ICDL
The Digital Skills Standard

ICDL Professional
ICT IN EDUCATION
Syllabus 1.0

Learning Material

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SNDK INVESTMENT

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ICDL ICT in Education

As digital technologies continue to evolve and impact every aspect of life, educators are tasked with the challenge of successfully integrating ICT into education. ICDL ICT in Education will guide you through the key skills you need to use ICT effectively in your teaching practice.

ICDL ICT in Education sets out essential concepts and skills to enable teaching and learning professionals to start engaging in the pedagogically effective use of ICT to support and enhance teaching, learning and assessment in the classroom.

Having completed this module you will be able to:

- Understand the key concepts and benefits of using ICT to support and enhance teaching, learning and assessment in the classroom.
- Outline considerations for planning an ICT-enhanced lesson.
- Understand safety, security and well-being considerations when using ICT in education.
- Outline ICT resources that can be used to support and enhance teaching, learning and assessment.
- Understand how to source and evaluate ICT resources to support and enhance teaching, learning and assessment.
- Outline the key features of classroom technologies.
- Use the key features of a learning platform.

What are the benefits of this module?

The ICT in Education module has been developed specifically for teaching and learning professionals in the education and training sectors who wish to develop their skills and knowledge in using technology to improve learning outcomes for their students.

The ICT in Education module provides an internationally recognised way of improving the use of ICT in your teaching practice and helping your students achieve their learning goals.

The module has been developed to rigorously high standards with the input of subject matter experts in the areas of teaching practice and IT user skills, ensuring that it is both relevant and comprehensive.

Once you have developed the skills and knowledge set out in this book, you will be in a position to become certified in an international standard in this area - ICDL ICT in Education.

For details of the specific areas of the ICDL ICT in Education syllabus covered in each section of this book, refer to the ICDL ICT in Education syllabus map at the end of the book.

Each lesson contains instructional content; a review exercise to reinforce the learning objectives; a list of references and suggestions for further reading.

LESSON 1 -
BENEFITS

After completing this lesson, you should be able to:

- Understand that ICT used in Education can consist of computers and devices, networks, applications/tools, and digital content
- Outline the benefits of using ICT to support and enhance teaching
- Outline the benefits of using ICT to support and enhance learning
- Outline the benefits of using ICT to support and enhance assessment
- Outline barriers to using ICT to support and enhance teaching, learning and assessment

1.1 Overview of ICT in Education

Concepts

As ICT evolves at a fast rate and becomes more and more integrated into every aspect of daily life, teaching and learning professionals are challenged with the task of successfully integrating ICT into education. Due to the proliferation of ICT available and the very nature of teaching and learning, this can sometimes seem like a daunting and complex task.

However, by developing your ICT skills and combining them with your existing pedagogical skills you will be able to use ICT in countless ways to support you in your teaching practice - from sharing knowledge and experiences with your peers to enhancing and improving the learning experience and assessment process for your students. As you build your competences in this area, you will find more and more ways to integrate technology effectively and successfully into your work thereby helping your students to achieve their learning goals.

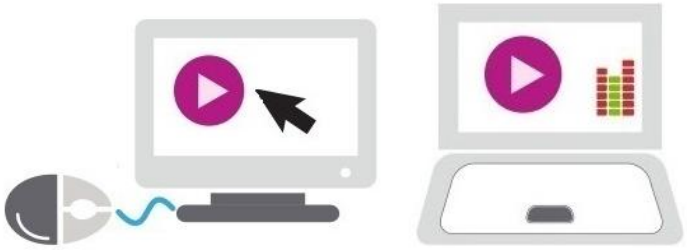
So what do we mean by ICT? Why should you integrate ICT into education? What are the benefits? And most importantly for you and your students, how do you start to successfully and effectively integrate ICT into your teaching practice to improve learning outcomes?

What do we mean by ICT?

ICT (Information and Communication Technology) covers a broad range of technologies. It can be defined as the technological tools and resources used for transmitting, storing, creating, sharing or exchanging data or information.

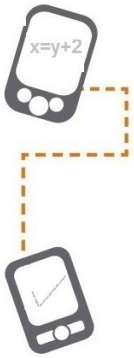
Broadly, ICT in education can consist of computers and devices, networks (including the Internet and social networks), applications/tools, and digital content.

Computers can include traditional desktop computers and mobile computers such as laptops, netbooks and tablets.

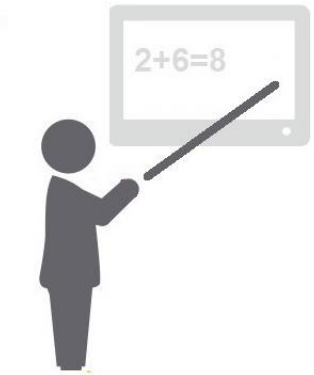


Devices can include:

- Mobile devices such as smartphones, media players, digital and video cameras, and e-readers.

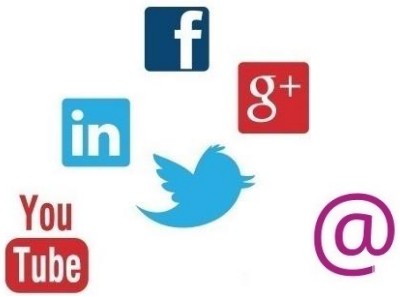


- Classroom display devices such as interactive whiteboards, digital projectors, and digital visualisers.



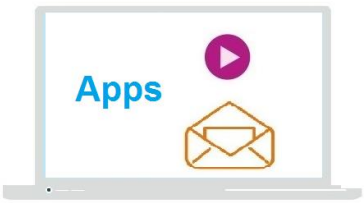
- Peripheral devices such as printers, scanners, speakers, webcams, microphones, and gaming devices. Note: speakers, cameras and microphones are often integrated into computers and smartphones.
- Assistive technologies such as specialist joysticks, tracker balls and keyboards.
- Data recording devices such as dataloggers.

Networks can include external technical network infrastructures such as the Internet and internal networks such as intranets. A network can also be used to describe social networks where teachers can share experiences, information, lesson ideas and content in online communities of practice; and where students can share ideas and information. In a learning context, social networks are sometime referred to as learning networks.

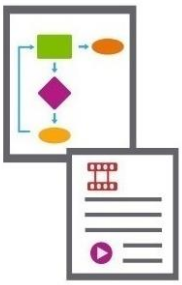


Applications/tools can include **generic applications/tools**, such as productivity tools, communication tools, collaboration tools, media authoring tools and assistive technology tools: tools that are used in the workplace, education, and everyday life.

Other types of tools can be broadly classified as **applications/tools that are created specifically for educational purposes**. These tools include subject-specific applications/tools, exploratory/game-based tools and learning platforms. Note: Learning platforms are also known as learning management systems (LMS), content management systems (CMS) and virtual learning environments (VLEs).



Digital content can include digital content in the form of text, images, audio, animation, video, and interactive content. It can includes things like reference materials and subject-specific materials. Digital content used in education should be age-appropriate, suitable for the curriculum, localised and culturally relevant.



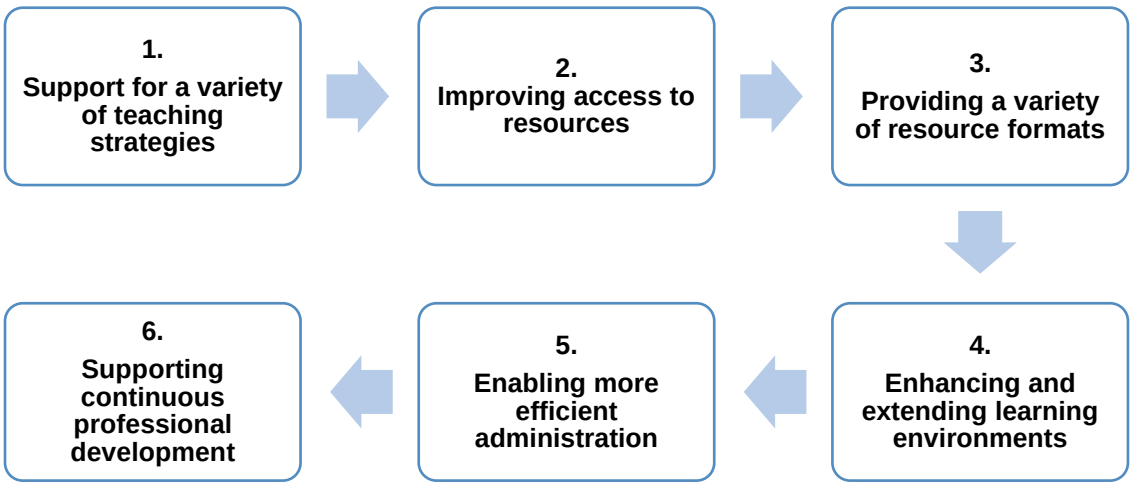
The breadth of ICT that can be used in education and the diverse nature of the topic is highlighted by the many different terms used to describe the use of ICT in education. Some other terms include:

- ICT-enhanced teaching, learning and assessment
- Technology-enhanced learning
- Learning technologies
- Educational Technology
- Edtech
- E-learning
- Computer-based learning
- Online learning

1.2 Benefits for Teachers

Concepts

So as a teacher, why should you integrate ICT into education? Some of the benefits for teachers include:

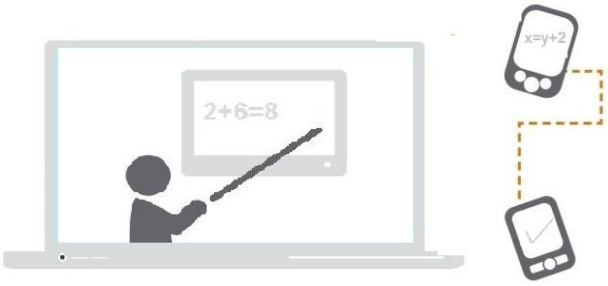


Benefits for teachers

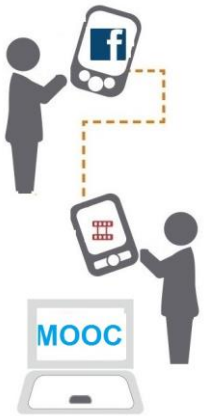
1. **Support for a variety of teaching strategies** – You will decide which teaching strategy or combination of strategies are appropriate in your teaching context, but you can use ICT to support your choices. ICT can support a variety of traditional and new teaching strategies in many engaging and innovative ways, including:
    - ✓ **Learner-centred or personalised learning** where the teaching is tailored to the student's learning needs. For example, you might select resources such as simulations or online quizzes that can be used to enhance the student's abilities.

- ✓ **Collaborative learning** where learning takes place with two or more learners learning together. For example, you might create learning activities where students complete online searches together, or record each other reading, storytelling, or speaking in foreign languages, or complete simulations or games together.
- ✓ **Inquiry-based learning** where learning takes place through problem solving and investigation rather than through presentation of facts. For example, you might create learning activities where students use online searches to discover answers, or use video calls to speak with experts, or document their findings electronically.
- ✓ **Project-based teaching or learning** where learning takes place through completing a project over an extended period of time to answer a complex or challenging question or problem. For example, you might create learning activities where students use online searching, or use recording tools to document an experiment, or use multimedia or presentation tools to document their project.
- ✓ **Flipped classrooms** where the traditional teaching model is flipped. In this strategy the transfer of facts and information, which traditionally takes place in the classroom takes place at home, typically using lecture style videos. And the completion of projects and exercises, traditionally completed as homework, takes place in the classroom.

2. **Improving access to resources** – You can use ICT to easily find and share resources. For example with the use of Internet and mobile technologies you can access and share resources quickly and easily from wherever you are, whenever you want. And the proliferation of social networks and other education-based websites and portals allows you to easily access a wide range of resources. Many resources are curated and free but you should always use your pedagogical and critical evaluation skills when selecting resources online.
3. **Providing a variety of resource formats** – You can use a wide variety of digital resource formats including text, images, audio, video, and animation to make your lessons more innovative, interactive and engaging for your students. You can incorporate different formats into your teaching practice, your learning and assessment resources and learning activities.
4. **Enhancing and extending learning environments** – You can use technologies such as display technologies in the classroom to enhance a traditional learning environment. You can also extend the learning environment to an online environment through the use of Internet connections and technologies such as learning platforms. You can also extend the learning environment to a mobile environment through the use of mobile technologies.



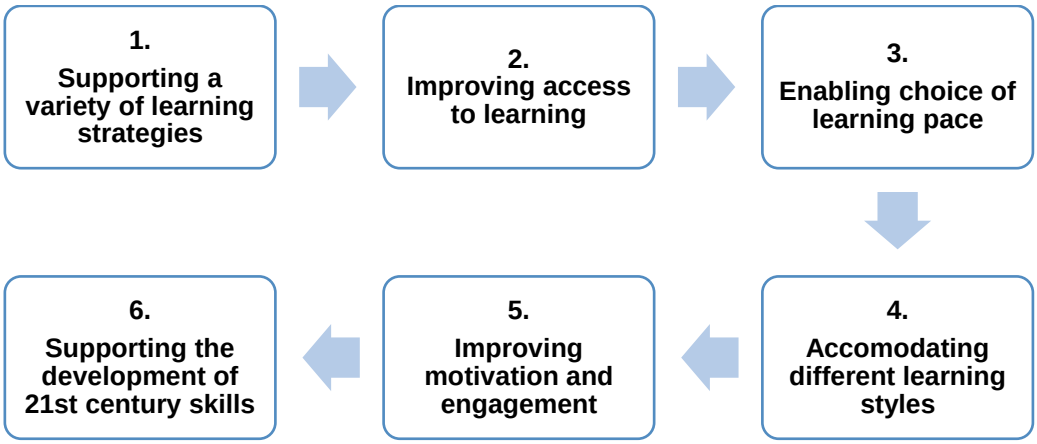
5. **Enabling more efficient administration** – As well as teaching your lessons, you will have many administrative tasks to complete on a regular basis. You can use ICT tools to complete your administration tasks more effectively and efficiently. Using tools like spreadsheets, databases, learning platforms and communication technologies to manage tasks like record keeping can give you more time to concentrate on student learning.
6. **Supporting continuous professional development** – You can use ICT for continuous professional development. For example, you can access online courses such as MOOCs (massive open online courses) and webinars (also known as web-based seminars). And you can use collaboration and communication technologies to engage with global and regional online communities and to create your own learning networks and communities of practice.



1.3 BENEFITS FOR LEARNERS

Concepts

Many of the benefits that teachers experience from integrating ICT into their teaching practice can also apply to students. But it can be worthwhile to look specifically at the benefits of using ICT for learners, including:

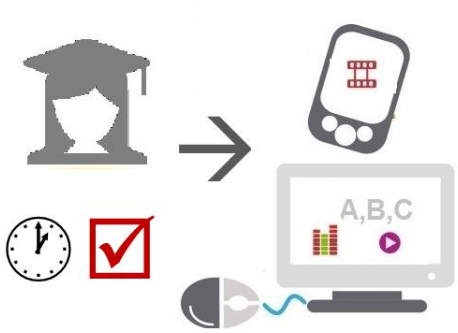


Benefits for learners

1. **Supporting a variety of learning strategies** – As outlined in the benefits for teachers you can use ICT to support a variety of traditional and new learning strategies including, among others, personalised learning, collaborative learning, and project-based learning. You can also use ICT to support other strategies including:

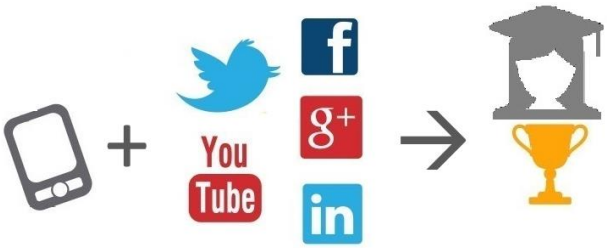
   - ✓ **Active learning** where the students participate in the learning process rather than being passive recipients of information. For example, students might find information and resources online or they might complete learning activities designed by you that use ICT tools to complete experiments and document results.
   - ✓ **Independent learning** where students, who are typically older, take responsibility for their own learning and can set and pursue their own learning goals with minimum direction. For example, older students might search online for information and resources using search engines or social networks or they might create their own learning resources using multimedia tools or productivity tools.
   - ✓ **Informal learning** where students follow their own learning paths rather than passively receiving information from the teacher as is usually the case in a more formal or traditional teaching model. For example, students might source and take online courses or they might join groups on social networks to share resources and ideas. As well as subjects covered by the curriculum, they might learn about other topics that interest them.

2. **Improving access to learning** – Students can use Internet and mobile technologies to access learning at any time and from any location. For example, older students might use the Internet to find reference materials, take an online tutorial, or communicate with their peers or experts at any time, from any location. And younger students might access age-appropriate learning at home or on a journey - for example they might practice their numeracy and literacy skills at home using online games.



3. **Enabling choice of pace of learning** – Students can use ICT to set the pace at which they learn. For example, students can use e-learning courses or simulations to learn at the pace that suits them.

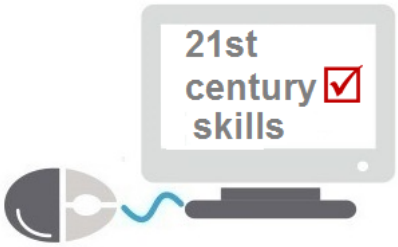
4. **Accommodating different learning styles** – You can use ICT to support different learning styles by using a variety of digital resource formats. Different formats such as text, image, audio, video, simulations, games, quizzes, and demonstrations can appeal to different learners.
5. **Improving motivation and engagement** – You can use ICT to improve student motivation and engagement by using a variety of active and engaging electronic resource formats such as videos, games and simulations. Students can also be motivated and engaged by using tools for learning that they typically use in their free time, such as social media tools.



6. **Supporting the development of 21st century skills** - There are many definitions of 21st century skills defined by different bodies but they can broadly be described in this context as the skills that students need to live and work in the ever-changing digital world of the 21st century. These skills include creativity, critical thinking, problem solving, communication and

collaboration skills, the ability to learn, social and civic responsibility, entrepreneurship and cultural skills, and ICT and information literacy skills.

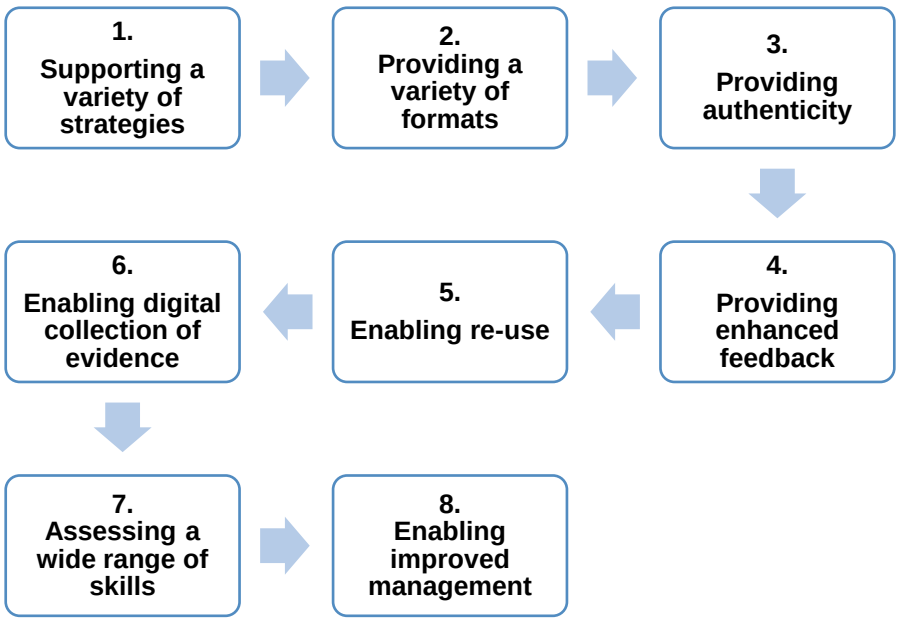
As well as developing ICT skills by learning how to use technology effectively, students can develop other 21st century skills while using technology in the learning process. For example, you can use technologies like search, collaboration, communication and content creation tools to support collaborative, problem-based and project-based learning strategies. In using these tools as part of the learning process, students can develop a wide range of 21st century skills.



