CONTESSA
Contemporary Teaching Skills for South Asia

Co-funded by the Erasmus+ Programme of the European Union

MODULE 5
DIGITAL TEACHING AND LEARNING

5.2 DIGITAL MEDIA AND TECHNOLOGY: TOOLS AND FORMATS FOR EDUCATIONAL PURPOSES

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Digital Teaching and Learning. Digital Media and Technology: Tools and Formats for Educational Purposes.

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Introduction

What is the CONTESSA course?

The CONTESSA course is one of the results of the "Contemporary Teaching Skills for South Asia" project co-funded by the Erasmus+ Program of the European Union. Its aim is to be a contribution to establishing successful teacher education programs for primary teachers, particularly in Cambodia and Sri Lanka, which will create a long-lasting positive impact on the overall educational systems.

It is increasingly important for successful educators to stay up-to-date with contemporary skills and methods to use inside and outside of the classroom. The CONTESSA course therefore offers five carefully selected modules, each of which contain three focuses aimed at the development of contemporary teaching skills. The modules and their focuses are as follows:

Module 1. Building Blocks of Primary Education
1. Twenty-First Century Teaching and Learning
2. Lesson Planning and Methodological Skills: Concepts, Tools and Application
3. Designing Learning Environments

Module 2. Excellence in Teaching: Profession-Specific Competences of Primary School Teachers
1. Teaching Comprehension: Roles, Tasks and Functions
2. Assessing Learning Results
3. Pedagogical Professionalization

Module 3: Learner-Centered Primary Education: Enhancing Co-Created Learning Processes
1. Individual Development and Problem-Solving Skills
2. Lifeworld-References and Future Prospect
3. Self-Determination, Empowerment and Self-Efficacy

Module 4: Embracing the Differences: Pedagogic Approaches to Diversity, Heterogeneity, Special Needs
1. Inclusive Pedagogy: Approaches and Strategies
2. Teaching and Learning in Diversity: Preparation, Realization, Assessment
3. Diversity-Sensitive Classroom Management

Module 5: Digital Teaching and Learning
1. E-Pedagogy and Digitally Enhanced Learning Environments
2. Digital Media and Technology: Tools and Formats for Educational Purposes
3. Online-Based Lesson Preparation and Conduction

Upon completion of this course, participants will be able to implement newly acquired contemporary teaching skills, engage all students in classroom activities and learn new ways to help students reach their full potential.

Who is the CONTESSA course for?

The "Contemporary Teaching Skills for South Asia" project aims at promoting contemporary teaching skills for pre-service and in-service teachers working in primary schools. The following document is specifically adapted for pre-service teachers.

Furthermore, the CONTESSA course is available for anyone interested in staying up-to-date with contemporary teaching skills.

This is the English version of the CONTESSA course. Material is also available in Khmer, Sinhala and Tamil.

What is the structure of the CONTESSA course?

As mentioned before, the CONTESSA course consists of five modules, each worth the equivalent of 3 ECTS. Ideally, the modules are all used together since individual modules refer to other modules, but they are also designed in a way that each one can be used on its own.

Each module contains three thematic focuses and documents are available for each focus. This makes a total of 15 documents available in the CONTESSA course. Each document contains a theoretical introduction to the focus, followed by practice exercises based on the theory. **STEP 1 – THEORY –** is meant as a revision of what has been read in the theoretical introduction. Practice exercises check the comprehension of the text to make sure that the underlying theory has been understood. **STEP 2 – EXPERIENCE –** offers examples of real teachers and how they practically implement the theory explained in the theoretical introduction. These examples are again connected to practice exercises which are meant to allow for the application of the previously learned theoretical knowledge. **STEP 3 – (SELF-)REFLECTION –** includes reflection questions based on each focus. **STEP 4 – PRACTICE –** is the final STEP where a teaching project is created based on what has been seen before in STEPs 1 and 2.

The practice exercises in STEPs 1 and 2 can be directly completed in this document. STEPs 3 and 4 are part of a separate portfolio document which has to be created by each individual. A template for this portfolio is available as a separate document.

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1 DEFINING MEDIA AND TECHNOLOGY

While the terms technology and media are often used interchangeably and can both be used to describe the same object, it is nonetheless important to make a differentiation between the two since they embody different approaches to teaching and learning. “Essentially definitions of technology range from the basic notion of tools, to systems which employ or exploit technologies.” (Bates, 2019, p. 222) Technology is thus not only the physically tangible computer, projector or screen but also the applications running on the computer and being projected on the screen. However, all of these elements are passive as long as no one interacts with them. The before mentioned approach between media and technology thus lies in how they are used to create meaning. Media depends on technology to work, but it encompasses the physical object by offering “unique formats and symbol systems that help convey meaning and knowledge” (Bates, 2019, p. 223). Technology is thus the physical and digital equipment, whereas media is the way this equipment is used. (Bates, 2019)

Advantages of using media in class:

- Complex ideas can be shown in a short period of time.
- Students receive access to contexts outside of their local environment.
- Students can connect theory with practical examples.

(Mateer, 2018)

Disadvantages of using media in class:

- **Copyright issues** have to be considered.
- Media scenes might not be age appropriate and thus have to be carefully selected by the teacher. Media generally has to be chosen in regard to its appropriateness and helpfulness in the primary education context. The use of technology alone does not enhance the learning experience, but rather its pedagogically supported application.

The following websites offer **freely usable** media:
pixabay.com
unsplash.com
creativecommons.org
pexels.com

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- Not all schools have the necessary technical equipment to provide students with digital media.

In the following, educational technology (physical and digital equipment) and educational media (how the technology can support the teaching and learning process) will be presented.

2 DIGITAL MEDIA AND TECHNOLOGY

As seen before, a digitally enhanced learning environment is characterized by the presence and use of a variety of digital educational technology such as computer systems, mobile devices, smart boards, document cameras or online media streams. They are used either on their own or in combination to support the teaching/learning process. Depending on the perspective, these technologies can be categorized into three different levels: teacher focused, student focused and school level infrastructure.

Teacher focused: Teachers might need a personal computer or laptop to enter grades, email parents and perform the administrative tasks needed for the classroom. Typically, the teacher's device is also used for classroom presentations. Smart boards provide the opportunity for easy onscreen interaction during time spent teaching.

Student focused: Students might also need computers or mobile devices depending on the task. These can either be provided by the school or personal devices are brought to the classroom. Smart boards provide the opportunity for easy onscreen interaction during time spent learning.

School level infrastructure: The school infrastructure is responsible for Wi-Fi access points for students' mobile devices but might also provide servers for **cloud computing**. With a school network permitting access to all teachers and students, documents can be shared over the school servers or a data cloud. In some cases, the

Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared

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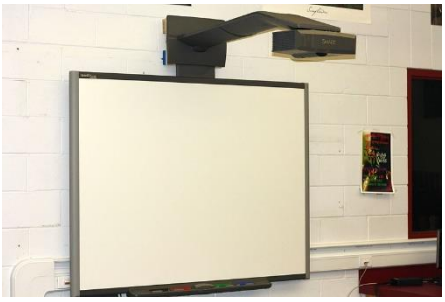
school's learning management system (LMS) is installed on the servers of the school and is thus accessible through an internal network. This way everyone has access to the stored data even during an internet breakdown.

In the following, some examples of digital educational technology will be presented, focusing on possible applications to support student learning.

pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. (Mell & Grance, 2011, p. 2)

2.1 Hardware



2.1.1 [1] SMART BOARD

A smart board is a large touch-sensitive screen fixed to the wall or a floor stand and connected to a computer. The screen of a computer or notebook can thus be displayed via a digital projector. Additionally, the smart board serves as input device: Users can either use their finger or additional tools such as particular pens to write on and control the smart board. (EduTech Wiki *Smart Board*, 2009)

The smart board can either be used in connection with a computer, where it is possible to switch between the computer screen and the whiteboard mode, or it can be used without a connected computer. In the latter case, the screen is a plain white surface to write on.

The following examples offer possibilities on how to use a smart board in class:

- The smart board can be used as classical projector for displaying presentations or showing videos and pictures.
- The smart board can be used as digital blackboard displaying information which students have to edit (e.g., correcting, highlighting) directly on the smart board.

[1] Picture Source: "Smartboard 2010" by Alex Fuerst (2010). CC BY-SA 3.0.

- The smart board can be used for brainstorming where students can directly write their ideas on the smart board.
- The smart board can be used for art classes by letting students draw directly on the smart board.
- The smart board can be used for math classes where students solve math problems directly on the smart board.
- DVD players can be connected to the smart board to show video material not available online.

(EduTech Wiki *Smart Board*, 2009)

Advantages of using a smart board in class:

- Visibility – Teachers and Students can control all applications of the notebook with the smart board's touchscreen as well as write directly on the smart board. This allows them to always be visible to the class instead of disappearing behind a fixed computer. (Yang & Lin, 2009)
- Time-saving – Information written on the smart board can directly be saved on the computer. In addition, the handwritten notes on the screen can automatically be converted into editable text. This allows students to concentrate on the information provided by the teacher or other students if they do not wish to take notes. The notes can also be provided to students who are absent. (Davidovitch & Yavich, 2017)
- Diversification – Different multimedia formats (e.g., videos, pictures, audio) can be displayed on the smart board, which enables the visualization and diversification of presented learning content. (İstifçi et al., 2018)
- Flexibility – Teachers and students can bring their own notebooks, tablets or smartphones, and with the right interfaces they can connect their technology with the system of the smart classroom (İstifçi et al., 2018). This is handy for presentations or if students want to share documents with their colleagues on a big screen so the whole class can discuss them.

