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APRELI@

TESSA Share – Apréli@ Collection for School Leadership

# Transforming teaching-learning process: Leading the use of technology in your school

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Version E240421 [Leading_use_of_ICT-24.04.21]

## School leadership collection

The TESSA Share – Apréli@ School Leadership OER (Open Educational Resource) intended for school leaders, or any resource-person in charge of pedagogical supervision within the structure (such as a director of study, director of schools, quality assurance officers, a head of department or a head of year/grade). Local pedagogical supervision can also use booklets from this collection with good effect. For the sake of convenience, we will group these people under the name "School Leader".

By making the school the privileged locus for Professional Learning and Development (PLD), the collection aims to help school leaders to transform the school structure they are responsible for into an 'Extended Professional Learning Community' (ELPC) based on the continuous collaborative professional development of all actors.

The collection can be considered as a toolbox, consisting of several booklets in which school leaders can select the tools that are best suited to their reality and use them to meet the specific needs of their school community.

The different booklets are not to be exploited in a linear fashion: it would be more appropriate to select suitable elements to respond to a specific problem identified in and by the school. The booklets can also be used to set up training workshops, or to facilitate a thematic meeting with, for example, other local school leaders.

The booklets briefly present various concepts, focusing on practices, offering a wide range of case studies, activities, pauses for thought and resources, mainly African Open Educational Resources (OER).

In order to carry out the various activities on offer, school leaders are invited to keep a learning diary in order to help them to document, organise and capitalise in the long term their learning and their development. The collection thus contributes to the PLD of the school leaders themselves.

The broad objective of the collection is to facilitate the transformation of teaching-learning processes to enhance effective learning. It is about accompanying teachers so as to enable them to set up a model of horizontal learning where the learners are fully engaged in the construction of their learning and where the teacher acts as guide, coach and/or mentor. The school leader has a crucial role to play in facilitating this educational paradigm shift.

This collection is the result of the adaptation, contextualisation and enrichment of OERs produced by TESS-India for the leaders of Indian institutions (http://www.tess-india.edu.in). The examples presented this collection have been gathered from different countries in sub-Saharan Africa.

*Notes :*

As Internet links may become obsolete, we recommend that you download and save this booklet and the various additional resources it contains. The list of additional resources can be found in the appendix at the end of the document. You can also use a search engine to find a document whose Internet address has been changed.

## Acknowledgement

We would like to express our heartfelt thanks, for their invaluable contribution to the realisation of this booklet, their infinite patience and their availability of every moment, to:

- Michèle Deane, teacher and teacher educator and teacher-educator educator, UK
- Geneviève Puiségur-Pouchin, Apréli@'s president
- Dele Yaya, Former Director, Field Operations & Students Services/TESSA Coordinator, National Teachers' Institute, Kaduna, Nigeria
- We also thank all those who will tell us about their return and will contribute to the continuous improvement of our OER.

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# Introduction

This booklet ***Leading Teacher's Professional Development*** is a free educational resource (OER) developed by a group of teacher educators to support school leaders and any resource-person that accompany staff's Professional Learning and Development (LPD) within their institution with a view of enhancing the conditions and quality of learning in the school.

It is an adaptation of the Apréli@ booklet (not dated, c) ***Piloter l'usage des TICE dans votre établissement*** and of the TESS-India Unit ***Leading the use of technology in your school*** (no date), both available under a Creative Commons Attribution-ShareAlike licence:

https://aprelia.org/fr/?view=article&id=1989 or
http://aprelia.org/cahiers/c4/fichiers/C4_Piloter_l_usage_des_TIC_dans_votre_etablissement.pdf
and
TESS-India Leading the use of technology in your school

It also draws on the work carried out by TESSA and Apréli@ in French-speaking Sub-Saharan Africa, separately or jointly, as well as the resources resulting from this work.

It belongs to a collection of booklets that relates to the key issue of improving learning through school-based professional co-development. You may find it useful to refer to other booklets in the collection to develop your skills and knowledge as well as to the TESSA resources that are particularly pertinent to this key question. The collection includes:

- Leading the school development plan
- Leading teachers' professional development
- Supporting teachers to raise performance
- Accompanying teachers: mentoring and coaching
- Leading the use of technology in your school
- Inclusive education toolkit
- Teaching practice supervisors' toolkit
- Working with Teachers: A Handbook for Teacher Educators

## What this booklet is about

> 'It is well accepted that information and communication technologies (ICT) have an immense potential to impact education – of children, of teachers, or teacher educators and others, and provide newer and more effective ways of mitigating some of the challenges being faced by the educational system.'
>
> (Central Institute of Educational Technology, 2013)

Many school leaders aspire to have computers or other hardware, such as tablets, smart phones, interactive white boards, etc., available in their school for students to use in order to support their learning. Others will have heard about computers but may have never really interacted with them themselves or do not believe they can support teaching and learning.

The purpose of this booklet is to support you in making the most of available technology in your school, even if you do not have computers. The intention is that your teacher-colleagues, with

motivation and the right skills, will be able to use technology that is available. As school leader, you do not need to be a technological expert (although you will benefit from developing basic skills), but you must provide a vision for ICT to support teaching and learning and to create the environment in which your teacher-colleagues will embrace this potential.

This booklet will highlight some of the ways in which technology can support student learning and the implications for teachers. Using ICT to support learning requires new pedagogical skills from teachers: the internet provides wide and more democratic access to multiple sources of knowledge, but it is also necessary to be able to choose the relevant information and to make it appropriate to the school learning context. The teacher's role is less to "transmit" knowledge and more to accompany learners to allow them to develop new skills to search for information, analyse it, sort it, select it, integrate it into a school task. This fundamentally changes the relationship between teacher and student. And it is not only the relationship between the teacher and the learner that is changing. Technology, be it hardware or software (programs), is also changing extremely rapidly, and young and beginner teachers may have more skills than established teachers and may be in a better position to keep abreast of changes. Some of your older teacher-colleagues may feel threatened; it is up to you to encourage them and create an environment where teachers learn from each other.

It is important to note that the focus of this unit is on leading the *use* of technology to support learning in your school. It is not about *teaching* technology as a subject, nor is it about installing equipment, hoping that their mere presence will cause an educational miracle. ICTs are therefore not a magic wand, but a tool with great potential, which must be intelligently used to serve educational and sustainable development objectives (ADEA, 2016).

## What you will learn in this booklet

The resources, activities, pauses for thought and case studies in this booklet will help you to:

- gain insights into the range of technology that might be used in your school
- consider the creative use of ICT tools and devices in school
- consider ways in which you can use the internet to support your own learning
- support your teacher-colleagues in using the internet for their own learning and in their classrooms.

## Your learning diary

During your work on this booklet, you will find it useful to make notes in your Learning Diary. If you have not already started one, this is a book or folder (either paper or electronic) where you can document thoughts, ideas and plans together in one place.

You may be working through this booklet on your own, but you will learn much more if you are able to discuss your learning with another school leader. This could be a colleague with whom you already collaborate, or someone with whom you form a new relationship. It could be through an organised activity or on a more informal basis. Notes you make in your Learning Diary will be useful for this, as well as for helping you to map your own learning and professional development.

# 1 What technology and skills do you have access to?

## The hardware

**Figure 1:** Hardware can benefit your school…

'Technology' includes a large range of different devices such as desktop computers, laptops, mobile phones, smartphones, tablets, projectors, printers, scanners, digital cameras and so on, as well as software, applications and digital resources that make it possible to use these devices. Some of these can be used on their own, with appropriate software; others can be connected to the internet. It is the case that mobile devices are spreading very rapidly in Africa and that they constitute a privileged means of access to the internet, particularly for people who cannot afford a computer. It therefore makes sense to plan around this emerging trend. As a school leader you should try to increase your awareness of technological developments and how they can be harnessed to enhance learning so that you can look for opportunities to provide access to these technologies in your school.

## The Internet

**Figure 2:** and so can give access to the Internet.

The internet is an immensely powerful resource. Having access to the Internet in a school can make an enormous difference to the opportunities available to teachers and students. Even if the internet is not available in school, some of the benefits can be realised by using devices that can be connected to the internet elsewhere in order to download materials that can then be used offline. These devices include USB keys, mobile terminals, CDs, flash drives, etc.

Although the Internet is not currently widely available outside the urban areas, this will change over time, with mobile devices rapidly offering greater reach and capabilities. It is for example easier and easier to have smart phones or tablets equipped with a SIM card, or to use rechargeable 3G or 4G keys or modems.

## Teachers' ICT knowledge and skills: UNESCO competency framework for teachers

In 2018 UNESCO, industry leaders and global subject experts updated the UNESCO ICT document: ***the UNESCO ICT Competency Framework for Teachers*** (UNESCO, 2018) that was published for the first time in 2008 and revised in 2011. This latest edition takes account of the 2030 Agenda for Sustainable Development. It also includes OER and addresses the issue of inclusive education. It provides " hands-on instruction and examples on pedagogical use of ICT (…) as vital tools in teaching and in facilitating learning process." (p. 49). It also stresses that "teacher professional development in ICT competencies should be recognized as a process rather than an isolated training event" (p. 49) and considers the benefits that Open Educational Resources (OER) bring. (p. 7).