1.4 Benefits for Assessment

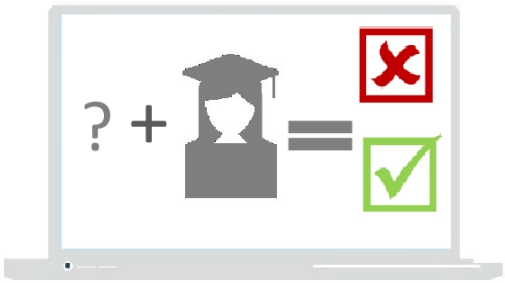
Concepts

There are many benefits for teachers and learners from using ICT to support and enhance the assessment process, including:



Benefits of using ICT for assessment

1. **Supporting a variety of assessment strategies** – You can use ICT to support and enhance a wide range of assessment strategies and types, including diagnostic assessment, formative assessment, summative assessment, formal assessment, informal assessment, self-assessment, peer assessment, and collaborative assessment. For example, you might:
    - ✓ Use an online survey for diagnostic assessment to determine a student's current abilities or progress.
    - ✓ Use an electronic portfolio or an onscreen test to demonstrate a student's skill in a summative assessment.
    - ✓ Use an online quiz, simulation or game for practice and self-assessment.
    - ✓ Use collaborative tools such as blogs to enable peer and collaborative assessment.
2. **Providing a variety of formats** – You can use ICT to include a variety of formats in your assessment. You can use text, images, audio, animation, and video to make your assessment appealing and engaging for students.
3. **Providing authenticity** – You can use ICT to make assessment more authentic for students by incorporating real-world scenarios. For example, you might use simulations, virtual worlds and social media to create assessment where students can practice or demonstrate their skills in authentic situations.
4. **Providing enhanced feedback** – You can use ICT to provide immediate and adaptive feedback to students. For example, you might source or create an onscreen assessment where students receive immediate feedback tailored to their responses.



5. **Enabling re-use** – ICT provides assessment formats and collaboration tools that enable assessment to be easily shared and re-used. Sharing and re-using assessment can help reduce your workload. For example, you might find a quiz or simulation online so you don't have to create one from scratch. Or your school might share formative assessment on a shared network that everyone can access.
6. **Enabling digital collection of evidence** – You can use ICT to collect evidence of student learning in digital format. Collectively these types of tools are commonly known as electronic portfolios. You can use electronic

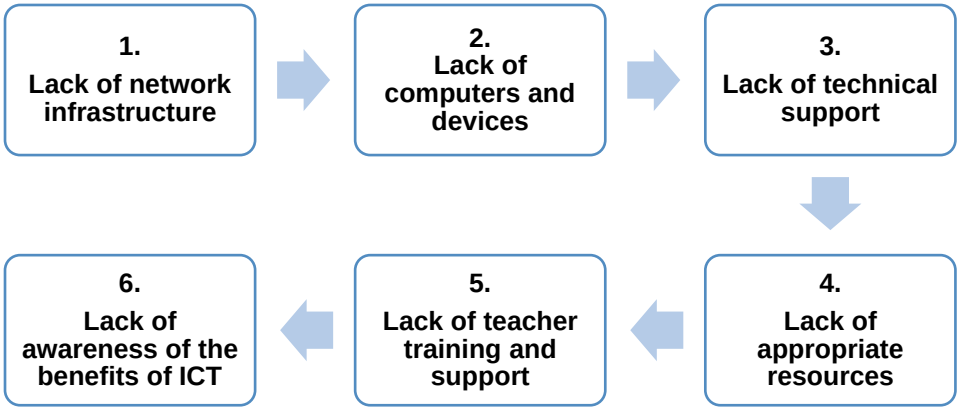
portfolios for different types of assessment including formative and summative assessment. For example, students can demonstrate their knowledge and skills by creating content in different formats using a range of authoring tools. They can also update their work easily. And they can share their work using tools like online storage, social networks and learning platforms.

7. **Assessing a wider range of skills** – You can use ICT to assess a wider range of student skills than can typically be assessed in the classroom. You can use different assessment types such as electronic portfolios, simulations, games, and virtual worlds to allow students to demonstrate skills that go beyond the physical walls of the classroom.
8. **Enabling improved management** – You can use ICT to improve how you manage assessment. For example, you can use tools such as spreadsheets, databases, learning platforms, plagiarism detection software, and communication tools to manage submissions, marking, storage and communication of results.

1.5 Potential Challenges

Concepts

Despite the many benefits of using ICT in education, it may not always be possible to integrate ICT effectively into your teaching practice. You should be aware of the potential challenges you might face when planning to use ICT in education so that you can plan ways to overcome them. Some potential challenges include:



Challenges to using ICT in education

1. **Dependency on network infrastructure** – You need to have access to a good quality Internet connection, such as high speed broadband, in your classroom in order to access Internet technologies during lessons. If you don't have access to a good Internet connection in your classroom you will not be able to take advantage of learning technologies like online resources, communication tools and collaboration technologies.
2. **Lack of computers and devices** – You need to have access to a sufficient number of good quality computers and devices. A lack of good quality computers and devices can be a challenge to using ICT effectively.

3. **Lack of technical support** – You need to be able to access technical staff and support services (e.g. hotlines) when you have problems in order to use ICT effectively. You need support to maintain and upgrade technical equipment such as computers, devices, and networks. And you need support in using and maintaining software and content. A lack of technical support can leave you with ICT that you can't use.

4. **Lack of appropriate resources** – You need to be able to access suitable resources to create effective lessons. Resources need to be:

    - ✓ Age appropriate
    - ✓ Subject-specific
    - ✓ Localised
    - ✓ Culturally relevant

    A lack of appropriate learning resources may mean you can't tailor your lessons to your students' needs. You can use ICT to create your own resources but this can be time consuming.

5. **Lack of teacher training and support** – You need appropriate training and ongoing support in both the technical and pedagogical aspects of using ICT in education. You need to be confident that you can use technology effectively to transform your students' learning experience and improve their learning outcomes. If you don't have the required skills, you might not be confident in your abilities and this in itself can be a challenge. The type of teacher training and support you receive in your school system is typically outside your control but you can start to build your competences by taking relevant courses, talking to colleagues who have experience in the area, and joining relevant online communities.

6. **Lack of awareness of the benefits of ICT** – If school staff, students and parents are not aware of the benefits of using ICT in teaching, learning and assessment it can result in a lack of motivation to use ICT. You can raise awareness in your school about the benefits of integrating ICT into education.

1.6 REVIEW EXERCISE

1. You are discussing with a colleague the different types of ICT that you could potentially use in your classroom. Which one of the following is the best description of the broad range of ICT that you can use?
    a. It is mainly eLearning courses.
    b. It is mainly word processing and presentation applications.
    c. It is mainly computers in a computer lab.
    d. It is mainly computers, devices, the school network, the internet, applications, and digital content.

2. You are telling a colleague about the possible benefits of using ICT in their teaching practice. Which one of the following is a possible benefit for them?
    a. Access to professional development resources on the Internet.
    b. Immediate improvement in student behaviour in class.
    c. Automatic improvement in teaching skills.
    d. Less need to plan lessons in advance.

3. List three possible benefits of using ICT for learning:

    _____

    _____

    _____

4. Which one of the following is a potential benefit of using ICT when assessing student progress?
    a. It guarantees improved test results.
    b. It ensures that test questions are always accurate.
    c. It makes it easier to re-use test questions.
    d. It checks that assessment questions are mapped to the curriculum.

5. Which one of the following best describes common challenges of integrating ICT into lessons?
    a. Lack of appropriate content tailored to the curriculum.
    b. Lack of fast internet connections and appropriate devices for the whole class.
    c. Insufficient technical support or pedagogical advice.
    d. All of the above options.

1.7 REFERENCES AND FURTHER READING

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LESSON 2 -
SAFETY, SECURITY AND WELL-BEING

After completing this lesson, you should be able to:

- Understand the concept of an acceptable use policy (AUP)
- Understand the importance of educating students and parents about safe and responsible Internet use
- Outline some potential risks for students using the Internet
- Outline ways to minimise risks for students using the Internet
- Be aware of the importance of protecting student data by implementing relevant data protection laws
- Understand the teacher's role and responsibilities in implementing data protection policies
- Recognise some methods for protecting data on computers and devices
- Recognise some ways to help ensure teacher and student well-being while using a computer or device

2.1 Acceptable Use Policies

Concepts

When using ICT in an educational environment it is good practice to set some rules for how it can be used by staff and students in order to protect everyone from potential risks. A good starting point is to create a document called an acceptable use policy (AUP).

An acceptable use policy (AUP) is a document that outlines what the school determines is acceptable in terms of behaviour when using computers and the Internet. It typically applies to students and staff.

You should check if there is an existing AUP for your school system that you can use. If not, there are many examples of AUPs available online that you can use as a starting point for creating your own AUP.

In general, AUPs typically cover the appropriate use of e-mail, Internet, social media, network equipment, data, computers and mobile devices. They can also cover a wide range of ICT issues, including:

- Internet safety
- Data security
- Data protection
- Accessibility
- Health and safety

Your AUP should be created with input from parents, students, teachers, and school management. It should be communicated to all students, staff and parents, and you should continually review and update your AUP to take account of continuous advances in technology.

2.2 Potential Online Risks

Concepts

There are many potential risks for young people when using the Internet whether in school, at home or on mobile devices. In a school environment, this can cause much concern among staff and parents. You should ensure that students and parents are aware of the potential risks associated with using the Internet, particularly the risks associated with social media.

However, the risks associated with using the Internet, including social media, are usually a result of how people use the Internet and how they behave online rather than the technology itself. You should also ensure that students and parents understand how to use the Internet safely and responsibly. To raise awareness, you might cover this topic in class with students and inform parents through information sessions or sending information home. And you should also document appropriate guidelines for using the Internet and social media in your AUP.

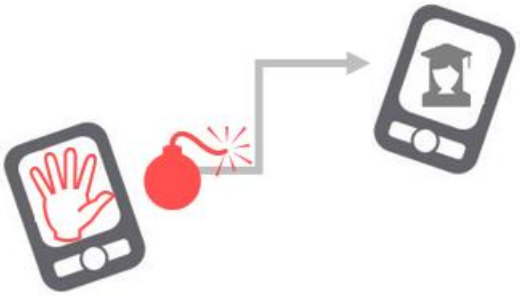
One potential risk for students is **online bullying**, also known as cyber bullying. This is when an individual or group of students make another student feel threatened or marginalised. For example, students may use social networking sites to post hurtful comments or spread rumours about others. It is easy to assume a false identity or to be anonymous online, which can make bullying online easier.

Another potential risk for students is **sexting**. This is the taking and sending of sexually suggestive or explicit messages or images, usually using a mobile phone. The sender has no control over how these messages or images are used after they are sent. Images and messages can be shared widely and quickly by text, email or social networks. Furthermore the messages or images will exist forever and could have negative consequences into the future. You should also make your students aware if creating, transmitting or possessing a sexual image of a minor is illegal in your jurisdiction and that they could be committing a criminal offence by sexting.

When online, students may also be at risk of **receiving unsolicited messages.** These types of messages can be known as spam or junk mail. They pose a threat as they may contain viruses. Or they may be sent with the intention of tricking you into disclosing personal information – this is known as phishing. For example, older students might receive an unsolicited message that aims to trick them into disclosing personal information such as bank details.

Students may also be at risk from **accessing or downloading illegal or inappropriate material**. There is a lot of material on the Internet that is illegal or not age appropriate. Young people might access this material by accident, for example, in an online search or they might access it on purpose. They should also be aware that they should not create or share illegal or inappropriate material. As well as being ethically inappropriate they might be at risk of committing a criminal offence, depending on the laws in the jurisdiction.

Another potential risk for students when they are online is being tricked or **lured into inappropriate behaviour or meetings** by people who assume false identities and pose as potential friends online. These people might make friends with the intention of tricking young people into inappropriate behaviour either while they are online or in the real world. For example, on social networks adults might pretend to be the same age as a young person in order to gain their trust but with the intention of taking advantage of them. Once someone has gained the young person's trust they might trick them into swapping explicit photos or videos or behaving inappropriately. They might also trick the young person into meeting in real life in order to cause harm them.



2.3 Minimising Online Risks

Concepts

Despite all the potential online risks, you can help young people minimise the risks and stay safe and responsible online by sharing some general tips. These include:

1. Always treat others with respect online. You should treat people online with the same respect you treat people in real life.
2. Do not access or create inappropriate materials or messages.
3. Report any inappropriate materials or messages to your parents, a teacher or another trusted adult.
4. Do not share your personal information or passwords with anyone.
5. Make sure you use appropriate privacy settings in social media. Your posts can easily be shared with large numbers of strangers quickly if you don't set your privacy options.
6. Do not reply to unsolicited messages.
7. Report any unsolicited messages to your parents, a teacher or another trusted adult.
8. Always log off from websites.
9. Never meet someone in real life that you have met online.
10. Report any requests for meetings with people you meet online to your parents, a teacher or another trusted adult.

It can also be appropriate for teachers and parents to control young people's access to Internet content and social media/networks. You can do this in several ways including:

- ✓ **Using software solutions to control access to Internet content**. One type of solution you can use is content filtering software. There are different types of content filtering software - for example you can set options in web browsers, search engines and operating systems to restrict what students can access. In addition, you can set restrictions for the entire school at the network level using a proxy server.
- ✓ **Physically monitoring student's online activity and regulating the length of time on devices**. You can set scheduled internet sessions and physically monitor the content that students access in school. And at home, especially with younger children, parents can ensure that they only use devices in their presence and at set times.

As well as protecting young people from online risks, you should keep yourself safe online and protect your professional reputation, especially when using social media. Many of the same risks and guidelines for young people can be applied to adults as well. A lot of information on social media is public so you should check that your privacy settings on social media are appropriate – for example you probably don't want students to see photographs you have posted or photographs you are tagged in, so you should adjust your privacy settings accordingly.

Even if you think you are protected by your privacy settings you should be aware that when you post something online you no longer have control over it. Electronic information can be easily copied and shared. For example, someone could take a screen shot or photograph of a screen that can then be shared in different ways.

And be careful that you don't post, share or like anything that might cause you or others embarrassment or possibly compromise your professional reputation or your school's reputation.

Schools should include appropriate guidelines in their AUP outlining how students and teachers can protect themselves online.

2.4 DATA PROTECTION

Concepts

As well as protecting student's safety when they are online it is important to protect student data in a school environment. This can include things like contact details, medical information, and assessment results. Schools can protect student data by implementing relevant data protection laws and outlining the relevant guidelines in their AUP. Data protection laws are different depending on the legal jurisdiction so schools need to check what is appropriate in their context.

In a school environment as a teacher you should know who is responsible for setting your school data protection policies. You should also understand your own role and responsibilities.

Depending on the data protection laws in your jurisdiction, the following might be part of your role and responsibilities in relation to data protection:

- Only collect information about students for a specific purpose and ensure that it is relevant and up-to-date.
- Inform students about their data protection rights and give them access to information held about them on request.
- Ensure that any data held about students is kept secure and isn't shared without prior permission.
- Only keep data about a student for as long as necessary.
- Only publish photographs of students, for example on the school website, with prior permission. In some cases permission is needed from the student and their parent or guardian.

2.5 DATA SECURITY

Concepts

Another aspect of protecting data in schools is protecting data from potential threats that might result in loss of data or damage to data. Schools should implement relevant solutions and outline the rules around them in their AUP.

Potential threats to data might include:

- Malware threats
- Unauthorised people accessing data
- Data theft
- Accidental damage

Some solutions for protecting data from loss or damage include:

- ✓ **Setting up security policies** and reviewing them regularly to make sure they are fit for purpose.
- ✓ Upgrading **security software** on a regular basis to protect against new threats.
- ✓ Using **anti-virus software** to protect computers and devices from malware threats. Some types of anti-virus software can prevent malware from being installed. And some types can detect and remove malware once it is present.
- ✓ Using **firewall software** to protect your internal network against threats from an external network such as the Internet. Firewall software controls the incoming and outgoing network traffic.
- ✓ Using **encryption software** to protect sensitive information from unauthorised access. Information is encoded so that it can be read by authorised people only.
- ✓ **Backing up data** by making copies of electronic information. Data should be saved to another storage medium regularly and stored offsite. This is important in the event that data is lost through theft or damaged by a flood or fire in the school.
- ✓ **Using good password policies** such as using strong passwords (typically a minimum of eight characters with a mix of numbers, letters and cases), changing passwords regularly, and not sharing passwords.
- ✓ **Securing equipment** by storing all equipment in a secure location. Some tips for keeping devices secure include:
    - Using laptop or tablet trolleys.
    - Locking them securely in safe storage facilities.
    - Using password controls.
    - Setting up remote tracking, locking, and wiping to be used in the event of loss or theft.

Mobile devices such as tablets and laptops are particularly easy to steal in a school environment because they are easy to carry and hide, and because devices are used by a number of different people it can be difficult to keep track of them.

2.6 WELL-BEING

Concepts

While using ICT, it is important that you and your students protect your physical well-being and that it is noted in the AUP. Prolonged use of a device can result in a number of short- and long-term effects if not used appropriately. Some simple tips include:

1. **Take regular breaks** if working at a computer or device for a long period of time to help avoid eye strain, neck, back and wrist strain. You should move away from the computer or device for a few minutes every 30 minutes.

2. **Ensure appropriate positioning** when using ICT equipment in schools to avoid neck, back and wrist strain or repetitive strain injury. In schools there are lots of different people of different sizes and heights using the same equipment so the position of each person in relation to the desk, chair, and computer or device should be adjusted so that it is right for them.

   When using a **desktop computer**, some recommendations for appropriate positioning include:

   - ✓ Keep your arms in line with the desk.
   - ✓ Make sure your knees have space under the desk.
   - ✓ Keep your back well supported.
   - ✓ Position your wrists slightly above the keyboard.
   - ✓ Ensure that the mouse is at the same height as the keyboard.
   - ✓ Ensure that the top of the screen is at eye level.
   - ✓ Look down rather than up at the monitor.

When using a tablet, some recommendations for appropriate positioning include:

- ✓ Use a separate keyboard for extensive text entry on tablets.
- ✓ Use a tablet stand to position the tablet at an appropriate angle for reading.

3. **Ensure appropriate lighting** while working on a computer or device to avoid eye strain. Some recommendations include:
   - ✓ Ensure there is enough natural light.
   - ✓ Ensure monitors are at right angles to windows to avoid glare.
   - ✓ Ensure students never look directly into the beam of data projectors.
   - ✓ Use short or ultra-short throw data projectors, for example if installing interactive whiteboards.
4. **Ensure adequate ventilation** in rooms where computer equipment is being used. Computer equipment can generate heat, so always make sure that rooms with computer equipment are well-ventilated.
5. **Ensure rooms are hazard free** and there are no loose cables connecting equipment that you or students can trip over.

2.7 REVIEW EXERCISE

1. Which one of the following best describes an AUP?
    a. It provides teachers with pedagogical strategies.
    b. It contains the school calendar of events.
    c. It contains a list of students by class.
    d. It provides guidance about appropriate behaviour when using ICT.

2. Which TWO of the following statements are TRUE?
    a. Students and parents need to know about safe and responsible Internet use.
    b. Parents do not need to know about safe and responsible Internet use.
    c. Online risks are mainly because of people's behaviour rather than technology.
    d. There are no risks for students using online tools such as social media.

3. List four potential risks for students using the Internet:

    _____

    _____

    _____

    _____

4. Parents have expressed concerns about students seeing inappropriate content using the Internet in school. Which one of the following is the most appropriate way to protect students online?
    a. Tell them they are not allowed to view inappropriate material.
    b. Use content filtering software options.
    c. Provide them with a list of approved websites to visit.
    d. Don't allow them to use the Internet in school.

5. Which two of the following statements are TRUE?
    a. Data protection laws are not applicable in a school environment.
    b. Data protection laws vary depending on the jurisdiction.
    c. Teachers should comply with data protection laws.
    d. Teachers do not need to know about data protection laws.

6. You want to publish photographs on your class blog of students at a recent school concert. Whose written permission should you typically request before publishing the photos in order to comply with data protection policies?
    a. The school principal.
    b. The software provider.
    c. The school website administrator.
    d. Your students and their parents or guardians.

7. Match the software to the correct description:

1.	2.	3.
Anti-virus software	Encryption software	Firewall software

a. _____ can be used to protect an internal network against threats from an external network such as the Internet by controlling the incoming and outgoing network traffic.
b. _____ can be used to protect sensitive information from unauthorised access by encoding it so that it can be read by authorised people only.
c. _____ can be used to protect computers and devices from malware threats by preventing, detecting and removing malware.

8. List four ways to ensure teacher and student well-being when using ICT in class:

_____

_____

_____

_____

2.8 REFERENCES AND FURTHER READING

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LESSON 3 -
PEDAGOGY AND ICT

After completing this lesson, you should be able to:

- Outline how ICT can support different learning styles
- Outline how ICT can support different teaching/learning strategies
- Outline how ICT can support different learning environments

3.1 ICT AND LEARNING STYLES

Concepts

There are many learning style theories and models, which classify learning styles or preferences in many different ways. You will determine which learning style model, if any, is appropriate for you in your teaching context. A typical example is to identify whether learners have one or more of the following learning styles:

- An auditory learning style where learners prefer to learn by listening.

- A visual learning style where learners prefer to learn through visual depictions.

- A kinaesthetic learning style (also known as a tactile learning style) where learners prefer to learn by practicing or "doing" and relating things to their own experience.

Note: While learning styles are a common concept, there is some debate about how important they are for learning. One argument proposes that while students may have learning preferences, supporting them does not lead to better learning outcomes and it is more useful to recognise and support differences in student abilities, interests, and background knowledge.

Using ICT to support learning styles

You can use ICT to support learning styles in many ways. You can appeal to individual learning styles across teaching, learning and assessment activities by using resource formats that suit the learning style. And when teaching a whole class you can appeal to a range of learning styles in the class by using a variety of formats.