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Disadvantages of using a smart board in class:

- Handling – For first time users, writing on the smart board can be difficult, with the handwriting looking large, blocky and messy. Teachers need professional introductions on how to use the equipment and practice writing on the smart board (Davidovitch & Yavich, 2017). Lacking this kind of instruction and practice, a lot of teachers use the smart board solely as a regular projector screen (Yang et al., 2018; İstifçi et al., 2018).
- Price – Smart boards can be very expensive (the price of a smart board varies from 900 to 5.000 US-Dollars, depending on its functions). They thus have to be provided by the school.
- Equipment – Students might not have the necessary equipment at home to receive the saved notes taken on a smart board or to connect to the smart board for presentations.

2.1.2 [2] DOCUMENT CAMERA

Document cameras are digital overhead projectors. With this kind of camera, worksheets, pages from books and even three-dimensional objects can be displayed. More advanced versions can even record videos and scan documents.

The costs of a document camera ranges from under 100 to more than 1.000 US-Dollars, depending on its functions. (Scholastic Teacher, n.d.)

The following examples offer possibilities on how to use a document camera in class:

- When reading a story to the class, the book can be placed under the document camera and projected so that the whole class can see the illustrations.

[2] Picture Source: "Ken-A-Vision's FlexCam 2 document camera connected to a laptop computer" by Ken-a-Vision (2012). CC BY-SA 3.0.

- Demonstrations can be placed under the document camera and projected so that the whole class can see them better, for example, science or art demonstrations.
- The document camera can be used instead of a blackboard or smart board. Information is written on a sheet of paper and placed under the document camera, which is projected to the whole class.
- Instead of printing out a quiz for every student, the original copy can be placed under the document camera and projected so that the whole class can see it.
- When comparing solutions to a given problem, they can be placed under the document camera and projected so that the whole class can see them.
- Rules and routines can be placed under the document camera and projected so that the whole class can see them.
- To let students know how much time they have for an activity, a kitchen timer can be placed under the document camera and projected so that the whole class can see it.
- Details can be shown and enlarged so that every student can see them, no matter whether they are in the front or the back of the classroom.

(Scholastic Teacher, n.d.)

<u>Advantages of using a document camera in class:</u>

- Money-Saving – With the use of a document camera, it is unnecessary to print out everything, which saves money and paper.
- Money-Saving – The document camera can partly replace a more expensive smart board.
- Handling – The document camera is intuitive and easy to use.
- Price – More affordable document cameras start at 70 US-Dollars.

(Scholastic Teacher, n.d.)

Disadvantages of using a document camera in class:

- Visibility – Teachers writing on a sheet of paper displayed via the document camera might not be visible to all students.
- Price – Document cameras can still be too expensive and thus unaffordable.
- Equipment – A document camera requires a projector to display its projections.

2.1.3 SMARTPEN

The smartpen is a digital pen manufactured by Livescribe™. It has the basic functions of a regular ballpoint pen, but additionally the words written with it - on special digital paper - can be digitalized and edited on a digital device (e.g., computer, laptop). In addition to importing writing, smartpens can record audio with their built-in microphones. That way, teachers and students are able to record what has been said while writing, which they then can listen to on the smartpen itself or save on a storage device and listen to over the computer. The written notes are synchronized with the audio, which allows the user to click on a specific word in the notes which then plays that specific part in the audio recording connected to it. (Patti & Vince Garland, 2015)

The following examples offer possibilities on how to use a smartpen in class:

- When presenting information, the teacher can use the smartpen together with a smart board or a document camera and share the saved written document together with the audio recording.
- Teachers can create “pencast lessons by writing notes on the special digital paper with the pen, and simultaneously explaining the written notes” (Patti & Vince Garland, 2015, p. 240). The text together with the audio explanations can be provided to the students, who then finish the lesson on their own.
- For a written test, the teacher can record the instructions on the smartpen and students can then individually listen to them while writing the exam.

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- To diversify the ways in which students give an examination answer, students could either write/draw the answers with the smartpen or record their answers on the smartpen. This is especially helpful when reading fluency is examined.
- Homework assignments can be written with the smartpen, adding oral explanations for each task.

Advantages of using a smartpen in class:

- Time-saving – Since a smartpen can turn written text into computer editable text, notes can easily be saved and distributed.
- Time-saving – Taking notes with a smartpen takes less time than taking notes with a computer. (Van Schaack, 2009)
- Support – Students who have difficulty taking notes and listening at the same time can pay more attention to what is being said by using the smartpen's recording option instead of concentrating on writing. (Van Schaack, 2009; Patti & Vince Garland, 2015)
- Support – The smartpen can be used by blind students to read **audio-tactile graphics**. (Van Schaack, 2009)

Disadvantages of using a smartpen in class:

- Legality – One has to be aware about whether recording oral presentations is acceptable or allowed.
- Handling – Smartpens require charging after six hours of use, which has to be considered in order for the equipment to work during lessons. (Boyle & Joyce, 2019)
- Price – Smartpens can be expensive, especially if every student is meant to receive a pen (prices vary from 80 to 200 US-Dollars). (Patti & Vince Garland, 2015)
- Equipment – Students might not have the necessary equipment at home to receive the saved notes taken with a smartpen or listen to the audio.

Tactile graphics are adaptations of visual graphics in which lines have been raised and areas elevated or textured to make them accessible to touch. These include tactile representations of pictures, maps, diagrams, graphs, and other nontextual spatial arrangements. (Fusco & Morash, 2015, p. 97)

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2.1.4 [3] SMARTPHONES AND TABLETS

A smartphone is a device in a manageable size that can be used to make phone calls and access wireless Internet, among other features. The possibility to download applications on a smartphone turns it into an attractive device for digitally enhanced teaching and learning. (EduTech Wiki *Smartphone*, 2013)

Tablets, on the other hand, are usually bigger than smartphones and are not used to make 'traditional' phone calls. However, they can also be used for online communication via conferencing tools. Their bigger size makes them more practical for digital writing. Similar to the smartphone, they can also access wireless Internet and download different applications. (EduTech Wiki *Tablet*, 2013)

<u>The following examples offer possibilities on how to use smartphones and tablets in class:</u>

- Smartphones and tablets can be used to access the school's LMS to share documents.
- Smartphones and tablets can be used to provide students with feedback and alert them to deadlines for projects.
- Students can use their smartphones and tablets to search for information for group work.
- Students can use their smartphones and tablets to communicate and collaborate with each other.
- Smartphones and tablets can be used as e-books for an in-class library or reading project.
- Students can create their own videos and audio files with the help of smartphones and tablets.

(EduTech Wiki *Smartphone*, 2009)

<u>Advantages of using smartphones and tablets in class:</u>

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- **Ubiquity** – Smartphones and tablets are portable and light enough to easily carry them around, which allows learning from wherever and whenever.
- Handling – Today's students grow up with smartphones and tablets, which is why these devices can easily be manipulated by them.

(EduTech Wiki *Smartphone*, 2009)

- Flexibility – Smartphones and tablets can be connected to the smart board or a television screen, or their display can be projected with the help of a document camera.
- Diversification – Different multimedia formats (e.g., videos, pictures, audio) can be used on the smartphones and tablets, which enables the visualization and diversification of presented learning content. (İstifçi et al., 2018)

Disadvantages of using smartphones and tablets in class:

- Handling – Smartphones and tablets require regular charging, which has to be considered in order for the equipment to work during lessons.
- Use – Most primary schools do not allow students to bring or use their smartphones or tablets in the classroom. Teachers have to specifically tell students to bring their devices for a specific lesson where their use is allowed.
- Use – Children in general, but particularly primary school children, should only have limited access to screens. It has to be kept in mind that "[d]igital devices are not the only way to learn" (British Department for Education, 2020, online). Primary school children should also read books or other printed texts and write by hand.
- Equipment – It cannot be expected that every child has access to a smartphone or tablet.

[T]he idea of **ubiquitous learning** broadens the use of technology allowing people to learn from anywhere and at any time. (Palau & Mogas, 2019, p. 56)

[3] Picture source: Open Source from pixabay.com

2.2 Software

Besides the hardware (the actual physical equipment in a classroom), software, which runs on the physical equipment, is of equal importance. It includes operating systems, mailing programs, calculating and writing tools. In the context of teaching and learning, learning management systems (LMS) play an important role. In the following, a selection of educational software will be presented.

2.2.1 LEARNING MANAGEMENT SYSTEMS

Google Classroom edu.google.com

Google Classroom is a free virtual learning environment provided by Google. It allows for communication, collaboration as well as sharing of documents between teachers and students and using other Google tools such as Gmail, Google Docs or Google Calendar. A variety of additional apps (e.g., Quizlet) can also be integrated into Google Classroom to diversify the teaching/learning experience. Google Classroom can either be provided by the school, or teachers can use their personal Google accounts to work with their students. In this second case, students will also need their own Google account, whereas if the school offers Google Classroom this is not necessary.

