachers about the programmes, share feedback, and adopt practices that supplement the effectiveness of TV-based learning.



Case 4: China's educational television channel (CETV4)

China's CETV4 is the only national broadcasting channel. It has drawn lessons from SARS crisis of 2003 and 2008 and from the Wenchuan earthquake. Based on the open-studio classroom, the channel has carefully organized courses on subjects including culture, history, traditional Chinese, and classic art appreciation. The majority of teachers, students and parents across the country felt that the content was diverse, rich, colourful and appealing.

On 17 February, CETV4 launched the 'ditto class', a TV classroom with live content for each high school grade. Lessons included campus songs and popular science education.

CETV4's programmes bring together teaching resources covering the primary school curriculum and a large amount of history and humanities content. With a modular programming layout, they inspire students' patriotic feelings and interest in learning. The programmes are broadcasted to all parts of the country through satellites, supporting remote areas with weak network signals or poor access to cable TV, ensuring that the resources are available for students in these areas.

CETV4 runs classes for up to 12 hours a day, allowing students to study at their own pace. During COVID-19 school closures, the broadcast satellite added four more channels.

In addition to the live CETV4 programmes, more than 10 private video-hosting cloud platforms and searching applications were mobilized to support teachers and students to find more details of TV lessons and provide feedback on the programmes.

Curriculum highlights:

1. Extremely long live broadcast every day

The main content is launched in the form of live broadcast, which is delivered in real time.

2. Satellite transmission coverage

Currently CETV4 broadcasts through cable and IPTV, serving more than 380 million people across the country. On 10 February 2020, during the COVID-19 school closures, the platform mobilized new four channels to support the country's 143.8 million rural families and underdeveloped areas.

3. National top teacher team, and the introduction of elite curriculum content

CETV4 invited outstanding teachers from the primary school affiliated to Tsinghua University to record live TV lessons and answer students' questions. Because teaching students through TV is different from the classroom, the teachers carefully prepared courseware that will offer a new learning experience to students all over the country.

4. Look back, answer questions, and learn more

After the teachers finish their live broadcast on TV, they interact with students, teachers, and parents, and address students' difficulties. The live broadcasts have been widely welcomed by students and parents since they started on 10 February.

For more information: <https://www.tvchinese.net/cctv/cetv4/>

4.4 Formative assessment for TV-based learning

It is important to collect evidence of learning over time. After the end of each TV programme, the subject teacher could interact with the students through the telephone or SMS to gauge their understanding, answer their questions, and guide them through the homework. Discussion with students remains the most powerful and meaningful way to check their learning.

4.4.1 Use print material to supplement the TV programmes

Supplementing television programmes with print material, like workbooks, handouts, and newspaper-based activities can improve their learning. Give students guidelines or checkpoints to let them know what they need to submit and when.

4.4.2 Engage with parents

Teachers can provide a list of items against which parents and caregivers can monitor students' progress when they watch the programmes and complete the homework. The list can include extra information to support teacher-parent collaboration, like how the results are reported to teachers and what aspects their child needs help with.

4.5 Working with other teachers, parents, and school administrators

Throughout the school closures, it is important to provide support to students, parents/caregivers, and teachers, and enable two-way communication and feedback to ensure that the TV programmes have an impact.

4.5.1 School administrators should try to connect teachers and provide technical and pedagogical support

A toll-free helpline, mobile SMS hotline, and where possible, an email account can be set up to offer technical assistance. Educational television can be

made more interactive by providing questions during lessons and collecting the answers via phone calls, SMS, email or social media, either later or in real time.

4.5.2 Provide socio-emotional support to teachers and students

The transition to learning entirely through educational TV is challenging. Providing socio-emotional support through this tough time will ease the transition. Jamaica for example has dedicated 36 helplines to support parents, and in Spain, the education minister sent a letter of encouragement to teachers, parents, and students.

4.5.3 Establish communities of practice

Mobilize experienced teachers to provide peer support and coaching to newer teachers, e.g. through mobile applications. This could lead to the establishment of communities of practice, informal communities that support teachers' growth. They can evolve based on members' common interest in a particular domain or area, or the goal of gaining knowledge related to a specific field.

4.5.4 Tips for parents to create a positive TV-based learning experience for their children



Active parenting can ensure that children have a positive experience with television. Parents can help their children by doing the following:

- Watching programmes with their children, including news programmes.
- Asking the child what s/he understood and what questions he/she may have.
- Placing time limits on TV viewing (per day and per week).
- Looking for signs of fear or anxiety that may be caused by TV programmes, such as sleeplessness, bedwetting, crying, and fear of being alone.

- Encouraging their children to engage with peers and get involved in hobbies and sports.
- Helping them to watch TV with purpose, by selecting individual programmes.
- Choosing shows that meet their child's developmental needs, such as educational programmes on public television.
- Setting aside periods of time when the television will be off, e.g. when children are doing their homework or when the family is eating a meal together.
- Encouraging discussions with their children about the programmes they are watching, e.g. to point out positive behavior such as cooperation, friendship, and concern for others; make connections to history, books, places of interest, and personal events; talk about your personal and family values; compare what they are watching with real events; and highlight the role of advertising and its influence on people's behaviour.

4.6 Free resources for TV-based distance learning

Table 10. Free national and international TV channels

Name	Description	Website link	QR code
Mindset Network in sub-Saharan Africa	A free digital satellite channel launched in 2003, broadcasting across Africa. From 1 April 2020, MultiChoice launched a second channel, Mindset Pop (Pop Primary), catering to primary school pupils.	https://www.mindset.africa/	
TV – SABC education	A public service channel broadcast by the South African Broadcasting Corporation (SABC), which carries programming in English and Nguni. During the crisis, it launched the COVID-19 TV and Radio Curriculum Programme for Learners.	http://www.sabceducation.co.za/	
Ubongo	Africa's leading children's edutainment and media company, which produces video (animation and live action), music, audio drama, and print materials, as well as interactive content for children, caregivers, and educators.	https://www.ubongo.org/	

For more information about Educational TV resources, please see:

World Bank. 2020. *Remote Learning, Distance Education and Online Learning During the COVID-19 Pandemic: A Resource List by the World Bank's Edtech Team* (English). Washington, DC: World Bank Group. <http://documents.worldbank.org/curated/en/964121585254860581/Remote-Learning-Distance-Education-and-Online-Learning-During-the-COVID19-Pandemic-A-Resource-List-by-the-World-Banks-Edtech-Team>

4.7 Planning the use of TV programmes in post-COVID-19

TV programmes can complement education beyond the school closures and facilitate lifelong learning. They also provide students with realistic conversation and dialogues, which improve their listening skills. The Korean Educational Broadcasting System (EBS),

for example, aims to inform, educate, engage and enlighten the public, with quality programmes for all ages, bolstering lifelong learning.²⁵

²⁵ EBS.2020.EBS Korea Educational Broadcasting System. <https://global.ebs.co.kr/global/main/index>

5. Radio-based distance learning

5.1 Understanding radio-based distance learning

Even in this digitally-saturated age, radio is still the most commonly-accessed technology across the globe. UNESCO reports that 75% of households in the world have access to radio. In sub-Saharan Africa, in particular, 80-90% of households have access to a working radio set.²⁶

For areas where internet coverage and hardware is lacking, radio-based options can support students' learning. Radio programmes can be transmitted through national channels using relay systems over shortwave or FM radio.²⁷

Radio-based teaching has facilitated education for a long period of time in various permutations, which are summarized here as three basic forms: traditional radio, interactive radio, and podcasts.