All versions of the UNESCO Framework emphasises that it is not enough for teachers to have ICT skills and to be able to pass them on to their students. Teachers must be able to help students become collaborative, problem-solving and creative learners who use ICTs to be effective citizens and actors/actresses in the work market. The ICT CFT underlines the fact the teacher professional development should be understood as a life-long process.

The Framework consists of 18 competences organised according to the six aspects of the teaching professional practice over three levels of teachers' pedagogical use of ICT.

The six aspects of the teaching professional practice are:

- Understanding ICT in education policy
- Curriculum and assessment
- Pedagogy
- Application of digital skills
- Organisation and administration
- Teacher professional learning

The Framework is arranged over the three successive stages or levels of a teacher's development in making use of ICT.

| Stage | Teacher's competences | Impact on learners. |
|---|---|---|
| | Teachers acquire | Learners: |
| **Knowledge Acquisition** | knowledge about using technology and basic ICT competences | use ICT to be effective learners |
| **Knowledge Deepening** | ICT competences that are conducive to creating student-centred learning environments. | develop higher order thinking and problem-solving skills |
| **Knowledge Creation** | competences that encourage them to model good practice and set up learning environment | create the kind of new knowledge required for more harmonious, fulfilling and prosperous society |

(UNESCO, 2018, p. 8-10, 22-23)

African countries have begun to develop an ICT for Education curriculum; for instance, in Kenya, the Basic Education Curriculum Framework emphasises the need to integrate ICT in teaching and learning and places digital literacy as one of the core competencies in the Competency base Curriculum (Kenya Institute of Curriculum Development, 2019, p. 124). Zimbabwe Ministry of Primary and Secondary Education published a Syllabus for Information Communication Technology for Grade 3 to 7.

## Case Study 1: What technology do teachers currently use?

*Mrs Nsisong has been teaching for 20 years and been the school leader for ten. This term she has two new young teachers, Mrs Emeka and Mr Olu. Last week she went into the staffroom and found them gathered around a mobile phone! Initially, she was a bit irritated, so went over to see what all the fuss was about – but she soon realised that she should be using the technological know-how and devices of her young staff to improve learning.*

*Here is what she says*:

Mrs Emeka has a smartphone and she had downloaded a film from YouTube. When I asked what was so interesting, they showed me the film. It was a video of a young boy from a rural area in Côte d'Ivoire, equipped with a solar panel school bag (CGTN Africa, 2016). Thanks to the energy accumulated by the schoolbag on the way back from school, there was enough lighting for him to complete his homework after sunset. Colleagues in the staffroom were all the more interested that they remembered that not so long ago, they had to complete their homework underneath a street lamp and the light was so faint that they could hardly see what they were writing, not to mention the mosquitos that were making the best of the situation!

I happened to know that JSS Class 3 were carrying out a project on renewable energies, and it suddenly occurred to me how good it would be to be able to show them the film as it could help pupils understand the issues and show them that Africans have undertaken to develop their own solutions. I talked to the young teachers about how they use their phones – they seem to

be on the internet all the time and to be very active on social networks, but they hadn't really thought about how they could use all this in their teaching. I encouraged them to show the film to their students in small groups while the rest of the class was engaged in another task related to the topic. The encounter made me realise how little I really know about the internet and how much potential there might be to enhance classroom practices and make them more active and attractive.

Case Study 1 raises the issue of using mobile phones in school. Some schools actively discourage the use of mobile phones in school for both students and teachers. It is clearly unprofessional for a teacher to take phone calls or send text messages while they are teaching. However, as mobile phones become more powerful and "smarter", it is perhaps appropriate to consider how teachers could use them to support learning in their classroom, making lessons more active and attractive and opening windows on the world. But this is an issue that you may need to approach with caution. Talk to your teacher-colleagues and make it clear that they all understand the importance of professionalism, but that they be flexible to think about how they could use mobile terminals in teaching-learning, bringing to the learners a real educational added-value.

## Activity 1: Carrying out a technology audit

*The purpose of this activity is for you to begin to think about how technology might be used effectively in your school and to find out what technology your teacher-colleagues are using in their daily lives, and maybe in their teaching.*

1. Ask your teachers to complete the questionnaire in **Resource 1**, *Teachers and ICT*
2. In your Learning Diary, use the answers in the questionnaire to make a summary of the main problems and concerns that your teacher-colleagues have about:
    a. their work,
    b. the technology that they use in their daily lives
    c. the technological skills that they currently have.
3. For each of the main problems and concerns, think of a way in which access to technology could contribute to a solution. **Resource 2**, *Solutions ICT brings common challenges*, has some suggestions.
4. Which pieces of technology (hardware, software, etc.) do you think could make the greatest impact on teaching and learning in your school?

## *Discussion*

*Some of your teacher-colleagues will be confident in their use of technology. Some will be extremely competent. There will also be some who have limited opportunities to access technology and relatively few skills but are confident to try. There will be some, however, who lack confidence and give up easily when they encounter difficulties.*

*Your role is to create an environment in which teachers can learn from each other and become confident in their use of technology.*

*The questionnaire will give you an idea of how close your teacher-colleagues are to this aspiration. It may also enable you to identify one or several ICT 'champions' – teachers who are confident users of ICT and will be able to help you to influence and support their colleagues.*

## Case Study 2: Using a laptop and a projector

*English teacher, Mr Pepple, explains how he uses his laptop in school and gets access to the internet to download resources and information.*

My laptop is my most treasured possession! I use it all the time. I can connect to the internet at my friend's house and download materials that I can use in school. Sometimes when there are connection problems, I go to a hotel in the town centre and pay for internet access for an hour. Last week I downloaded a cartoon in English to show to JSS Class 3.

I used to put the laptop on a table and get my pupils to sit on the floor to watch. This really was not terribly satisfactory. But last term, I managed to persuade the Parents-Teachers Association to donate
₦ 50,000 for computer equipment. I spent it on a projector and a set of loudspeakers. So now, we all watched the cartoon, but I realised that pupils could not understand the English accent and that the speech was too fast for them. So, we watched the cartoon with no sound and I organised a brainstorming session to work out what the story was about. Having done that, I introduced some of the key words that came up frequently in the story. I played the cartoon again and we played 'Spot the Word'. I have found that it is helpful for students to be able to listen to people speaking English – it has helped their pronunciation and their understanding – and it also enabled them to retain most of the key words.

I have two colleagues in the English department who are very interested in my work with my laptop, but they don't feel up to trying on their own quite yet. I want to help them to use the laptop in their lessons too so that they gain skills and confidence in using technology, as well as broadening their use of teaching resources. Initially they have been watching my lessons, but they are already asking me to find specific resources that they might use, for example on pollution.

This case study shows how the innovations and excitement of technology can be brought into school by accessing and downloading resources from the internet and then playing them in school. Mr Pepple invested in some equipment (a laptop, speakers and projector) that he then used to enhance student learning in English. The students not only benefit from the downloaded resources, but also from exposure to the hardware and equipment on which they are played.

You will have also noticed how the English teacher is not only focusing on his students but also on the development needs of his colleagues, building capacity so that more students benefit.

# 2 Technology for your personal use

The Internet and mobile data transfers make knowledge and training much more accessible to everyone in different places, so that teachers don't have to travel to sometimes far-away training centres, etc. Teachers and school leaders are now in a much better position to take charge of their own learning and professional development, which is very helpful when modelling these attitudes, behaviours and processes to their students.

The first step in taking charge of your own professional development and encouraging your teacher-colleagues to do the same, is to explore the resources that are freely available on the Internet. You should share those that are helpful, extract any elements that can be recycled in your own context and start developing a library of digital, disciplinary, educational and cultural resources.

This booklet is part of a collection of African OER (Open Educational Resources) jointly produced by Apréli@ and TESSA Share for teachers and school leaders in Africa. These resources are free and have a Creative Commons license. This means that you can download and modify them, adapt them to your context and needs, make as many copies as you like and share them in the same conditions as the original. They are therefore very accessible and highly adaptable – you can make them fit your context and needs. They are probably a good place to start in your search for other appropriate OER, as they already incorporate other quality African OER, such as OER Africa, The African Storybook Project or the African Teacher Education OER Network.

## Activity 2: Exploring OER

*This activity will enable you to explore and evaluate some OER depositories and plan to share them with your teacher-colleagues.*

Next time you have access to the internet, explore some OERs.