- You can support auditory learners using audio-enabled digital content. For example, audio books, podcasts, video, television, radio, and audio-enabled e-learning courses. You can also incorporate the use of audio

when designing learning activities. For example, you might design a learning activity where students use audio recording devices and editing software to create an audio recording about a subject in the curriculum.

- You can support visual learners using image and video formats. For example, you might use video and graphic rich e-learning, presentations, and online demonstrations, video calls with outside experts or other classes and modelling software. You can also incorporate the use of visual formats when designing learning activities. For example, you might design a learning activity where students use digital video cameras and video creation software to create a digital story.

- You can use interactive formats such as simulations, interactive games and quizzes to support kinaesthetic learners. You can also incorporate the use of interactive formats when designing learning activities. For example, you might design a learning activity where students use Internet search tools to complete a search for information on a particular topic. Or you might ask students to use a simulation to practice a concept or skill they are learning about in class.

3.2 ICT AND TEACHING/LEARNING STRATEGIES

Concepts

As mentioned when discussing the benefits of using ICT in education there are many approaches to using ICT to support and enhance traditional and new teaching and learning strategies. You will decide which teaching and learning strategy or combination of strategies are appropriate in your teaching context and which type of ICT is appropriate to support your choices. Some examples include:

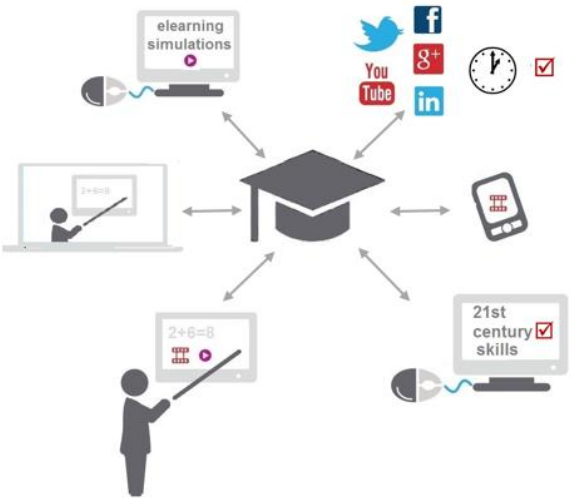
- ✓ Learner-centred learning
- ✓ Collaborative learning
- ✓ Informal learning

Learner-Centred Learning

In a learner-centred learning approach, sometimes known as a personalised or differentiated learning approach, the teacher's focus is on tailoring learning to suit the individual student and their needs, their background knowledge, abilities, interests, and learning style. In this model the student is an active participant, constructing their own learning, at their own pace. This is in contrast to traditional teacher-centred learning approaches, where the teacher is a knowledge expert, transferring information to a passive student, at a pace set by the teacher.

Examples of how you can use ICT to support learner-centred learning include:

- Using tools like simulations and online quizzes to assess learning progress.
- Using tools like online surveys to identify individual learning styles.
- Designing strategies to suit individual learning styles by using different resource formats.
- Students using tools like e-learning courses to learn at their own pace.
- Students using tools like Internet search tools to become active participants in constructing their own learning.

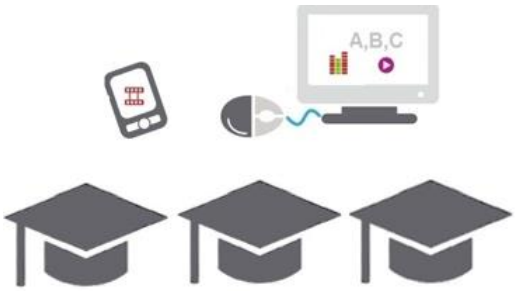


Collaborative Learning

In collaborative learning approaches, the teacher's focus is on facilitating two or more students or a whole group to work together to learn something. This can take the form of finding information, solving problems, discussing topics and creating information together. Teachers are facilitators in this type of learning and students are active participants in their own learning.

You can use ICT in learning activities that support collaboration between students including:

- Activities where students use the Internet to find information together.
- Activities where students use collaboration tools to create content collaboratively.
- Activities where students use communication tools to discuss topics and solve problems together.



Informal Learning

In informal learning, students learn in an informal context that is not directed by their teachers. In this type of learning, students are active participants in their own learning, they use their own approaches to learning and set their own learning goals. This is generally more relevant for older students.

ICT provides tools that can support informal learning. Using Internet and mobile technologies, students can access information when and how they want and at a pace they set themselves. Some examples include:

- Searching for information using search engines.
- Communicating using online chat tools or social media.
- Collaborating to complete projects using tools like online storage tools.
- Creating content using blogs.
- Participating in courses using online learning websites.

3.3 ICT AND THE LEARNING ENVIRONMENT

Concepts

You can use ICT to support a variety of learning environments from traditional teaching environments to blended learning environments to wholly online learning environments.

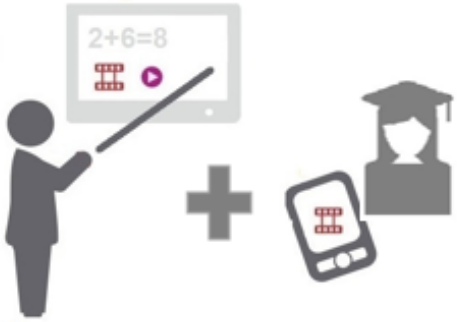
Traditional teaching environments

In traditional teaching environments the teacher's focus is on transferring knowledge to students and enabling learning within a classroom environment. In a traditional teaching environment you can use ICT to enhance your teaching, engage your students and improve their motivation.

For example, you might use presentational technologies such as interactive whiteboards, digital projectors, and screen sharing software. Or you might use digital educational resources on devices like tablets instead of traditional books.

Blended learning

In blended learning the teacher combines the traditional classroom environment with online learning practices. This approach can be a good way to facilitate active and independent learning among students.



For example, you might introduce a topic in class and follow up with a simulation in class or an online discussion after class. Or you might use a flipped classroom approach where you ask older students to read instructional materials or watch video lectures for homework. Then you can use the time in class for problem-solving and project work to reinforce the learning.

Online learning

In online learning all of the teaching and learning takes place online using Internet-connected computers and devices, including mobile devices.

There are many approaches to online learning. For example, in an online course you might use email for sending instructions, learning materials and assessment to students. Or you might attend or hold a tutorial online using a 'webinar'. Or you might take part in an online course delivered and managed completely online over several weeks or months delivered using a learning platform or other form of online delivery.

3.4 REVIEW EXERCISE

1. Which one of the following would you suggest as the most appropriate learning activity for a student with a preference for an auditory learning style?

    a. Listening to a podcast.
    b. Completing a simulation.
    c. Reading an ebook.
    d. Watching a video online.

2. You have designed a learning activity where students work together in pairs to complete a series of online assessment questions for formative assessment. Which one of the following terms best describes this learning strategy?

    a. Learner-centred.
    b. Informal.
    c. Personalised.
    d. Collaborative.

3. You are describing an online learning environment to a parent. Which one of the following is the best description?

    a. It is when a teacher uses a computer to create lesson materials.
    b. It is when a teacher uses an interactive whiteboard in the classroom.
    c. It is any type of technology used by students in the classroom.
    d. It is the use of internet-connected computers and devices for learning.

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LESSON 4 -
PLANNING TO USE ICT

After completing this lesson, you should be able to:

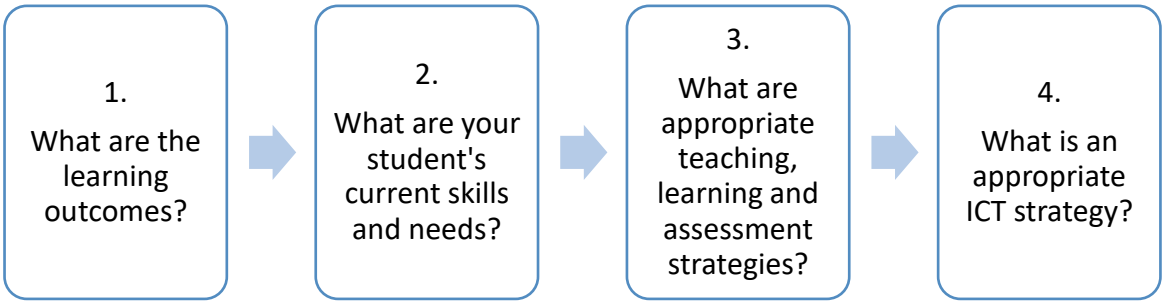
- Outline steps involved in planning an ICT-enhanced lesson
- Recognise that planning an ICT-enhanced lesson includes the selection of appropriate ICT for lesson preparation, teaching activities, learning activities, assessment activities
- Outline practical considerations when planning an ICT-enhanced lesson
- Understand the importance of ensuring equal access to ICT for all students
- Identify some options for enhancing accessibility
- Create a lesson plan for an ICT-enhanced lesson

4.1 LESSON PLANNING

Concepts

When you start to use ICT you need to incorporate it into your lesson planning. Planning an ICT-enhanced lesson involves a variety of steps similar to those in planning any lesson, but with the additional task of selecting appropriate ICT. Whatever ICT you select, it should aim to support and enhance the learning experience and outcomes for your students.

There are many approaches to lesson planning and you will use the approach that suits your context. For example, you might start by identifying the learning outcomes and your student's skills and needs. Then you might decide on a suitable teaching strategy. And in an ICT-enhanced lesson you will select suitable ICT. You should consider all of the factors together in order to determine the best approach for your lesson.



Planning an ICT-enhanced lesson

1. **Identifying the learning outcomes** involves identifying the goals or objectives of the lesson, which are generally determined by the curriculum goals. This may include the development of higher-order thinking skills or transversal skills as well as the development of subject-specific skills.
2. **Identifying the student's skills and needs** can include identifying their existing skills, their preferred learning style, their motivations, their expectations. For older students this can also include their experience of learning.
3. **Selecting appropriate teaching, learning and assessment strategies** involves identifying appropriate strategies that will achieve the learning outcomes and will be appropriate for the student, based on their skills and needs.
4. **Selecting an appropriate ICT strategy** involves selecting an ICT strategy that will achieve the learning outcomes, will be appropriate for the student and will support your teaching, learning, and assessment strategies.

   For example, you may decide that a collaborative learning strategy is appropriate to achieve the learning outcomes for a particular class group. You

may decide to support this using ICT in a learning activity where students will find information on the Internet in pairs and add it to a class wiki.

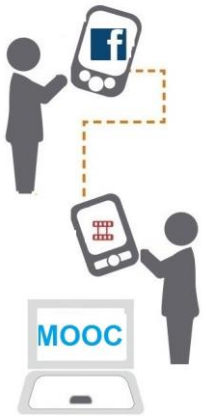
4.2 LESSON CONSIDERATIONS

Concepts

When planning an ICT-enhanced lesson you should consider the selection of appropriate ICT for all aspects of your lesson including:

- Lesson preparation
- Teaching activities
- Learning activities
- Assessment activities

Lesson preparation



You can use ICT to help when you are preparing your lesson. This may include tasks such as sharing teaching best practice with other teachers in an online community, browsing the Internet for content and resources, creating digital content like presentations or videos, preparing learning activities for students, and preparing assessment. Some examples might include:

- Asking other teachers for best practice examples on using ICT via a forum.
- Finding a video online that you can show in class.
- Creating your own video to show in class or for a flipped classroom scenario.
- Designing a learning activity for students to create a video on a topic in class.
- Creating an online survey to help assess student progress.

Teaching activities

When you are preparing your lesson you should select the ICT for your teaching activities. This involves selecting the computers and devices and ICT resources that you will use during the lesson. This can include selecting an appropriate learning environment. Some examples might include:

- Using an interactive whiteboard in the classroom to show a video.
- Using a learning platform to store course materials for students to access.

Learning activities

When you are preparing your lesson you should select the ICT for the student learning activities. This involves selecting the computers and devices and ICT resources that students will use during learning activities in the classroom or for follow-up learning activities at home. Some examples might include:

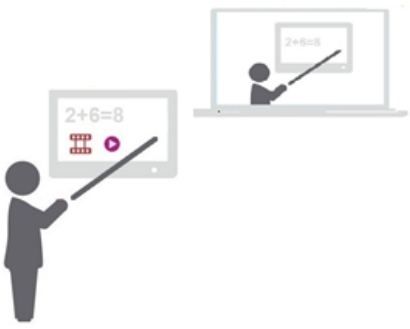
- Asking students to work individually to read a digital text book.
- Asking students to work in pairs to search online.
- Asking students to work in groups using a wiki to create content for a project.
- Asking students to create a digital story.

Assessment activities

When you are preparing your lesson you should select the ICT for assessment activities. This involves selecting the computers and devices and ICT resources that will be used for assessment and feedback.

Some examples might include:

- Using an online quiz for diagnostic assessment.
- Using an online test for summative assessment.
- Using a simulation for diagnostic assessment.



4.3 PRACTICAL CONSIDERATIONS

Concepts

When planning to use ICT in a lesson, it is important to select an ICT strategy that can be implemented. You will need to consider the practical aspects of using ICT in your lesson as the practical considerations will impact the type of ICT strategy that you can implement.

Available ICT and support

You should consider what ICT is available inside and outside school and what technical support is provided. Some considerations include:

- What type of Internet connection is available and how fast is it?
- Is there a wired or wireless network available in all classrooms?
- Is there a system for storing files on a network or online?
- What types of computers and devices are available and how many are there?
- What type of applications are available?
- What type of digital content is available?
- Do new resources need to be created?

Teacher skills

You should also consider your ICT skills and just as importantly your pedagogical skills in the effective use of ICT. Your ICT abilities and skills will have an impact on the type of ICT strategy that you can implement.

Student ICT skills

You should consider your student's ICT skills and whether they will require support to use the technology you are considering.

Room layout

You will need to consider the layout of your room and whether it is suitable to support the ICT strategy you are considering. You should think about whether computers and devices are in classrooms or computer labs in your school. And you should think about what room layout suits the approach you want to implement. You may need to modify the room layout to suit your approach and you will need to check if this is possible.

Timetabling

Another consideration is the duration of the lesson and what you can achieve in the available time. You should consider if there are any other timetabling constraints.

Additional ICT, training and supports required

You should also consider if any additional ICT, training or support is needed to support the implementation of the selected ICT strategy.

For example, are there any additional connectivity, equipment, content or room requirements? Or are there any additional training and support needs? As well as technical training this might include training in how to use ICT effectively to achieve learning outcomes.

4.4 ACCESS CONSIDERATIONS

Concepts

There are many ways that ICT can be used to improve access to learning for students. Internet and mobile technologies can be used to help students access learning from anywhere and at any time – for example students in remote locations can have lessons with a teacher using video chats or email.

And at the same time, one of the challenges when using ICT in education is to ensure that all students have **equal access to ICT** and the learning opportunities that ICT can provide. You should aim to ensure that all your students benefit equally from using ICT for learning.

If the school has a "bring your own device" (BYOD) policy, where students are allowed to bring their own computers and devices into school, those who don't have the devices should be provided with access in school. And if the school expects students to use the Internet and computers and mobile devices at home they should ensure that all students have access to them.

Schools should also ensure that students with disabilities can access the various ICT resources being used and opportunities for learning that ICT can facilitate. Some options to consider in relation to improving accessibility include:

- Assistive technologies
- Web accessibility guidelines
- Accessible PDF documents

Some assistive technologies include:

Special keyboards and other input devices such as roller balls, which enable physically disabled students, unable to use the keyboard or a mouse, to input data into a computer or device.

Speech recognition software which helps students who are unable to use special keyboards by translating voice commands and converting speech into text. It may be used along with an onscreen keyboard.

Screen reader software helps students who are blind or visually impaired by reading aloud the output from a computer screen line by line. Students can listen to the content using headphones. This type of software may be used along with a **braille display** and a normal keyboard for input.

Braille display devices display the content from a computer screen line by line in braille characters by raising pins through a flat surface. Students who are blind or visually impaired can read the output in braille.

Screen magnifiers magnify content on-screen to help students who are visually impaired see the content more easily.

On-screen keyboards provide an alternative to a physical keyboard. Students with a physical disability can type with a mouse or other pointing device, such as a head mouse, a joystick, pen, or mouth-stick.

There are many **operating system settings** within computers, tablets and smartphones that can be configured to make the technology more accessible without the need for additional devices. These include setting onscreen colours, screen and text contrast and text size. You can search online to find out the options for your operating system.

As well as assistive technologies, any websites that you use should follow **web accessibility guidelines**. Web accessibility guidelines aim to make web pages accessible to everyone. There are many guidelines provided by different bodies and governments. You should check what the common standard in your region is. Some examples include using high contrast between the text and the background to make the screen easier to view and ensuring that there are equivalent alternatives provided for any auditory or visual content. It is also important to ensure that **PDF documents are accessible**.

4.5 CREATING AN ICT-ENHANCED LESSON PLAN

Task

In this task you are going to create a lesson plan for an ICT-enhanced lesson of your choosing.

Identify a lesson that you are considering enhancing using ICT. Consider how you would successfully integrate ICT into the lesson. Your ICT strategy should meet the lesson goals, the student's needs, and your teaching, learning and assessment strategy. You should also consider any practical issues and ensure that the learning is accessible to all your students.

Create a lesson plan for your ICT-enhanced lesson and document it in a format of your choosing. You can be as detailed as you need to suit your purposes. You can use a lesson plan template of your choosing, find an appropriate one online, or use the sample lesson plan template provided on the following page. You can modify the template as needed.

Whatever format you choose to document your lesson plan, try to include the following information:

1. The learning outcomes.
2. The student's skills and needs.
3. The teaching, learning and assessment strategy.
4. The ICT strategy.
5. Available ICT and ICT support such as computers and devices, internet connections, type of network etc.
6. Your ICT skills and pedagogical skills in the use of ICT.
7. Any room layout considerations.
8. The duration of the lesson and any timetabling considerations.
9. Any requirements for additional ICT (such as new software, hardware or content), ICT training or ICT support.
10. Any accessibility considerations.

Lesson Plan

	Description
Lesson Title	
Learning outcomes	
Lesson duration	
Student skills and needs	
Teaching, learning and assessment strategy	
ICT Strategy	
Preparation	
Available ICT and Support	
Additional information	

Sample Lesson Plan Template

4.6 REVIEW EXERCISE

1. Which one of the following is the most important question to consider when selecting technology for an upcoming lesson?
    a. Is it free and available in the classroom?
    b. Is it already popular with your students?
    c. Is it appropriate for your students and your teaching strategy?
    d. Is it the latest technology and will it impress your students?

2. Which one of the following is TRUE in relation to how ICT can be integrated into your teaching practice?
    a. It is only useful for presenting content to the whole class group in the classroom.
    b. It is best used for creating summative assessment and managing test results.
    c. It can be used for preparing materials, teaching and assessing, and for student learning.
    d. It is most useful for managing attendance records.

3. You have planned an activity where students will work in groups to search for information using the internet on tablets. Which one of the following is the most important practical consideration?
    a. Access to a wireless network in the classroom.
    b. Access to a sufficient number of PCs or laptops in the classroom.
    c. Access to an interactive whiteboard and projector in the classroom.
    d. That the students will enjoy the activity.

4. List three options for enhancing accessibility for your students:

    _____

    _____

    _____

4.7 REFERENCES AND FURTHER READING

- JISC (2009), 'Effective Practice in a Digital Age: A guide to technology-enhanced learning and teaching', available: http://www.jisc.ac.uk/media/documents/publications/effectivepracticedigitalage.pdf [accessed 05/04/2017]
- Common Sense Media video 'Introduction to the SAMR Model', available: https://www.commonsensemedia.org/videos/introduction-to-the-samr-model [accessed 05/04/2017]
- Common Sense Media video 'Ruben Puentedura on Applying the SAMR Model', available https://www.commonsensemedia.org/videos/ruben-puentedura-on-applying-the-samr-model [accessed 05/04/2017]
- Mishra & Koehler (2006), 'Technological pedagogical content knowledge: A framework for teacher knowledge.', available: http://punya.educ.msu.edu/publications/journal_articles/mishra-koehler-tcr2006.pdf [accessed 05/04/2017]
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- Special education Support Service web site, 'Assistive Technology - An Overview', available: http://www.sess.ie/resources/assistive-technology-overview [accessed 05/04/2017]
- W3C web site, 'A paraphrased summary of Web Content Accessibility Guidelines (WCAG) 2.0', available: http://www.w3.org/WAI/WCAG20/glance/ [accessed 05/04/2017]

LESSON 5 -
ICT RESOURCES FOR TEACHING AND LEARNING

After completing this lesson, you should be able to:

- Identify types of digital content that can be used to support and enhance teaching and learning and outline their key features
- Identify communication tools that can be used to support and enhance teaching and learning and outline their key features
- Identify online collaboration tools that can be used to support and enhance teaching and learning and outline their key features
- Identify productivity tools that can be used to support and enhance teaching and learning and outline their key features
- Identify image, audio, video tools that can be used to support and enhance teaching and learning and outline their key features

5.1 DIGITAL CONTENT

Concepts

There are many types of ICT resources and possibilities for how they can be used to support teaching and learning. Part of your task in planning ICT-enhanced lessons will be to select appropriate ICT resources.