5.1.1 Traditional (broadcast) radio

Broadcast radio engages audiences without assumptions about their surroundings. Students can listen to it regardless of their location. Almost all available radio channels fall into this category.

Traditional radio education relies on the brain's ability to focus on what we are hearing. This method of distance education is more suitable for older students, who are able to concentrate for longer periods, and is less likely to be appropriate for primary school students.

Currently, for many countries, traditional radio lessons would be the quickest option to facilitate continued schooling. Most countries have state, private and community radio stations, and a number of them use broadcast radio for educational purposes. For example, the archipelago of Cabo Verde uses radio-based lessons, tutoring, and dramas to reach students on its 10 islands.²⁸

5.1.2 Interactive radio instruction

Interactive radio instruction (IRI) is a distance education intervention used in developing countries that combines broadcast radio with active learning. Intended to improve educational quality, interactive radio prompts specific actions by teachers and students, offering two-way communication among presenters and audiences. Students are assigned tasks or asked to respond verbally to the radio (during carefully timed pauses in transmission). During IRI, students listen but also play, sing, move, dance, answer questions, demonstrate skills to nearby listeners, evaluate each other's skills, and essentially engage in as many ways as possible to practise their new learning.

IRI is traditionally accessed by learners who are listening in classrooms (and so can turn to each other to complete tasks), and are guided by a teacher who can reinforce the instructions, write on the blackboard and provide feedback. During the COVID-19 school closures, IRI must be used differently. Students are learning at home without teachers or other peers, so parents or other family members need to support the learning, guide the learners' responses to the radio, provide them with feedback when they answer the questions, and invite them to write or draw on the board.

26 Global Partnership for Education. 2020. *School, Interrupted: 4 options for distance education to continue teaching during COVID-19*. <https://www.globalpartnership.org/blog/school-interrupted-4-options-distance-education-continue-teaching-during-covid-19>

27 Education Development Center. 2020. The case for learning by radio. <https://www.edc.org/sites/default/files/Case-Learning-Radio.pdf>

28 Global Partnership for Education. (2020). *School, interrupted: 4 options for distance education to continue teaching during COVID-19*. Retrieved from <https://www.globalpartnership.org/blog/school-interrupted-4-options-distance-education-continue-teaching-during-covid-19>

Some IRI uses pre-recorded broadcasts, while some use live broadcasting, where presenters interact with students in real time. If there is internet access, this is easier as students can use their phones, emails, and/or apps to send their responses.

Effective interaction requires coordination and guidance from parents or older siblings. Teachers can also encourage students to self-direct and self-assess their learning.

Community radio

Community radio, where locals broadcast their own programmes, caters to the interests of a specific local audience. What makes a community radio powerful is its potential to reach out to people with little or no access to information. It is an efficient tool for educating and informing the audience about critical issues such as health, safety and sustainable development.

School radio

School radio enables schools to support learning by providing programmes related to the curriculum, such as math and history courses. Interactive school radio programmes can support the development of students' communication skills and build their confidence by enabling them to discuss issues that are important to them.

5.1.3 Podcasting

A podcast is an audio file available to download, often delivered in series. Using a podcast hosting service, which requires an internet connection, listeners can subscribe to a series and then receive new episodes automatically. This is often more convenient than having to seek out and download each new episode.²⁹

Podcasting can be used in schools to engage learners, offering teachers the opportunity to easily broadcast audio content that students can then listen to at their convenience. A student only needs to subscribe to a podcast feed in order to receive the content.

5.1.4 Analysing radio-based distance learning

Key elements of radio-based distance learning can be found in Table 11, which reviews its potential and limitations, as well as the gaps that teachers' pedagogical strategies would need to address.

²⁹ EDC. (2020). Learning at Home in times of Crisis Using Radio. Retrieved from <https://www.edc.org/sites/default/files/WB-IAI.pdf>

Table 11. Key elements of radio-based distance learning

Key elements of teaching and learning practices	Main media and technology tools	Radio-based distance learning		Notes on planning the required facilitation
		Interactive radio	One-way radio	
Supported formats of content	Videos			
	Multimedia demonstration			
	Audio	✓	✓	
	Text			
Supported devices to access content	Computers			
	Smartphones			
	Feature phones			
	Other digital devices, e.g. Kindle etc.			
	TV			
	Radio	✓	✓	
	Paper			
Accessibility	People with visual disability	✓	✓	
	People with hearing disability			
	Other disabilities			
Management of courses and content	Automatically searchable by topic and grade			
	Editable and re-usable			
	Open-source and extended resources			
	Spaces to store, manage, and share resources			
	Tools to support resource development			
Management of curricular calendars	Adaptive calendars based on learners' paces and learning styles			
	Online learning calendars accessible anytime and anywhere			
	Fixed calendar or programmes	✓	✓	
Teaching activities	Synchronous live-streamed interactive lessons			
	Asynchronous video-based lessons followed by synchronous interactive tutorials and teacher-student discussions			
	Asynchronous video-based lessons followed by asynchronous coaching			
	On-demand and controllable video/TV programmes			

Key elements of teaching and learning practices	Main media and technology tools	Radio-based distance learning		Notes on planning the required facilitation
		Interactive radio	One-way radio	
Teaching activities	One-way video/TV broadcasting without control over pace or replay			
	On-demand and interactive radio programmes	✓	✓	
	One-way radio programmes		✓	
	Paper-based reading			
Student interaction and collaboration	Online collaborative makers' practices or project-based learning			
	Real-time online discussion or group work			
	Asynchronous online discussion or group work			
	Sharing messages through TV or radio programmes			
	Communication through mobile SMS	✓	✓	
	Communication through paper-based letters	✓	✓	
Formative and summative assessment	AI-powered formative assessment and personalized learning pathways			
	Automated test distribution and administration			
	Multimedia presentation of learning outcomes			
	Shared spaces to collect learners' submissions			
	Auto grading and reporting of assessment results			
	Shared spaces to present outputs to facilitate peer assessment and learning			
	SMS-based tests	✓	✓	
	Telephone-based monitoring of learning processes	✓	✓	
	Paper-based tests administered by post	✓	✓	

5.2 Designing and facilitating radio-based distance learning

5.2.1 Consider household technology readiness

Teachers should be informed about household readiness to access radio devices and signals, and understand how governmental agencies deliver radio programmes to students, e.g. through national radio stations, public or privately owned stations, regional or community stations, satellite channels with digital signals, shortwave radio, channels broadcast from other countries, and internet radio.