1. Look at the *Key Resources* document available on the Pan-African page of the TESSA website (https://www.open.edu/openlearncreate/course/view.php?id=2042). Choose two or three that cover issues that you would like to tackle in your school. Find at least two teacher development OERs in the subject resources (maths, science or English) that would help teachers to implement the approaches described in the *Key Resources* document in their classrooms.
2. In your Learning Diary, make a plan for sharing these materials with your teacher-colleagues. For example, if they have email addresses, you could send them a link; alternatively, you could download a resource onto your laptop and sit with one teacher to show them.
3. Explore some of the other OERs available on the Internet. **Resource 3**, *Exploring OERs* offers some suggestions of websites that you might try.
4. For each website, take a critical look at the resources. **Resource 3** has a checklist that you could use in order to decide if the resources might be helpful for your school.

## *Discussion*

*OERs are resources that are designed to be used flexibly so they can be adapted for a variety of uses and purposes. You can 'pick and mix' resources and ideas from the OERs you find to meet your own needs. It is important to take a critical view of these resources and evaluate their quality, as the global freedom to write and publish on the internet means that anyone can produce and publish an OER.*

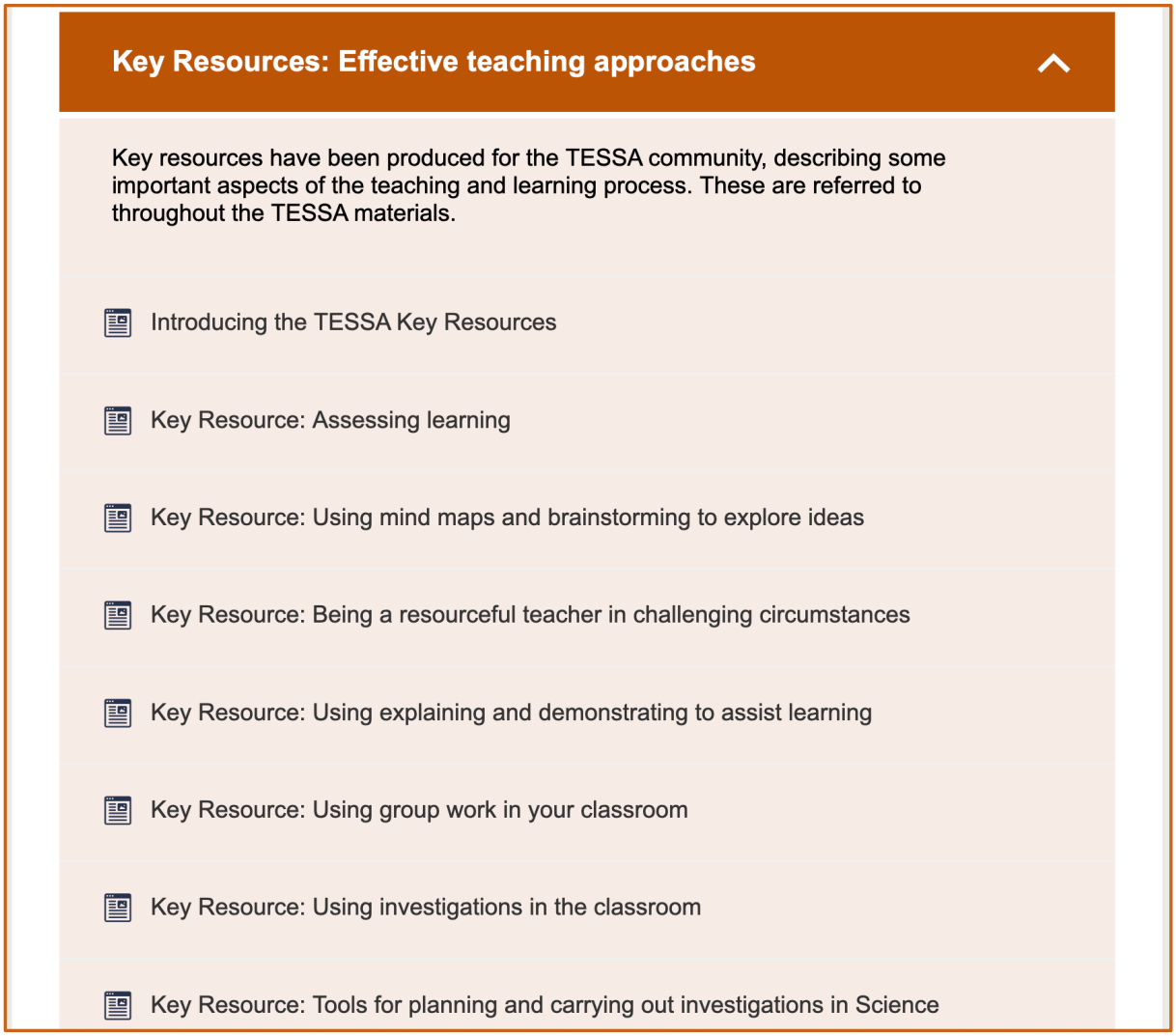



**Figure 3**: The TESSA Key Resources screen on the TESSA OER site

## Case Study 3: Mrs Babatunde uses the Internet to build her knowledge and skills

*Mrs Babatunde is the head teacher at an elementary school about 35 km from the nearest town.*

*Here is her account:*

I love working in my school, but it is a long way from the facilities of the city and in a different state from where I grew up. I have chosen to live in the city and travel to school by bus every day – this is so I can have access to the internet in the city. I have bought a tablet that I use all the time!

When I joined the school four years ago, there were 69 students on roll and attendance was around 40 per cent. I went to talk to the families and found out that the children were bored at school – they could not see the relevance of what they were learning to their lives. I decided to change the timetable and introduced two activity periods each day, after assembly and after lunch.

There is a strong tradition of art and craft in the village, so I used the internet to learn more about the traditions in this part of Nigeria and the skills required. Using films on YouTube, I taught myself the skills and devised some projects for the children to undertake in the activity periods. The activity periods have become extremely popular. I have noticed the growing enthusiasm pupils show, the skills they develop there, their increased active and participative behaviour. This has benefited the whole school life and learning. There are now 257 students on roll and attendance is 90 per cent – and I am an expert in art and craft, despite never having studied it before! I have even posted some videos of my pupils' and my work on YouTube, and they seem quite successful!

## Case Study 4: Mr Ihejerika uses his laptop to help him in his role as a school leader

*Mr Ihejerika is a school leader at a small rural secondary school with nine teachers. He has his own laptop.*

*Here is his account:*

When I started as a school leader, I was surprised by the amount of administration that I had to do. The office was full of files and it was difficult to keep track of everything. I had my own laptop and could access the internet at my friend's house. I wanted to find ways of using my computer to help me with the administration. I decided to use a spreadsheet to keep track of all the data generated by the teachers.

First, I had to learn to use a spreadsheet. To help me do this, I registered on a MOOC (Massive Open Online Course) I found on a free platform. After 6 weeks, I had my certificate and I felt confident in using spreadsheets. We have now reached the stage where I have taught my teacher-colleagues to enter all the end-of-topic test scores into a spreadsheet on my computer. I can manipulate the figures, calculate averages and plot graphs. As a result of this analysis, I have discovered there is a huge difference in the test scores when the science teachers are teaching outside their specialism.

I have two science teachers: one studied physical science and the other studied biological sciences, but they both have to teach the whole syllabus. Both of them expressed their need for support in their non-specialist sciences. I had found some materials online that explained scientific ideas very clearly. Last week I taught their classes and they both had the use of my laptop for an hour. I had downloaded some videos and simulations that went beyond what they could read in the textbooks. I showed them how to operate the mouse and open and close files and asked them to explore the materials. Both of them said they felt better equipped to teach the next topic. They both wanted to borrow my laptop, so they could show some of the simulations to their class.

## Activity 3: Thinking about your own learning needs

*In this activity you are going to reflect on your own ICT skills, on the available support, be it hardware, software or human networks.*

1. Think critically about your own ICT skills.
   - What skills would you like to develop?
   - How could you develop these skills?
   - Is there a teacher who could help you?
2. Using everything you have read in this booklet so far, think about how you could use the following to support you in your role as school leader or in your own professional development:
   - a laptop with word processing, spreadsheet and presentation programmes
   - a laptop with a wifi connection to the Internet
   - a mobile phone without Internet access
   - a smartphone (or a tablet with a SIM card)
   - a tablet
   - an LCD projector.
3. In your Learning Diary, make a 'wish list' of equipment that you would like in your school. Look at the costs associated with everything on your wish list.
4. Now think about your network and your community. Are there any groups of people who could help you acquire some of this equipment? You can use this initial list to help you fundraise and look for suppliers in a targeted way.

   To raise funds beyond your local circle, you could present the educational project using the requested funds by launching a campaign on a crowdfunding platform on the Internet. If your project is convincing enough, people from all over the world could contribute to your budget goal.