The following examples offer possibilities on how to use Google Classroom:

- Documents can be virtually shared. Assignments can be distributed and handed in via Google Classroom. Feedback on the assignments can be done via the system as well. Additional material or links can also be shared.
- Students can collaborate when working on a project or presentation.
- Teachers can offer different assignments or resources to the students, who can choose from them according to their needs and interests.

(Pappas, 2015)

Advantages of using Google Classroom:

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- Access – It can be accessed from all devices and is free for all its users.
- Handling – Google Classroom is intuitive and easy to use.
- Time-saving – Documents are saved online and can be shared with everyone.
- Money-Saving – With the use of Google Classroom, it is unnecessary to print out everything, which saves money and paper.

(Pappas, 2015)

- Inclusive – Google Classroom is accessible to SEN students. (Google Support, n.d.)

Disadvantages of using Google Classroom:

- Access – If the school does not offer Google Classroom, all students and the teacher need a Google account.
- Access – If you need more than 100GB of storage, you will have to pay for Google Classroom.
- Handling – It might be more difficult to handle for people who are not accustomed to Google products.

(Westfall, 2020)

- Equipment – Students might not have the necessary equipment at home to access Google Classroom.

Moodle moodle.org

Moodle is a free and open-source learning management system. It is usually provided by the school, either running on the school's internal servers or hosted by certified Moodle partners. Moodle offers a variety of different tools to communicate, collaborate, share documents and assess learning. Due to its versatile tools, it is one of the most popular LMS available. (Yaman, 2010) In primary schools it is mostly used for project-based work (Ekici, Kara, & Ekici, 2012).

The following examples offer possibilities on how to use Moodle:

- Documents can be virtually shared. Assignments can be distributed and handed in via Moodle. Feedback on the assignments can be done via the system as well. Additional material or links can also be shared.
- Students can collaborate when working on a project or presentation.
- Teachers can offer different assignments or resources to the students, who can choose from them according to their needs and interests.

Advantages of using Moodle:

- Access – It is open source and can be installed by everyone.
- Ubiquity – Students can access content whenever and wherever.
- Diversification – Different multimedia formats (e.g., videos, pictures, audio, quizzes, forums) can be used, which allows for diversification of learning.
- Time-saving – Documents are saved online and can be shared with everyone.
- Money-Saving – With the use of Moodle, it is unnecessary to print out everything, which saves money and paper.

(*Moodle – Advantages and Disadvantages*, n.d.)

Disadvantages of using Moodle:

- Access – You need a server on which Moodle can operate.
- Price – If Moodle is hosted by a certified Moodle partner, additional charges apply.
- Handling – Moodle can be difficult to handle for people who are not accustomed to it.

(*Moodle – Advantages and Disadvantages*, n.d.)

- Equipment – Students might not have the necessary equipment at home to access Moodle.

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2.2.2 COMMUNICATION TOOLS

[3] E-Mail

E-mail communication is an example of asynchronous communication. It means that communication takes place "at different points of time, usually at the time *and* place of choice of the participant" (Bates, 2019, p. 237). This is the case, for example, if a student contacts the teacher via e-mail. The student chooses the time and place of writing the message and the teacher can also reply whenever and from wherever s/he wants.

The following examples offer possibilities on how to use e-mail communication:

- The teacher can use e-mail to communicate with students and parents, informing them about assignments or giving them feedback.
- Additional resources can be shared via e-mail.

Advantages of using e-Mail communication:

- Flexibility – E-mail users are independent of place and time.
- Time-saving – Information can be distributed to multiple people at the same time.

Disadvantages of using e-mail communication:

- Time – If every student is meant to receive a slightly different e-mail, the process can be very time-consuming.
- Access – Internet connection is necessary to send and receive e-mails.
- Interaction – E-mail communication is limited to written messages and cannot replace face-to-face communication (Bates, 2019). Personal contact with teachers is especially important for elementary school children.
- Equipment – Students might not have the necessary equipment at home to write or receive e-mails.

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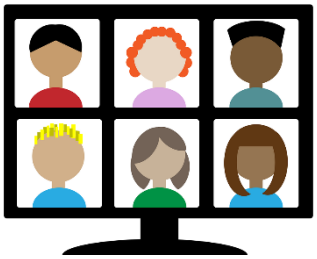

[3] Zoom zoom.us

Zoom is an example of *synchronous* communication. It means that communication takes place "at the same time, but not necessarily in the same place" (Bates, 2019, p. 237). Synchronous communication with students in the same place would be teaching and learning in the physical classroom. Synchronous communication with students in different places would be teaching and learning in a virtual classroom. In both cases, students participate in a lesson at the same time. In the first case, they are all physically present in one room/building. In the second case, they meet in an online setting, which they access from, for example, their home. This latter case has gained significance due to the COVID-19 pandemic.

The following examples offer possibilities on how to use Zoom:

- The teacher can give assignments to students, which they have to complete on their own at their own pace. Afterwards, Zoom is used to meet with the whole class and discuss the solutions and possible problems.
- Students can use Zoom for projects or to prepare a presentation.
- Zoom calls can be offered to students or parents if they have questions.

Advantages of using Zoom:

- Price – In its basic version, Zoom is free.
- Handling – Students do not need an account but can join a meeting through a link.
- Collaboration – Zoom has a collaborative whiteboard option with which every participant can share ideas.

(*How Appropriate is Zoom for Online Learning*?, n.d.)

Disadvantages of using Zoom:

- Access – A strong Internet connection is necessary.

- Access – Teachers need a Zoom account to organize an online session.
- Price – The free version is limited to 40 minutes if more than two people participate.
- Visibility – If a lot of students participate, the video image of each student is very small.
- Interaction – Personal contact with teachers is especially important for elementary school children, which is more difficult with a conferencing tool.
- Equipment – Students might not have the necessary equipment at home to participate in a conference call.

2.2.3 ONLINE LEARNING RESOURCES

Didax didax.com

Didax offers virtual manipulatives which enable students to simply drag virtual objects into different positions to show equations or other mathematical concepts.

The following examples offer possibilities on how to use Didax in class:

- Counting, addition, or subtraction can be practiced.
- Comparison can be practiced.
- Shape recognition and angles can be practiced.

Advantages of using Didax in class:

- Access – It is free to use.
- Access – The tools can be integrated into online learning platforms.
- Time-saving – A number of free activities using the Didax tools are available to download on the homepage.

Disadvantages of using Didax in class:

- Access – Internet connection is necessary to access the website.
- Equipment – Some sort of projector is necessary for everyone to see the website. In classes where there are no smart boards or computers,

teachers could use a television screen and connect their smartphone or project the smartphone's screen with the help of a document camera.

Quizlet quizlet.com

Quizlet is a free online quiz tool with which quizzes and tests can be generated.

The following examples offer possibilities on how to use Quizlet in class:

- With the help of flash cards, vocabulary or multiplication sets can be practiced.
- Use Quizlet for generating tests.
- Different assignments or resources can be offered to students, who can choose from them according to their needs and interests.

(Gresehover, 2019)

Advantages of using Quizlet in class:

- Access – It is free to use.
- Handling – Quizlet is intuitive and easy to use.
- Time-saving – Quizlet Test automatically grades the students' answers.
- Diversification – Different tools can be used, which allows for diversification of learning.

(Stauffer, 2019)

Disadvantages of using Quizlet in class:

- Access – Internet connection is necessary to access the website.
- Access – A Quizlet account is needed.
- Advertisement – In the free version, advertisements are incorporated on every page, which might distract students.
- Quality – Since everyone can provide public quizzes on Quizlet, students might learn incorrect information if these public quizzes are not created by their teacher and contain, for example, spelling mistakes. Teachers should tell their students to only learn with quizzes they have created.

(Stauffer, 2019)

- Equipment – Some sort of projector is necessary for everyone to see the website. In classes where there are no smart boards or computers, teachers could use a television screen and connect their smartphone or project the smartphone's screen with the help of a document camera. Alternatively, the quizzes can also be printed and brought to class.
- Equipment – Students might not have the necessary equipment at home to use Quizlet.

Mentimeter mentimeter.com

Mentimeter is a free online presentation tool with additional features such as quizzes or polls.

The following examples offer possibilities on how to use Mentimeter in class:

- Using the poll option to brainstorm ideas.
- Using the poll option or quiz option to check student understanding of a topic.
- Using the poll option to get feedback from students to see in which area they might need additional support.
- Use as alternative presentation tool to PowerPoint.

(Sabo, 2018)

Advantages of using Mentimeter in class:

- Access – It is free to use.
- Diversification – Different tools can be used, which allows for diversification of learning.

Disadvantages of using Mentimeter in class:

- Access – Internet connection is necessary to access the website.
- Access – A Mentimeter account is needed.
- Limit – In the free version, you are limited to two questions.
- Limit – In the free version, you cannot import contents from one activity to another. (Sabo, 2018)

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- Equipment – Some sort of projector is necessary for everyone to see the website. In classes where there are no smart boards or computers, teachers could use a television screen and connect their smartphone or project the smartphone's screen with the help of a document camera. Alternatively, the quizzes can also be printed and brought to class.
- Equipment – Students might not have the necessary equipment to participate in a Mentimeter activity.