5.2.2 Adjust curricular objectives and the depth and breadth of learning content according to the limitations of radio programmes

Where classes already use radio- or audio-based teaching, it is not advisable to change the content of the programmes. A well-created set of programmes has built-in revision cycles and connects learning objectives across subject areas. The teacher should consider the integration of the whole when changing a specific part of a programme.³⁰

If a class has to adopt radio-based learning unexpectedly, the teacher may need to adjust the curricular objectives and content according to the programmes available. Radio-based learning may make the teaching progress slower, but the primary goal during the pandemic is to ensure students engage in learning. Where a country provides unified, nationally-broadcasted curricular courses, teachers can guide students to access the corresponding programmes and specify the pace of learning. If a country does not provide unified national broadcasting curricular courses, teachers may search for appropriate programmes suitable for their students' learning needs.

5.2.3 Prepare study calendars and checklists for students

As distance-learning programmes may be scattered across various radio channels, teachers could organize a schedule and a checklist for their students. These should include the name of the programme and channel, time of broadcast, and guidance for pre- and post-programme activities. Teachers may inform students of the schedule and checklist through email, post, telephone, SMS, or mobile apps.



Case 5: Kenyan radio lessons keep students learning during COVID-19

The Kenyan Ministry of Education took several measures in cooperation with the Kenya Broadcasting Corporation (KBC) and the Kenya Institute of Curriculum Development (KICD) to broadcast educational radio programs for students from Grade 3, 4, classes 5, 7, and 8 during school closures. The programs provide more than ten courses, such as English, Kiswahili, mathematics, science, life skills, and so on.

For more information: KICD.(2020). KICD radio lessons keep students learning during COVID-19 break. <https://www.the-star.co.ke/covid-19/2020-03-16-kicd-radio-lessons-keep-students-learning-during-covid-19-break>

³⁰ Education Development Center. 2020. *Learning at home in times of crisis using radio*. <https://www.edc.org/sites/default/files/WB-IAI.pdf>

5.3 Organizing and monitoring radio-based learning

5.3.1 Help students prepare home-based learning settings

Delivering education away from the school leads to physical and psychological separation for teachers and learners. Teachers should advise parents and community members on how to prepare an appropriate learning space. They might suggest that parents and caregivers help their children to select a quiet space and remain focused and attentive, and support their children's learning by releasing them from household chores, minimizing interruptions, and protecting the study space from intrusion by other family members, neighbours, and animals.

5.3.2 Distribute support materials

Ideally, a teacher's guide should accompany educational radio programmes, so teachers can find out about the content ahead of time and mentally prepare for the lesson. Before the school closures, radio-based learning worked under the assumption that students had the required resources, e.g. a

reference poster or workbook. If a programme series is reliant on any of these items, the teacher may need to carefully consider how to get these materials to children in their homes.³¹

Such distribution is dependent on a number of variables including the nature of the materials, their current availability in the country or region, lockdown restrictions on movement or interaction with others. The best solution is to work closely with the government, local communities, schools, and students' families to identify the most suitable means of distributing the materials.

5.3.3 Collect feedback from parents or caregivers

It is essential to get feedback from parents or caregivers about students' learning processes. Since most families are not ready to facilitate and monitor daily home-based learning, especially with multiple children, obtaining feedback will help teachers provide individualized guidance and suggestions (see section 5.6).

³¹ Education Development Center. 2020. *Learning at home in times of crisis using radio*. <https://www.edc.org/sites/default/files/WB-IAI.pdf>



Case 6: COVID-19 in Sierra Leone – Bridging the learning gap through radio

UNICEF published a case study on how Sierra Leone uses radio programme to keep the learning continuity of 2.6 million students during COVID-19 school closures.

For more information: UNICEF. (2020). COVID-19 in Sierra Leone: Bridging the learning gap through radio. <https://www.unicef.org/wca/stories/covid-19-sierra-leone-education>

5.4 Formative assessment for radio-based distance learning

Purposefully-designed formative assessments, carried out several times per week, can be used to monitor learning and inform the learner on their progress.³² The sub-sections below provide four tips for teachers conducting formative assessments during the pandemic.

5.4.1 Promote support for students to conduct self-reflection

Teachers should stay in regular contact with students and/or parents through phone calls or SMS, so that students have opportunities to communicate to the teacher what they know, what has helped them learn, and what they're still unclear about. Teachers can use this feedback to make adjustments to the study schedule.

5.4.2 Design formative exercises

Formative questions, tests, and exercises can be designed to closely monitor students' learning. For example, teachers might have students summarize on a regular basis what they have learned. Online tools can be used to produce and administer formative tests or quizzes. Written assignments such as short essays, research papers, and case study analyses can also be used as formative exercises to monitor and enhance learning.

5.4.3 Encourage remote peer collaboration

If internet access is available, teachers can use social media to encourage students to share information with each other, based on appropriate protection of their privacy. Older students can be assisted to set up social media groups where they can engage in informal communication, collaborate with their peers, and complete learning tasks together after listening to radio programmes.

5.4.4 Use accessible tools to collect submissions from students

Teachers should try to find ways to collect submissions that are accessible and convenient to parents and students, such as social media groups or SMS. They should not overload parents and students with requests to submit assignments or exams. Teachers can use a checklist for specific students or groups of students to record data related to specific outcomes or categories of outcomes; data include words, numbers, and representative symbols.

5.4.5 Tips for conducting formative assessment in low-resource and low-connectivity contexts

Just as teachers' four methods above, the formative assessment could be carried out for remote learning during school closures. Some tips and principles can help teachers to conduct formative assessment more efficiently.

Clarity of targeted goals. Even though formative assessment is not as apparent as a summative assessment, clarifying the assessment's objectives, criteria, and standards are vital for teachers and students to assess themselves.

Timely and high-quality feedback. After the learning has gone on for a while, teachers should give timely and high-quality feedback for students' performance to be aware of their learning status and adjust their learning accordingly.

Correction opportunities for students. After teachers' feedback to students, there should be opportunities for students to perform again in a better way. In this way, students could get a more precise understanding of the curriculum goals, and better identification of their learning situation.

Because formative assessment in low-connectivity contexts depends more on students' awareness of their learning status, the three including goals, timely and high-quality feedback, and correction opportunities could play a fundamental role in improving students' self-learning and self-assessment ability.

³² UNESCO. 2020. *Distance learning strategies in response to COVID-19 school closures*. <https://unesdoc.unesco.org/ark:/48223/pf0000373305>

5.5 Planning the use of radio programmes post-COVID-19

It is advisable to plan strategies that move away from rapid responses and toward long-term improvements to infrastructure. Choose radio programmes that are relevant to the national curriculum. Maintain such new practices after schools reopen.

Assess students' achievements and curriculum coverage during the school closures and consider adjustments that will allow learners to catch up when schools reopen. Diagnose the impact of the school closures on learning and identify learning gaps, especially among vulnerable groups. Implement appropriate remedial actions with accelerated learning strategies to improve curriculum coverage. Facilitate peer learning through sharing personal experiences, including health and safety information, challenges faced by students, and lessons learned during the pandemic. This can help students process and understand their experience.