## *Discussion*

*Technology can support you in your daily role by making administrative tasks easier and more efficient. For example, by carrying out a more sophisticated analysis of test scores, Mr Ihejerika in Case Study 4 was able to identify a problem and start to work on a solution.*

*The Internet is a source of information and materials for professional development. There are materials that will support your own learning and resources to support and train your teacher-colleagues, rather than relying on a suitable training course becoming available.*

*When you consider the hardware that you might like, you also need to consider the maintenance demands and costs. It is therefore important to have a budget and include people who can service your equipment in it.*

This section has highlighted the potential for technology for your personal use – harnessing the opportunity to learn new skills, provide new tools and find free educational materials. Other possible uses for technology by you could include:

- taking photographs of students' work in order to encourage peer review or show to parents
- taking a video of your school to publicise the work you do and show to potential financial donors
- joining online networks to communicate and collaborate with other school leaders
- producing documents and presentations about your school for the school management committee (SMC)
- keeping up to date with current developments in education and finding out how others tackle problems
- motivating your teacher-colleagues to develop new skills
- using text messages or apps such as WhatsApp or Skype to communicate with your teacher-colleagues.

# 3 Supporting teachers in the use of technology

The questionnaire that you used in Activity 1 will show that the teachers in your school have a variety of skills and experiences of using ICT, often called 'digital literacy'. Some will be in the first stage of digital literacy while others include ICT into their lessons most successfully. Your role is to encourage them to use this know-how, however under-developed, to support their professional learning, and to understand how to use technology in their classrooms to support learning.

It is helpful to divide the approaches needed to train teachers in ICT into four categories, listed below (adapted from the UNESCO ICT Competency framework for teachers, 2018):

## Developing key ICT skills

It is possible that some of your teacher-colleagues need help with basic skills such as using a mouse or opening and closing documents. Your challenge is to give them the confidence to see the use of ICT as something that will help them in their work, so that they undertake the first stage of ICT learning with confidence.

## Using ICT to develop pedagogical skills

ICT in school can support pedagogical diversification, enabling more active, participatory, learner-centred approaches to learning. It can also enable a greater variety in the organisation of learning activities, from whole class activities to work in groups of various sizes down to pairs or even individual work. It can support moves from rote learning to acquiring higher-order skills such as problem-solving, questioning, organising, evaluating and generating knowledge (Latchem, 2010). ICT can also support inclusion, ensuring that marginalised groups have access to materials and resources. Short videos and simulations can stimulate discussion; students can create their own presentations; students can collaborate with and communicate with students in other parts of the world, by taking part in e-twinning like the Apréli@ e-twinning, for example. The Apréli@ e-twinning resources are available in French and in English (not dated, a).

As they become more comfortable with the pedagogical uses of ICT, teachers move from the frontal position of transferring knowledge to a position alongside the learners, taking the role of guide, mentor, facilitator supporting the construction of knowledge, know-how and savoir-être (or interpersonal skills). The relationship between the teacher and the pupil becomes more "horizontal" and more "democratic", each in her/his role and place contributing to achieving a common learning objective, clearly defined in advance. By actively engaging in their learning, not only do students become better at learning, but they develop self-confidence and self-esteem.

If you are deciding what technology to buy for your school, the first criterion of choice should be that of the added value to learning; in particular, you need to reflect on the extent the technology helps teachers to improve their teaching and the pupils' learning.

## Using ICT to support subject learning

ICT can be used to support specific areas of the curriculum. Recording devices can enrich language teaching, for example, and simulations can enrich the teaching of science. Access to the Internet gives learners the opportunity to undertake research of their own and learn about topics that interest them in depth. Thus, learners will further develop their self-confidence, autonomy and self-esteem.

## Using ICT to support professional learning

ICT can be used to support teachers' professional learning. You could encourage teachers to work together to find and adapt OERs for use in their classrooms. They could work in pairs to film each other in the classroom and then discuss the films with a view to improving their teaching. Teachers who have gaps in their subject knowledge will find a huge number of resources on the internet to help them, including quizzes, simulations and sample test papers with answers. Access to the Internet will also provide them with the opportunity to communicate with other teachers through networks, and to develop the skills highlighted in the discussion after Activity 1.

### Activity 4: Supporting teachers in the use of technology

*This activity will enable you to reflect on how you could lead groups of teachers in enhancing their classroom practice and/or own work by using ICT.*

Go back to the summary you made from the questionnaire in Activity 1 and the list of challenges you identified.

In the light of the activities and case studies that you have read so far, how could you encourage your teacher-colleagues to make better use of the technology available to them?

Identify a specific example of an activity that you could undertake with a group of teachers in your school for each of the four categories given above, namely:

- Developing key ICT skills
- Using ICT to develop pedagogical skills
- Using ICT to support subject learning
- Using ICT to support professional learning

The TESSA teacher development OERs and the Apréli@ educational e-twinning resources highlight opportunities to use ICT in the classroom. These might give you ideas for using ICT to develop pedagogical skills or support subject and professional learning.

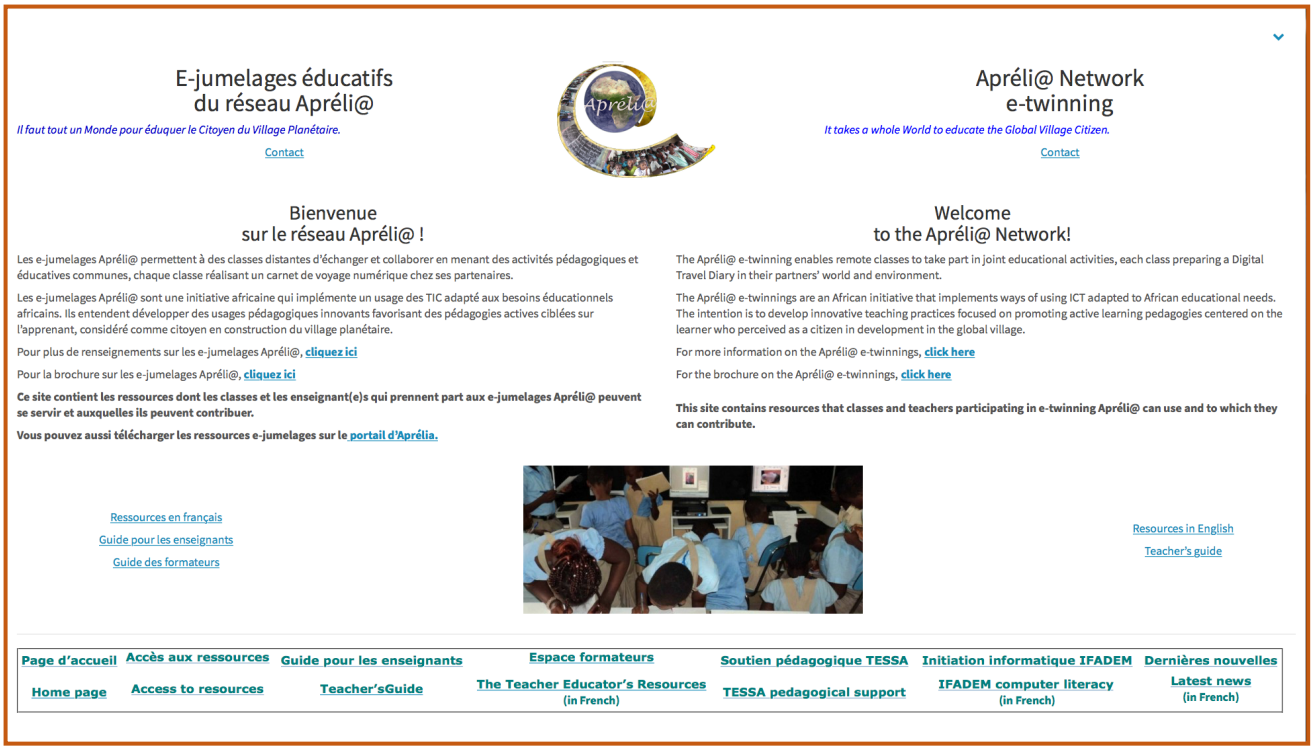



**Figure 4**: Apréli@ educative e-twinnings home page

# 4 Linking technology, skills and learning purpose

Internet access in Africa is growing fast, thanks to mobile devices, phones and tablets. For many years now, young African companies have been creating endogenous solutions adapted to African needs and contexts. These solutions are often the result of young enterprises, such as VMK (Congo), Qelasy and Solar Pack (Ivory Coast). Qelasy is the inventor in 2014 of the first African educational tablet "made with love in Cocody" while the young entrepreneur Evariste Akoumian invented the first solar schoolbag, distributed by the Ivorian company Bravo Communication.

As a matter of fact, an increasing number of teachers and students will have access to technology outside school. Your role as school leader will be to ensure that teacher-colleagues and students in your school have access to technology that is required for you to collectively achieve your educational goals.

A common mistake is to focus on the technology rather than on what you intend to do with it and how it will benefit learning. Another error is to underestimate the practical difficulties of maintaining computer equipment. Being clear about your educational priorities will enable you to select the technology that is most likely to help you meet those priorities.