Khan Academy khanacademy.org

Khan Academy is a free online video library covering a vast diversity of different topics. Additionally, it provides interactive quizzes based on the videos. Khankids also offers downloadable packets for different learning topics for young students: khankids.zendesk.com

The following examples offer possibilities on how to use Khan Academy in class:

- Use videos in class to introduce a certain topic.
- Let students watch the videos at home and discuss their content in class.
- Use videos to educate yourself on certain topics.
- Videos can be proposed to students as additional source of information.

Advantages of using Khan Academy in class:

- Access – It is free to use.
- Flexibility – Students can watch the videos at their own pace. (Herman, 2014)
- Language – Demo sites ("a functioning site with a subset of content translated") are also available in Khmer and Tamil. (Khan Academy Support, n.d.)

Disadvantages of using Khan Academy in class:

- Access – Internet connection is necessary to access the website.

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- Distraction – If students are supposed to watch the videos at home, teachers have little influence over if they actually watch the videos or simply surf online. (Haack, n.d.)
- Language – Material is not available in Sinhala.
- Equipment – Some sort of projector is necessary for everyone to see the website. In classes where there are no smart boards or computers, teachers could use a television screen and connect their smartphone or project the smartphone's screen with the help of a document camera.
- Equipment – Students might not have the necessary equipment at home to watch videos on Khan Academy.

Storyline Online storylineonline.net

Storyline Online is a free online library for read aloud books.

The following examples offer possibilities on how to use Storyline Online in class:

- Use videos in class for children to listen to the stories. They can either individually or as a whole class listen to them and then exchange ideas.
- Let students watch the videos at home and discuss their content in class.

(Burns, 2019)

Advantages of using Storyline Online in class:

- Access – It is free to use.
- Flexibility – Students can watch the videos at their own pace.
- Support – Each video has a teacher guide including ideas on how to integrate the video in class.

Disadvantages of using Storyline Online in class:

- Access – Internet connection is necessary to access the website.
- Availability – There is only a limited number of books available.
- Language – Only English versions of books are available.
- Equipment – Some sort of projector is necessary for everyone to see the website. In classes where there are no smart boards or computers,

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teachers could use a television screen and connect their smartphone or project the smartphone's screen with the help of a document camera.

- Equipment – Students might not have the necessary equipment at home to watch videos on Storyline Online.

3 CAMBODIAN LEARNING PLATFORMS AND TOOLS

- MoEYS E-learning (elearning.moeys.gov.kh) - Video lessons offered by the Ministry of Education for different grade levels and subject areas.
- Think! Think! (think.wonderlabedu.com) – A platform offered by the Ministry of Education, Youth and Sport in cooperation with the Japan International Cooperation Agency providing different types of puzzle games to young students. 15,000 types of new puzzle games are being made available on the ministry's Facebook pages (MoEYS Cambodia and Krou Cambodia) every Monday, Wednesday and Friday from 5:00-5:30 pm (Cambodian time). They also provide free online classes to young students, which are available online and they plan to air them via Satellite Decho TV (DTV) in the near future to also reach children without Internet access at home.[4]
- TVK-Education (moeys.gov.kh) - Educational program supporting learning for students in kindergarten, primary and secondary schools broadcasted on the National Television of Kampuchea and other cable TV networks throughout the country (e.g., TVK2, Decho DTV's channel 22) as well as on the Ministry of Information's mobile app. Students can also access this content on demand via different digital platforms of the Ministry of Education - its mobile app, YouTube channel, Facebook page as well as eLearning centers. They can also download video lessons from e-schoolcambodia.com and Wiki School Apps.[5]

[4] Information taken from the MoEYS homepage; accessed 2021, Feb. 26
[5] Information taken from The World Bank homepage; accessed 2021, Feb. 26

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4 SRI LANKAN LEARNING PLATFORMS AND TOOLS

- Channel Eye and Nethra TV - State-run TV channels broadcasting educational content during the time of school closures.
- E-thaksalava (e-thaksalawa.moe.gov.lk) - The national e-learning portal of the Ministry of Education offering learning materials to facilitate learning from home for grades 1-12.[5]

5 THE EVALUATION OF DIGITAL TOOLS

To facilitate the choosing of appropriate digital media and technology, different models exist. One of these models is the Rubric Model developed by Western University. It is organized into eight categories, each of which comprises a set of characteristics or criteria against which digital tools are evaluated, and each criterion is assessed against three standards: works well, minor concerns, or serious concerns.

The rubric is not intended to be overly prescriptive but serves as a framework to respond to a teacher's needs and be adapted as appropriate. For example, when a rubric criterion is not relevant to the assessment of a particular tool, it can be excluded without impacting the overall quality of the assessment. […] *Teachers should choose digital tools in the context of the learning experience and align them with the intended learning objectives.* Given the diversity of outcomes across learning experiences, digital tools should be chosen on a case-by-case basis […].

The first category is functionality. Broadly speaking, functionality considers a tool's operations or affordances and the quality or suitability of these functions to the intended purpose—that is, does the tool

serve its intended purpose well? In the case of digital tools, the intended purpose is classroom use.

- Scale. […] A *digital* tool should be flexible in accommodating various class sizes but also be capable of supporting small-group work. Hence, scale focuses on the tool's affordances to accommodate the size and nature of the learning environment.
- Ease of Use. When a tool is inflexible, is cumbersome in design, is difficult to navigate, or behaves in unexpected ways, it is likely to be negatively perceived by teachers and students. Comparatively, a tool tends to be more positively perceived when it feels intuitive and easy to use and offers guidance through user engagement. The ease of use criterion therefore focuses on design characteristics that contribute to user-friendliness and intuitive use.
- Tech Support / Help Availability. When technical problems or lack of user know-how impairs the function of a tool, users must know where to turn for help. Timely support helps *teachers* feel comfortable and competent with *digital* tools and helps students self-regulate their learning. […] Such support is often best provided either through *school*-based technical support or through robust support from the platform itself.
- Hypermediality. Cognitive psychology emphasizes the importance of giving learners multiple, diverse forms of representation organized in a way that lets them control their own engagement. (Ambrose et al., 2010) Hypermediality is achieved by providing multiple forms of media (audio, video, and textual communication channels), as well as the ability to organize lessons in a non-sequential way. (Ardito et al., 2004) This criterion therefore focuses on assessing how a tool's functions support and encourage *teachers* and students to engage with and communicate through different forms of media in a flexible, nonlinear fashion.

The second category is accessibility. […] *It encompasses* Universal Design for Learning (UDL) principles of flexible, adaptable curriculum design

See also Module 4 “Embracing the Differences: Pedagogic Approaches to Diversity, Heterogeneity and Special Needs”

to support multiple learning approaches and engagement for all students […].

- Accessibility Standards. […] The documentation for a *digital* tool should provide information regarding the degree and nature of a tool's ability to meet accessibility standards. Unfortunately, such information is often missing, raising a serious concern that developers have not valued accessibility standards in their design and support of the *digital* tool.
- User-Focused Participation. […] [T]he user-focused participation criterion rewards digital tools that address the needs of diverse learners and include broader understandings of literacies and student capabilities.
- Required Equipment. Given that inaccessibility is a mismatch between a learner's needs in a particular environment and the format in which content is presented (Gay), […] environmental factors *impacting accessibility play a significant role/have to be considered*. These factors include necessary hardware (e.g., speakers, a microphone, and a mobile phone) and the technology or service (e.g., high-speed internet connection) that learners need to engage with a digital tool. Generally, the less equipment required, the more accessible the tool will be to a broad group of users, regardless of socioeconomic, geographic, or other environmental considerations.
- Cost of Use. Continuing with a consideration of socioeconomic factors as a broader question of accessibility, this criterion evaluates the financial costs of a tool. […] [A]t best, tool use is open access […] *or covered by the school.*

The third category is technical. This category considers the basic technologies needed to make a tool work.

- Integration/Embedding within a Learning Management System (LMS). […] Any *digital* tool adopted for teaching should be able to be either embedded or integrated into an institution's LMS. […] Overall, if students can access a tool directly and consistently within an LMS, the learning experience is strengthened.

- Desktop/Laptop Operating Systems and Browser. […] Can learners effectively use the digital tool on a desktop or laptop computer if they have a standard (i.e., any commonly used OS), up-to-date (i.e., any OS still supported by its vendor) operating system (OS) and/or browser? […] The more OSs or browsers a tool supports, the better: any tool that can be used only by users of one OS or browser is cause for concern. Selecting a digital tool that can be installed and run on up-to-date versions of Windows and Mac OS enables access for nearly all desktop and laptop users.
- Additional Downloads. A tool that requires learners to install additional software or browser plug-ins—whether on their own system or in the tool itself—is problematic. As in the case of Adobe Flash players, which were initially popular but later blocked by many browsers due to security issues—if a *digital* tool relies on another piece of software in order to work, it risks being rendered obsolete due to factors beyond the tool developers' control.

The fourth category is mobile design. With the continued adoption of mobile devices worldwide, instructional methods and tools that deliver content using mobile technology will continue to grow and therefore warrant their own assessment category.

- Access. […] [S]tudents, regardless of the mobile device they choose to use, should be able to access and interact with the tool either through the download of an application ("app") built for their OS or through the browser.
- Functionality. Ideally, the mobile version will have few to no differences from the desktop version. If there are multiple mobile versions for different OSs, the functionality of different versions should be the same. In addition the user experience should consider the constraints of smaller mobile device screens, either by using responsive design or by offering a mobile app.