Keep radio-based learning as a supplementary approach to post-COVID-19 teaching practices. The long-term goal should be to integrate key constituent elements, such as upgraded learning platforms and improved distance-learning capacities, for more inclusive, open and resilient education systems in the future.³³

5.6 Working with other teachers and parents

5.6.1 Work with other teachers

When teachers work together to share information, resources, ideas and expertise, learning becomes more accessible and effective for students. When teachers collaborate with their colleagues, this often results in increased academic understanding, more creative lesson plans, and reduced isolation. Three strategies to support collaboration among teachers are as follows:

- Build relationships and a sense of community by communicating with each other about teaching concerns and personal circumstances. Foster a community of practice where you all advance together.
- Arrange regular meetings to share experiences, either face to face or through social media, video conferencing, or telephone.
- Those teachers with previous distance-learning experience can help their colleagues by providing practical advice, sharing articles, and supporting the design and broadcast of video and/or radio programmes.

5.6.1 Work with parents or caregivers








With governments asking people to stay at home, parents, older siblings, and neighbors can help students with radio-based learning. Teachers can use the telephone, post, emails or social media to connect with caregivers and provide guidance regularly, e.g. once or twice a week. Teachers can advise caregivers on how to facilitate students' engagement with radio-based programmes and help the student follow the instructions in the broadcast.³⁴

33 UNESCO. (2020). Distance learning strategies in response to COVID-19 school closures. Retrieved from <https://unesdoc.unesco.org/ark:/48223/pf0000373305>

34 Education Development Center. 2020. *Repurposing established radio and audio series to address the COVID-19 educational crises*. <https://www.edc.org/sites/default/files/Repurposing-Established-Radio-Audio-Series.pdf>

5.7 Free radio resources and programmes for teachers

Table 12. Free radio resources and programmes for teachers

Tool	Description	Website link	QR code
The European Broadcasting Union (EBU)	An alliance of public service media organizations, established on 12 February 1950, consisting of 116 member organizations from 56 countries, and 34 associate members from a further 21 countries.	https://www.ebu.ch/radio	
School Radio	Part of the UK's Broadcast Radio group, it offers equipment so that schools can create their own radio station. The resource pages offer lesson plans and information about how radio activities link to England's National Curriculum.	https://www.schoolradio.com/resources	
Great Learning Podcasts for the Classroom	An initiative created by Common Sense Media, an NGO, to support parents to choose appropriate audio content. It advocates the use of podcasts in the classroom, since they are free and cover nearly every topic and genre	https://www.common sense.org/education/articles/17-great-learning-podcasts-for-the-classroom	
Programmes on national radio	Two blocks of programmes prepared jointly by Argentina's Ministry of Education and Ministry of Media and Public Communication. One is from 9 to 12pm, and the other from 2 to 6pm.	https://www.educ.ar/recursos/151434/seguimos-educando-en-radio-nacional-ciclo-basico-de-educacion-secundaria?from=150936	
Education Development Center	Useful guidance and resources for teachers about interactive radio instruction.	https://edc.org/resources	
Learning at home in times of crisis using radio	A toolkit from the Education Development Center (EDC) that provides practical advice on how to develop interactive audio instruction.	https://www.edc.org/sites/default/files/uploads/IAI-Adaptation-Toolkit.pdf	
Repository of radio content for education (USAID)	A collection that includes interactive radio instruction (IRI) and interactive audio instruction (IAI) resources.	https://gdlradio.org	

6. Print-based distance learning

6.1 Understanding print-based distance learning

Distance learners usually depend heavily on paper-based learning materials like books and study guides. These materials can be distributed by post, email or

websites. Print-based distance learning can be useful when there is no internet access, and when paper is supplementary to online teaching. Table 13 lists some of the advantages and disadvantages of using printed materials.

Table 13. Advantages and disadvantages of printed materials

Advantages	Disadvantages
<p>The student is able to</p> <ul style="list-style-type: none"> • skim-read content • make annotations • develop a flexible learning schedule • get comfortable <p>Materials can</p> <ul style="list-style-type: none"> • facilitate the study of difficult concepts • be produced at a low cost • be readily available 	<ul style="list-style-type: none"> • No interactions • Limited communication • It is more difficult to engage • It requires reading skills • Time is needed for delivery

During the school closures, teachers and students are all relying on the internet more than ever. However, in many countries, the internet is difficult or slow to access, and printed educational materials are distributed instead of or in combination with other types of distance learning. Chile, for example, has launched the 'I learn at home' programme, which distributes online content in print to 3,700 rural schools.

Analysing print-based distance learning

Key elements of print-based distance learning can be found in Table 14, which lists its potential and limitations, as well as the gaps that teachers need to address.

Table 14. Key elements of print-based distance learning

Key elements of teaching and learning practices	Main media and technology Tools	Print-based	Notes on planning the required facilitation
		material and textbooks	
Supported formats of content	Video		
	Multimedia demonstration		
	Audio		
	Supporting text	✓	
Supported devices to access content	Computers		
	Smartphones		
	Feature phones		
	Other digital devices, e.g. Kindle		
	TV		
	Radio		
	Paper	✓	
Accessibility	People with visual disability		
	People with hearing disability		
	Other disabilities		
Management of courses and content	Automatically searchable by topic and grade		
	Editable and re-usable		
	Open-source and extended resources		
	Spaces to store, manage, and share resources		
	Tools to support resource development		
Management of curricular calendars	Adaptive learning calendars based on learners' paces and learning styles		
	Online learning calendars accessible anytime and anywhere		
	Fixed calendar or programmes	✓	

Key elements of teaching and learning practices	Main media and technology Tools	Print-based	Notes on planning the required facilitation
		material and textbooks	
Teaching activities	Synchronous live-streaming interactive lessons		
	Asynchronous video based lessons followed by interactive tutorials and teacher-student discussions		
	Asynchronous video based lessons followed by asynchronous coaching		
	On-demand and controllable video/TV programmes		
	One-way video/TV broadcasting without control over pace or replay		
	On-demand and interactive radio programmes		
	One-way radio programmes		
	Paper-based reading	✓	
Student-student interaction and collaboration	Online collaborative makers' practices or project based learning		
	Real-time online discussion or group work		
	Asynchronous online discussion or group work		
	Sharing of messages through TV or radio programmes		
	Communication through mobile SMS	✓	
Communication through paper-based letters	✓		
Formative and summative assessment	AI-powered formative assessment and personalized learning pathways		
	Automated distribution and administering of tests		
	Multimedia presentation of learning outcomes		
	Shared spaces to collect learners' submissions		
	Automated grading and reporting of assessment results		
	Shared spaces to present outputs to facilitate peer assessment and learning		
	SMS-based tests	✓	
	Telephone-based monitoring of learning processes	✓	
Paper based test to be communicated through posted letters	✓		

6.2 Designing activities for print-based distance learning

Through appropriate instructional design, students can become self-directed and engage with printed materials. The most common strategy is to incorporate a problem or activity into the text. Teachers must find ways to encourage learners to engage with the activities and undertake deep learning, such as providing a variety of tasks that meet individual needs.

Being flexible with production specifications can accelerate the printing process and reduce costs. During these challenging times, affordable products delivered on time are more important than high-quality printing.