Note: The term “ICT resource” can be used to mean different things depending on the context. Some things it might mean are:

- An application or tool
- A form of digital content
- A type of ITC designed specifically for education
- A generic type of ITC
- An ITC learning resource for students
- An ITC professional development resource for teachers.

In addition a considerable amount of digital educational content is packaged along with applications/tools so there is not always a clear distinction between what is an educational application or tool and educational content.

One type of ICT resource is digital content. Digital content can be described as electronic forms of information accessed via the Internet, CD, DVD or television. What type of digital content you select and how you use it will depend on your teaching context. It is useful to know some of the different types available when making selections. Some examples include:

Digital courses – These are commonly referred to as e-learning courses. They support distance learning and learner-centred learning. They enable the student to select the pace, location and time of their learning. They can be used in the classroom to re-enforce learning, to provide instruction and for revision. Or they can be stand-alone learning environments. A particular type of course is a Massive Open Online Course (MOOC), which is an online course that is open to unlimited numbers of participants. Another type of course is a Small Private Online Course (SPOC), which is an online course that is open to a limited number of participants, typically students enrolled in an on-campus course. A SPOC supports blended learning and flipped classroom learning, which combine online learning with face to face interaction.

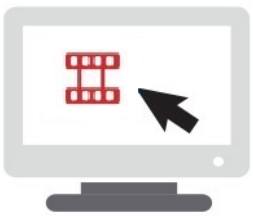
Digital reference materials – These can include online encyclopaedias, maps and dictionaries. They are a good source of information and online versions can be accessed from anywhere at any time.

Electronic books or eBooks – These can include books such as subject-specific text books, reference books, and novels. They are usually downloaded and read on a mobile or handheld device. They can replace heavy hard copies of books and depending on the type of book and device they might include features such as bookmarking and highlighting.

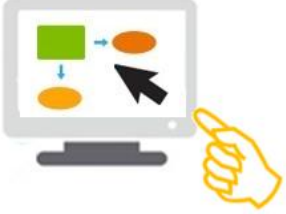
Videos – These can include movies or short video clips. They are an engaging teaching tool and can show students things beyond the classroom that they can't experience for themselves. You can also record your own videos to provide instruction or re-enforcement before, during or after class. Videos can also be used in assessment as an additional way to show information. They can be distributed as podcasts also known as vodcasts when video is included. These are recordings that students subscribe to, which can then be downloaded from a website or learning platform.

Audio files – These have similar uses to video files and can be used to engage students. They can be used as another form of instruction or re-enforcement before, during or after class. They can also be used in assessment. And they can be distributed as podcasts.

Animations – These are animated clips and similar to videos they can be used to demonstrate concepts and engage students.



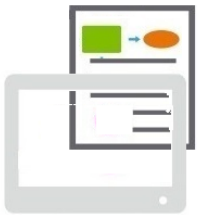
Simulations – These present the student with real-life experiences in a simulated environment. They can be used by students to learn a skill in a safe environment. There are different types of simulation which can range from scenario-based simulations where the student has to solve conceptual problems to others where a student practices technical skills in a completely simulated environment. Typically simulations support personalised feedback.



Virtual worlds – These are simulated worlds, where users interact with each other as avatars, in most cases over the Internet. They are useful for engaging students and enabling them to problem-solve, experiment and develop social skills. Students can re-create events from history or literature and carry out virtual experiments.

Examples include Second Life, Activeworlds, Disney's Toontown, Club Penguin, KidsCom, Tootsville, and Habbo.

Augmented reality – This is a type of virtual reality in which digital content is overlaid onto physical objects or videos/pictures of objects, sometimes using GPS coordinates. This can be used to provide additional contextual information to a learner.

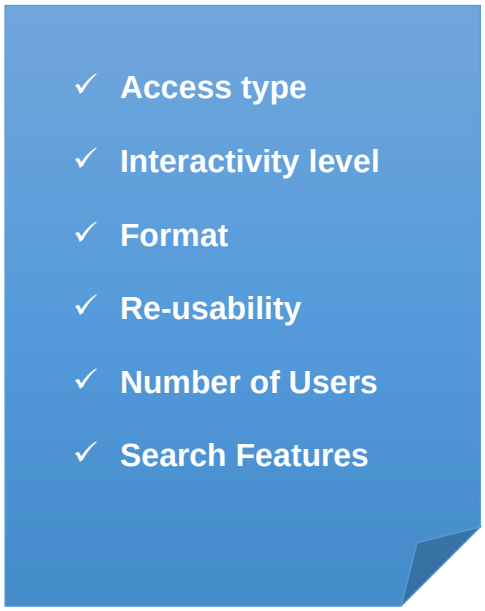


Digital games – These come in a wide variety of formats from single user/player to multiple-player. Some examples include adventure games, role playing games (RPG), massive multiple online role-playing games (MMORPG), puzzles, sports games, racing games, and shooter games. They can be played on computers and devices such as tablets, Wii, PlayStation and Xbox. Playing and creating games is useful for developing higher order skills and motor skills.

Data sets – These are organised collections of data or information, which are usually structured in lists, tables, and databases. They are typically used in science education.

Key Features

Digital content varies depending on the type of content and how it is licensed for use in education. When selecting digital content you should consider what type of content will help your students achieve their learning goals. To do this, it can be helpful to consider the key features of the content.



Some key features of digital content

✓ Access type

You should consider how you are going to access the content. Digital content can be accessed locally using a DVD/CD or by downloading from a school network or the Internet. Digital content can also be accessed or streamed online from the Internet, which is sometimes referred to as web-based content. With an Internet connection and the appropriate equipment, web-based content can be accessed from anywhere in the world, at any time.

✓ Interactivity level

You should also consider whether you want the content to be interactive and what level of interactivity you want. With interactive content you can interact with the content. There are different types of interactivity ranging from simple to complex.

- A simple type of interactivity might be receiving feedback on correct or incorrect answers.
- A complex type of interactivity might be getting personalised feedback in a simulation.
- Interactive content which doesn't include feedback might involve moving things around on the screen or using an online map.
- Digital content can also be non-interactive, for example, static colouring sheets that you print, onscreen presentations and videos.

✓ Format

You should also consider the type of format you want to use. Digital content comes in multiple type of formats - text, images, video, animation, audio and games. Formats can be mixed and students typically find multimedia formats

more engaging. However in some contexts, such as reading a book online, text-only formats might be more appropriate.

✓ **Re-usability**

You should consider whether you want to use existing content or create your own content. Some digital content is licensed so that it can be re-used for educational purposes at no cost. For example, Open Educational Resources (OERs) and licensing schemes, like Creative Commons, provide teachers with a wide range of resources. These licenses allow teachers to find content that is appropriate for their class and subject and use them free of charge. And sometimes the licenses also allow you to adapt the existing resources for free. If you are creating your own content, you should also consider whether you will want to share it with other teachers, for example on relevant OER sites.

Some example of OER sites include

- OER Commons (https://www.oercommons.org/)
- The open textbook library (http://open.umn.edu/opentextbooks/)
- MIT Open courseware online textbooks (https://ocw.mit.edu/courses/online-textbooks/)
- Learningpod (http://www.learningpod.com/)

✓ **Number of users**

You should also consider how many users you want to use the content and if there are any licensing requirements or usage restrictions. The number of users that can access the content will depend on how the content is licensed, as well as its access type. Some content can be used by one or more people. And some content, for example web-based content can be used by multiple people at the same time.

✓ **Search features**

Depending on the type of content, you might need to consider whether search features are important for your purposes. In many cases digital content can be searched, which allows users to quickly find the information they need. And you can search online for recommendations and reviews when looking for digital resources, for example blogs, teacher communities, social networks and Ministry of Education sites.

5.2 COMMUNICATION TOOLS

Concepts

Another type of ICT resource that can be useful in supporting and enhancing teaching and learning is communication tools. To make appropriate choices within your teaching context, it is useful to know some of the tools available and their features. Some examples include:

E-mail

E-mail is a commonly used tool for exchanging electronic text-based messages between two or more people. E-mails are exchanged over the Internet or other computer networks. They can include file attachments in multiple formats. Other features include calendars and contact lists.

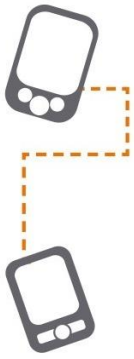
Some commonly used examples of e-mail tools include Google's Gmail and Microsoft Outlook.

In a teaching and learning context, you can use e-mail for administration purposes but you can also use it in teaching, learning and assessment activities. Some examples include:

1. Sending lesson content, resources and tips to students or groups of students.
2. Sending and receiving assessments from students.
3. Students practising writing in different languages by exchanging e-mails with students in other countries.
4. Communicating with parents, for example sending class information and reports to parents.

Text messaging

Another widely used tool is text messaging. This is used for the exchange of brief, electronic messages between two or more devices over a phone network. Short message service (SMS) refers to text messages and multimedia message service (MMS) refers to picture, audio and video messages.



In a teaching and learning context some examples of how you might use text messaging include:

1. Sharing school news with parents.
2. Communicating with students - for example with older students it can be used for sharing homework, projects

and assignments, and things like daily learning tips.

Online chat

Online chat is a very popular way to communicate over the Internet. It is used for the real-time exchange of text messages between two or more people over the Internet.

Some commonly used examples of online chat tools include Apple iMessage and instant message in Skype.

In a teaching and learning context some examples of how you might use online chat include:

1. Helping students collaborate with each other on projects or essays.
2. Collaborating with your peers for research purposes and professional development.
3. Answering student queries.

Web conferencing

Web conferencing is another popular tool. It is used for the real-time exchange of voice and video messages over the Internet. Some web conferencing tools are enhanced with collaboration features such as screen sharing, polls and surveys, interactive whiteboards, recording, scheduling and calendars.

Some common examples include Adobe Connect 9 for schools, Blackboard Connect, Cisco WebEx, Citrix GoToMeeting, Google+ Hangouts, and Skype.

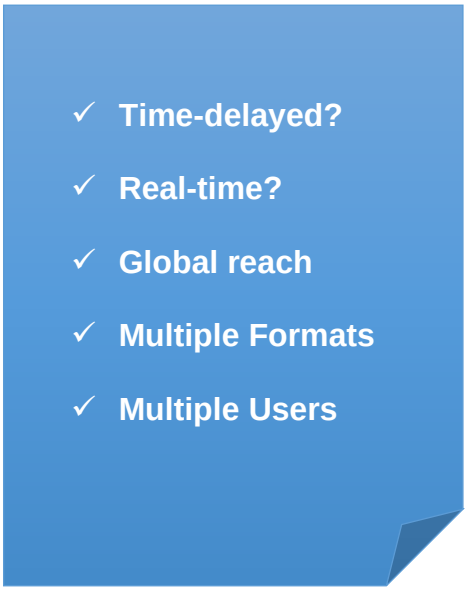
In a teaching and learning context some examples of how you might use web conferencing include:

1. Connecting with other classes in different countries - for example to learn about geography or explore other cultures.
2. Connecting with speakers and experts from around the world without them having to travel. For example, you could have foreign language speakers in language classes or sport or geography experts giving talks.
3. Students having study sessions or discussing group projects with their peers.
4. Facilitating revision sessions with students.

Note: Video conferencing is another type of communication tool which traditionally had different functionality from web conferencing. However, changes in technology mean there is less of a difference between them with web-conferencing supporting two-way video and video conferencing supporting content sharing and presentation tools.

Key Features

Communication tools vary depending on the type of tool and how they are licensed for use in education. When selecting communication tools it is helpful to know their key features so you can select tools that are suitable for your purposes.



Some key features of communication tools

✓ **Time-delayed or real-time?**

You should consider whether time-delayed or real-time communication is suitable for your needs.

- **Time-delayed communication** is also known as asynchronous communication. It doesn't require people to be present at the same time in order to communicate. E-mail and text messaging are examples.
- **Real-time communication** is also known as synchronous communication. It requires people to be present at the same time in order to communicate. Online chat and web conferencing are examples.

✓ **Global reach**

Given the appropriate Internet and mobile technologies you can communicate from anywhere in the world, at any time. You should consider what type of access you need for different tools. For example, you will need Internet access to use email, web conferencing and online chat.

✓ **Support for multiple formats**

You should consider how you want to communicate - via text, voice or video or a combination of all modes? And you should consider whether you want to be able to share screens and files. For example, you can use web conferencing for voice and video calls and for sharing screens and files. Ensure that you select the technology that allows you to communicate in a way that suits your needs.

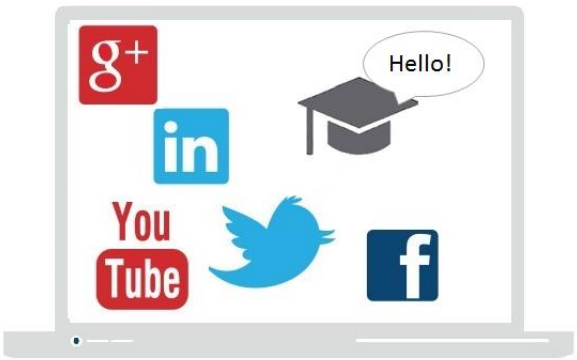
✓ **Support for multiple users**

Another feature to consider is whether you want to communicate with one person or multiple people at the same time and how you want that to work. For example, you can use online chat for one-to-one chats or group chats. You can also use web conferencing to talk one-on-one, broadcast to multiple people, or have two-way conversations with a group of people. And when using email you can send one email to multiple people and keep the email addresses private by entering them in the BCC field.

5.3 Online Collaboration Tools

Concepts

Another type of ICT resource that can be used in many different ways to support and enhance teaching and learning is online collaboration tools, sometimes referred to as Web 2.0 tools or social software.



You might use online collaboration tools for collaborating to create or share content, for commenting on and rating content, or for searching for relevant content. Some online collaboration tools can be used for creating online Personal Learning Portfolios (PLPs), where you document your learning. Or you might participate in a virtual learning community, sometimes known as Personal Learning Networks or Professional Learning Networks (PLNs), where you can connect with people interested in the same learning goals.

Which tools you use and how you use them will depend on many factors. It is useful to know the different tools available and their features so you select tools that are suitable for your teaching context. Some examples include:

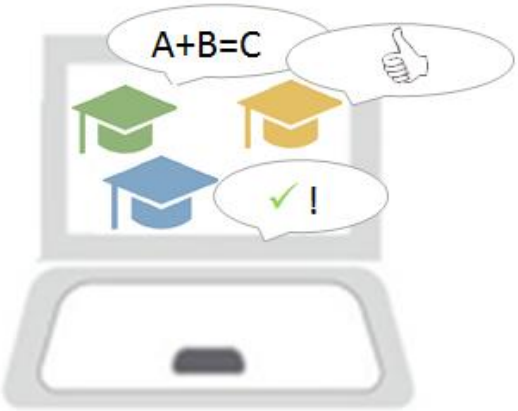
Online discussion forums

Online discussion forums are online sites used for discussions where people post messages. A single conversation is called a "thread" or topic and can be replied to by multiple people. Forums can be moderated or unmoderated and they can either require users to register or allow them to be anonymous. How forums work will depend on the purpose of the forum.

Online discussion forums can be stand alone or be included as features in other tools like learning platforms. Common standalone examples include Forums.com and Lefora.

In a teaching and learning context some examples of how you might use online discussion forums include:

1. Discussing topics of interest with other teachers in the context of professional development.
2. Designing learning activities asking students to discuss or debate topics they are studying in class – either as a learning activity or a type of assessment.
3. Students collaborating with each other on a project or assignment.



Blogs (web logs)

Blogs are online websites that allow users to create text entries in chronological order. They can include hyperlinks, images, audio and video files. People can post comments on the different blog entries.

You can create your own blog. Some common examples of tools for creating blogs include Edublogs, Google Blogger and WordPress.

Or you can search online for blogs discussing educational topics relevant to your teaching context. There are a huge number of blogs on a wide variety of

educational topics ranging from recommendations on the best educational online tools, to lesson plans, to subject-specific information.

In a teaching and learning context some examples of how you might use blogs include:

1. Creating your own blog to use as a personal learning portfolio (PLP).
2. Searching educational blogs for ideas that you can use in your own teaching.
3. Creating a class or subject-based blog for sharing content and resources with your students.
4. Creating a class website for sharing class news, videos and pictures.
5. Designing learning activities asking students to create or contribute to blogs by posting content or comments. This can develop collaboration, reflection and critical evaluation.
6. Students creating their own blogs to use as a portfolio for their work. These can be used for learning purposes or as examples of work that can be assessed.
7. Students searching blogs for information for their studies.

Microblogs and Social Networking sites

Microblogs are similar to blogs except that messages are restricted in length. For example, Twitter allows messages with up to 140 characters, known as tweets, which can include photos or audio clips. You subscribe to "follow" someone to receive updates from them. You can also search using topics or hashtags. Another common microblog platform is the site Tumblr.

Social networking sites are public or private online websites that allow users to communicate with people in their network by sharing ideas, pictures, links, audio, video, activities, events, and interests. Most sites require users to have a profile page. As well as social networking sites like Facebook, Google+, and LinkedIn there are also sites developed specifically for educational contexts such as TES Connect and Edmodo.

In a teaching and learning context, some examples of how you might use **microblogs** and **social networking sites** include:

1. Developing a professional or personal learning network (PLN) by following people who post about educational topics relevant to you. Older students might also find this useful in their context.
2. Joining specific interest groups to enhance your professional development.
3. Creating and sharing posts that build your own personal learning portfolio (PLP). Again this might apply to older students.
4. Searching for information.
5. Sharing resources, links, short instructions or tips with students, for example on a class page.
6. Conducting surveys with your students.
7. Setting up student groups for communicating with each on project work.
8. Communicating class news and activities with students and parents and the wider community. This is a useful two-way communication channel.

Wikis

These are online websites that allow users to add, edit or delete content. They can include forums and tracking features.

You can create your own wiki - some common examples of wiki creation tools include: Google Sites, PBworks and Wikispaces.

Or you can search online for wikis on topics relevant to your teaching context.

In a teaching and learning context some examples of how you might use wikis include:

1. Creating personal learning portfolios (PLPs).
2. As a method of delivering course resources.
3. Creating learning activities that ask students to create content either as individuals or collaborating in a group.
4. For researching.

Media sharing sites and social bookmarking sites

Media sharing sites are online websites used for hosting and sharing media files such as photos, presentations, videos.

Some common examples include

- **Photo sharing**: Flickr, Instagram, and Picasa

- **Video sharing**: Vimeo, YouTube, YouTube EDU and TeacherTube
- **Slide sharing**: Slideshare

Social bookmarking sites are websites used for collecting, storing, managing and sharing links/bookmarks and in some cases articles and images.

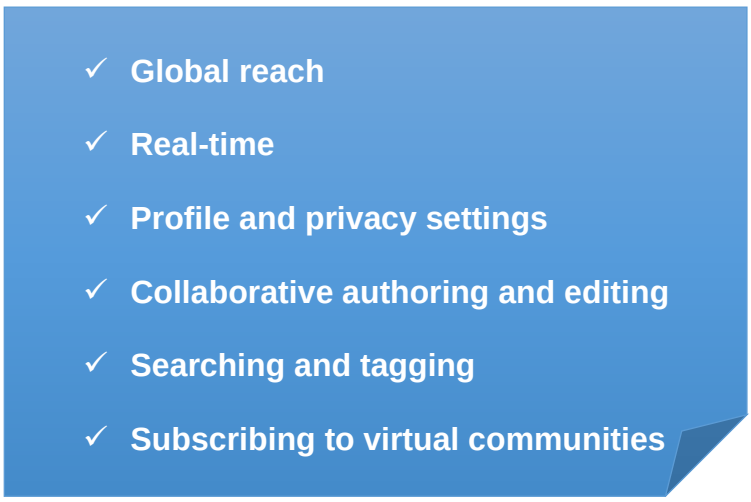
Some common examples include Delicious, Diigo, Learnist, and Pinterest.

In a teaching and learning context some examples of how you might use media sharing sites and social bookmarking sites include:

1. Finding resources for teacher professional development.
2. Finding educational content.
3. Finding content for use in teaching resources or student projects.
4. Sharing content easily – for example sharing reading lists on social bookmarking sites.
5. Collecting resources for projects and study.

Key Features

When selecting collaboration tools you should consider what type of tool will suit your purposes and be aware of its key features. And you should consider how you will manage the various collaboration features in an educational setting.



Some key features of collaboration tools

✓ **Global reach**

You will need access to the Internet to use online collaboration tools. You can access online collaboration tools and content from any location at any time. You should consider setting some rules for your class on appropriate use of these tools. For example, if you use social media to communicate with students you should consider the parameters of when you will be available and when you would expect students to be online and the purpose of the account

✓ **Real-time**

You should consider how you want to use the tools to collaborate. Typically you can use the tools to post and edit content or interact instantly in real-time. Again you should consider your availability and what you expect from your students.