- Offline Access. To enhance its flexibility, any digital tool that accesses the Internet should offer an offline mode to expand access for those who have limited or intermittent connectivity.

The fifth category is privacy, data protections, and rights. While *digital* tools offer numerous potential benefits for students and teachers, they also can entail risks. The primary concerns relate to personal information and intellectual property (IP).

- Sign Up / Sign In. […] Ideally, no user of a *digital* tool will be required to disclose personal information when accessing a tool—thus guaranteeing the protection of information. If personal information is to be collected, *teachers* should be the only ones required to provide that information (thereby protecting students), or the tool needs to have been vetted through appropriate channels (e.g., a *school*'s procedures for IT risk assessment) to ensure that the collection of student data by a third-party group is being protected according to local and *school* standards.
- Data Privacy and Ownership. *Digital* tools can also raise various copyright and IP concerns. Tools are increasingly hosted by for-profit companies *on external servers*; these companies can sometimes claim ownership of the work that is residing on their servers. (Rodriguez 2011) Further, some *digital* tools may protect users' IP but make their content publicly available by default. Other tools give users greater autonomy over how content will be shared. The key factors to assess here are the IP policies of the tool and the user's control over how content is shared. Ultimately, users should maintain their IP rights and be able to exercise full control over how their content is made public.
- Archiving, Saving, and Exporting Data. The platforms used for hosting a tool may not reliably ensure adequate protection against data loss. *Teachers* should thus analyze *digital* tools to determine how data or content can be migrated back and forth between the service and its user. In part, this guards against data loss through export and backup while also

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offering learners the flexibility to freely move their content between tools rather than being locked into or committed to one tool.

The sixth category is social presence. […] [I]t focuses on establishing a safe, trusting environment that fosters collaboration, teamwork, and an overall sense of community.

- Collaboration. […] *Teachers* are encouraged to design learning activities and environments that provide students with frequent and varied opportunities to interact with their peers and collaborate on activities to build a sense of community. […]
- User Accountability. […] *Teachers* must also be able to control learners' contributions by moderating forums and managing forum privileges. These features not only support social presence but also aid in supporting student assessment.
- Diffusion. […] [S]tudents who feel familiar with a tool are more likely to feel comfortable with and positive about using it, thus contributing to regular use, endorsement, and sense of belonging.

The seventh category is teaching presence. […] *It is* related to tool elements that enable teachers to establish and maintain their teaching presence through facilitation, customization, and feedback.

- Facilitation. Effective teaching presence requires a facilitative approach, characterized as: providing timely input, information, and feedback; questioning or challenging students' thinking; modeling inquiry; and demonstrating cognitive engagement. Some *digital* tools support these activities better than others. The rubric gives preference to tools providing easy-to-use features that enhance a *teacher's* ability to effectively engage in facilitation activities.
- Customization. […] *A tool can support the alignment of intended learning objectives and learning activities and assessments* when it gives *teachers* the flexibility to customize how learners will engage with a tool, thus enabling them to focus on specific uses while disregarding other, distracting functions. Ideally, the tool also supports teachers in

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communicating this intentionality—making it clear to students why they are doing what they are doing. […]

The eighth and final category is cognitive presence. […] *It* considers a tool's ability to support students' cognitive engagement in learning tasks.

- Enhancement of Cognitive Task(s). Ideally, a *digital* tool enhances or transforms learning. […] The rubric encourages *teachers* to select technologies that modify or redefine tasks rather than simply substituting one task for another without adding functional value.
- Higher-Order Thinking. This criterion measures a tool's ability to help learners integrate, rearrange, or extend new and existing information to achieve a purpose or find answers to a complex problem. In considering a tool's cognitive elements, *teachers* should consider its ability to support higher-order learning tasks such as critical thinking, problem solving, and reasoning.
- Metacognitive Engagement. Metacognitive activities are those that prompt understanding, regulation, and reflection of students' own cognitive activities across the learning process. […] This is commonly achieved through formative feedback—the opportunity to test knowledge, track performance, and monitor improvement in an effort to modify thinking or behavior for improved learning. (Schute 2008) The rubric […] gives priority to those tools that enable teachers to provide formative feedback in support of students' growth through self-regulated learning and reflective practice.

To sum up, the **Rubric Model** offers educators a framework, with criteria and levels of achievement, to assess the suitability of a *digital* tool for their learners' needs and for their own learning outcomes and classroom context. The rubric was designed with utility in mind: it is intended to help teachers independently evaluate e-learning tools.[6]

See also Module 5, Focus 3 "Online-Based Lesson Preparation and Conduction"

[6] Taken from Anstey & Watson (2018, online). CC BY 4.0. Changes made to all CC BY texts used in this document are indicated in italics or square brackets.

6 KEY POINTS

- ✓ Technology is the physical and digital equipment available in a classroom, whereas media is the way this equipment is used in the teaching/learning process.
- ✓ Possible hardware available in a digitally enhanced classroom are smart boards, document cameras, smartpens, tablets and smartphones. Their use always has to be pedagogically considered according to the learning objectives of a lesson and needs of students. Children should not be exposed to too much screen time, especially at the primary level.
- ✓ Possible software options available in a digitally enhanced classroom are learning management systems (LMS), such as Google Classroom or Moodle, communication tools, such as e-mail or Zoom, and online learning resources, such as Didax, Quizlet, Mentimeter, Khan Academy, or Storyline Online. Their use always has to be pedagogically considered according to the learning objectives of a lesson and needs of students. Teachers also have to consider the necessary hardware available to students inside and outside of the classroom.
- ✓ The Rubric Model can help evaluate digital tools used for teaching and learning.

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STEP 1 PRACTICE EXERCISES

A Answer the following multiple-choice questions. There can be MULTIPLE correct answers:

1. What is the difference between media and technology?
   a) There is no difference.
   b) Technology is the physical and digital equipment, whereas media is the way this equipment is used.
   c) Media is the physical and digital equipment, whereas technology is the way this equipment is used.

2. What are advantages of using a smart board in class?
   a) By directly writing on the smart board, users are always visible to the class instead of disappearing behind a fixed computer.
   b) Writing on a smart board can be difficult for first time users.
   c) Other digital tools can be connected to the smart board and their content can be shared via the smart board.

3. What are advantages of using a document camera in class?
   a) Users might not be visible when writing on a sheet of paper displayed via the document camera.
   b) A document camera needs a projector to display its projections.
   c) Document cameras are cheaper than smart boards and their functions can partly replace the ones offered by smart boards.

4. What are the advantages of using a smartpen in class?
   a) Since a smartpen can turn written text into computer editable text, notes can easily be saved and distributed.
   b) Students who have difficulty taking notes and listening at the same time can pay more attention to what is being said by using the smartpen's recording option instead of concentrating on writing.
   c) Recording oral presentations is not always legally allowed or acceptable.

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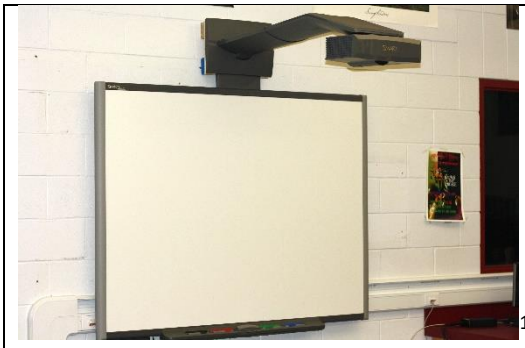
5. What are the advantages of using tablets and smartphones in class?
   a) Children in general, but particularly primary school children, should only have limited access to screens.
   b) The smartphones' small screen size can make it difficult to view and properly display materials
   c) Smartphones and tablets are portable and light enough to easily carry around, which allows learning whenever and wherever.

B Match the pictures with the digital technology:

 1	
2 	

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 3	
 3	

C Drag and drop the following objects into the appropriate category in the chart below:

blackboard[1] – books[2] – printed written texts[3] – real-life objects[4] – laptop[5] – smartphone[6] – tablet[7] – computer[8] – smartboard[9] – eBooks[10] – smartpen[11] – pen and pencil[12] – document camera[13]

Digital Technology	Analog Technology

D Indicate if the following statements are true or false:

1. Google Classroom and Moodle are examples of Learning Management Systems (LMS). T/F

2. E-mail communication is an example of asynchronous communication, where communication takes place at different points of time. T/F

3. Zoom is an example of synchronous communication, where communication takes place at the same time, but not necessarily in the same place. T/F

STEP 1 PRACTICE EXERCISES - SOLUTIONS

A Answer the following multiple-choice questions. There can be MULTIPLE correct answers:

1. What is the difference between media and technology?
   a) There is no difference.
   b) Technology is the physical and digital equipment, whereas media is the way this equipment is used.
   c) Media is the physical and digital equipment, whereas technology is the way this equipment is used.

2. What are advantages of using a smart board in class?
   a) By directly writing on the smart board, users are always visible to the class instead of disappearing behind a fixed computer.
   b) Writing on a smart board can be difficult for first time users.
   c) Other digital tools can be connected to the smart board and their content can be shared via the smart board.

3. What are advantages of using a document camera in class?
   a) Users might not be visible when writing on a sheet of paper displayed via the document camera.
   b) A document camera needs a projector to display its projections.
   c) Document cameras are cheaper than smart boards and their functions can partly replace the ones offered by smart boards.