The postal service has been affected by COVID-19 disruption like all sectors of society, so the print materials need to be distributed well in advance. Distribution to large school districts can be complex. Teachers should seek out an experienced provider of these services to help them ask the right questions and streamline the process.

Students need to know exactly which materials they have to engage with and by when, so teachers must give them clear instructions for use and a clear timeline. Print materials are inherently non-interactive, so teachers should embed instructional principles that encourage deep thinking and high-quality feedback. In some cases, this may mean a specified schedule for delivering responses or assignments via email, mobile apps or social media groups.

Teachers can intentionally develop students' self-directed learning skills by helping them set daily goals, offering ideas for managing their time, and reviewing their responses promptly.

Teachers should design motivating tasks that include clear goals, content, formats, output, evaluation criteria and real-world relevance. Tasks should be vivid and meaningful, promoting students' critical thinking skills and personal growth, and inspiring them to pay attention to social issues. Instructions for each task should be clear for the learner, so that parents and caregivers are not over-burdened.

6.3 Organizing and monitoring print-based distance learning

Printed materials are highly dependent on students' self-direction. As long as teachers and students carry teaching and learning appropriately according to the feature of print-based distance learning, learning outcomes can also be fully achieved.

- Fully Prepare for the materials and directions of the course for students**

Since the printed materials can be the main or only sources that students can access as learning content, teachers must ensure the distribution of the printed materials before the beginning of the course and leave time to deal with technological problems. A clear direction of the course and how to use the printed materials should be prepared in advance as well, and adaptation can be made according to students' feedback.
- Provide a considerable schedule for both teachers and students.**

The sense of teachers' existence can be weak in the process of print-based, so except depending on students' self-direction, teachers should suggest a detailed daily study plan weekly or monthly for students to clarify learning tasks and assignments, and the time to complete. The study plan should also provide some self-regulation and time management tool to guide students to monitor themselves learning situation. At last, an official timeline of every submission and test can hold students to focus on the learning outcome and force them to complete it on time, facilitating their self-assessment and reflections to become a habit.
- Active interaction and communication with students**

One of the disadvantages of print-based distance learning is the inadequacy of interaction and communication among teachers and students. The learning process needs constant, active, and timely communication to adapt learning content and schedule, solve learning questions effectively, and even personalize learning; provide immediate feedback will motivate students as well. Although the communication methods may be restricted by physical conditions, teachers should still ensure

stable communication tools and routine and design activities that need interactions, and try to integrate diverse ways to communicate based on the need and the features of tools, no matter how traditional the tools are, such as via mail letters and text messages.

Some guidelines for incorporating print materials in distance learning can be found in A Teacher's Guide to Distance Learning.³⁵



Case 7: Using printed materials in African countries

To delay the spread of COVID-19, almost all countries in sub-Saharan Africa have closed schools. However, the development of African countries is quite different, and some countries have very limited access to technology and the Internet. Therefore, for some countries/regions, the use of printed materials is a cost-effective way of distance learning. For example, Sudan's government and Somalia's government plan to provide printed self-learning packages to help maintain students' learning.

For more information: S., Carvalho, S. F., and Gera, R. 2020. Learning equity during the coronavirus: Experiences from Africa. <https://blogs.worldbank.org/education/learning-equity-during-coronavirus-experiences-africa>

6.4 Formative assessment for print-based distance learning

During COVID-19, the home became an important learning environment. As a teacher, it is important to regularly give feedback, follow up with each student, and pay extra attention to learners with special needs so that they will not fall behind. Assessment plans can help teachers ensure that students are learning.³⁶

Purposefully designed sessions for formative assessments, held a few times per week, can be effective in monitoring learning. Adjustment of the methods of formative assessment (e.g. answers sent by SMS) is important to ensure that all students can participate. Methods for a formative assessment include the following:

- **Multiple-choice tests** can assess different parts of the curriculum and measure achievement at various levels. Questions can range from recall and comprehension to more complex levels, such as analysing a scenario, applying principles, discriminating between concepts, interpreting content, judging relevance, and evaluating solutions.
- **Journal writing** is a useful tool for encouraging student reflection, and teachers can assess journal entries with a rubric. The following are tips for designing a good reflective journal assessment:
 - Consider the types of reflective journals that fit your course. If students lack experience with reflective journals, a structured template with specific questions and guidelines would be appropriate.
 - Explain to students the purpose and benefits of reflective journals at the very beginning.
 - Make sure there are clear instructions and assessment criteria for the students (e.g. What can students put in their journals? What is the definition of 'reflection'? What is the approximate length for each journal entry?).

35 Barron, A. E. 1998. *A teacher's guide to distance learning*. Florida Center for Instructional Technology, College of Education, University of South Florida. <https://fcit.usf.edu/distance/>

36 UNESCO. 2020. *Dealing with obstacles to distance learning*. <https://en.unesco.org/news/dealing-obstacles-distance-learning>

- Be aware of policies concerning students' privacy and confidentiality.
- Decide on the regularity of journal entries (e.g. weekly, monthly).
- Provide timely feedback to students through phone calls with parents or through periodical postal mails.
- **Essays** are flexible and can assess higher-order learning skills, but they are time-consuming for teachers to mark. Teachers can expedite this by preparing a marking scheme with anticipated comments and responses.

Design assessment tasks according to expected learning outcomes. Teachers can design a feedback form and tell parents to notify them of the completion of the task by email or phone within a specified timeframe.

6.5 Working with other teachers, parents and school administrators

Ineffective communication between parents and teachers can be a major obstacle when trying to facilitate learning at home, but fortunately it can be improved. It is important to explain the roles of parents and school administrators, especially when using printed-based distance learning.

To respond to the crisis in the short term, staff members should be designated to facilitate communication among school staff, students and their families, and provide regular official updates

from school leadership. In the medium and long term, the administrators should ensure that up-to-date contact details are available for all members of the school community, particularly those deemed most vulnerable. Communication mechanisms should be formalized, including mechanisms for following up with at-risk students.

Students and families should be asked for feedback on the learning during the school closures so that they can share their concerns around the next steps.



Case 8: Printed learning packages covering indigenous language in New Zealand






The Ministry of New Zealand has produced and distributed printed learning packs to students who do not have a computer or internet access. Printed packs in English and Māori can be requested by schools or *kura* (Maori-language schools). *Whānau* (Maori families) can also register for a Māori pack on the *KauwhataReo* website. For early-years students, printed packs go to families and *whānau* who receive Targeted Funding for Disadvantage (TFFD). Parents can ask whether their TFFD service has requested packs for its students.

Resources are available for more than 50 subject areas. Schools can order subject-specific hard copies for NCEA (National Certificate of Educational Achievement) students who lack internet access and/or a suitable computer at home. Eligible students can see the list of available resources, and then ask their school to order the resources on their behalf.