✓ **Profile and privacy settings**

You should consider your profile and privacy settings carefully. Typically you can set privacy options on your account to determine levels of access. In an educational context this is particularly important as you and your students will probably want to restrict access to specified people. You should also consider the type of profile you want to create. Typically you can create unique profiles, which facilitates searching and determines what recommendations you receive. You might want to create a profile to represent your class group where you post on behalf of your class, or a profile for each student where they can each post individually, or a profile for yourself where you can post on your own behalf. Your approach will depend on the tools, their functionality and what will work in your context.

✓ **Collaborative authoring and editing**

You should consider what content creation and editing features you need and how you want to use them. You can create and edit content either individually or collaboratively. Multiple students and teachers can use the same tool at the same time and work on the same thing at the same time. You can also comment on other people's content or posts. You should consider setting class rules for what is acceptable for students when commenting on other student's profiles or posts.

✓ **Searching and tagging**

You should consider what search and tagging features are useful for you. Typically you can search for people, groups and content, which can be useful for finding resources and information. And you can tag people, groups and content in posts, which facilitates sharing and searching. You should consider privacy issues around this and the best way for your class to use these features. For example if your students have profiles you may not want them to be found in open Internet searches.

✓ **Subscribing to virtual communities**

You should consider what groups, people or content you want to subscribe to follow. And you can create profiles, groups or content for others to follow. You should also consider how you want to manage this with your students. For example, if you have a class profile you don't want random people subscribing to follow your profile so you need to set your settings appropriately.

Concepts

Another type of ICT resource is productivity tools - these are widely used to improve productivity and efficiency. Many of these tools can also be powerful tools for content creation and managing information. Word processing, spreadsheet, presentation and database tools are packaged together in Office suites such as Microsoft Office, OpenOffice and Google's offering Gsuite. Other tools such as web browsers, web search, concept mapping, online storage and note taking tools, among others, can also be described as productivity tools.

How you use these tools will depend on factors such as your teaching strategy but it is useful to know the tools available and some of their possible uses for teaching and learning.

Word processing

Word processing tools are widely used for composing, editing and printing written material. They can include text, images, hyperlinks audio clips and video clips. Common examples include Apple Pages, Apache OpenOffice Writer, Google Docs, and Microsoft Word.

In a teaching and learning context some examples of how you might use word processing tools include:

1. Creating newsletters, school reports, sign in sheets, lesson plans.
2. Creating flash cards, printable work sheets, handwriting practice sheets, diagrams, quizzes, word walls.
3. For creating student essays, assignments, projects.

Spreadsheets

Spreadsheets are commonly used for organising and analysing data in tabular form. Common examples include Apple Numbers, Apache OpenOffice Calc, Google Sheets, and Microsoft Excel.

In a teaching and learning context some examples of how you might use spreadsheets include:

1. For attendance records, timetables, staff schedules, budgets.
2. For teaching multiplication tables, number theory, statistics, creating charts and graphs.

Presentation

Presentation tools are commonly used for the display of information in a slide show. They can include animations, images, sound and video clips. Common examples include Apple Keynote, Apache OpenOffice Impress, Google Slides, Microsoft PowerPoint, and Prezi.

In a teaching and learning context some examples of how you might use presentation tools include:

1. Creating updates for parents, posters, awards.
2. Creating instructional interactive presentations, hand-outs, surveys, and quizzes.
3. For students creating presentations, project work and for showcasing their work as an e-portfolio.

Database

Databases are commonly used for organising a collection of data. Common examples include Apache OpenOffice Base, Filemaker, and Microsoft Access.

In a teaching and learning context some examples of how you might use databases include:

1. Storing student records and contacts.
2. Creating a reference tool for students.
3. Collating student data from field work or experiments.

Search engines

Search engines are used for searching the web for images, videos, news, shopping websites, and more. You search by entering keywords in a search field. Common examples include Ask, Google search, Google Scholar (aimed at education), Microsoft Bing, and Yahoo! Search.

In a teaching and learning context some examples of how you might use search engines include:

1. Information searching.
2. Research for teacher continuous professional development.
3. Research for teaching and learning activities.

Concept mapping

Concept mapping tools are used for creating diagrams of the relationships between concepts (also known as mind mapping). Common examples include Microsoft Visio, Mindjet, and Mindmeister.

In a teaching and learning context some examples of how you might use concept mapping tools include:

1. Note taking
2. Brain storming
3. As an alternative to essay writing
4. As a visual display of connections.

Online storage

Online storage tools are used for synchronising and sharing files across computers and devices. They also enable collaborative authoring. Common examples include Apple iCloud, Dropbox, Google Drive, and Microsoft OneDrive.

In a teaching and learning context some examples of how you might use online storage tools include:

1. Collaborating on projects with multiple contributors.
2. Storing and managing student work and assignments

Note taking

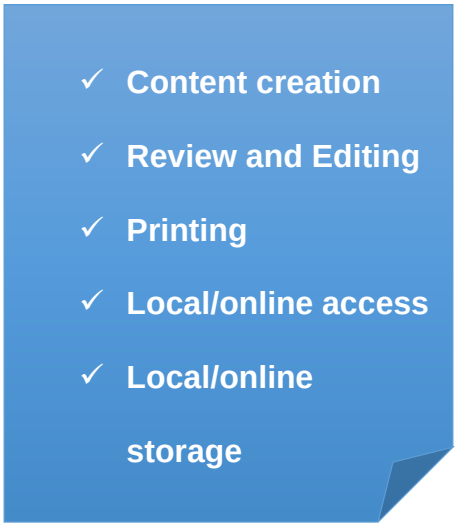
Note taking tools are used for capturing, organising and finding information. Common examples include Evernote and Microsoft OneNote.

In a teaching and learning context some examples of how you might use note taking tools include:

1. For lesson planning.
2. For collaborating on projects.
3. For capturing whiteboard content.

Key Features

When selecting productivity tools you will need to consider what type of tool you want to use to suit your purposes and be aware of its key features. And it is important that you consider how to manage the various features in an educational setting.



Some key features of productivity tools

✓ **Content creation**

You should consider what content creation features are important to you. They can include features such as the insertion of text, hyperlinks, images, animation, audio and video clips.

✓ **Review and editing**

Other features to consider are review and editing. Typically you can edit information by inserting, formatting, and deleting information, checking spelling and grammar, inputting comments and marking up or highlighting information.

✓ **Printing**

Also consider if printing is important and what print features you need.

✓ **Local/online access**

An important consideration is how you want to be able to access the applications. Productivity tools can be accessed either locally from the hard drive of a computer or device or they can be accessed online. An application accessed online can also be known as a web-based application or more commonly as a web app or a cloud-based app.

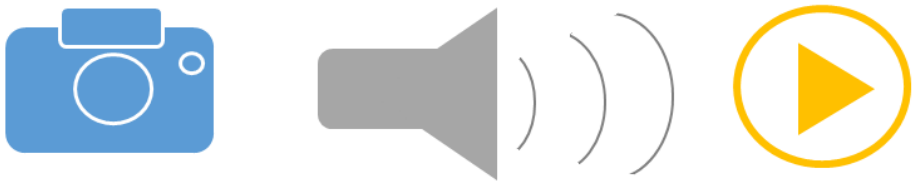
✓ **Local/online storage**

You should consider what type of storage you need. Files can be stored either locally on a hard drive, on an internal network or online sometimes called “in the cloud”. Online storage facilitates multiple people accessing files at the same time.

5.5 Image, Audio and Video Tools

Concepts

Image, audio and video tools are ICT resources with many possible uses in teaching and learning. How you use these tools will depend on many factors but you should understand the tools available and their key features when selecting appropriate ICT.



Some examples include:

Image Editing Tools

These tools are used for editing all sorts of images such as photographs. Common examples include Adobe Photoshop, Apple Photos for OS X, Google Picasa, Microsoft Paint, and GIMP.
In a teaching and learning context some examples of how you might use these tools include:

1. Creating teaching resources
2. Editing photographs of field trips and experiments
3. Use in learning activities such as editing images for use in student projects.

Audio recording and editing tools

These tools are used for recording and editing audio files. Common examples include Audacity, and Microsoft Windows Sound Recorder.

In a teaching and learning context some examples of how you might use these tools include:

1. Creating teaching resources such as educational podcasts.
2. Teachers or students adding narration to presentations.
3. Recording audio feedback for students.
4. Recording a student's understanding of a topic.
5. Assessing a student's progress over time. For example recording students speaking a foreign language in foreign language lessons or recording

students reading out loud for literacy development. This can be used for assessment and for the student to assess their own progress.

6. Students interviewing and recording people for use in a project or assignment. They might record a local person talking about the area or an expert giving an opinion on their subject.

Video recording and editing tools

These tools are used for creating, editing and sharing videos/movies from scratch, and using existing videos, image and audio files, and recording screen activity (also known as screencasts). Common examples include:

- **Movie making:** Animoto, Apple iMovie for Mac and iOS, Microsoft Moviemaker, Vine.
- **Screencasting:** Adobe Captivate, Camtasia, Jing, Loom, Snagit.

In a teaching and learning context some examples of how you might use these tools include:

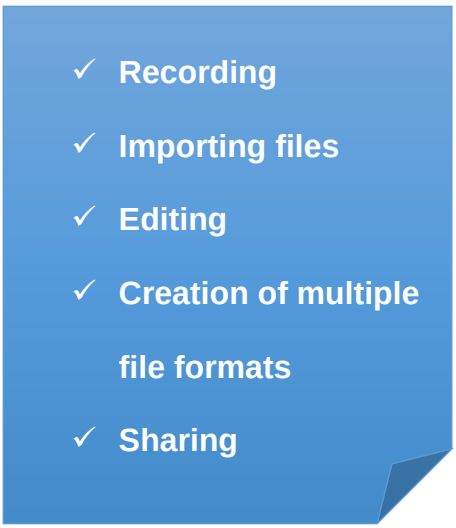
1. Recording lessons to create instructional videos for students.
2. Recording videos of onscreen software or app tutorials using screencasting tools.
3. Recording online video conferences.
4. For students to create videos in learning activities – for example to create digital stories to support literacy development or to interview people for projects in various subjects or to record students giving performances or presentations.
5. Recording students' progress over time for formative assessment for example in language skills or music skills. This can be used for both teacher assessment and students recording themselves for self-assessment.
6. Creating work for inclusion in student's e-portfolios.
7. Recording classroom activities to share with students and parents.

Media players

These tools are used for playing audio and video and viewing images. Common examples include Apple QuickTime, RealTimes (previously RealPlayer), Windows Media Player.

Key Features

When selecting image, audio and video tools you should consider what type of tool will suit your purposes and understand its key features, which vary depending on the tool. It is also important to consider how to manage the various features in an educational setting.



Some key features of image, video and audio tools

✓ Recording

You should consider what type of recording features are important for your purpose. This can involve live recording of images, audio or video. For example audio tools can be used to record narration or music.

Video tools can be used to record teacher and student activities for multiple educational purposes. You can record a lesson so students can watch it either for homework in a flipped classroom scenario or as a revision tool. And students can use video recording in learning activities as a way to document their understanding of a subject or to document their work for a project.

And screencasting tools can be used to record what's happening onscreen. You can record tutorials on how to use software and apps for students and they can make their own videos to show their skills.

✓ Importing files

You should consider the source of your recordings. Depending on the tools used some files will need to be imported in order to be edited. This can involve importing different types of files such as photos, videos and audio files from computers or digital devices.

✓ Editing

You should consider the level of editing your files will require and which tools have the functionality you require. You can edit files by cutting, copying, and pasting among other things:

- **Image editing** can include cropping images, adding text, rotating images and flipping images.
- **Audio editing** can include cutting, copying, splicing or mixing sounds together and changing the speed or pitch of a recording.
- **Video editing** can include setting playback options such as trimming the beginning or end of a video clip, splitting a video into two smaller items, changing the order or clips, and changing the speed. It can also include adding and editing music or narration and titles, credits, transitions, and other effects either automatically or manually.

✓ **Creation of multiple file formats**

You should consider what tools will be used to play your finished files and what formats they require. Different file formats are required depending on the purpose of the finished image, audio or video file. For example, some media-sharing sites require specific file formats. Most tools export to different file formats.

✓ **Sharing**

You should consider whether you want to share your finished files and how you want to share them. Most tools have the functionality to share files online via social networking sites, media-sharing sites, or by email. This can be useful for sharing video tutorials with the class or for sharing videos of classroom activities with students and parents to encourage engagement and improve motivation.

5.6 REVIEW EXERCISE

1. You are interested in joining a MOOC for professional development. Which one of the following best describes a MOOC?
    a. An online world where multiple users interact as avatars.
    b. An online media sharing platform.
    c. An online chat that is open to multiple participants.
    d. An online course that is open to unlimited numbers of participants.

2. Which one of the following would be the most suitable for students to have a text-based conversation about homework in real-time?
    a. Text messaging.
    b. E-mail.
    c. Online chat.
    d. Web conferencing.

3. You are interested in finding out how other teachers are integrating technology into their teaching practice. Which one of the following online tools would you most likely use?
    a. A simulation.
    b. A social networking site.
    c. An eportfolio.
    d. An ebook.

4. Which one of the following tools would your class most likely use to write an essay?
    a. Word processing software.
    b. Audio recording software.
    c. Video recording and editing software.
    d. Concept mapping software.

5. You want to create a tutorial for your class explaining how to use a software application. Which one of the following is the most appropriate tool for capturing onscreen activity?
    a. Audio recording software.
    b. Video recording and editing software.
    c. Database software.
    d. Image editing software.

5.7 REFERENCES AND FURTHER READING

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LESSON 6 -
CLASSROOM TECHNOLOGIES

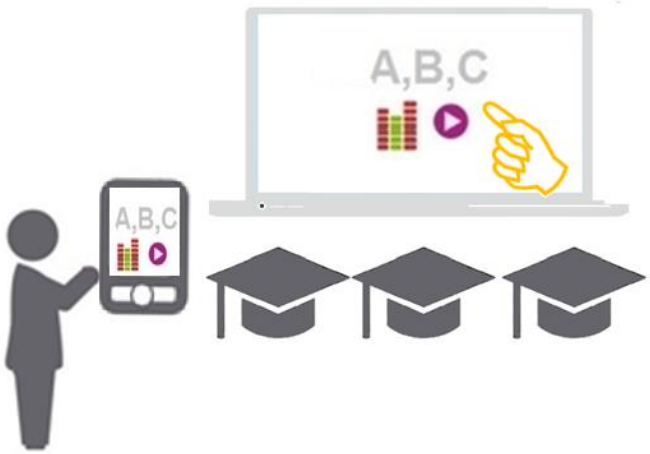
After completing this lesson, you should be able to

- Understand the concept of an interactive whiteboard and outline its key features
- Understand the purpose of a digital projector in the classroom and outline its key features
- Understand the purpose of a digital visualiser in the classroom and outline its key features
- Understand the concept of screen sharing tools and outline their key features
- Identify equipment used in teaching, learning and assessment to support the creation and use of image, audio and video files and to support communication and online collaboration
- Understand the concept of mobile learning and outline the key features of mobile devices
- Understand the terms 1:1 computing and Bring Your Own Device (BYOD)

6.1 INTERACTIVE WHITEBOARDS

Concepts

Interactive whiteboards are one of the many technologies that you can use in your classroom to support and enhance your teaching. An interactive whiteboard (IWB) is an interactive display technology that is used instead of, or in conjunction with, traditional blackboards or whiteboards. It typically includes a large wall mounted whiteboard that works with a computer and a digital projector to display what's on the computer screen. You use an electronic stylus/pen or a finger to interact with the computer by interacting with the image on the whiteboard.



IWBs come with applications/tools and some come with ready-made educational resources and teacher support. Also some educational publishers provide IWB educational resources. There are also online communities for resource sharing with IWBs.

Examples of IWB suppliers include Promethean, SMART Technologies, Mimio, eInstruction, TeamBoard.

Applications/tools and learning resources are generally specific to the brand of IWB that you use. Although there is a common file format (.*iwb), which enables some content interoperability, it isn't implemented across all products. Before buying resources you should check that they are compatible with your IWB. Cloud-based software from suppliers like Promethean (ClassFlow) and SMART Technologies (SMART amp) aim to resolve interoperability issues and enable the use of IWBs with devices such as tablets and smartphones.

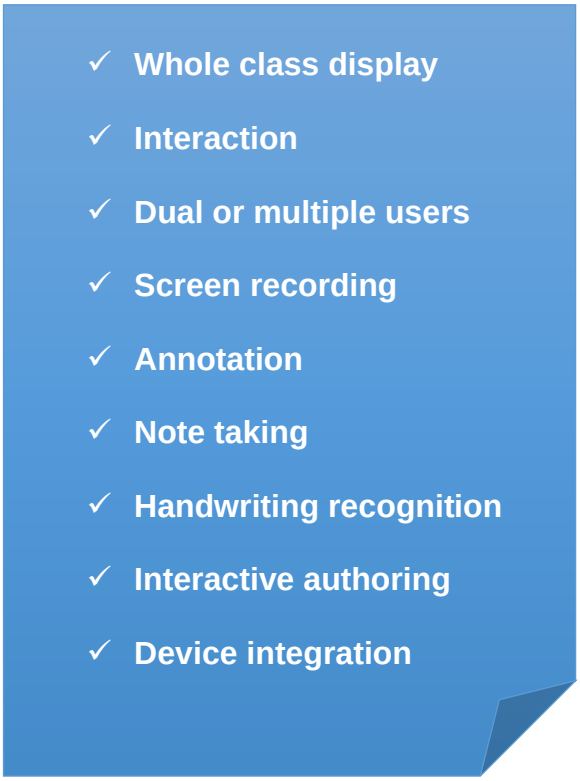
Some examples for how you can use interactive whiteboards in the classroom include:

1. For viewing websites and searching for information on the Internet.
2. For using ready-made or teacher-created learning content and interactive activities.
3. For taking notes during a lesson and saving them for future use.

4. For annotating web pages, images etc.
5. For converting handwriting into electronic text.
6. For demonstrating how software works.
7. For recording screen activity and capturing the screen.
8. For showing videos and video clips.
9. For sharing and evaluating a student's work with the class.

Key Features

There are many different types of interactive whiteboard but in general most IWBs include similar key features. You should consider what is important in your context. The features can broadly be categorised as follows:



Some key features of interactive whiteboards

You can use IWBs for **whole-class display** and **interaction**. You can view and interact with applications/tools, websites, images, and videos from a connected device.

IWBs can also be used with **two or more people at the same time**. You can divide the screen so that each student has their own section that they control remotely from a device such as a tablet. Or you can provide students with their own set of tools that works on all or a section of the board.

You can also use IWBs for **screen capture and recording**. You can take screenshots of applications/tools, websites, images, videos and you can record screen activity.

IWBs can also be used for **annotation and note taking**. And in many cases they have **hand writing recognition** features. You can use a pen or highlighter tool to mark-up notes on screen or to highlight certain sections. Other tools include screen shades, timers, cameras and onscreen keyboards.

Another key feature of IWBs is **interactive authoring**. You can create your own resources using a variety of authoring tools – examples include text, shape, highlighter, pen, spotlight, and drag and drop tools as well as in-built clipart, learning objects, videos and sounds, pages and backgrounds. You can also embed video clips, documents and web pages.

A powerful feature of IWBs is the ability to **integrate them with other devices** such as tablets, learner response systems (LRS) and document cameras. You and your students can use wireless tablets to operate the IWB from anywhere in the room. Students can use learner response systems to answer questions using wireless handsets/clickers or apps on mobile devices. The results can then be displayed on the IWB. This can be an engaging way to assess student's progress. And you can use digital visualisers/document cameras to display still images or video of objects in the room on the IWB screen.

6.2 DIGITAL PROJECTORS

Concepts

Digital projectors are widely used in education. They display whatever is happening on a computer screen or device on a large screen for everyone to see. They include short throw and ultra-short throw projectors as well as long throw or portable projectors. Short throw and ultra-short throw projectors are mounted above the person presenting close to the screen or wall that the image is projected onto. This reduces shadow effects, screen glare and possible eye damage caused by the presenter looking into the projector beams.

Some examples of how you can use digital projectors in the classroom include:

1. For instruction or demonstration of concepts, educational resources, videos to a whole-class environment.
2. For demonstrating a student's work to the class.

3. Using wireless tablets you can connect with the digital projector from anywhere in the room.
4. Using a wireless mouse and keyboard you can interact with the screen image from anywhere in the classroom.
5. Using digital visualisers/document cameras you can display still images or video of objects in the room on the screen.
6. Interactive whiteboards can be used as the projection screen to enhance interactivity.

Key Features

Digital projectors can be used for whole class display on a large screen. They can be integrated with other devices to display what is on the device – for example you can display what is on tablets, digital visualisers and interactive whiteboards.

6.3 DIGITAL VISUALISERS

Concepts

Digital visualisers, also known as document cameras, can be useful for classroom teaching. They are a digital camera on the end of a rigid or flexible arm with controls in a base unit. When used along with a digital projector or PC monitor it allows teachers and students to show physical objects on a screen to the whole class.