## Case Study 5: Mr Solomon is frustrated

*Mr Solomon has recently started work in a new school. He was posted there by the State Education Authority and had been told that the school was well equipped with computers.*

*Here is his account*:

I was very excited to be starting work at a new school. I had been told that they had 25 laptop computers that students can use in lessons! When I arrived, however, I found that the laptops were in a locked cupboard and that no one had used them for some time. There was only one key to the cupboard, which was in the school leader's office. If the school leader was away from school, no one could get the key.

The computers were old and slow. Some of them had no mouse, or damaged keyboards, or the chargers had been lost. The ones that worked had Word, Excel and PowerPoint and a CD drive. There were some CD-ROMs with educational software, but the computers were not networked – so the CD-ROM would have to be loaded on each machine separately. Some of the licence code numbers had been lost, so the contents of the CD-ROMs could not be opened. Some of the older children could remember using the laptops, but they told me that they had not learnt much, because the teacher was not really sure how to use the computer.

This is perhaps not too uncommon a situation: not enough thought had gone into planning the maintenance and support of the computers in school. The equipment does not look after itself and users do not automatically know how to use it. See **Resource 4**, *Maintenance and support*, for further advice on maintenance and support.

It is also likely that, in Mr Solomon's new school, the choice of equipment was made without considering how its use would contribute to improving learning. As stated in the introduction to this

booklet (page 8), it "is not about *teaching* technology as a subject, nor is it about installing equipment, hoping that their mere presence will cause an educational miracle. ICTs are therefore not a magic wand, but a tool with great potential, which must be intelligently used to serve educational and sustainable development objectives."

This means that before introducing equipment and uses, it is essential to think carefully about the added value they can bring to teaching and learning and how this can be achieved. As pointed out in the TESSA document, Key resource *Using new technologies*: "The use of new technologies, like any other teaching and learning strategy, needs planning for: you need to understand the potential of any specific form of ICT (a computer with Internet access, for example) before incorporating it into your daily teaching". Making the link between ICT and learning is therefore at the heart of teaching practice.

In practical terms, you will need to consider the most appropriate ways of using ICT to achieve the key objectives of your School Development Plan. For each of these objectives, it will be necessary to determine whether ICT can make a significant contribution and what would be the most appropriate ways of using it, given your context.

## Activity 5: Linking technology to learning or identifying the potential added value of ICT for your establishment

*The aim of this activity is to encourage you to think about how ICT could contribute to improving the teaching-learning experience and outcomes, in relation to the priorities defined by your school development plan.*

The table below provides a list of educational outcomes that could be targeted by your school development plan (SDP). If some of them are not part of SDP, you can of course disregard them. Conversely, you may need to add educational objectives relevant to your SDP. You may also wish to rearrange the lines in the table in the order of your key objectives and needs.

Below the table, you'll find some ideas to support and guide your reflexion.

You may want to carry out this reflection with the help of internal or external educational managers, and even, if you feel it is relevant and feasible, members of the management committee.

| **Educational outcome** | **How can technology help? What technology would be needed?** |
|---|---|
| Teachers develop more participatory approaches in their lessons | |
| Teachers see themselves as facilitators of learning, guiding and supporting students on their learning journey | |
| Teachers see themselves as learners, keen to take control of their own professional | |

| | |
|---|---|
| development | |
| Leaners learn the basics about computers: switching on and off, logging on and off, file management, creating documents and presentations | |
| Learners learn how to search the internet, find information and store it for future use | |
| Leaners learn how to send email messages and engage with social media | |
| Teachers have access to educational software such as simulations | |
| Teachers have access to resources that will enliven their lessons, such as YouTube videos, film clips, news reports or photographs | |

## *Discussion*

*For each of the planned educational outcomes, it is important to consider the resources and strategies available to achieve them and to reflect on the unique contribution of ICT use.*

*One way of developing more participative approaches in lessons could be to organise group work; this can be done in many ways, including by rotation, by setting up different learning stations, each dedicated to a specific activity that contributes to achieving one or more of the lesson's learning objectives. Pupils work in groups, each group moving from station to station to carry out the activities. One of the stations could promote the use of a laptop with internet access to enable learners to complete one of the activities.*

*To encourage teachers to see themselves as learners eager to take charge of their own professional development, the school resources room could be equipped with a PC with an internet connection, and an interactive menu of courses and resources that meet their professional development objectives. If an internet connection is not available, the courses and resources could be downloaded onto memory sticks or external disks.*

*In all cases, choices and decisions should be made as a team or group, according to identified needs and pre-established criteria, so as to share skills, strategies and discoveries, support less confident colleagues and encourage reluctant ones.*

## Case Study 6: Mrs Innocent receives a donation

*Mrs Innocent is the school leader of a small rural secondary school. A past pupil has recently returned to the village, having made money by running a successful business. He has come to see Mrs Innocent.*

*Here is her account:*

Last week I had a visit from a past student. He told me about what he had done since leaving school: he had set up a business that had recently been taken over by a large chain and he has made a lot of money. He was keen to give something back to the school and came with the offer to set up a dedicated computer room, with 20 computers for students to use.

I did not want to appear ungrateful, but my heart sank. There are only eight teachers in the school and I know that no one has the knowledge or skills to look after a room like that, and some of them would not be able to use a computer themselves. Moreover, we don't have the resources to buy educational software and if we did, to make good use of it, we would need the computers to be properly networked together. I would much prefer to have some laptops, projectors and a wifi connection, but he was keen to establish a technology room in the school that could be named after him – 'The Dele Yaya Computer Room'.

I thanked him for his offer and invited him back the next day. I told him that I needed to think about the logistics and to tell the teachers about his extraordinary offer. Mrs Yunusa teaches the 9th grade class and I know that she uses the internet on her phone when she is in town. I have a laptop. I found Mrs Yunusa and we made a plan.

Mrs Yunusa was teaching the structure of the atom, so we went into town in the evening to the house of a friend of hers who had a wifi connection. We downloaded a film from a website called 'Powers of Ten' which helps students to understand the relative sizes of an atom and the nucleus.

The next day, when Mrs Yunusa was teaching the JSS 3 Class, she used my laptop to show the film. The students were amazed and delighted! They had to sit on the floor, but most could see – there was a real 'buzz' in the room.

I took Dele into the room and he was impressed. It enabled me to explain that what I would really like would be a laptop for each teacher, a projector and a wifi connection, or a set of tablets that we could pre-load with educational applications. Rather than spend all his money at once, I suggested that he spent some on the equipment and then agreed to pay for the wifi connection for five years. I suggested that we put a plaque near the entrance to the school, thanking him for his generous donation to the school.

Activity 5 and Case Study 6 highlighted the fact that it is important that the technology you choose depends on the educational outcomes you wish to achieve. Sometimes, a simple option such as a single laptop and a projector can actually have more impact on more students than being able to provide a set of laptops to a class. As tablets come down in price, they may provide many benefits. They allow mobile uses that are very easy to implement, for example to make small films or take pictures in the school or around the school or during field trips.

Also, local initiatives can produce usable technology at relatively low cost.

## Activity 6: Lectures and courses on the Internet

*This activity will enable you to consider the availability of local low-cost online resources for the professional development of the teaching and management team.*

For this activity, you need access to the internet.

### 1 On-line lectures

Watch a presentation by Vinay Venkatraman about digital inclusion (http://www.ted.com/talks/vinay_venkatraman_technology_crafts_for_the_digitally_underserved).

Resources on the TED website are examples of open content that you can use for your own development or for training purposes, or even with students, to extend thinking and develop new perspectives. TED talks are generally deliberately inspiring and provocative, and therefore provide much food for thought.

The column on the right-hand side of the screen offers a list of lectures. If you are not interested by any of the lectures offered here, use the search tool [ 🔍 ] and type the key words for the theme(s) that correspond to the needs of your teaching colleagues at the moment. In your learning diary, make a note of these titles and don't forget to note the URLs, in other words the website address of these videos so that you can quickly find them again. For example :

> The child-driven education :
> https://www.ted.com/talks/sugata_mitra_the_child_driven_education

### 2 On-line courses

The recent development of massive open online courses (MOOCs) offers teachers the opportunity to access content that enables them to develop skills and know-how in a more interactive way.

The TESSA collection of courses has been designed to address some of your teaching colleagues' common concerns and expectations. You will find a list of these courses on the Courses page of the TESSA Portal.

Two of the TESSA courses contain sections that enable planning the integration of ICT into teaching and learning and the use and adaptation of OER to support it:

- *TESSA: Making teacher education relevant for 21st Century Africa*
- *Inclusive teaching and learning*

Explore these two courses quickly and note in your logbook the sections that you could use with teachers in your school.

Within a school, teachers may decide to do a TESSA course in groups. This is totally possible and should be encouraged. Most of the courses offer a facilitator's guide or kit which enables a member of the group to take the role of facilitator and support her /his colleagues in gaining as much as possible from the course (or section) and in completing it.