For more information: <https://www.education.govt.nz/covid-19/distance-learning/>

6.6 Free resources to support print-based distance learning

Table 15. Free tools for teachers to support learning in low-tech contexts

Tool	Description	Website link	QR code
Kolibri	Free resources packaged for offline use with over 80,000 pieces of content provided by UNHCR partners of Learning Equality. Supports customization according to national curricula and provides solutions for reaching disconnected groups. Languages include Arabic, Bengali, Bulgarian, Burmese, Chinyanja, English, Farsi, French, Fulfulde Mbororoore, Hindi (India), Gujarati, Korean, Marathi, Portuguese (Brazilian), Spanish (Latin America), Spanish (Spain), Swahili (Tanzania), Telugu, Urdu (Pakistan), Yoruba, and Vietnamese.	https://learningequality.org/kolibri/	
Ubongo	A platform for leveraging entertainment, mass media, and local content via mobile devices. Available to African families at low cost.	https://www.ubongo.org/	
Ustad Mobile	Solutions to facilitate the access to and sharing of educational content offline, without requiring internet connection, WiFi, or mobile data. English interface.	https://www.ustadmobile.com/lms/	
Learncloud	Educational content organized by subject to enable lifelong learning for underserved communities. Available in Algonkian, Anishinaabemowin, Arabic, Chinese, Cree, English, French, German, Hindi, Inuktitut, Italian, Khmer, Maasai, Michif, Mohawk, Nepali, Oji-Cree, Pashto, Portuguese, Romanian, Russian, Spanish, Swahili, and Turkish.	https://learncloud.rumie.org/search	
Achieve3000	Free access to resources for differentiated literacy instruction. For students without internet access, the company offers 'literacy printable packets', a set of texts with 20 printable articles and questions that add up to a month's worth of content differentiated for students whose reading is at, below, or above grade level. Lessons can be downloaded and sent by email or post, and include strategic math, arts, science, and reading.	https://achieve3000.com/community-resources/remote-learning-2020/	

7. Facilitating home-based learning for pre-primary education

During confinement, many parents and teachers are working at home alongside their children, and trying to keep their children entertained and engaged. For the youngest children, teachers need to change the way they teach so that this group does not miss out on learning experiences.

To better facilitate early reading and maths at home, this section provides teachers with ideas and resources for positively and proactively engaging children aged eight and under.

With parents overwhelmed by their own pressures, perhaps due to a job loss or the new demands of working from home, it can be difficult for them to help their children keep up with their learning, especially in maths and literacy. An effective home-based learning environment has the following three characteristics:

- Active participation and engagement with family members;
- Collaborative group work, with frequent feedback and interaction;
- Connection to real-world situations and contexts.

7.1 Creating a safe and friendly home-based learning environment

To support families during confinement, teachers should help them create a successful home-based learning environment and develop their children's literacy and math skills. Children need opportunities to observe their surroundings and model the way language is used in daily life. To provide these opportunities in the home environment, parents can describe their food in terms of their texture, temperature, smell and taste; and talk about the furniture around the house, explain what it is made of and where the raw materials came from.

Children also need to receive positive feedback from caregivers on their attempts at reading and writing. Parents should feel free to discuss their own interests and highlight the value of their child's activities. Engagement includes not only dealing with resources and materials but also having a positive parental attitude.

Ordinary household tasks can be used to support learning. For example, parents might try sorting laundry by colour or type of clothing, or count the cutlery while setting the table for a meal.



Child Reading by mohamed mahmoud hassan
Available at <https://www.publicdomainpictures.net/en/view-image.php?image=269819&picture=child-reading> under [CC0 Public Domain](#)

Case 9: An innovative example to facilitate children's reading at home

To better facilitate children's reading, a virtual story-time is being created in Instagram (#SAVEWITHSTORIES). Through the live platform of Instagram, followers are reading books as an entertaining distraction to isolation. Authors and celebrities are also working together to read short books for others. This project has not only entertained children and parents, but also raised funds for programmes of schools and communities.

For more information: <https://www.instagram.com/savewithstories/?hl=fr>

7.2 Facilitating the parent-child relationship

Children learn best from interactive and hands-on experiences with people they care about. During lockdown, parent-child companionship can greatly enhance children's development. Being at home is an opportunity to build more open, trustworthy relationships that enhance children's emotional resilience and strengthen communication within the family.

Case 10: Strategies for ensuring early-child education uninterrupted in China

In China, early-age curricula are based on games and real-life experiences as described in the Guidelines for Early Child Learning and Development. Under the Policy of the Ministry of Education of China on Ensuring Learning Uninterrupted When Schools are Closed, free resources were provided to support children's, and guidance on distance learning were also provided for parents and teachers to support children's home based learning:

- **Ensure adequate communication among parents, teachers and children.** Pre-school teachers should divide the class into units and carry out online home visits. They should communicate with two to three children every day, to check their physical and mental states as well as their behaviours in the family. The visits were documented in a form that includes notes on the child's development and home-based activities, as well as feedback from parents.
- **Provide high-quality and relevant resources for parents.** After assessing the needs of parents and the characteristics of children in the class, teachers should recommend resources that are relevant to both parents and children.
- **Provide effective parental guidance.** Teachers should provide parents with advices on children's daily schedules of learning and physical activities to keep their physical and mental development, and ensure sufficient bedtime. Teachers also cooperated parents to help children understand the pandemic and adapt themselves to its social implications.

For more information: http://www.moe.gov.cn/jyb_xwfb/gzdt_gzdt/s5987/202002/t20200212_420385.html

7.3 Guidelines for screen time

With schools closed, parents across the world are resorting to online tools and apps to keep their children entertained. During the pandemic, children are spending more time online, staring at screens while they are at home.

Excessive screen time reduces creative free play, interactions with siblings and parents, and vigorous physical activity. Increased TV and media exposure may negatively influence behaviour (e.g. choosing unhealthy foods, displaying aggression, and experiencing language delays). Considering the students' audiovisual health, they should learn to control electronic products' use time to be reasonable and not affect everyday work and rest. According to age characteristics, the length of time students of different age groups facing electronic screens every day should be other. Students and their parents can also determine the period and size of each day's use of mobile phones, electronic devices, and the Internet, and jointly abide by the established rules. Some suggestions for managing screen time are given from Guidelines for Early Care and Education Programs, 3rd Edition(CFOC3).³⁷



Case 11: Moms' advices on home-schooling in the United States

Parents in the US used some of the schools' online tools, phone apps and worksheets to keep up with children's classwork. They also turned walls in their house into whiteboards so they could write a study schedule, and their children could practice writing numbers. They took the opportunity to talk online with each other, sharing emotional support and online resources.

For more information: 8 Black homeschool moms share advice for homeschooling during COVID 19. https://rattlesandheels.com/8-black-homeschool-moms-share-advice-for-homeschooling-during-covid-19/?fbclid=IwAR00Bg3-Ca5CKGFsfksRx1eS56WqYkiLun46tHvK6zw4-Utb1hPm_2St7tQ

7.3.1 Tips for parents to facilitate children's home-based learning

During the pandemic, many parents have suddenly found themselves in a new role, that of a teacher. Six tips for parents to help children continue learning at home are as follows:

- 1 Stay in touch with the child's school.
- 2 Find online resources to help supplement learning materials from the school, such as virtual museum tours.
- 3 Seek out lesson plans to aid instruction and look for online platforms like Khan Academy.
- 4 Create a flexible schedule and routine for learning at home.
- 5 Consider the needs and adjustments required for the child's age group.
- 6 Look for ways to make learning fun.