4. What are the advantages of using a smartpen in class?
   a) Since a smartpen can turn written text into computer editable text, notes can easily be saved and distributed.
   b) Students who have difficulty taking notes and listening at the same time can pay more attention to what is being said by using the smartpen's recording option instead of concentrating on writing.
   c) Recording oral presentations is not always legally allowed or acceptable.

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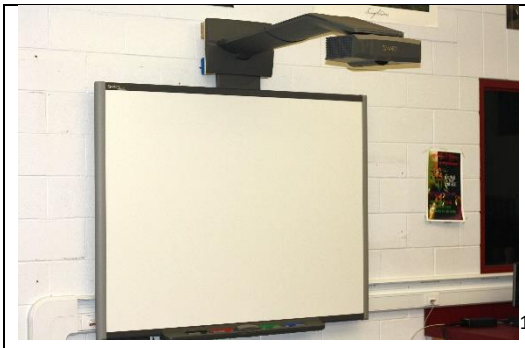
5. What are the advantages of using tablets and smartphones in class?
   a) Children in general, but particularly primary school children, should only have limited access to screens.
   b) The smartphones' small screen size can make it difficult to view and properly display materials
   c) Smartphones and tablets are portable and light enough to easily carry around, which allows learning whenever and wherever.

B Match the pictures with the digital technology:

 1	**smartboard**
2 	**document camera**

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 3	**smartphone**
 3	**tablet**

C Drag and drop the following objects into the appropriate category in the chart below:

blackboard[1] – books[2] – printed written texts[3] – real-life objects[4] – laptop[5] – smartphone[6] – tablet[7] – computer[8] – smartboard[9] – eBooks[10] – smartpen[11] – pen and pencil[12] – document camera[13]

Digital Technology	Analog Technology
5	**1**
6	**2**
7	**3**
8	**4**
9	**12**
10	
11	
13	

D Indicate if the following statements are true or false:

1. Google Classroom and Moodle are examples of Learning Management Systems (LMS). T/F
2. E-mail communication is an example of asynchronous communication, where communication takes place at different points of time. T/F
3. Zoom is an example of synchronous communication, where communication takes place at the same time, but not necessarily in the same place. T/F

STEP 2 PRACTICE EXERCISES

A Watch the following video showing a class using a smart board (https://www.youtube.com/watch?v=2wpdmPnIx54; audio transcription can be found in the appendix of this document). Match the examples of how the smart board is used with the pedagogical value:

to research different places in the world – to talk to experts, e.g., authors of books they have read – to illustrate presentations, e.g., for book presentations

Examples of how the Smart Board is used	Pedagogical Value
Google Earth	
Skype	
Presentation	

B Listen to this teacher talk about teaching with a smart board (Audio File 5.2.1; audio transcription can be found in the appendix of this document). Answer the following multiple-choice questions. There can be MULTIPLE correct answers:

1. What is the advantage of using a smart board for her?
   a) The classroom opens up to the world.
   b) You do not have to write with chalk anymore.
   c) It allows access to various other educational platforms.

2. How does she use the smart board?
   a) She shows the students audio-visual content related to the subject.
   b) She shows presentations.
   c) She lets students interact with the smart board.

C Listen to this teacher talk about LMS (Audio File 5.2.2; audio transcription can be found in the appendix of this document). Answer the following multiple-choice questions. There can be MULTIPLE correct answers:

1. Which learning management system/conference tool does she use?
   a) Schoology.com

b) Google Classroom
c) ZOOM
d) Skype

2. What are the advantages she mentions?
   a) You can teach the entire classroom through the online platform.
   b) It can be accessed via different devices.
   c) It is accessible to SEN students.
   d) It allows for the possibility to share presentations, video, audio, and visuals.

D Listen to this teacher talk about LMS (Audio File 5.2.3; audio transcription can be found in the appendix of this document). Answer the following multiple-choice questions. There can be MULTIPLE correct answers:

1. Which learning management system does he use?
   a) Schoology.com
   b) Google Classroom
   c) ZOOM
   d) Skype

2. What are the possibilities of this LMS?
   a) Create lessons
   b) Upload videos
   c) Post links
   d) Create texts
   e) Upload audio
   f) Create questions for students to answer

3. What are the advantages of the LMS he mentions?
   a) It is good for organizing learning activities online.
   b) You can create automated tests.
   c) Students can interact with content wherever and whenever.
   d) It is accessible to SEN students.
   e) It helps students effectively communicate online.

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f) You can use it as e-mail/exam place/chat so that all school communication is on one platform.

4. What are the disadvantages of the LMS he mentions?
   a) It does not work on every device.
   b) It is very expensive.
   c) It does not work on older smartphones or on non-smartphones.

E Listen to this teacher talk about communication tools (Audio File 5.2.4; audio transcription can be found in the appendix of this document). Answer the following multiple-choice questions. There can be MULTIPLE correct answers:

1. Does he talk about synchronous or asynchronous communication tools?
   a) synchronous
   b) asynchronous
2. What tools does he mention?
   a) Moodle
   b) Zoom
   c) E-mail communication
   d) Google Meet
3. What is Google Meet's advantage compared to Zoom?
   a) Easier handling
   b) No time limit
   c) No account necessary

F Listen to this teacher talk about online tools (Audio File 5.2.5; audio transcription can be found in the appendix of this document). Answer the following multiple-choice questions. There can be MULTIPLE correct answers:

1. Which online tools does he use?
   a) Video converters
   b) Quizlet
   c) Video editors
   d) Audio recorders

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e) Google Earth
f) YouTube videos
g) Mentimeter
h) Online books

2. Why does he use online books?
   a) Not everyone can afford to buy books and there are many free online books.
   b) It is better for the children's eyes.
   c) He wants to be ecologically conscious and not use paper books.

G Look at the Rubric Model evaluation of ZOOM. Answer the following questions:

1. Can larger Zoom groups be divided into smaller sub-groups? YES/NO
2. Does ZOOM allow users to communicate through different channels? YES/NO
   a) Give an example:
3. Is in-person or email-based support available in case of technical difficulties? YES/NO
4. Is ZOOM fully accessible to students with special educational needs? YES/NO
5. Does ZOOM have the full capacity to address the needs of diverse learners, their various literacies, and capabilities? YES/NO
6. Can ZOOM be used offline? YES/NO
7. Do students need an external account to access ZOOM? YES/NO
8. Does ZOOM offer the possibility for synchronous and asynchronous communication? YES/NO
   a) Give an example:

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Evaluated Tool: ZOOM[7]

Category	Criteria	Works Well	Minor Concerns	Serious Concerns	Not applicable
Functionality	Scale	**The tool can be scaled to accommodate up to 300 users with the flexibility to subdivide the larger group into smaller subgroups**	The tool can be scaled to accommodate any size class but lacks flexibility to create smaller sub-groups or communities of practice	The tool is restrictive to a limited number of users and cannot be scaled	
	Ease of Use	The tool has a user-friendly interface and it is easy for teachers and students to become skillful with in a personalized and intuitive manner	**The tool has an interface that may be confusing to some; there is limited opportunity for personalization**	The interface is not user-friendly for either the teacher or learner; it is cumbersome, unintuitive, rigid, and inflexible	
	Tech Support / Help Availability	**In-person or email-based technical support is readily available and aids users in troubleshooting tasks or solving problems experienced**	Technical support and help documentation is available but limited, incomplete, or not userfriendly	Technological support and help documentation is not available	
	Hypermediality	The tool allows users to communicate through different channels (audio, visual, textual) and allows for non-sequential, flexible/adaptive engagement with material	**The tool allows users to communicate through different channels (audio, visual, textual) but is limited in its ability to provide non-sequential, flexible/adaptive engagement with material. At this time, ability to add**	The tool is restrictive in terms of the communication channels employed (audio, visual, textual) and presents information sequentially in a rigid, inflexible format	

[7] Adapted from *Zoom* (n.d., online) and Anstey & Watson (2018, online).