Some examples of how you might use digital visualisers in the classroom include:

1. For showing physical objects such as small artefacts on the screen to the whole-class such as text, images, objects, living things.
2. For demonstrating techniques to the whole-class like writing or threading a needle.
3. For showing student work to the whole class.
4. For capturing images and videos that can be looked at again including capturing time-lapse video to track changes over a period of time.

5. If the PC is connected to an interactive whiteboard, then the image captured by the digital visualiser can be annotated.

Key Features

The key features of document cameras can broadly be categorised as:

1. Display of physical objects when used along with a digital projector or PC monitor.
2. Magnification of objects.
3. Image capture and storage.
4. Video capture.
5. Integration with other devices such as digital projectors, computers, interactive whiteboards.

6.4 Screen Sharing Tools

Concepts

Screen sharing tools are tools that can be used to share a screen across one or more computers or devices or to gain access to another person's screen in real-time through a network. There are many different screen sharing solutions available and the appropriate solution will depend on the computers and devices being used and the network set-up.

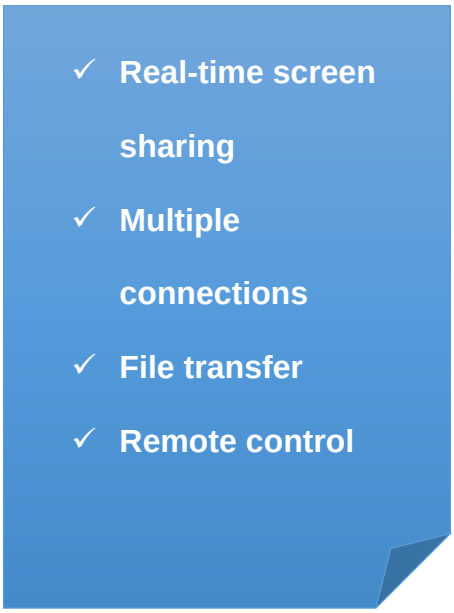
Some examples of how you might use screen sharing tools in the classroom include:

1. For sharing different types of learning resources with students.
2. For demonstrating something you are doing on your device by mirroring what is on your screen to a whole-class display screen.

3. For sharing a student's screen with the whole class so they can share their ideas and work, which can improve student motivation.
4. For viewing what a student is doing on their device from a remote location, which can be helpful for formative assessment as well as ensuring students are using devices appropriately.
5. For taking control of a student device from your device, which can be a useful way to help students if they need support on a task.
6. Screen sharing solutions for mobile devices enable teachers and students to move around and still share the screen of their mobile devices so the class can move to the best position for the lesson, for example moving with their devices into groups for project work.

Key Features

The key features of screen sharing tools can broadly be categorised as:



Some key features of screen sharing tools

You can share screens in **real-time**. You can display your screen on an individual student's screen or on a whole-class display screen, such as a whiteboard, interactive display or HDTV instantly. You can also view a student's screen on your screen so you can monitor their progress. Or you can display a student's screen on a whole-class display screen to show the student's work to the whole class. This can be a good way to give the student positive feedback and encouragement.

You can have **multiple connections**. You can share your screen with many screens so the whole class or a group of students can see your screen on their individual devices at the same time. A student's screen can also be shared across multiple screens so they can share their work with the rest of the class.

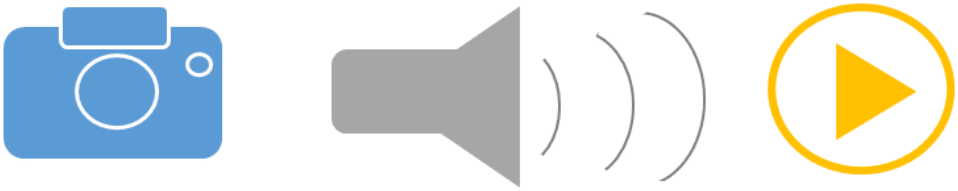
You can **transfer files** between devices instantly. This can include audio and video.

You can **take control of a student's device remotely** so you can help the student with their work.

6.5 Image, Audio and Video Equipment

Concepts

To create, edit and use image, audio and video files you will need certain types of equipment. The type of equipment needed will depend on your set-up.



You might use **Computers** including desktop computers, laptops, netbooks and tablets. These may have integrated cameras and video recorders that can be used for recording, editing and viewing and for listening and watching files.

You might also use **stand-alone recording devices.** These can include stand-alone image, video and audio recording devices such as digital cameras, digital video recording devices, and Dictaphones.

In order to play multimedia files you might need a **media player**. Media players are devices for playing audio and video files such as MP3 players and iPod Touches.

If you want to scan documents you will need a **scanner**. Scanners can be used to scan paper-based documents such as student photos or artwork, which can be used in the creation of multi-media content.

If you are recording audio you will need a **microphone**. Microphones are used for recording audio such as narration, music, and sounds for use in multi-media content such as slideshows, videos. They can be stand-alone or integrated into a device.

And if you are listening to audio recordings you will need **speakers** or **headphones**.

Depending on the set-up being used, you will also need to use **appropriate connection cables** to connect the various devices.

6.6 Communication and Collaboration Equipment

Concepts

You will also need certain equipment to use communication and online collaboration tools, for example for video calls. And again this will depend on your setup. You might use **computers** and **devices** such as Internet-connected desktop computers, laptops, netbooks, tablets, smartphones and mobile phones.

If the computer or device doesn't have an integrated camera, you will need a **webcam** in order to enable video calls.

If the computer or device doesn't have a built-in microphone, you will need a **microphone** for voice and video calls.

If the computer or device doesn't have built-in speakers, you will need **speakers** for voice and video calls. In a classroom environment, if privacy is needed for a call or you want to reduce the noise for others you might use **headphones**. Headphones may also be used if there is only one student on the call.

Depending on the set-up being used, you will need to use **appropriate connection cables** to connect the various devices.

6.7 Mobile Learning

Concepts

Mobile learning can be described as the use of mobile devices to enable learning anytime and anywhere through the use of Wi-Fi or mobile broadband. Learning can take place in the classroom or outside the classroom. For example, learning can happen on school field trips, at home and on journeys.

Mobile devices that support mobile learning are sometimes referred to as personal learning devices. Some examples are

- E-book readers
- Laptops
- Netbooks

- Tablets
- Smartphones
- Mobile phones
- Portable media players

Different mobile devices may have different capabilities for connecting to the Internet. As mentioned, the two main ways of connecting to the Internet using mobile devices are:

1. Wi-Fi – this is a connection via a wireless network.
2. Mobile broadband – this is a connection via a mobile phone network.

Generally smartphones can connect to the Internet via Wi-Fi or via mobile broadband so they typically can connect from anywhere at any time. There may be an additional cost from a mobile network provider for this service and it may be costly.

Generally tablets connect to the Internet via Wi-Fi access. Not all tablets can connect to the Internet via mobile broadband so a tablet may not connect to the Internet when it is outside a Wi-Fi spot. You can still view content that is stored on your device and use many apps without an Internet connection.

Using mobile devices for teaching and learning

There are many benefits of mobile learning, which can lead to improved learning outcomes for students.

- ✓ Mobile devices can support new ways of learning such as student-centred and personalised learning as well as just-in time learning and just-in-time assessment.
- ✓ You can select suitable apps and content for your curriculum and your individual student from a wide range on the various online app stores.
- ✓ Mobile content is interactive and engaging and can help bring subjects to life which can help students gain a deeper understanding of the subject.
- ✓ Mobile technologies are relevant and appeal to students which can help improve their motivation and engagement.
- ✓ You can design learning activities based on using mobile devices which can make learning active and engaging. For example, students can create multimedia projects collaboratively using their mobile devices.
- ✓ You can create interactive content and courses using mobile devices.
- ✓ Students can access mobile courses from their mobile device from anywhere at any time.

Key Features

Mobile devices share similar features such as being flexible and portable, but they also include differences. Deciding which device is appropriate depends on your individual teaching, learning and assessment needs. To make appropriate selections, it can be helpful to understand some of the key features of mobile devices:

- ✓ Screen size
- ✓ Input options
- ✓ Start-up speed
- ✓ Battery life
- ✓ Integrated features
- ✓ Operating systems
- ✓ Applications
- ✓ Storage
- ✓ File organisation

Some key features of mobile devices

- ✓ **Screen size** – You should consider what screen size is appropriate for your purposes. Devices with smaller screen sizes are usually more portable. And larger screen sizes make content easier to view so they are

more useful for group work. For example, smartphones are typically useful for one student, whereas tablets and laptops can also be useful for working in pairs or groups.

- ✓ **Input options** – You should consider how you want to interact with the device. Devices with touchscreens such as smartphones and tablets are easy to use, which can make them useful for younger students. However touchscreens don't facilitate lots of text entry and editing, which can be important for completing project work. You can typically add external keyboards to tablets but laptops and netbooks already have integrated external keyboards, which can make them more useful for older students completing assignments.
- ✓ **Start-up speed** – You can turn tablets on almost instantly, which means they can be ready to use straight away. Laptops and netbooks generally take longer to start-up so may not be as useful if speed is important to you.
- ✓ **Battery life** – You should consider whether battery life is important for your purposes. Tablets generally have a longer battery life than laptops or netbooks and typically last all day without needing to be recharged.
- ✓ **Integrated features** - Smartphones and tablets typically have integrated front and back cameras and video recorders. These can be used for multiple educational purposes such as taking photos on field trips, recording interviews and for video calls. Web cameras are usually integrated into laptops and netbooks, which can be useful for making videos, video calls and capturing onscreen activity. Laptops and netbooks also typically have integrated DVD/CD players, which may be useful if resources are not available online. Due to these additional integrated features laptops and netbooks aren't as portable as smartphones and tablets so they are not as useful for field trips.
- ✓ **Operating systems** –
    - Laptops and netbooks from various providers typically run Microsoft Windows (e.g. 7, 8, 10) or Apple MacBook running OS X.
    - Smartphones and tablets use mobile operating systems. Some of the most common smartphone and tablet combinations are Apple's iPad and iPhone running the iOS operating system; tablets from various providers, such as Samsung running the Android operating system from Google; and Microsoft Surface running Windows.
- ✓ **Applications** - In general smartphones and tablets run a web/cloud-based version of content creation and productivity applications such as Google apps, Microsoft Office 365, and Apple iWork productivity apps. Smartphones and tablets also run discrete mobile applications, known as apps, which are available for download from relevant online application stores. There are many eBooks (novels, text books, reference books etc.), educational apps and content available for different subjects and educational levels, many of which are free.

You should evaluate apps in the same way as all other educational resources to ensure that they are suitable for the curriculum, the student's age and skill level as well as being compatible with the device. Not all eBook publishers provide content for all devices and not all devices play all content.

- ✓ **Storage** - With smartphones and tablets file storage is mostly online, also known as cloud storage, or by transferring files to an external storage device like an external hard drive. Laptops and netbooks can use online storage, but they also have larger hard drive capacity so they can be used to store students' files locally.
- ✓ **File organisation** - File management is an important consideration in an educational context, especially if multiple students are using the same device to create and store their work. You should consider what system you would use and rules for use.

6.8 MOBILE COMPUTING SOLUTIONS

Concepts

When planning to use mobile devices in an educational environment there are a few approaches that you might consider:

- **1:1 computing** - A 1:1 computing approach can be described as an approach where the school usually provides every student and teacher with their own electronic device, such as a desktop computer, laptop, tablet, netbook, media player, or smartphone.

- **Bring Your Own Device** - A Bring Your Own Device (BYOD) approach can be described as an approach where students use their own personal electronic devices in school for 1:1 computing scenarios.

When implementing a mobile computing solution in an educational environment, it is important to consider the management of the solution. You should consider how devices and connections to the school network will be managed and how applications and content will be distributed to devices. Different approaches have different advantages and disadvantages.

A 1:1 computing approach provides the school with more control over the management of devices. However a BYOD approach may make it easier for students to bypass mechanisms that prevent them from having unfiltered access to the Internet when in school.

A BYOD approach allows class assignments to be finished at home and could also prove to be more cost effective, particularly if the school already has a good network infrastructure and Wi-Fi which does not need to be upgraded.

On the other hand, some parents who are already worried that the children are spending too much time on their mobile devices may not welcome the fact that the school introduces a BYOD strategy.

Finally, there is a danger of creating a ‘digital divide’ if the school cannot provide devices to students who do not own one or who have a device which has limited functionality compared to most of their peers.

6.9 REVIEW EXERCISE

1. An interactive whiteboard has recently been installed in your classroom. Which one of the following do you find is the most effective way to use it with your class?
    a. For use in a one-to-one tutorial with a student who is struggling to grasp a concept.
    b. For use by students to complete summative assessments.
    c. For use by students to complete projects in small groups.
    d. For working through an online tutorial with the whole class group.

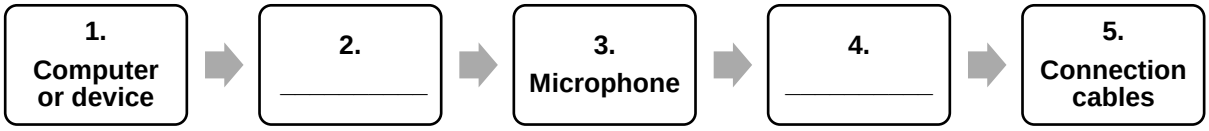
2. Select the equipment best suited to show a video on your PC to the whole class?
    a. Printer.
    b. Scanner.
    c. Digital projector.
    d. Digital visualiser.

3. Select the equipment best suited to show a leaf magnified to the whole class via a digital projector?
    a. Speaker.
    b. Printer.
    c. Microphone.
    d. Digital visualiser.

4. Your students are working individually on tablets and you would like to show one student's work to the whole class. Which one of the following is the most appropriate tool for this task?
    a. Screen sharing tools.
    b. Blogging tools.
    c. Messaging tools.
    d. Elearning tools.

5. Select the equipment best suited to record a video of a science experiment:
    a. Scanner.
    b. Printer.
    c. Digital camera.
    d. Digital projector.

6. Complete the list of equipment needed to hold a web conference between your students and an expert giving a talk remotely:



7. List 4 features of mobile devices that you should consider when selecting ICT for teaching and learning:

   _____

   _____

   _____

   _____

8. Match the correct term to the option below:

BYOD	1:1

   a. In a _____ computing approach the school usually provides everyone with their own electronic device.
   b. In a _____ computing approach students use their own personal electronic devices in school.

6.10 REFERENCES AND FURTHER READING

- European Schoolnet (2010), 'Making the most of your interactive whiteboard', available: http://moe.eun.org/c/document_library/get_file?uuid=f4a9e773-b50a-4327-a164-46d209e93eaa&groupId=10620 [accessed 05/04/2017]
- PDST Technology in Education (2009), 'Interactive Whiteboards advice sheet', available: http://www.ncte.ie/media/16InteractiveWBs(Nov09).pdf [accessed 05/04/2017]
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LESSON 7 -
ICT RESOURCES FOR ASSESSMENT

After completing this lesson, you should be able to:

- Identify on-screen assessment tools that can be used to support and enhance assessment and outline their key features
- Identify electronic survey/voting tools that can be used to support and enhance assessment and outline their key features
- Identify tools that can be used to support the management and administration of assessment and outline their key features
- Understand the term electronic portfolio and how it can support and enhance assessment
- Identify tools for supporting the use of electronic portfolios and outline their key features
- Understand how ICT can support and enhance collaborative assessment

7.1 On-Screen Assessment

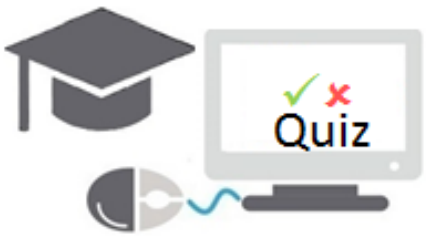
Concepts

There are many ICT resources that can be used for assessment. One type of digital assessment can be described as on-screen assessment, which refers to assessment that is delivered and marked by a computer or device.

Onscreen assessment can be used for diagnostic assessment to determine a student's level of understanding at a point in time. It can also be used for formative assessment to determine a student's progress at a point in time. It can be used for self-assessment by the student or for assessment by the teacher. Onscreen assessment can provide the student with personalised feedback including course resources, which can enable the student to self-correct. Onscreen assessment can also be used for summative assessment to determine if learning outcomes have been achieved.

There are many products available and what is appropriate will depend on many factors including the individual teacher, student and curriculum needs. Some examples of onscreen assessment tools include:

- ✓ **Computer-based quizzes/tests** – These include quiz creation tools (also called question authoring tools) in learning platforms or stand-alone tools as well as off-the-shelf test banks. They can include immediate and personalised feedback.



Some examples of question authoring tools include:

- Hot potatoes
- That quiz
- ExamTime
- Testmoz
- Quibblo
- Edpuzzle
- Blendspace
- Socrative
- Kahoot
- Google Forms
- QuizWorks

- ✓ **Interactive games, simulations, virtual worlds** – These provide risk-free rehearsal of real-world skills in authentic simulated environments.

Key Features

When selecting onscreen assessment tools you should consider the key features you want to include. The key features vary depending on the tool but broadly you should consider the following:

- ✓ Onscreen assessment covers a broad range of **multiple question types** ranging from multiple-choice questions to complex simulation-based questions. You should select the type of onscreen assessment and question type that is appropriate for the type of learning you are supporting. Depending on the technology, some onscreen assessment questions can also include graphics, animations, simulations, audio, and video.
- ✓ Another feature to consider is support for **automatic marking and management of results**. This improves consistency of marking and can include collating, storing, displaying, and analysing results. This can reduce the teacher's workload in terms of manual marking thereby enabling more time for e more frequent review of the student's progress.
- ✓ Another feature to consider is the type of experience for the student and the breadth of skills that can be assessed in onscreen assessment. The use of simulated and real world environments in certain types of onscreen assessment can provide students with an **authentic assessment experience**.
- ✓ Another useful feature of onscreen assessment is support for **immediate and personalised feedback.** Feedback tailored to the student can help you and students to identify and correct any issues immediately. It provides information on the student's level of learning to the student and the teacher.
- ✓ You should also be aware of **re-use and sharing** features**.** Some technologies allow multiple students to take the same assessment as well as enabling a student to re-take the same assessment repeatedly to practice a skill. And sharing features allow teachers to easily share assessment resources online, for example in online teaching communities. This means you can search and find relevant assessment online which can reduce your workload.
- ✓ Another feature to consider is how the onscreen assessment is accessed. Depending on the tools, they can be accessed **locally** as stand-alone applications, or **online** via the Internet or a learning platform.

7.2 SURVEY TOOLS

Concepts

Electronic surveys and response systems can be used as assessment tools for collecting responses to questions. They can support different learning approaches such as diagnostic and formative assessment by providing you with a way of determining the progress of a group of students at a particular point of time. They don't provide feedback to students directly but they enable you to provide immediate feedback and to adapt your teaching practice to suit the student. They also support student engagement and self-assessment.

One type of survey tool you can use is and **online survey tool**. You can use these for creating and conducting surveys with students. Students can respond from computers and devices with some types accepting texts from mobile phones or responses via Twitter. Examples include SurveyMonkey, Google Forms, and Poll Everywhere.

Another type of survey tool you can use is an **electronic voting system (EVS).** You can use this in the classroom to ask a group of student's questions which they answer by pressing buttons on hand-held response devices, referred to as clickers or responders. The results can be converted into charts and shown onscreen. Examples are Promethean ActiveExpression, SMART Response PE and TurningPoint. Increasingly, these hardware solutions are being replaced by software/apps that run on tablets and other mobile devices like Socrative or within new cloud-based, collaborative learning platforms like Promethean ClassFlow and SMART amp.

Key Features

When selecting survey tools you should consider the key features that are important for your purposes. The key features of these tools vary but broadly you should consider certain features:

- ✓ You should consider whether you want to conduct surveys in real-time. You can conduct surveys in **real-time** using electronic voting systems in the classroom. Or you can use online voting tools where responses are submitted by text message or via a website. You can also use online voting tools can to gather responses from students in their own time, so the responses are **time–delayed** or not in real-time.

- ✓ You should also consider where you want to conduct your survey. Online survey tools can have a **global reach**. They can be accessed from anywhere in the world with the right equipment and an internet connection, so they facilitate mobile assessment. Whereas electronic voting systems are **classroom-based**.
- ✓ When selecting a tool you should consider the **different question formats** supported. Generally electronic response systems support multiple choice questions. And online voting tools support both open text questions and multiple choice question types.
- ✓ Another feature to consider is how the tool supports the **management and display of results**. Most tools provide collation and display of results that can be shared with the whole class or a group of learners.

7.3 Assessment Management Tools

Concepts

There are many generic and specific educational tools available to help with the management of the assessment process. You can use them to manage tasks such as:

- ✓ Distribution of assessment
- ✓ Submission of assessment by students
- ✓ Marking of assessment
- ✓ Storing results
- ✓ Sharing results

Generic products that can be helpful in the assessment process include office productivity software. For example **spreadsheets** can be used for recording, storing and distributing results. You can also use **databases** for recording and storing results in tables and creating assessment reports. And you can use **email** for distributing assessment and results and students can use it for submissions.