Case 12: Parent-child interactive games on air

A total of 130 pre-school teachers from 10 kindergartens in Guiyang City of Guizhou province participated in the online 'Parent-child games on air'. Based on the Guidelines for Early Learning and Development, this programme mobilized parents and children to design interactive educational games, record videos of the game playing, and share them online with other parents. When facilitating the design of the games, teachers considered families in urban and rural areas and the need for simplicity and the use of local materials. They also thought about the patterns of children's physical and mental development and learning characteristics.

For more information: Chinanews. 2020. <https://m.chinanews.com/wap/detail/sp/sp/shipin/cns/2020/03-31/news9143226.shtml>

37 Caring for Our Children, 3rd Edition. National Health and Safety Performance Standards: Guidelines for Early Care and Early Education Programs. Retrieved from <https://ebooks.aappublications.org/content/caring-for-our-children-3rd-edition>

7.3.2 for teachers of early-years children

During the pandemic, early-years teachers may be able to provide informal support to parents and children via telephone and video conferencing. These teachers should pay attention to the design and

implementation of courses; guide parents to provide interaction and support with health habits, games, and reading; understand the perspective of children and connect the home situation with age-specific development; and prepare for challenges while being flexible in their expectations.



Case 13: Experience from a pre-school teacher at an international school

During the covid-19, many preschool teachers' experiences could be used to facilitate children to learn at home. For example, Amy Silberman, a preschool teacher at an American international school in China, noted teachers should help children develop their social and emotional skills, physical abilities, cognitive abilities, and language and literacy skills. To develop children's social and emotional skills, she asked children to use Seesaw and post yoga videos on Seesaw and Wechat groups so that kids and their parents could play activities at home. To promote physical development, she asked children to use home materials and practice yoga by different poses. To develop children's cognitive skills, she encouraged children to use voice comments to connect with other kids. She also provided opportunities for children to watch, participate, and record. So children could share with others.

For more information: Silverman, A. 2020. Special Online Feature. <https://www.naeyc.org/resources/pubs/tyc/apr2020/play-child-development-and-relationships>



Case 14: Professional development – Online reading club for teachers

In response to the closures of kindergartens caused by the outbreak of COVID-19, the Department of Education in Zhejiang Province planned and implemented strategies for supporting pre-school teachers to prepare themselves for the next semester including through setting up online reading clubs for teachers. Here are some details on how the Xiuzhou Experimental Kindergarten of Zhejiang Province planned and organized the reading club for teachers.

At the outset of the COVID-19 outbreak, a webinar was organized to plan the home based reading and professional development activities. An online reading club, a community of home based reading, was then established to connect teachers who are isolated at home. The online reading club was used to facilitate the recommendations of books among teachers, and facilitate the sharing of notes and insights of book reading exercises. Home based reading activities were purposefully planned towards the improvement of teachers' professional capacities. Teachers were organized to assess the situations that teachers, parents, and children are facing, and gain understanding on what teachers need to explain to children about the virus, what health caring knowledge teachers need to provide to children, and how to education children through telling stories of real characters fighting the virus. Through the online reading club, teachers were also guided to reflect on new topics that can be drawn on the lessons of COVID-19 outbreak, including education on life skills, and values on relation between human and the nature and how they can integrated into the curriculum. Teachers were encouraged to use the method and tools of concept mapping to support the planning the key topics, targets, and timelines of actions. As one of results of the reading club, teachers need to create lesson plans to ensure the results will be implemented when kindergartens are re-opened. During the exercise, external experts were mobilized to deliver online lectures and provide technical advices.

For more information: Noah.com. 2020. Xiuzhou: Experimental kindergarten during the epidemic. Network teaching and research activities. <http://www.noaheducation.com/News.aspx?NewsID=10939&TypeID=15>

7.4 Supporting pre-primary education transition from home to school settings

It is likely that for some period of time, early-years children will continue to stay at home. The COVID-19 crisis will increase the number of children experiencing abuse, homelessness, and poverty, making access to high-quality early education and care programs more important and more difficult. The following are four ways in which teachers and school administrators can support these children.

Continuously utilize a child- and family-centred approach. Early education and care programmes can strengthen families and support children’s healthy social and educational development through building relationships, learning experiences, and resources. These programmes can transform children’s and parents’ lives, cultivating potential and reinvigorating opportunity.

Build a state-wide initiative to create supportive learning environments. State policy should establish a vision for teaching and learning that integrates the goals of academic success, health and safety, and

strong school communities in a supportive climate. State agencies should explore how to actualize this vision.





Review and revise state policy. Existing state policies may facilitate or hinder efforts to create supportive learning environments. It is critical that policymakers review and revise state policies to align initiatives not only with health and safety guidelines but also for alignment with trauma-informed principles.









Support local, school-driven initiatives to create supportive learning environments. State policy should provide schools with the resources they require to explore the needs of the local community and examine their readiness to meet the needs of all children.

7.5 Resources for parents and teachers

A number of online services that offer high-quality audiobooks and ebooks are listed in Table 17. Parents, teachers and children can explore what they offer and feel free to share them widely.

Table 16. Audiobooks and ebooks for early-years children

Name	Description	Website link	QR code
Audible for Kids	A collection of audiobooks from Amazon. While schools are closed, children can listen to stories in this collection for free. Available in six languages.	https://www.audible.com/ep/kids-audiobooks	
Bookshare	Children with dyslexia, low vision, and other reading barriers can get free access to books in audio, audio + highlighted text, braille, and large font.	https://www.bookshare.org/cms/help-center/learning-center/school-closure	
Tales2Go	More than 10,000 audiobook titles (including Spanish titles) from leading publishers. There are also book-based lesson plans for core reading skills, including phonemic awareness, phonics, fluency, vocabulary, and comprehension.	https://www.tales2go.com/	
Epic!	35,000 resources, including ebooks, audiobooks, learning videos, quizzes, and teacher-curated collections. Also includes Spanish titles.	https://www.getepic.com/	

Name	Description	Website link	QR code
Global Digital Library	Digital storybooks and other reading materials accessible from mobile phones or computers. Built under the Norad-UNESCO partnership. Available in 43 languages .	https://www.digitallibrary.io/	
African Storybook	Open access to picture storybooks in 189 African languages .	https://www.africanstorybook.org/	
StoryWeaver	Digital repository of multilingual stories for children. Available in 232 languages .	https://storyweaver.org.in/	
Worldreader	Digital books and stories accessible from mobile devices. Available in 52 languages .	https://www.worldreader.org/	
Quizlet	Flashcards and games to support learning in multiple subjects. English -based interface but offers an interface of the corresponding language when learning French, German, Latin, and Spanish .	https://quizlet.com/en-gb	
One Billion	Child-focused application aiming at reading, writing, and numeracy skills, provided by a non-profit organization.	https://onebillion.org/	
Biblioteca Digital del Instituto Latinoamericano de la Comunicación Educativa	Free access to Spanish works and book collections for students and teaching staff of all ages, from pre-schoolers to university students. Available in Spanish .	http://bibliotecadigital.ilce.edu.mx/	
Lezioni sul sofà	A collection of Italian-language books for children, complemented by read-aloud features as well as videos discussing books and art. Available in Italian .	https://www.lezionisulsofa.it/	

8. Integrating blended learning in the post-COVID-19 era

During school closures when distance learning programmes were introduced, many teachers mastered the ability to conduct synchronous or asynchronous online teaching, utilize online learning resources, and/or design and facilitate TV- or radio-based learning. Most teachers learned how to use varied communication tools to stay connected with parents and students. Depending on the readiness of digital devices and internet connectivity at their schools, teachers should be continuously supported to integrate some of the effective practices of distance learning into blended learning models as schools reopen.