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			captions for videos is limited to manual input		
Accessibility	Accessibility Standards	The tool provides accessibility standards in their design and support	**The tool has some limited capacity to be fully accessible for users or for materials to be made accessibility-friendly. While there are tools that will allow for Zoom sessions and recordings to be accessible, these require manual input from teachers and/or students**	The tool fails to provide accessibility standards in their design and support	
	User-Focused Participation	The tool is designed to address the needs of diverse learners, their various literacies, and capabilities, thereby widening opportunities for participation in learning	**The tool has some limited capacity to address the needs of diverse learners, their various literacies, and capabilities**	The tool is restrictive in meeting the diversity of needs reflective in the student body. The tool likely restricts some learners from fully participating	
	Required Equipment	Proper use of the tool does not require equipment beyond what is typically available to teachers and students (computer with built-in speakers and microphone, internet connection, etc.)	**Proper use of the tool requires equipment that is common and/or purchased at a low cost. A microphone and webcam are required**	Proper use of the tool requires specialized equipment requiring moderate to significant financial investment	
	Cost of Use	All aspects of the tool can be used free of charge	**All aspects of the tool can be used free of charge. However, meetings with more than two participants are limited to 40 minutes. Otherwise, the**	Use of the tool requires a fee, membership, or subscription. Use of the tool requires a purchase that is likely to pose a financial burden on students	

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			upgrade to a paid version is necessary		
Technical	Integration/Embedding within LMS	The tool can be embedded or fully integrated into an LMS while maintaining full functionality of the tool	**The tool can be embedded and fully integrated into a number of LMS**	The tool can only be accessed in an LMS through a hyperlink or static representations of the tool (e.g., file export), rather than a functional version of the tool itself	
	Desktop / Laptop OS	**Users can effectively utilize the tool with any standard, up-to-date operating system (i.e., Windows 10, Apple OSX, etc.)**	Users may encounter limited or altered functionality depending on the up-to-date operating system being used	Users are limited to using the tool with one specific, up-to-date operating system	
	Browser	**Zoom settings can be accessed and modified by any standard, up-to-date web browser (i.e., Google Chrome, Safari, Firefox, Internet Explorer 10 etc.). The Zoom stand-alone app is required in order to place and receive video calls**	Users may encounter limited or altered functionality depending on the up-to-date browser being used	Users are limited to using the tool through one specific browser	
	Additional Downloads	Users do not need to download additional software or browser extensions	**The tool requires the user to download the Zoom stand-alone application. This can be downloaded from the Zoom website**	The tool requires a version of a browser extension or software	
Mobile Design	Access	**The tool is fully functional with a range of electronic mobile devices (laptops, tablets,**	The tool offers an app, but only for a limited set of mobile operating systems. Tool is not accessible through a mobile	Access to the tool is limited or absent on a mobile device	

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		touchscreens, mobile devices, etc.)	browser. Design of the mobile tool constrained by the limitations of the mobile device		
	Functionality	There is little to no functional difference between the mobile and the desktop version, regardless of the device used to access it. No difference in functionality between apps designed for different mobile operating systems	**Basic features of the main tool are functional on the mobile app, but advanced features are limited**	The mobile app functions poorly such that core features are not reliable or non-existent. Significant difference in functionality depending on the mobile device's operating system used to access the tool	
	Offline Access	Offers an offline mode: Core features of the tool can be accessed and utilized even when offline, maintaining functionality and content	Offers a kind of offline mode, where the tool can be used offline but core functionality and content are affected	**The platform cannot be used in any capacity offline**	
Privacy, Data Protection, and Rights	Sign Up / Sign In	**Use of the tool does not require the creation of an external account or additional login**	Either teachers are the only users required to provide personal information to set up an account; or the tool has been vetted through appropriate channels to ensure strict adherence to local, school, or personal policies/standards for protecting the collection and use of student personal data by a third party group	All users (teachers and learners) must provide personal information to a third party in creating an account and there is some question or concern of the adherence to local, school, or personal policies/standards for protecting the collection and use of such data by the third party group	
	Data Privacy and Ownership	**Users maintain ownership and copyright of their intellectual**	Users maintain ownership and copyright of their intellectual	Users forfeit ownership and copyright of data; data is shared	

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		property/data; the user can keep data private and decide if/how data is to be shared	property/data; data is shared publicly and cannot be made private	publicly and cannot be made private, or no details provided	
	Archiving, Saving, and Exporting Data	**Users can archive, save, or import and export content or activity data in a variety of formats. It is possible to download the chat log, as well as record the video session**	There are limitations to archiving, saving, or importing/exporting content or activity data	Content and activity data cannot be archived, saved, or imported exported	
Social Presence	Collaboration	**The tool has the capacity to support a community of learning through both asynchronous and synchronous opportunities for communication, interactivity, and transfer of meaning between users. Synchronous is the default, but asynchronous is supported through making recordings available**	The tool has the capacity to support a community of learning through asynchronous but not synchronous opportunities for communication, interactivity, and transfer of meaning between users	Communication, interactivity, and transfer of meaning between users is not supported or significantly limited	
	User Accountability	The tool provides technical solutions for holding learners accountable for their actions	**The tool provides some solution for holding learners accountable for their actions. While students have the ability to change their names, it is possible to require that they be logged into an official account**	There is no technical solution for holding users accountable to their actions	
	Diffusion	**The tool is widely known and popular, it is likely that most students are familiar with the**	Learners' familiarity with the tool is likely mixed, some will	The tool is not well known/foreign, it is likely that learners are not familiar with	

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		tool and have basic technical competence with it	lack basic technical competence with its functions	the tool and lack basic technical competence with its functions	
Teaching Presence	Facilitation	**The tool has easy-to-use features that would significantly improve a teacher's ability to be present with students via active management, monitoring, and engagement. These include reactions, polls, and the ability for participants to raise their hands**	The tool has limited functionality to effectively support a teacher's ability to be present with learners via active management, monitoring, engagement, and feedback	The tool has not been designed to support a teacher's ability to be present with learners via active management, monitoring, engagement, and feedback	
	Customization	**The tool contains many different features which are adaptable to its environment. It is easily customized to suit the classroom context and targeted learning outcomes**	Limited aspects of the tool can be customized to suit the classroom context and learning outcomes	The tool cannot be customized	
Cognitive Presence	Enhancement of Cognitive Task(s)	**The tool enhances engagement in targeted cognitive task(s) that were once overly complex or inconceivable through other means**	The tool enables functional improvement to engagement in the targeted cognitive task(s)	The tool acts as a direct tool substitute with no functional change to engagement in the targeted cognitive task(s)	
	Higher Order Thinking	Use of the tool easily facilitates learners to exercise higher order thinking skills (given consideration to design, facilitation, and direction from teacher)	**The tool may engage students in higher order thinking skills (given significant consideration to design, facilitation, and direction from instructor)**	The tool likely does not engage learners in higher order thinking skills (despite significant consideration to design, facilitation, and direction from teacher)	

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	Metacognitive Engagement	Through the tool, learners can regularly receive formative feedback on learning (i.e., they can track their performance, monitor their improvement, test their knowledge)	**Opportunities for receiving formative feedback on learning are available, but infrequent or limited (i.e., poor opportunities for tracking performance, monitoring improvement, testing knowledge on a regular basis)**	There are no opportunities for formative feedback on learning (i.e., lacking opportunities for tracking performance, monitoring improvement, testing knowledge on a regular basis)	

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STEP 2 PRACTICE EXERCISES - SOLUTIONS

A Watch the following video showing a class using a smart board (https://www.youtube.com/watch?v=2wpdmPnIx54; audio transcription can be found in the appendix of this document). Match the examples of how the smart board is used with the pedagogical value:

to research different places in the world – to talk to experts, e.g., authors of books they have read – to illustrate presentations, e.g., for book presentations

Examples of how the Smart Board is used	Pedagogical Value
Google Earth	to research different places in the world
Skype	to talk to experts, e.g., authors of books they have read
Presentation	to illustrate presentations, e.g., for book presentations

B Listen to this teacher talk about teaching with a smart board (Audio File 5.2.1; audio transcription can be found in the appendix of this document). Answer the following multiple-choice questions. There can be MULTIPLE correct answers:

1. What is the advantage of using a smart board for her?
   a) The classroom opens up to the world.
   b) You do not have to write with chalk anymore.
   c) It allows access to various other educational platforms.

2. How does she use the smart board?
   a) She shows the students audio-visual content related to the subject.
   b) She shows presentations.
   c) She lets students interact with the smart board.

C Listen to this teacher talk about LMS (Audio File 5.2.2; audio transcription can be found in the appendix of this document). Answer the following multiple-choice questions. There can be MULTIPLE correct answers:

1. Which learning management system/conference tool does she use?

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a) Schoology.com
b) Google Classroom
c) ZOOM
d) Skype

2. What are the advantages she mentions?
a) You can teach the entire classroom through the online platform.
b) It can be accessed via different devices.
c) It is accessible to SEN students.
d) It allows for the possibility to share presentations, video, audio, and visuals.

D Listen to this teacher talk about LMS (Audio File 5.2.3; audio transcription can be found in the appendix of this document). Answer the following multiple-choice questions. There can be MULTIPLE correct answers:

1. Which learning management system does he use?
a) Schoology.com
b) Google Classroom
c) ZOOM
d) Skype

2. What are the possibilities of this LMS?
a) Create lessons
b) Upload videos
c) Post links
d) Create texts
e) Upload audio
f) Create questions for students to answer

3. What are the advantages of the LMS he mentions?
a) It is good for organizing learning activities online.
b) You can create automated tests.
c) Students can interact with content wherever and whenever.
d) It is accessible to SEN students.

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e) It helps students effectively communicate online.

f) You can use it as e-mail/exam place/chat so that all school communication is on one platform.

5. What are the disadvantages of the LMS he mentions?

a) It does not work on every device.

b) It is very expensive.

c) It does not work on older smartphones or on non-smartphones.

E Listen to this teacher talk about communication tools (Audio File 5.2.4; audio transcription can be found in the appendix of this document). Answer the following multiple-choice questions. There can be MULTIPLE correct answers:

1. Does he talk about synchronous or asynchronous communication tools?

a) synchronous

b) asynchronous

2. What tools does he mention?

a) Moodle

b) Zoom

c) E-mail communication

d) Google Meet

4. What is Google Meet's advantage compared to Zoom?

a) Easier handling

b) No time limit

c) No account necessary

F Listen to this teacher talk about online tools (Audio File 5.2.5; audio transcription can be found in the appendix of this document). Answer the following multiple-choice questions. There can be MULTIPLE correct answers:

1. Which online tools does he use?

a) Video converters

b) Quizlet

c) Video editors

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d) Audio recorders
e) Google Earth
f) YouTube videos
g) Mentimeter
h) Online books

2. Why does he use online books?
   a) Not everyone can afford to buy books and there are many free online books.
   b) It is better for the children's eyes.
   c) He wants to be ecologically conscious and not use paper books.