Specific educational tools that can be helpful in the assessment process include **learning platforms**. These can be used for scheduling and managing submissions; marking assessment; collating, recording, storing and distributing results. Examples include Moodle, itslearning, Fronter, Blackboard Learn, and eFront.

You can also use **automated essay marking tools** to automatically mark documents. These types of tools use statistical analysis of text. You can use them for formative assessment to give personalised feedback to students on their writing abilities. You can also use them for marking summative assessment.

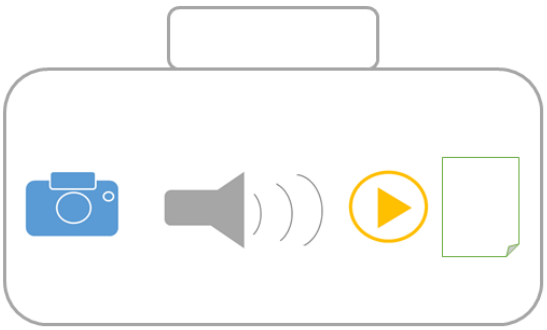
You can also use **plagiarism prevention tools** to check the originality of a student's work. These tools compare a document to other documents stored in databases using algorithms. The databases might contain other student papers and content from the Internet or academic institutions. Plagiarism tools can be useful in formative assessment to show students how to avoid plagiarism and improve their writing skills. They can also be useful in summative assessment to check for plagiarised content. Examples include Turnitin (for use by teachers), Writecheck (for use by students). In some cases they can be integrated with learning platforms so that you can check work automatically when it is submitted.

7.4 Electronic Portfolios

Concepts

An electronic portfolio, also known as an e-portfolio or digital portfolio, is another ICT resource that can be used for assessment.

It is a collection of electronic evidence created by a student to record their learning and achievements. Students can use them to demonstrate and present the outcome of their learning as well to reflect on the process of how they achieved the outcome.



You can use electronic portfolios for different types of formative assessment. For example, a student might write a blog post or record an audio or video piece and in reflecting on their work they are performing self-assessment. Also, you and your students might comment on their work in the comments section of their blog thereby providing peer and teacher assessment.

Electronic portfolios can also be used to support different forms of summative assessment. For example, students might organise their work into a format such as a presentation that they can present for assessment or showcase of their learning.

Tools for supporting the creation of electronic/digital portfolios include:

- Standalone electronic portfolio systems that incorporate all the tools needed, such as Mahara.
- Generic tools for specific tasks such as productivity tools, image, audio and video creation tools, and social media tools such as blogging tools.

Key Features

When selecting an approach to e-portfolios and appropriate tools, you should consider the key features that are important for you and your students. The features will vary depending on the tool.

You should consider how you want your students to use the tool to **capture evidence of learning** and reflection on learning. You might want students to be able to include an essay in a word document, a piece of scanned artwork, a photograph or video captured on a mobile phone, or a student-created movie.

You should also consider whether the tool can **support multiple formats**. You might want your students to be able to capture and create evidence of their learning in multiple formats such as text, hyperlinks, images, animation, audio, video, and blog entries.

Another feature to consider is the **organisation of materials**. You might want students to be able to select and organise evidence of their learning in a format that can be presented or showcased either for assessment or career purposes.

You should also consider the type of storage that is important for your purposes – **local storage on a computer or device, storage on a school network or online storage** or a combination. An electronic portfolio can be as simple as a few files stored in a folder on a school network or it can be part of an integrated system, which stores files online. Students might want to access and update their eportfolio after they leave school so how it is stored is important.

Another key feature of e-portfolios to consider is **support for revisions**. Typically students will need to update their work over time. This is an important feature for lifelong learning. Students might want to access and update their portfolio after they leave school to show as evidence of their learning to further education institutions or future employers.

You should also consider how the e-portfolio supports **access control**. In some systems access to students' work can be managed at a school level or by the student.

You should also consider whether collaboration features are important. Some electronic portfolio systems **enable collaboration** through commenting or collaborative editing.

7.5 Collaborative Assessment

Concepts

Collaborative assessment is the assessment of a student's work by multiple people. The work can be either individual or group work and it can be assessed by multiple people such as teachers, other students (peer-assessment), parents, industry experts and the students themselves (self-assessment).

Collaborative assessment can lead to improved learning by

- Developing student awareness of learning outcomes and evaluation criteria.
- Enabling the teacher to monitor progress.

ICT can support collaborative assessment by providing tools that enable multiple people to assess a student's work. Tools for supporting collaborative assessment include online collaboration tools such as blogging tools and social networking tools. They facilitate multiple people being able to view a student's work and provide feedback on it through the use of commenting.

7.6 REVIEW EXERCISE

1. You are searching online for an engaging quiz to use with your students. Which one of the following would you most likely use?
    a. An online video.
    b. An online chat.
    c. An interactive game.
    d. An e-book.

2. List 3 features that you should consider when selecting a suitable electronic survey tool:

    _____

    _____

    _____

3. List 3 tools that are useful for managing the assessment process:

    _____

    _____

    _____

4. You have decided to use electronic portfolios as part of your assessment strategy and you want to explain them to your class. Which one of the following is the best description?
    a. An electronic record of your exam results that shows your progress.
    b. A hard copy record of your work that is stored in folders in the classroom.
    c. A website for sharing class news with your parents.
    d. An electronic record of your work that can be updated and shared.

5. Which one of the following is the most appropriate to support collaborative assessment?
    a. Database tools.
    b. Presentation tools.
    c. Social networking tools.
    d. Electronic survey tools.

7.7 REFERENCES AND FURTHER READING

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- Helen Barrett (2012), 'mPortfolios, Step-by-Step Model', available: https://sites.google.com/site/mportfolios/processes/step-by-step-model [accessed 05/04/2017]
- JISC (2008), 'Effective practice with e-Portfolios, Supporting 21st century learning', available: http://www.jisc.ac.uk/media/documents/publications/effectivepracticeeportfolios.pdf [accessed 05/04/2017]

LESSON 8 -
SOURCING AND EVALUATING ICT RESOURCES

After completing this lesson, you should be able to:

- Identify sources of ICT resources
- Understand the importance of evaluating ICT resources using a systematic approach such as an evaluation matrix
- Be aware of the importance for teachers and students of critically evaluating digital content
- Recognise appropriate criteria for evaluating digital content for use in education
- Recognise appropriate criteria for evaluating applications/tools for use in education
- Understand the terms copyright, intellectual property rights, plagiarism, and Creative Commons licenses
- Recognise the need to acknowledge sources and seek permission to use digital text, images, audio, and video as appropriate
- Be aware of the importance of using licensed software
- Outline types of software licenses: end-user license agreement (EULA), multi-user license, open source, shareware, freeware
- Evaluate an ICT resource to determine its effectiveness in supporting and enhancing teaching, learning and assessment

8.1 Sourcing Suitable ICT Resources

Concepts

There are countless sources and providers of ICT resources available which might be overwhelming when you first start to use ICT in your lessons. There are lots of lists online of the "top" tools for teaching and learning or the "best" learning resources. Over time you will build up your own list of "top" ICT resources, which are suitable in your context. It can be useful to know the main types and sources of ICT resources.

Educational ICT resources

One type of ICT resource is educational ICT resources, which can consist of **applications and tools** and **digital content** designed specifically for education. These can include applications like learning platforms and classroom management technologies, as well as digital content such as digital text books, videos, interactive content, simulations and digital lectures, amongst others.

Some sources of educational ICT resources include:

- Moodle
- Google Play for Education
- Pearson
- Houghton Mifflin
- Promethean
- SMART Technologies
- Discovery Education
- BBC Learning
- TED-Ed
- Providers on the various online App stores

Reference sites

Another type of ICT resource is digital reference materials. A good source of ICT reference materials are online reference sites. These include sites that provide maps, encyclopaedias, dictionaries, news, cultural resources, books and journals.

Some examples of reference sites include:

- The Encyclopaedia Britannica site
- The Concise Columbia Electronic Encyclopaedia online sixth edition

- Wikipedia
- The Encyclopaedia Smithsonian online
- The National Geographic Mapmaker
- Perry-Castañeda Library Map Collection
- Google Maps
- The Biography site Bio.
- The online Webster dictionary and thesaurus
- The Collins online dictionary and thesaurus
- Europeana
- Google scholar
- Google Books
- The Digital Public Library of America
- The Directory of Open Access Journals

Social media sites

Social media sites can be a good source of ICT resources. There are many discussion forums, blogs, microblogs, social networks, media sharing sites, and social bookmarking sites with pages and groups about educational topics. There are also those that are specifically designed for educational topics. You can use these sites to find and share educational ICT resources. And you can join relevant groups and become part of relevant learning communities.

You can search for relevant people, organisations and topics on sites such as Facebook, Twitter, LinkedIn, Instagram, Pinterest and YouTube. For example YouTube has specific educational channels like YouTube EDU that collate top educational videos. And you can join sites designed specifically for educators such as TedEd.

Professional groups sites

Another source of ICT resources is sites hosted by professional groups interested in using ICT for educational purposes. You can search for professional groups that are relevant for your topic. For example Historiana is a portal of digital historical sources developed by EUROCLIO, the European Association of History Educators.

National portals from Ministries of Education

National portals provided by Ministries of Education can be an important source of ICT resources. These sites can provide an important gateway to educational resources specific to your country. In many cases they provide access to free resources that have been recommended and made available under open licensing schemes such as Creative Commons.

Open Educational Resource (OER) repositories

A good source of free ICT resources are Open Educational Resource (OER) repositories. These sites collate and host educational resources that can be used free of charge for teaching, learning, and assessment. Sometimes they have also been released under an intellectual property license so that they can be adapted and re-purposed by others.

Some examples of OER repositories include:

- The European Schoolnet Learning Resource Exchange for schools
- OER Commons
- The Khan Academy
- TES Connect
- The Massachusetts Institute of Technology OpenCourseWare project

Generic applications

Another type of ICT resource are generic applications and tools – for example productivity tools and content creation tools that are used to perform many tasks. Some sources of generic products commonly used in education include:

- Microsoft with Microsoft Office and Office 365
- Google with Google Gsuite and the Google Apps for Education suite
- Apple with iWorks, Apache with OpenOffice
- Adobe with their suite of products

Custom development

Creating your own ICT resources (user-generated content) such as videos, printable worksheets, and IWB resources is another method of incorporating them into your lesson. On a larger scale this might involve an institution commissioning the creation of customised resources such as curriculum or course content to suit their particular needs.

8.2 EVALUATING ICT RESOURCES

Concepts

When you start searching for suitable ICT resources, you will want to select resources that improve your lessons, your students learning experiences and learning outcomes. And you will want to select accurate and reliable content.

However selecting appropriate resources can sometimes seem overwhelming. There are so many options to choose from and so many decisions to make about

their suitability. And knowing when content is accurate and from a reliable sources, especially when searching online, isn't always straightforward.

There are many sites, blogs and social media posts that aim to share inaccurate information to mislead people, either to further a political or religious agenda or for financial gain. There are hoax sites and "Fake news" sites and posts that are written as though they are factual and true but they are actually fabricated. There are also sites and posts that use misinformation and inaccuracies to promote radical ideologies or to support a particular point of view. It is important for teachers and students to always critically evaluate online content to make sure that it is from a reliable source and can be trusted.

In order to select suitable, effective and trustworthy ICT resources, you and your students should always critically evaluate resources using:

- ✓ A systematic approach
- ✓ A well-defined set of evaluation criteria

Systematic Approach

When evaluating ICT resources you should follow a systematic approach. The evaluation process should take place over a period of time starting with the lesson planning stage. And after you have used a resource you should evaluate it again to decide whether it was helpful, if you would use it again and if you would recommend it to others.

One approach to evaluating ICT resources systematically is to use an **evaluation matrix**. Evaluation matrices are used to evaluate a number of options against specified criteria. Evaluation matrices are useful when there is a significant investment to be made in technology, for example when selecting a learning platform or suite of products. You can find many pre-defined evaluation matrices available online or you can create one to suit your own needs.

However you may also be choosing digital content or apps on an ongoing basis in the classroom where you don't always have time to complete a detailed evaluation matrix. In these cases you should still use a systematic approach but it might involve a more streamlined checklist – this could be done as a quick run through a list in your head or completing a quick checklist you have printed out.

The key is to take time to critically evaluate the ICT resource to make sure that it meets your criteria before you use it.

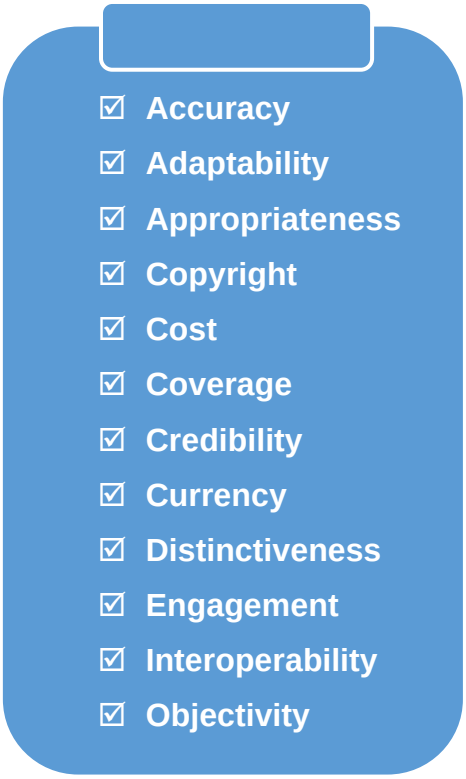
Evaluation Criteria

There are many different sets of evaluation criteria for digital content and applications that have been defined by various national bodies, Ministries of Education and professional organisations. You should check the recommendations for your country, region or school and think critically about the criteria that are appropriate for your needs.

Some typical criteria for evaluating **digital content** includes:

- ✓ **Accuracy** – You should consider how accurate and correct is the content? Accuracy refers to the extent to which digital content is correct and true. It can be determined through the extent of errors, evidence of research provided through citations, footnotes or a bibliography, and peer-review validation where the information has been reviewed or referenced by others of similar competence in the field.
- ✓ **Adaptability** - Can the content be modified to suit the teacher's purpose?
- ✓ **Appropriateness** - How appropriate is the content for the curriculum and student? Appropriateness refers to the extent to which digital information is appropriate for a particular need. It can be determined by identifying whether the information is appropriate both in content and format for the curriculum goals, the teaching, learning and assessment strategy and the student in terms of age, ability, language, culture and special need. In terms of format what type of media formats are used, for example text, images, video, animation, simulations etc. and are they appropriate?
- ✓ **Copyright** - Is there a copyright associated with the digital content? Can the content be used or easily adapted/modified for educational purposes?
- ✓ **Cost** - How much does the digital content cost? Cost refers to whether the information is free or has a fee.
- ✓ **Coverage** - How complete is the content? Coverage refers to the extent to which digital content is adequate for its purpose. It can be determined through the depth of the information in terms of historical references, international references and whether it is summary or complete information.
- ✓ **Credibility** - How credible is the content? It is important to critically evaluate the content to make sure that is from a reliable source. Credibility refers to the extent to which digital content has been produced by an authoritative source and is reputable in nature. It can be determined through the availability of the author's credentials and contact details, and the publisher's reputation. Online information can be biased and may not always be reliable or true. There can be an agenda behind information – for example it could be a form of advertising or it could be designed to further a political or religious ideology. If the publisher is anonymous it can signal that the content is not credible.

- ✓ **Currency** - How up-to-date is the content? Currency refers to the extent to which digital content is current and frequently updated. It can be determined through the presence of a date, the frequency of updates, if associated links are updated, if the information is still valid.
- ✓ **Distinctiveness** - To what extent does the digital content provide new opportunities over traditional learning resources?
- ✓ **Engagement** - Does the resource really engage and motivate learners?
- ✓ **Interoperability** - Does the content run on different devices and operating systems and is it cross-platform? Interoperability refers to the extent to which the content conforms to international standards, specifications or interchange formats.
- ✓ **Objectivity** - How objective is the content? Objectivity refers to the extent to which digital content is impartial and factual. It can be determined by identifying whether the purpose is to inform, persuade, sell a product/service or entertain and determining if the information is fact or opinion.

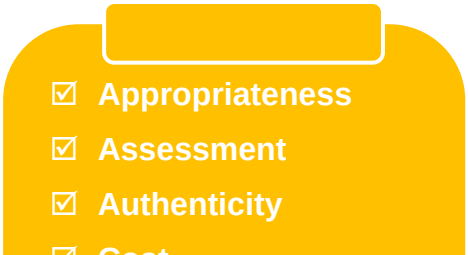


Digital content evaluation criteria

Some typical criteria for evaluating **applications** and **tools** include:

- ✓ **Appropriateness -** How appropriate is the application/tool for the curriculum and student? Is the application/tool appropriate for the curriculum goals, the teaching, learning and assessment strategy and the student in terms of age, ability, language, culture and special need?

- ✓ **Assessment** - Is assessment included and what type of assessment and feedback is provided? For example, is the feedback in text or audio? Is there scoring available to the student? Is feedback personalised? Is there management of results? Can feedback and results be printed?
- ✓ **Authenticity** - How authentic is the application/tool for the curriculum and student? Does it provide a real-world environment for the student?
- ✓ **Cost** - What is the cost of the application/tool? Is there an educational price available? Is it an open educational resource? What is the total cost of ownership? For example an application such as a learning platform may be free to install but you also need to consider the cost of hosting it and supporting and maintaining it. You will need to consider whether it would be more cost effective to do this yourself or pay a 3rd party provider.
- ✓ **Installation and use** - What are the minimum memory and operating system requirements to run the software? Is the tool available offline (CD-ROM, DVD, downloaded from the Internet) and/or online (streaming)? Is the tool available for use on computers and devices? Does it require any special software to run such as a proprietary multimedia player?
- ✓ **Interactivity** - Is interactivity included? What level of interactivity is included? Is it simple or complex?
- ✓ **Interoperability** - Is the application/tool interoperable with other systems?
- ✓ **Licensing** - What are the licensing requirements? Is the licence single user, multiple user, network licence, trial version?
- ✓ **Security features** - What security features are available?
- ✓ **Support** - Is appropriate pedagogic support provided on how the tool relates to the curriculum and how it can be used for teaching, learning and assessment? Is technical support provided in relation to installation, use and maintenance?
- ✓ **Usability** - How easy is the application/tool to use and navigate? Does it include bookmark features or the ability to restart at a particular point? Can the student or teacher determine the rate of progress? Is there easy to use help? Is the application/tool accessible to students with special needs?



Application and tools evaluation criteria

8.3 USING ONLINE RESOURCES RESPONSIBLY

Concepts

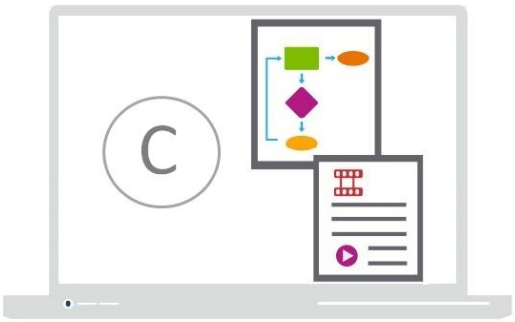
There are a vast number of ICT resources online that you can use in your teaching practice. However, there are rules and responsibilities when using online resources. These rules apply to anyone using online resources including students so ensure that they know their responsibilities as well.

Plagiarism

One important rule when using online resources is to avoid **plagiarism.** This can be defined as deliberately using someone else's words and ideas and passing them off as though they are your own. Most teachers look out for plagiarism in their students work but may not be thinking about it when they are searching for online resources to use in class. You should always acknowledge your sources appropriately.

Copyright

Another important rule is to avoid infringement of **copyright**. Copyright can be described as a set of rights granted to the creator of an original work, which allows them to copy, distribute and adapt their work and prevents anyone else from doing so. In most cases copyright is effective from the creation of the work for a set period of time, after which the work is said to enter the public domain. Copyright often does not need to be registered. Nearly all software or resources purchased or downloaded are protected by copyright. This means that software, text, images, audio or video files cannot be used without the author's explicit permission and users can be prosecuted for illegally using this copyrighted material. You must always seek permission to use any resource covered by copyright – software, digital text, images, audio, and video - and always acknowledge sources appropriately.



Intellectual Property Rights

Another concept to be aware of when sourcing online resources is **intellectual property rights (IPR)**, which are the rights someone has over something they have created for a period of time. It can cover content, inventions, artistic works, symbols, names, images, and designs used in commerce among other things. Some types of IPR include patents, copyright and trademarks. You should be careful not to infringe someone's IPR.

Software Licenses

You should also be familiar with different types of **software licenses** and how you can use a resource depending on the type of license. Software products are usually licensed and it is important to use them in accordance with their license terms and conditions. Depending on the license and relevant laws, using software products without permission may result in civil and criminal penalties.

Different types of licenses determine how the software can be used.

- **An End–user license agreement (EULA)** is also known as the software license or user license and it is a legal contract between the manufacturer and/or the author and the end user of an application. The EULA defines

how the user can and cannot use the software and any restrictions imposed by the manufacturer.