Educational authorities face different choices in re-opening the schools and they have to follow governmental instructions on public health, which is based on an assessment of the associated benefits and risks and informed by cross-sectoral and context-specific evidence. To support national and local authorities' decision making and planning for school reopening, UNESCO, UNICEF, the World Food Programme and the World Bank jointly proposed a Framework for reopening schools.³⁸

Yet, most schools have re-opened for the new academic year. The first priority for school re-opening relates to teachers' and students' **physical protection**. It is also important to communicate within the school community about health and safety measures in order to build trust and reassure parents and other stakeholders of the safety of schools. The following are three suggestions for teachers to elaborate as the become part of re-opened schools.

- First, teachers should actively participate in continuous dialogues with school leaders to help them better formulate policies and plans for school

reopening. Such efforts would clarify teachers' own roles in the success of safe, inclusive return-to-school efforts, including overall well-being and the learning recovery process. As teachers are often the first point of contact with students and parents, they should also be prepared to provide fact-checked updates to students and parents and help to stop the spread of COVID-19 misinformation.

- Secondly, as schools reopen, students' and staff members' health is of paramount importance and teachers must attend to the safety of everyone on the premises, including themselves. They should keep up to date with the latest information and policies on school reopening, know how to use personal protective equipment to prevent infection, and find out how to apply international standards in the classrooms and the school as a whole. Teachers should also know how to reorganize classroom learning, including setting upper limits on numbers of students, aligned to physical distancing standards.
- Finally, teachers need to provide psychosocial support to students and families, as the COVID-19 pandemic has resulted in psychological distress for many of them. Students' physical, psychological, and social-emotional well-being should be prioritized over academic obligations, and resources should be made available for students and their families. Teachers should also identify at-risk students to mitigate dropout and help those out of school to return.

It is also of great importance that teachers maintained the competencies gained during school closures and they consider transitions between online and face-to-face learning within the classroom context or beyond. Bearing in mind the variety of experiences that different schools had, the following three suggestions could be considered:

³⁸ UNESCO, UNICEF, the World Bank, the World Food Programme and UNHCR.2020. Framework for Reopening Schools. <https://www.unicef.org/documents/framework-reopening-schools>.

(1) Review the outcomes of online learning during school closure

Teachers should first organize review lessons to test what has been learned during school closures, ask students to complete a knowledge sheet to demonstrate what they learned, and teach students how to summarize their knowledge. Teachers could also check students' learning and identify gaps by giving them self-evaluation forms or asking them to draw knowledge maps. Teachers could also combine online evaluation and offline tests, and then give multidimensional feedback to students and parents.

(2) Redesign school learning to include the best practices of online learning

After getting students' feedback, teachers should reflect on the whole situation and design their lesson plans accordingly. The content that students learned effectively could be reviewed quickly or taught by the students, while the content that was more problematic could be taught again by the teacher. Teachers should also try to utilise their recent experiences to supplement face-to-face teaching with online content. All online experiences, from downloading worksheets to using distance learning platforms, can offer opportunities to expand students' horizons and facilitate school learning. OER resources and online learning repositories could be utilised for the benefit of the students.

(3) Carry out differentiated learning and integrate group with individual learning

When conducting the reopening lessons, teachers could use differentiated group learning, as students may vary a great deal in the skills they have learnt. Recognising such differences allows students to take on responsibility for their learning and increase motivation and engagement. Different teaching methods can be used, such as peer support in groups which can expand in activities after class.

8.1 Shaping the post-COVID-19 new normal

With most schools re-opened across the world, attention should be paid to what was achieved during school closures and try to make it part of the new normal. It is of paramount importance for teachers to sustain best pedagogical practices, consider the innovative ways in which their pedagogical practices were infused with technology and how they could provide solutions to many problems in schools. The following would be key for understanding the benefits of using ICT as part of the curriculum:

(1) Sustain the positive mindset towards the use of ICT

Through the COVID-19 outbreak, schools, teachers, parents, and communities have recognized the value of distance learning solutions. With schools reopening, it might be a transformative opportunity for integrating technology into education at scale. Teachers should continue to maintain a positive attitude towards technology, raise awareness of data privacy and data protection, create a culture of digital teaching, and promote the implementation of flexible teaching.

(2) Retain teachers' improved competencies to integrate technologies into pedagogical activities

In a broader context of school- and home-based blended learning models, teachers' competencies are very important in facilitating the integration of technology into pedagogy. The following three key elements should be considered.

- Teachers should be conscious of or able to identify the problems to be addressed so that the new vision of teaching and learned can be achieved. They can then assess the effectiveness of available technologies to address the identified problems or visionary objectives.

- Teachers should understand the areas that technological solutions can actually support and take advantage of them. Some platforms for example may only offer access to content while other technological solutions may support instant feedback or group work.
- Teachers should keep up their improved competencies through training or informal support groups to develop skills in further integrating technologies into teaching and learning activities. A lesson could be separated into several activities, and technology could be deployed to improve the effectiveness of some of them. Schools should support teachers to build technology-enhanced teaching models.

Technology can be integrated into education in numerous ways and the recent school closures have led to emerging best practices. It is therefore important for teachers to reflect on their practices and summarize what worked and did not work. In the post-COVID-19 era, teachers will know how to utilize the national platforms, conduct synchronous online lessons, organize video-based flipped learning, and use TV and radio programmes for learning. Such knowledge equips teachers to address challenges in new ways.

All of these successful practices could be integrated into school-based teaching in the post-COVID-19 new normal.

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Ensuring effective distance learning during COVID-19 disruption

Guidance for teachers

School closures were mandated as part of public health efforts to contain the spread of COVID-19 from February 2020 in most countries, affecting close to 1.6 billion students. As the pandemic continues to evolve, education systems around the world face an unprecedented challenge. Governmental agencies are working with international organizations, private sector partners and civil society to deliver education remotely through a mix of technologies in order to ensure continuity of curriculum-based study and learning for all.

The effectiveness of distance learning strategies is conditioned by the readiness of technology, curricular courses and supporting content, home-based learning support, as well as monitoring and assessment. After curricular courses and delivery technologies are in place, teachers are in the frontline to design and facilitate learning activities, monitor and evaluate students' home-based distance learning processes, adjust their learning management accordingly, and assess students' achievement of learning outcomes.

This Guidance aims to help teachers understand key issues related to home-based distance learning during COVID-19 school closures and design and facilitate effective learning activities, with a special emphasis on education from pre-primary to upper secondary level.