You will have discovered the sections that pertain to incorporating ICT and OER to enhance learning and teaching:

- *Making teacher education relevant for 21st Century Africa*
  - Section 1 : the subsections *Tools for the 21st Century, ICT* and *Open Educational Resources*
  - Section 3: *Integrating ICT into teaching and learning*
  - Section 4: *Using and adapting OER to support teaching and learning*
- *Inclusive teaching and learning*, Section 4: *A toolkit for inclusive teaching and learning*

## Case Study 7: Organising a virtual meeting

Mrs. Tahir runs a community college in the State of Kano. Her college runs a project to integrate ICT into teaching and learning practice. It has already acquired a solid experience that greatly benefits teachers and learners in the school. The NTI State Office has asked Mrs. Tahir to share this experience with a dozen other local college school leaders. However, the distances between the different colleges being important, it was difficult for all participants to meet in one place. Also, Mrs. Tahir offered to host an online conference for which she created an online video conferencing session. She searched the internet for suitable software and chose Zoom, software for which the NTI had a subscription, which would allow her to organise a session lasting over 40 minutes.

From his room at the NTI State Office, some 60 miles away, the NTI State Coordinator co-led the session with Mrs. Tahir "around the virtual table". A few days before the session, Mrs. Tahir had sent her colleagues the internet link which allowed them to connect at the appointed time, to attend the school leaders' presentations and exchanges and to post their comments and questions live. The meeting lasted more than two hours. The presentations, explanations and exchanges were very clear, rich and informative. At the end of the session, Mrs. Tahir posted the recording on YouTube, so that everyone can watch it again according to their availability and needs, and post additional comments which she strove to answer as well as possible, with the help of other staff members from her colleagues (coaches and teachers).

The general opinion was that it had been a convincing and inspiring experience and Mrs. Tahir had many followers. It also gave ideas to teachers who, in turn, organised some Zoom mini sessions on issues raised during lessons, with pictures and videos. Students who had not understood the lesson were able to view it as much as they needed on the computers in the school library. This led to animated discussions between them; they worked together on the videos and helped each other in a most efficient and friendly manner.

### *Pause for thought...*

*What is your response to the video in Activity 6? Thinking about your local community, is there anyone who could help you in developing simple solutions to some of the issues around ICT?*

*This video about the BRCK may also help you consider alternatives:*
https://www.kickstarter.com/projects/1776324009/brck-your-backup-generator-for-the-internet

The final case study highlights some of the educational benefits of technology, as well as the role of teachers in realising those benefits.

## Case Study 8: Local content development in three schools

This project was set up in November 2016. Students from Primary 5 & 6 and JSS 1 were given the opportunity to make a short computer-based video presentation. The topic was left to the students' choice but had to be related to sustainable development and based on a question related to the local environment.

Teachers acted as the facilitator of the task, assisting each group as necessary. The students also had a 'mentor' for each local content development project – an expert from the community. Learning committees were set up in school with the idea of involving the village people in the endeavour. Where available, students could also enlist the help of resource-persons at the local NTI Study Centre. Each group had access to a webcam and applications such as MS Paint and PowerPoint.

The students designed the format, collected the required information and prepared the text on the computer.

The project was carried out in three schools. It was much more successful in one school, mainly because:

- the students were given a genuine choice and followed topics of their own choosing
- the teachers acted as facilitators, guiding and encouraging rather than telling
- the students received some coaching in effective groupwork, including the importance of people having distinct roles and responsibilities
- the learning committee was proactive, meeting regularly with the teams to receive a report on progress.

In one of the schools, the topics chosen were from the textbooks and the information presented did not extend greatly beyond the textbooks.

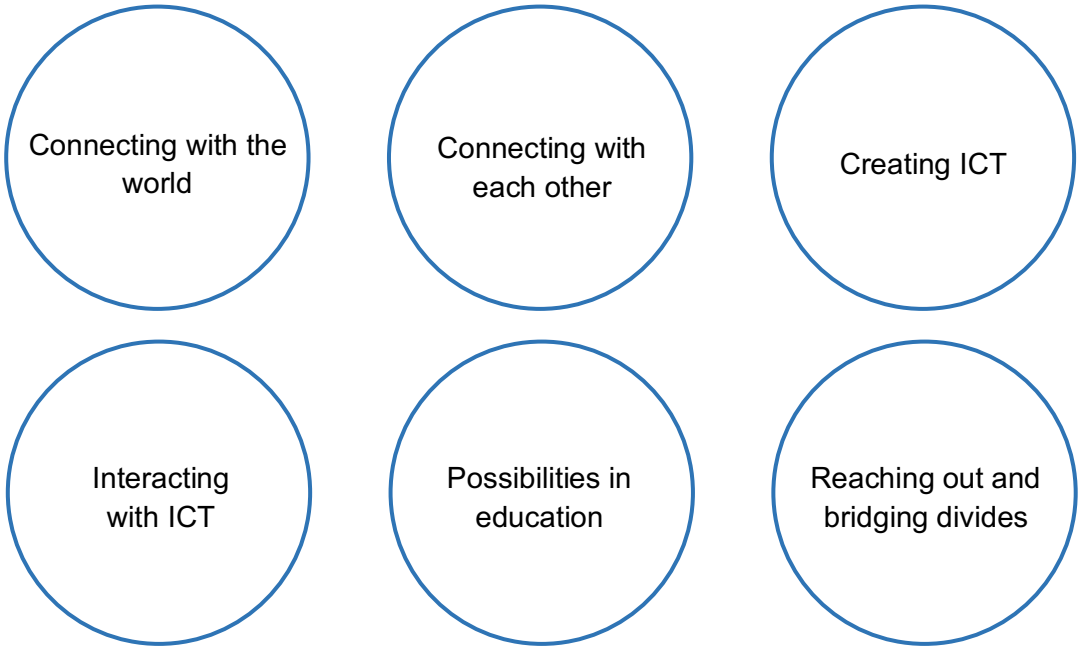
Whereas, in the school that was the most successful, work had been inspired by an example from one of the Apréli@ educational e-twinnings activity in Chapter 4, *Around our Partners' School* (Apréli@, no date, b): the aim was to "compose an electronic document in the form of a report on an aspect of the environment around our partners' school, containing texts, images and explaining in what and why this aspect is important."

Overall, the project was deemed to have been successful and highly motivating for students. The presentations will be available for other students – fulfilling one of the aims that students should be involved in knowledge creation.

However, one conclusion was that the teachers and the learning committee needed guidance to help them facilitate the efforts of the children without actually dominating them and stifling their curiosity and creativity.

# 5 Developing a strategic approach to ICT

The six strands to handle today's and tomorrow's technologies:




Six strands can be identified that are relevant for teachers and students in building their capacity to handle today's and tomorrow's technologies. These strands are as follows:

1. **Connecting with the world:** information literacy – that is, access to information and resources beyond the textbook for teaching and learning.
2. **Connecting with each other**: for support and professional development, updating different social media, netiquette, etc.
3. **Creating ICT**: to develop teaching resources, documents and audio-visual material, and to use appropriate file conventions and processes.
4. **Interacting with ICT:** understanding the interfaces and selecting the most appropriate tools; and understanding functionality, troubleshooting and safety, connectivity, and maintenance.
5. **Possibilities in education:** online resources, interactivity, linking to educational goals, critical view, exploration and experimentation, tools for administration, etc.
6. **Reaching out and bridging divides:** inclusion in terms of language, visual and auditory impairments, digital communities, wikis, etc.

### *Pause for thought...*

*Your ICT strategy will need to take this into account, but it also needs to reflect the current situation in your school. The activities in this unit should have shown you the level of ICT skills and use among your teacher-colleagues and provided you with some ideas about how ICT can support professional development and learning in the classroom. Hopefully you have identified one or two ICT champions who will be able to help you to develop your strategy.*

*In your ICT strategy you will need to remember to:*

- *improve the confidence and competence of your teacher-colleagues*
- *identify ways in which ICT can support teaching and learning in classrooms in your school*
- *improve the availability of technology by capitalising on technology that teachers already have and identifying 'high value' items – things that will make the greatest impact on the greatest number of people.*

## Activity 7: Building an ICT strategy

*This activity will enable you and a group of your teacher-colleagues to draw up an action plan that ties in with your country's national ICT for education strategy or curriculum.*

Working with your ICT champions, go back over the case studies and your notes from activities, and build an action plan for each of the elements of your strategy.

Check your plan against the Curricula for ICT in Education for your region, state or country in order to ensure that the actions you have identified will enable your school to make progress towards the aspiration set out by the regional or national objectives.

# 6 Summary

In the future it is highly likely that access to the Internet and the availability of affordable electronic devices will increase. As a school leader, you need to be aware that you are preparing children for life in a complex and fast-changing world. The more exposure that they can have to new technologies while they are at school, the better equipped they will be to contribute creatively to establishing, nurturing and helping to grow a knowledge-based society thriving to achieve the objectives of sustainable development.