G Look at the Rubric Model evaluation of ZOOM. Answer the following questions:

1. Can larger Zoom groups be divided into smaller sub-groups? YES/NO
2. Does ZOOM allow users to communicate through different channels? YES/NO
   a) Give an example: audio, visual, textual
3. Is in-person or email-based support available in case of technical difficulties? YES/NO
4. Is ZOOM fully accessible to students with special educational needs? YES/NO
5. Does ZOOM have the full capacity to address the needs of diverse learners, their various literacies, and capabilities? YES/NO
6. Can ZOOM be used offline? YES/NO
7. Do students need an external account to access ZOOM? YES/NO
8. Does ZOOM offer the possibility for synchronous and asynchronous communication? YES/NO
   a) Give an example: synchronous – conference call, asynchronous – video recording

STEP 3 PORTFOLIO TASK – SELF-REFLECTION QUESTIONS

Write an essay answer to the following self-reflection question. Your answer should be approximately 300-500 words long and answered in a coherent text with full sentences. THIS ESSAY ANSWER GOES INTO YOUR PERSONAL PORTFOLIO!

1. What is your experience with digitally enhanced teaching and learning? What kind of digital media and technology have you experienced during your years as a student? Was it helpful, or what else would you have needed to have felt maximally supported in your learning process?

STEP 4 PORTFOLIO TASK – TEACHING PROJECT

Create your own personal teaching project. Choose one digital tool and prepare an activity with it for your topic and class chosen in Module 1.1. This portfolio task should be approximately 800-1000 words long. THE TEACHING PROJECT GOES INTO YOUR PERSONAL PORTFOLIO!

APPENDIX

Transcript: Video File

Donna: Hi, I'm Donna Guerin from South Street Elementary and here's a clip highlighting how we use the smart board as a tool of technology in our classroom every day in kindergarten. We'll start out with a small video from my kindergarteners talking about technology in the classroom.

Kate: Hi, my name is Kate and I'm Vicente and we go to kindergarten here at South Street Elementary and we use this my voice to playing games. We love to play.

Vicente: And we go on Google Earth so we could fly all over the world.

Kate: And we go on Startfall so you can you know play different kinds of games.

Vicente: And we use the laptops to send our thoughts to Miss Guerin.

Kate: And we Skype people to learn more about them, not just a leader, about the books.

Vicente: And we use Kidpix to tell Miss Guerin what we did on Kidpix.

Kate: And we make hot dog movies, like the movie the hot dog man we made a long time ago.

Vicente: And we use Photo Booth to make videos and also take pictures.

Kate: And we go on Comic Life to make little speech bubbles and show Miss Guerin what we have to say.

Vicente: And we write on the smartboard.

Kate: And we love the smartboard so much. so bye bye people.

Donna: Here are some pictures of us using technology in our kindergarten classroom here at South Street Elementary. As you can see, we use the smart board on a daily basis for things like skyping authors around the world to meet the people that write the stories. We watch our podcasts that we make like the hot dog movie, we make wordles and we take out our laptops to do things like blogging on programs like Cover-It-Live to talk about things that we discussed in the classroom. We also like to use the smart board to do interactive writing where we can label pictures or diagrams or practice our sight words during small group instruction. We also like to use the smart board to show off our pictures that we downloaded off the internet for our oral book reports. We travel every day on Google Earth to different places around the world. The children chose places that they wanted to fly back to. They researched those places, found pictures, downloaded them and used them as a slideshow in an oral presentation of their book reports to show us all the wonderful places around the world that we have been and their favorite places they like to travel to. As you can see, we love the smart board and use it for many things in our classroom. We truly are 21st century learners here at South Street Elementary.

Transcript: Audio File 5.2.1

Teacher: It is really good, Sir, because now we are so used to the system of talk and talk where we write something on the board and students take the notes down, right? So but with smartboard is like, the entire world is at your fingertip kind of. Like you can, it has the Internet connection so you can show them audio-visual content related to the subject and you can do presentations and you can get the students to come and interact and do things on the smartboard itself. And you can have access to various

other educational platforms to the smartboard, that happened, all that happened, all that is possible within the classroom. So it opens up to the world.

Interviewer: Great, great.

Transcript: Audio File 5.2.2

Teacher: We use Zoom and Google Classroom at school for teaching these days.

Interviewer: Ok. So you use Google classroom and, what else?

Teacher: Zoom.

Interviewer: Zoom, right. So what are the advantages and even the disadvantages of online based tools, you feel?

Teacher: The advantage is, like you know in a time like this particularly now learning is really valued because of the situation in the country. You can't teach in a physical classroom. So the main advantage is you can teach your entire classroom through an online platform. So that is the major advantage of it. And like I said in a physical classroom we might not have the opportunity to share with them videos, and, if we don't have a smartboard, like I mean I'm talking about generally about all the teachers in the country. So think about general classrooms, Sir, we don't have what you call, we can't share a presentation, we can't show them a video, right, maybe the entire school just has one TV, like something like that. But when you use Zoom, right, or Microsoft teams or any platform like this, there is the opportunity of sharing audio visual, multiple things like PowerPoint presentation, right. So the lesson becomes really interesting for the students.

Transcript: Audio File 5.2.3

Teacher: We used a website, schoology.com, learning management system. In that website whole system you can use for lessons, you can make lessons in it; you can upload videos; you can post links; you can create text with different colors, which is really good for students to attract their attention; you can upload your own audio, like recording your audio, uploading it, finding links and uploading; making questions for students to answer. All that, the system that we used, I know that most of the schools did not use that system, but we used schoology.com. It is a website, it is a learning management system like I mentioned earlier. It's really good for organizing these learning activities online, where teachers, they make lessons and they ask students to listen to the audio, to watch the video, to answer the questions, just to create tests, to check how much students understood. You can make tests that are automatic. It means teachers do not need to check every answer of a student but the system automatically grades students. And they can take those tests as many times as they want. We organized midterm exams, final exams, we had them all online. That was the advantage of our educational system that we had in our school. It was good. Another advantage would be the time, as I mentioned earlier again, the students can go and listen to those classes and watch those videos and take those tests any time they have phones in their hands, anytime they have data, anytime they are available. Sometimes when parents are not at home, that means students cannot participate on any activity during the day, if they have no data they cannot do anything. So that was the advantage of our educational system. They can study any time they want, any time they can. Another advantage would be, because that system, schoology.com, it's kind of like SMS, like Facebook, you can make courses on that website for students to take and students can post comments, they can upload things and comment on each other's responses, they can see what other students are doing, they can send messages to each other. So that was another advantage, they learned how to effectively communicate online with each other. This website that we're using right now, even before Corona was around, I started thinking of it maybe in 2019, in the middle of 2019 or earlier, it's

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really good because even when we had school I started using this website, I showed it to our heads, divisional heads, and our principal and we all worked on it together to see what we can do in the future. It is a great tool to motivate students and to, I guess evaluate them because when teachers make tests they have to grade every single test, but with that system they just make one test and so the system automatically grades it. It makes teachers' jobs easier. Also you can use it as an e-mail, you can use it as a chatroom, you can use it as an exam place, I guess, because students can go and take exams there, it's good. The whole school communication can be done on one website. So I prefer that, I like it very much and I want our school to continue to use that. The disadvantage is that it doesn't work on every device. On older phones, it wouldn't work, on phones that are not smartphones it wouldn't work at all. You need a good smartphone to be able to access any of that website.

Transcript: Audio File 5.2.4

Teacher: In class it would be much easier. You just have to use a board, there is an option to use a board, you can write on your phone or on a tablet, whatever you have and show it to the students. Preparation in a Zoom class would not take as much time as preparation for the schoology class that we had in our learning management system. We use Zoom, some of the teachers, they prefer Zoom over schoology because it is easier to make lessons when you teach in Zoom, it is like a lecture. And we also use Google Meet because Google Meet doesn't have any time limit right now. And Zoom has 40 minute time limit, we use Google Meet.

Transcript: Audio File 5.2.5

Teacher: Our teachers use video converters, they use video editors, they use audio recorders to make voice recording and upload it all, we use YouTube videos, I guess that's kind of a digital tool. YouTube videos, they're very educational, there many educational videos there that can be used to teach students. Teach students by reading books online. I have uploaded some books for them to read and they're reading them all on devices. Because not everybody is able to buy actual books. You can just download them simply, there many available free books that you can download and read them. Because reading is really important for language acquisition whether it's English or Sinhala.

The digital age has provided a wealth of new educational tools for the classroom and successful educators understand the importance of incorporating them into their teaching. In this module, you will see how to effectively use information and communications technology (ICT) so that it aligns with learning objectives, subject matter and assessment in the classroom. Through concrete applications of technology, the opportunities provided by digital media will be shown to support and enrich the design and implementation of teaching and learning processes and a set of key digital skills will be developed so that you can better use digital media in pedagogical contexts

Enjoy!