The purpose of this booklet has been to help you

- understand that educational needs and objectives lead to the use of ICTs that are best able to respond adequately, efficiently, and sustainably to learning
- take into account the issues of cost, access, maintenance, sustainability, equity and inclusion to build ICT resources in your school

It is important that your ICT strategy:

- takes into account the skills and confidence of your teacher-colleagues
- achieves the educational outcomes you want to achieve
- puts you in a strong position to capitalise on any opportunities that arise (such as donations and gifts).

The introduction of digital technology at school impacts on all actors/actresses as well as their practices. When used well, ICT enables you to develop more active, participatory, diversified and motivating teaching-learning practices as well as new skills. We emphasise again the question of the digital resources that are used as well as the uses that are made of them, highlighting the major importance of the endogenous content, and more particularly the African REL, already available, or that your school can contribute to enrich.

# Resources

## Resource 1: Teachers and ICT

The purpose of this questionnaire is for school leaders to find out the knowledge and skills of teachers in order to plan how technology might be used to support teaching and learning in school.

### *a. Technologies you use at the moment in and outside school*

Please indicate in Table R1.1 which technology you currently use both in school and outside school.

***Table R1.1*** *The technology you, as teachers, use inside and outside school.*

| **Technology** | **Do you use this outside school?** | On a scale of 1–5, **how confident are you in using this equipment?** (1 = not at all confident and 5 = highly confident) | **Do you use this in the classroom?** |
|---|---|---|---|
| Desktop computers | | | |
| Laptop | | | |
| Internet access | | | |
| Basic mobile phone (but with a calculator, voice recorder and camera) | | | |
| Smartphone (with internet access) | | | |
| Tablet | | | |
| Email | | | |
| Social media (WhatsApp, X, Facebook, Instagram, Tik Tok, etc) | | | |
| Projector/screen | | | |
| Loudspeakers | | | |
| Printer | | | |
| Digital camera (perhaps linked to a phone or tablet) | | | |
| CD/tape player | | | |
| Television/DVD player | | | |
| Radio | | | |

## b. *Skills met or to be met*

What skills do you currently have or are keen to learn? Give your answers in Table R1.2.

***Table R1.2*** *Computer skills audit.*

| **Computer skills** | **I can do this** | **I am keen to learn how to do this** |
|---|---|---|
| Operating a mouse | | |
| Opening and saving files and creating folders | | |
| Word processing | | |
| Printing a document that you have created on a computer | | |
| Making presentations | | |
| Using a spreadsheet | | |
| Searching the internet | | |
| Downloading materials from the internet | | |
| Inserting a CD into a computer and accessing the contents | | |
| Reading files and saving files with a memory stick | | |
| Connecting the computer to loudspeakers and a projector | | |
| Taking photographs on a mobile phone or tablet | | |
| Saving photographs onto a computer from a digital camera | | |
| Use email software (e.g. Thunderbird, Gmail) | | |
| Sending and receiving emails | | |
| Sending an email with an attachment | | |
| Depositing and retrieving large files in a virtual space | | |
| Accessing social media : WhatsApp, X, Facebook, Instagram, Tik Tok, etc | | |
| Shopping on the internet | | |
| Watching film clips on social media | | |
| Uploading a film on to social media | | |
| Scanning a document into a computer | | |
| Make VoIP calls (WhatsApp, Zoom, Signal, Telegram, VK | | |
| Videoconferencing (WhatsApp, Zoom, Signal, Telegram, VK) | | |

## c. *Three challenges of your daily professional practice*

In your daily life as a teacher in this school, list the three biggest teaching and learning challenges that you face in your daily professional practice?

Back to activity 1

## Resource 2: Solutions ICT brings to usual challenges

### *a. The most common challenges faced by teachers*

The sort of challenges that teachers usually highlight include the following:

- 'I have a very big class.'
- 'I struggle to finish the syllabus.'
- 'The students are not motivated.'
- 'The students find the work very difficult.'
- 'I don't have enough resources.'
- 'I am not confident teaching some of the subjects in the curriculum.'
- 'The students are badly behaved.'
- 'I try to use participatory approaches, but students are reluctant to talk or to ask questions.'
- 'Attendance is very poor, so students miss work and then find it difficult to understand.'
- 'The syllabus is not relevant to the lives of my students.'
- 'I am told to use participatory approaches, but it's not possible because of the size of the class and the syllabus.'

### *b. Answers provided by technology*

Technology can tackle many of these challenges. By using a single laptop that can be periodically connected to the internet in order to download materials, and a projector, teachers can:

- provide stimulating and interesting introductions to new topics
- use simulations to explain complex ideas
- make links between curriculum topics and the real world.

By presenting both sides of the argument on a controversial topic, teachers can stimulate discussion and debate among students. Educational applications loaded onto a tablet can be used by students and teachers to develop understanding and are highly engaging. Using a computer to conduct research and to present information gives students the opportunity to take responsibility for their own learning.

Back to activity 1

## Resource 3: Exploring OERs

### a. *List of OERs*

Below is a list of websites that have OERs, particularly African OER:

- TESSA: https://www.open.edu/openlearncreate/course/index.php?categoryid=568
- Apréli@ Network e-twinning: http://wiki.aprelia.org/
- Active teaching and learning for Africa: ZEST : https://www.open.edu/openlearncreate/course/index.php?categoryid=450
- African Storybook Project: http://www.africanstorybook.org
- IFADEM: https://www.ifadem.org/en
- OER Africa: http://www.oerafrica.org

The following OERs are not endogenous African resources:

- The Commonwealth of learning resources: https://www.col.org/resources/
- ExamFear videos: https://www.youtube.com/user/ExamFearVideos
- Khan Academy: https://www.khanacademy.org/
- The OpenScience Laboratory: https://learn5.open.ac.uk/course/view.php?id=2
- OpenLearn: http://www.open.edu/openlearn/
- PhET simulations: https://phet.colorado.edu/en/simulations/category/new

### b. *Questions to evaluate the quality of resources*

Here is a checklist for assessing the quality of the materials that you find.

- Are the materials relevant to your context?
- Would they engage and motivate teachers and students?
- Do they help to address an identified need in your school?
- Are they well-written and easy to understand?
- Do they add value? Do they provide learning opportunities beyond those available in the textbook or through other sources?

### c. *Open and free software*

In addition, you should be aware that there is an increasing number of free, open-source software packages of very high quality available for accessing, using, sharing and producing OER. This software is constantly being developed, improved and enhanced by the user community. To find up-to-date lists, do an Internet search using the key words, e.g. "free and open-source software". You can add the field you are looking for to focus on the actual function you are looking for, e.g. "free and open-source software word-processing" or e.g. "free and open-source software presentation".

Back to activity 2

## Resource 4: Maintenance and support

Maintenance and support have ongoing costs. You could allocate responsibility to a member of staff who has appropriate knowledge and skills; alternatively, you may need to buy these services in or secure volunteers to help.

Maintenance can be provided either by people who are part of the school system or bought in. This includes monitoring patterns in the use of applications or equipment. Specific maintenance items might include:

- periodic replacement of parts and renewal of consumable supplies
- repair or replacement of faulty components
- periodic inspection and cleaning of equipment
- updating or upgrading hardware and software, including installing new operating system versions
- adding or deleting users from a system, or modifying user rights and properties
- periodic back-up of stored files on a school network
- monitoring the condition and functionality equipment and networks
- monitoring and updating safety system
- installing and removing equipment and applications.

ICT support is about working with users rather than on equipment and systems. Support keeps users working or helps them to improve the ways they work, including such items as:

- a helpline, or other forms of resolving a problem or providing advice
- automated information systems such as FAQs or newsletters
- initial training and familiarisation with equipment and software.

(Adapted from National Center for Education Statistics, 2003.)

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# References and bibliography

*The references are presented in two different ways. We invite you to choose the one that best suits your reading style.*

*References* are listed in the order in which they appear in the booklet.

*The bibliography* is arranged alphabetically by author.

Many of the references below are attributed to two sources:

- Agir pour la mise en Pratique des Ressources Éducatives Libres Africaines (formerly Association pour la Promotion des Ressources Éducatives Libres Africaines): Apréli@, https://aprelia.org/ (accessed 19 February 2024)
- Teacher Education in Sub Saharan Africa (TESSA) , Portal https://www.open.edu/openlearncreate/course/index.php?categoryid=568 (accessed 20 April 2024)

In order to simplify the two lists, we will use the acronyms of these two sources, Apréli@ and TESSA.

## References


- Creative Commons, CC BY-SA 4.0 DEED Attribution-ShareAlike 4.0 international: https://www.creativecommons.org/licenses/by-sa/4.0/ (accessed 21 April 2024)
- TESS-India: http://www.tess-india.edu.in (accessed 21 April 2024)
- TESS-India : Leading the use of ICT in your school www.open.edu/openlearncreate/mod/resource/view.php?id=57521 (accessed 21 April 2024)
- Apréli@ (no date, a) *Piloter l'usage des TICE dans votre établissement,* http://aprelia.org/cahiers/c4/fichiers/C4_Piloter_l_usage_des_TIC_dans_votre_etablissement.pdf (accessed 21 April 2024)
- TESSA (2024) Leading the school development plan, on line https://www.open.edu/openlearncreate/mod/page/view.php?id=219101(accessed 21 April 2024)
- TESSA (2024) Leading teachers' professional development https://www.open.edu/openlearncreate/mod/page/view.php?id=218816 (accessed 21 April 2024)
- TESSA (2024) Supporting teachers to raise performance https://www.open.edu/openlearncreate/mod/page/view.php?id=218817 (accessed 21 April 2024)
- TESSA (2024) Accompanying teachers: mentoring and coaching https://www.open.edu/openlearncreate/mod/page/view.php?id=218818 (accessed 21 April 2024)
- TESSA (2015) Inclusive Education Toolkit, on line: https://www.open.edu/openlearncreate/mod/oucontent/view.php?id=153822 (accessed 21 April 2024)

- TESSA (2014), Teaching Practice Supervisors' Toolkit, on line: https://www.open.edu/openlearncreate/mod/oucontent/view.php?id=153825 (accessed 21 April 2024)
- TESSA (pas de date, a) Working with Teachers, Handbook, on line : https://www.open.edu/openlearncreate/mod/oucontent/view.php?id=153824 (accessed 21 April 2024)
- Central Institute of Educational Technology (2013) *Curricula for ICT in Education*. New Delhi: National Council of Educational Research and Training, on line from: http://www.ncert.nic.in/announcements/notices/pdf_files/ICT%20Curriculuma.pdf (was accessed 8 January 2015 – no longer available).
- ADEA (Association for the Development of Education in Africa) (2016) 2ndAfrican ministerial Forum on ICT Integration in Education and Training "Advancing inclusive knowledge societies in Africa to implement Africa's Agenda 2063 and the SDGs", on line: http://www.africaictedu.org/files/presentation_en_17.05.2016.pdf (was accessed 24 November 2018 – no longer available)
- UNESCO (2018) *the UNESCO ICT Competency Framework for Teachers*, on-line: https://unesdoc.unesco.org/ark:/48223/pf0000265721 (accessed 21 April 2024)
- Kenya Institute of Curriculum Development, 2019, Nurturing Every Learner's Potential, on line https://kicd.ac.ke/wp-content/uploads/2019/08/BASIC-EDUCATION-CURRICULUM-FRAMEWORK-2019.pdf (accessed 21 April 2024)
- Zimbabwe Ministry of Primary and Secondary Education (2015) Information Communication Technology, Junior (Grade 3 to 7) Syllabus on line http://mopse.co.zw/sites/default/files/public/syllabus/ICT%20Junior.pdf (accessed 21 April 2024)
- CGTN Africa (2016) Cote d'Ivoire entrepreneur launches solar backpack for school children, on line: https://www.youtube.com/watch?v=5uSkhZtc_Y0, (accessed 21 April 2024)
- TESSA (no date) Key Resources, on line: https://www.open.edu/openlearncreate/course/view.php?id=2042 (accessed 21 April 2024)
- Latchem, C. (2010) 'Using ICT to train teachers in ICT', in Danaher, P. and Umar, A. (eds) *Teacher Education through Open and Distance Learning*. Vancouver: Commonwealth for Learning.
- Apréli@ (no date, a) educative e-twinning, on line: http://wiki.aprelia.org/, (accessed 21 April 2024)
- Prixim, Qelasy tablet, on line http://www.priximconsult.com/word/products/qelasy-tablet/ (accessed 24 November 2018 - no longer available)
- TESSA (no date) Key Resources, *Using new technologies* on line: https://www.open.edu/openlearncreate/mod/oucontent/view.php?id=153801 (accessed 21 April 2024)
- TESSA (no date) TESSA Courses, on line https://www.open.edu/openlearncreate/course/index.php?categoryid=47 (accessed 21 April 2024)

- Ushahidi (2013) 'BRCK – your backup generator for the internet' (online), Kickstarter, 4 June. Available from: https://www.kickstarter.com/projects/1776324009/brck-your-backup-generator-for-the-internet (accessed 21 April 2024)
- Apréli@ (no date, b) e-twinning resources, Chapter 4: Around our Partners' School, on line : access through https://moodle.aprelia.org/mod/page/view.php?id=624 (accessed 21 April 2024)

## Bibliography


- ADEA (Association for the Development of Education in Africa) (2016) 2ndAfrican ministerial Forum on ICT Integration in Education and Training "Advancing inclusive knowledge societies in Africa to implement Africa's Agenda 2063 and the SDGs", on line: http://www.africaictedu.org/files/presentation_en_17.05.2016.pdf (accessed 24 November 2018 no longer available)
- Apréli@ (no date, a) educative e-twinning, on line: http://wiki.aprelia.org/, (accessed 21 April 2024)
- Apréli@ (no date, b) e-twinning resources, Chapter 4, *Around our Partners' School* , on-line https://moodle.aprelia.org/mod/page/view.php?id=624 (accessed 21 April 2024)
- Apréli@ (no date, c) *Piloter l'usage des TICE dans votre établissement,* https://aprelia.org/fr/?view=article&id=1989 or http://aprelia.org/cahiers/c4/fichiers/C4_Piloter_l_usage_des_TIC_dans_votre_etablissement.pdf (accessed 21 April 2024)
- Central Institute of Educational Technology (2013) *Curricula for ICT in Education*. New Delhi: National Council of Educational Research and Training, on line from: http://www.ncert.nic.in/announcements/notices/pdf_files/ICT%20Curriculuma.pdf (was accessed 8 January 2015 – no longer available).
- CGTN Africa (2016) Cote d'Ivoire entrepreneur launches solar backpack for school children, on line: https://www.youtube.com/watch?v=5uSkhZtc_Y0, (accessed 21 April 2024)
- Creative Commons, CC BY-SA 4.0 DEED Attribution-ShareAlike 4.0 international: https://www.creativecommons.org/licenses/by-sa/4.0/ (accessed 21 April 2024)
- Kenya Institute of Curriculum Development, 2019, Nurturing Every Learner's Potential, on line https://kicd.ac.ke/wp-content/uploads/2019/08/BASIC-EDUCATION-CURRICULUM-FRAMEWORK-2019.pdf (accessed 21 April 2024)
- Prixim, Qelasy tablet, on line http://www.priximconsult.com/word/products/qelasy-tablet/ (accessed 24 November 2018 – no longer available)
- TESS-India: http://www.tess-india.edu.in (accessed 21 April 2024)
- TESS-India : Leading the use of ICT in your school https://www.open.edu/openlearncreate/mod/oucontent/view.php?id=57977 (accessed 21 April 2024)
- TESSA (no date) Key Resources, on line: https://www.open.edu/openlearncreate/course/view.php?id=2042 (accessed 21 April 2024)

- TESSA (no date) TESSA Courses, on line https://www.open.edu/openlearncreate/course/index.php?categoryid=47 (accessed 21 April 2024)
- TESSA (no date) Key Resources, *Using new technologies* on line: https://www.open.edu/openlearncreate/mod/oucontent/view.php?id=153801 (accessed 21 April 2024)
- TESSA (no date) Working with Teachers, Handbook, on line : https://www.open.edu/openlearncreate/mod/oucontent/view.php?id=153824 (accessed 21 April 2024)
- TESSA (2014) Teaching Practice Supervisors' Toolkit, on line: https://www.open.edu/openlearncreate/mod/oucontent/view.php?id=153825 (accessed 21 April 2024)
- TESSA (2015) Inclusive Education Toolkit, on line: https://www.open.edu/openlearncreate/mod/oucontent/view.php?id=153822 (accessed 21 April 2024)
- TESSA (2024) Accompanying teachers: mentoring and coaching https://www.open.edu/openlearncreate/mod/page/view.php?id=218818 (accessed 21 April 2024)
- TESSA (2024) Leading teachers' professional development https://www.open.edu/openlearncreate/mod/page/view.php?id=218816 (accessed 21 April 2024)
- TESSA (2024) Leading the school development plan, on line https://www.open.edu/openlearncreate/mod/page/view.php?id=219101(accessed 21 April 2024)
- TESSA (2024) Supporting teachers to raise performance https://www.open.edu/openlearncreate/mod/page/view.php?id=218817 (accessed 21 April 2024)
- UNESCO (2018) *UNESCO ICT: competency framework for teachers, version 3*, on line: https://unesdoc.unesco.org/ark:/48223/pf0000265721 (accessed 21 April 2024)
- Ushahidi (2013) 'BRCK – your backup generator for the internet' (online), Kickstarter, 4 June. Available from: https://www.kickstarter.com/projects/1776324009/brck-your-backup-generator-for-the-internet (accessed 21 April 2024)
- Zimbabwe Ministry of Primary and Secondary Education (2015) Information Communication Technology, Junior (Grade 3 to 7) Syllabus on line http://mopse.co.zw/sites/default/files/public/syllabus/ICT%20Junior.pdf (accessed 21 April 2024)