- **A Multi-user license** is a license that enables software to be installed on a specified number of computers or devices. Pricing for multi-user license depends on the number of end users and license purpose.
- **Open Source software** is software where the source code is published and made publicly available, allowing anyone to copy, modify and redistribute the source code without paying royalties or fees. Open source code is typically created through collaboration.
- **A Creative Commons license** is a type of open or free copyright license that allows people to determine how they share text, images, audio and video online. There are different types of Creative Commons licenses which determine how a resource can be used - for example some define that a resource can be used as long as the owner of the copyright is credited or some define that a resource can be adapted as long as the resulting resource is shared under the same terms as the original license.
- **Shareware** is also known as trialware or demoware. It is proprietary software that is free to the user for a trial period often with limited functionality or availability. The user can evaluate the software and decide whether to purchase it or not when the trial period ends.
- **Freeware** is a derivation of the words free and software. It is software that is usually free or available for an optional fee, often with limited functionality. Software vendors often provide free demonstration copies of their software online. This type of software, unless stated otherwise, is not covered by copyright rules.

8.4 EVALUATE AN ICT RESOURCE

Task

In this task you are going to evaluate an ICT resource of your choosing to see whether it is appropriate or not for your needs.

Select an ICT resource that you are considering using with your students – for example to support your teaching practice, in a learning activity with students or as an assessment method. It can be some form of digital content or an application or tool.

Evaluate the resource to determine its effectiveness in supporting and enhancing your lesson.

Document your evaluation in a format of your choosing. You can be as detailed as you need to suit your purposes. Sample formats for digital content and applications and tools have been provided on the next two pages. You can modify

these, or create your own format from scratch or find a suitable version online. Whatever format you use try to include the following information in your evaluation:

1. The name of the resource.
2. The provider of the resource.
3. How you intend to use the resource.
4. How the resource meets or doesn't meet a set of evaluation criteria. You can create your own list of evaluation criteria using the following lists for guidance:
    - ✓ For digital content - accuracy, adaptability, appropriateness, copyright, cost, coverage, credibility, currency, distinctiveness, engagement, objectivity, and interoperability.
    - ✓ For an applications and tools - appropriateness, assessment, authenticity, cost, interoperability, licensing, installation and use, interactivity, security features, support, and usability.
5. The evaluation result including whether you intend to use the resource and why.

ICT Resource Evaluation – Digital Content	
What is the resource name?	
What is the provider's name or website address?	
How do you intend to use the resource?	

Evaluation *(Mark the appropriate checkbox)*	Yes	No
Is the resource accurate? (i.e. is it free from mistakes? are there citations, footnotes or a bibliography? is there evidence that it has been reviewed or referenced by experts?)	☐	☐
Can the resource be adapted if needed?	☐	☐
Is the resource appropriate? (i.e. is it suitable for your subject, the curriculum, your student's age and abilities and your teaching, learning and assessment strategy?)	☐	☐
Is the resource covered by copyright?	☐	☐
Is the resource free to use in education?	☐	☐
Is the topic covered in the right depth for your purposes?	☐	☐
Is the resource credible (i.e. are the provider's contact details available and are they a trusted and reputable source?)	☐	☐
Is the information current? (i.e. is the date created available and is it recent?)	☐	☐
Will the resource add value to the lesson?	☐	☐
Will the resource engage students? (i.e. are there images, audio, video, animation, interactivity or something else to interest and motivate?)	☐	☐
Does the resource work with your devices and operating systems?	☐	☐
Is the resource objective? (i.e. is the information factual and unbiased? Is it free from advertising?)	☐	☐

Evaluation result	
Do you plan to use the resource?	
Give a brief explanation of why the resource is suitable or not for your purpose.	

Sample format for evaluating digital content

ICT Resource Evaluation – Applications/Tools	
What is the resource name?	
What is the provider's name or website address?	
How do you intend to use the resource?	

Evaluation *(Mark the appropriate checkbox)*	Yes	No
Is the resource appropriate? (i.e. is it suitable for your subject, the curriculum, your student's age and abilities and your teaching, learning and assessment strategy?)	☐	☐
If required, is assessment included and is it appropriate for your needs?	☐	☐
If required, does the resource provide an authentic environment for the curriculum and student?	☐	☐
Is the resource free to use in education?	☐	☐
Is the resource interoperable with your existing devices and systems?	☐	☐
Does the licensing suit your needs?	☐	☐
Does the resource suit your installation requirements (i.e. depending on your needs will it run online and/or offline?)	☐	☐
If required, do the interactivity features suit your needs?	☐	☐
Do the security features suit your needs?	☐	☐
Do the support features suit your needs? (i.e. if required, is there pedagogical support and technical support?)	☐	☐
Does the resource meet your usability requirements? (i.e. is it easy to use and navigate for all users?)	☐	☐

Evaluation result	
Do you plan to use the resource?	
Give a brief explanation of why the resource is suitable or not for your purpose.	

Sample format for evaluating applications/tools

8.5 REVIEW EXERCISE

1. You are searching for good quality online resources that are free to use for an upcoming lesson. Which one of the following sites would you most likely use?
    a. A news site.
    b. A shopping site.
    c. An online gaming site.
    d. An open educational resource site.

2. Which one of the following statements are TRUE in relation to online information?
    a. ICT resources found through search engines are always accurate.
    b. Information found on news sites is unbiased and reliable.
    c. Online information can be false and inaccurate.
    d. Social media sites only share accurate and authentic information.

3. You are evaluating a website for use as a possible teaching resource. Which one of the following should you check to ensure that the site is credible?
    a. Navigation.
    b. Interoperability.
    c. Author information.
    d. Interactivity.

4. List 4 criteria that you might use to evaluate an application?

    _____

    _____

    _____

    _____

5. You have found a photograph online that you want to include in a hand-out for your students. What type of copyright licence would allow you to use the photograph as long as you credit the creator?
    a. Plagiarism.
    b. End user license agreement.
    c. Intellectual property rights.
    d. Creative Commons.

6. Which one of the following is NOT a type of software license?
    a. EULA.
    b. Shareware.
    c. Evaluation matrix.
    d. Freeware.

8.6 REFERENCES AND FURTHER READING

- JISC (2013), 'Open Educational Resources infokit', available: https://www.jisc.ac.uk/guides/open-educational-resources [accessed 05/04/2017]
- Becta (2007), Quality Principles for Digital Learning Resources: improving learning through technology, available: http://webarchive.nationalarchives.gov.uk/20101102103654/publications.becta.org.uk//display.cfm?resID=32112 [accessed 05/04/2017]
- eQNET Quality Network for a European Learning Resource Exchange for schools, 'Travel Well Criteria', available: http://lreforschools.eun.org/web/guest/travel-well [accessed 05/04/2017]
- Norwegian Centre for ICT in Education, Quality Criteria for Digital Learning Resources (2013), available: http://iktsenteret.no/sites/iktsenteret.no/files/attachments/quality_criteria_dlr.pdf [accessed 05/04/2017]
- Khan Academy website, available: https://www.khanacademy.org [accessed 05/04/2017]
- Learning Resource Exchange for schools website, available: http://lreforschools.eun.org [accessed 05/04/2017]
- OER Commons website, available https://www.oercommons.org [accessed 05/04/2017]
- TES Connect website, available: https://www.tes.co.uk/teaching-resources/ [accessed 05/04/2017]
- MIT OpenCourseWare website, available: http://ocw.mit.edu [accessed 05/04/2017]

LESSON 9 -
LEARNING PLATFORMS

After completing this lesson, you should be able to:

- Understand the concept of a learning platform and identify its key features
- Create a course in a learning platform and set the category, name, start date, and number of weeks/topics
- Delete a course
- Create a user
- Assign users to a course in a learning platform
- Unassign users from a course in a learning platform
- Add content to the course page in a learning platform like a file, folder, existing content, label, page, or URL
- Delete content from the course page in a learning platform like a file, folder, existing content, label, page, or URL
- Be aware of available communication/collaboration activities in a learning platform
- Create a communication/collaboration activity like a forum, wiki, or chat
- Edit a communication/collaboration activity like a forum, wiki, or chat
- Remove a communication/collaboration activity like a forum, wiki, or chat

9.1 LEARNING PLATFORM FEATURES

Concepts

A learning platform is a suite of software that enables you to manage learning. A learning platform can consist of a number of tools that support the design and delivery of courses and a variety of learning experiences. A learning platform can serve as the foundation for an entire course or it can be used in conjunction with face-to-face learning.

They are sometimes known as Virtual Learning Environment (VLE), Learning Course Management System (LCMS), or Learning Management System (LMS). Increasingly all these systems are simply referred to as learning platforms.

Learning platforms can be either off-the-shelf, open source, or developed by educational institutions to suit their own requirements.

Some common learning platforms used in education are:

- Moodle (open source)
- eFront (open source)
- itslearning
- Fronter
- Blackboard Learn
- Microsoft SharePoint LMS (off- the-shelf)

Key Features

The key features of learning platforms vary depending on the tool but most platforms provide broadly similar features.

1. They provide **any-time global access**. This means that most learning platforms are installed on a web server so they can be accessed at anytime from anywhere over the internet.
2. They provide **interactive and re-usable learning content and assessment**. A learning platform can be used for creating and sharing resources and testing knowledge and receiving feedback. This includes multimedia resources and content, feedback and assessment.
3. They also support **administrative and tracking features**. These features include management of enrolment, assessment records and calendars.
4. And they typically include **communication and collaboration tools**. This includes peer-to-peer, student-to-tutor, and teacher-to-parent communication, and collaboration tools. These can include social media, video conferencing, instant messaging, email, and forums.

9.2 USING A LEARNING PLATFORM

Concepts

You can carry out various tasks in online learning platforms:

1. Creating and deleting courses.
2. Creating users.
3. Assigning and unassigning users to courses.
4. Adding and deleting course content.
5. Adding, editing and deleting forums, wikis, and chat tools.

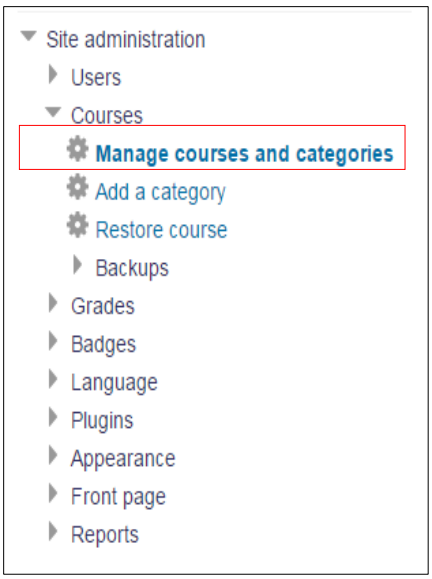
Steps

There are many learning platforms available but the following steps use Moodle version 2.8 as an open-source example of a learning platform. The steps for using other learning platforms will vary based on their features.

Creating a Course

To create a course in Moodle v2.8 and set the category, name, start date, number of weeks/topics:

1. Log in to the Moodle site as an **administrator**, **manager** or **course creator**.
2. Under the Administration block, click **Site administration**.
3. Click **Courses**.
4. Click **Manage courses and categories**.

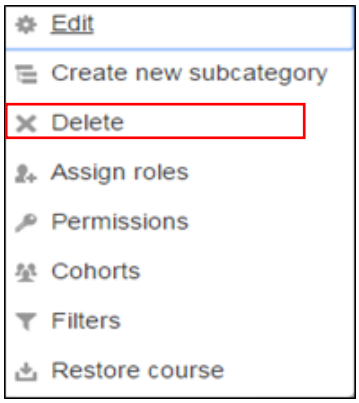


5. Select the **category** in which to add a new course.
6. Click **Create new course**.
7. Add the **course full name** and **course short name**.
8. Enter the **course start date**.
9. In the **Course format** section set the number of **weeks/topics**.
10. Click **Save changes**.

Deleting a Course

To delete a course in Moodle v2.8:

1. Log in to the Moodle site as an **administrator**, **manager** or **course creator**.
2. Under the Administration block, click **Site administration**.
3. Click **Courses**.
4. Click **Manage courses and categories**.
5. Select the **category** where the course is located.
6. Select the **sub-category** where the course is located if applicable.
7. To delete the course, click the **Delete** symbol.

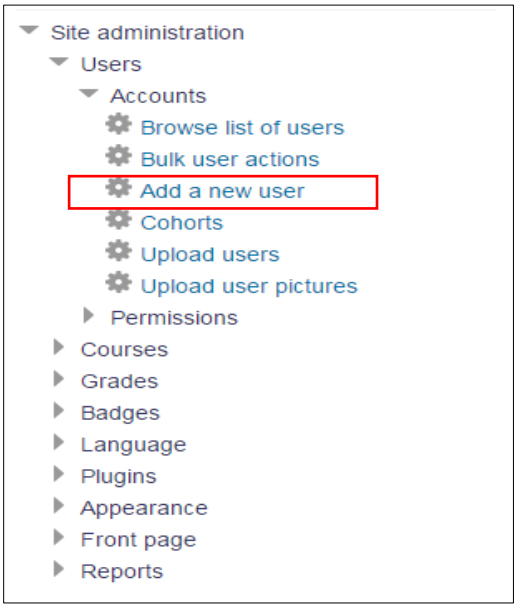


8. Click **continue** to delete the course.

Creating a User

To create a user in Moodle v 2.8:

1. Log in to the Moodle site as an **administrator** or **manager**.
2. Select **Site Administration** - **Users** - **Accounts** - **Add a new user**.

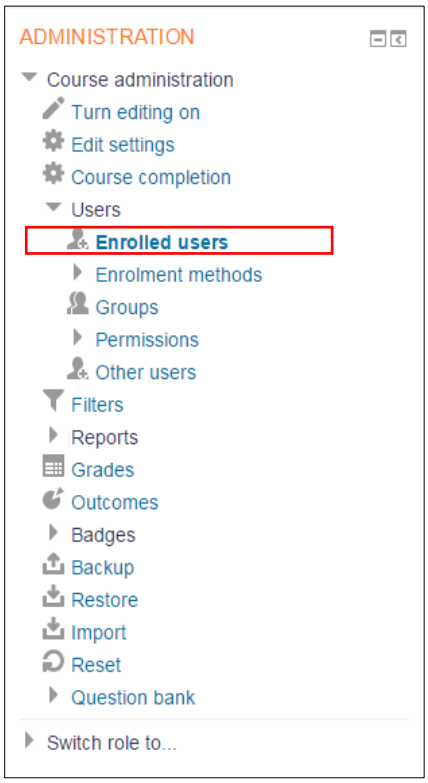


3. Add a **username**.
4. Enter the **password** for the new user.
5. Complete the rest of the required details such as **First name**, **Surname**, **Email address**, **City** and **select a country**.
6. Click **Create User** at the bottom of the page.

Assigning a User

To assign users to a course in Moodle v 2.8:

1. Log in to the Moodle site as a **teacher**.
2. Click the relevant **course**.
3. Under Course administration, click **Users - Enrolled Users**.



4. Click **Enrol Users**.
5. Set the user's role in the **Assign roles** drop-down menu.
6. Search for the user and click **Enrol** to the right of their username.
7. Add all the users and click **Finish enrolling users**.
8. A list of users enrolled in the course is displayed.

Unassigning a User

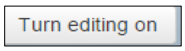
To unassign users from a course in Moodle v 2.8:

1. Under **Course administration**, click **Users - Enrolment methods**.
2. Select the **Enrol users** icon.
3. Select the **enrolled user** to unassign.
4. Click **Remove**.

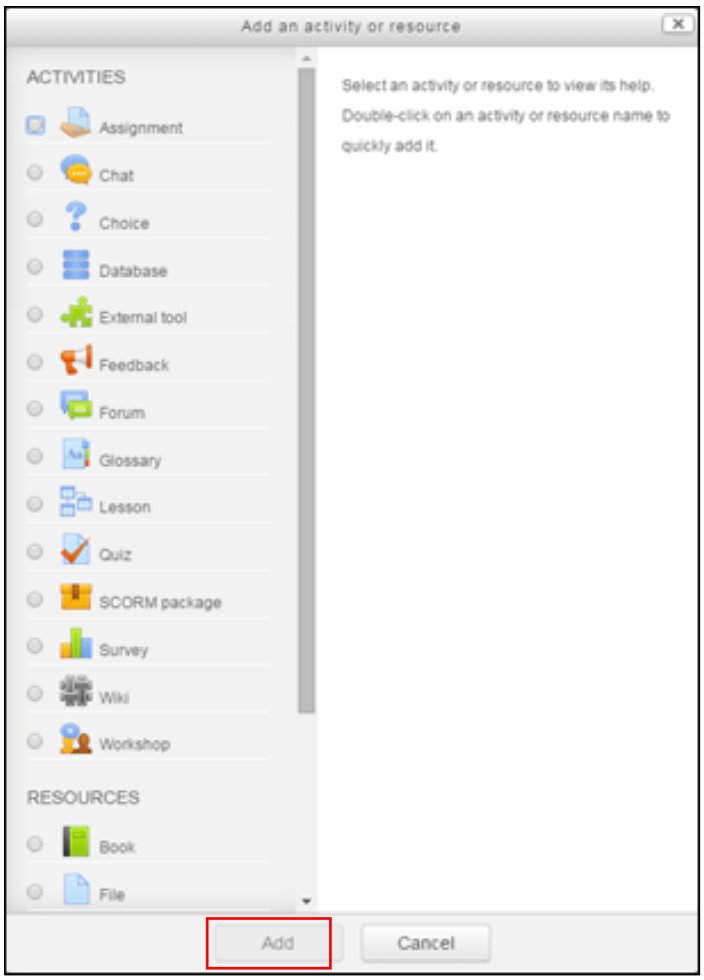
Adding Content

To add content to a course page in Moodle v2.8.

1. Log in to the Moodle site as a **teacher**.
2. Go to the relevant **course** to modify.
3. Click **Turn editing on**.



4. Go to the relevant **topic** or **week**.
5. Click **Add an activity or resource**.
6. In the **Add an activity or resource** menu select the relevant item.
7. Click **Add**. Or alternatively double-click the relevant item.



8. Complete the **form** for the item as appropriate. (Note: The steps on how to complete the details in the form for a specific type of content such as a file, folder, existing content, label, page or URL are outlined below).
9. Select **Save and return to course**.

To complete the form for a file or folder:

1. Enter the **Name** and **description** in the **Description text box**.
2. Click **Add**. Or alternatively drag and drop the file or folder directly into the content box.
3. Select **Upload a file** on the left hand side in the **File picker**.
4. Select **Choose File**.

5. Browse **to the file or folder location** on your computer and double click it or click **Open**.
6. Select **Upload this file**.

To complete the form for a label:

1. Enter the **text** of the label in the textbox.

To complete the form for a page:

1. Enter the **title** of the content in the **Name field** and a **description** of the content in the **Description section**.
2. In the Page content section add the **text** to display.

To complete the form for a URL:

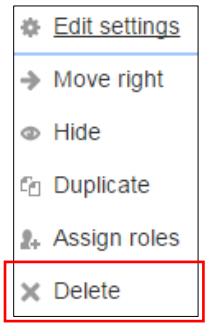
1. Add the **title** of the link in the **Name field** and a **description** of the link in the **description section**.
2. Enter the **URL** into the External URL field.

Note: The steps to add existing content to and delete content from the course page will depend on the existing content.

Deleting Content

To delete content such as a file, folder, existing content, label, page or URL from the course page in Moodle v 2.8:

1. Click **Edit** beside the relevant item.
2. Click **Delete**.
3. Click **Yes** to confirm.



Creating a forum, wiki or chat

To create a forum, wiki, or chat in Moodle v 2.8:

1. Log in to the Moodle site.
2. Go to the relevant **course** to modify.
3. Click **Turn editing on**.
4. Go to the relevant **topic** or **week**.
5. Click **Add an activity or resource**.
6. In the **Add an activity or resource** menu select the relevant item.
7. Click **Add**. Or alternatively double-click the relevant item.
8. Complete the form for the item as appropriate by entering a **name** and a **description** and any **additional settings** that are required – for example the **forum type** or the **first page name** and **mode of the wiki**.
9. Select **Save and return to course**.

Editing a forum, wiki or chat

To edit a title in a forum, wiki, or chat in Moodle v 2.8:

1. To edit a title, click **Edit title** icon beside the relevant title
2. Enter the **new title**.
3. Press **Enter**.

To edit the general settings in a forum, wiki, or chat in Moodle v 2.8:

1. To edit the general settings, click **Edit** beside the relevant activity.
2. Click **Edit settings**.
3. Edit the activity as required.
4. Select **Save and return to course**.

Removing a forum, wiki or chat

To remove a forum, wiki, or chat in Moodle v 2.8:

1. Click **Edit** beside the relevant activity.
2. Click **Delete**.
3. Click **Yes** to confirm.

9.3 REVIEW EXERCISE

1. You want to store revision resources online by topic so that your students can access them from home. Which one of the following is the most appropriate tool for this task?
    a. An admissions database.
    b. A school discussion forum.
    c. An online learning platform.
    d. A school website.

2. You are explaining to your principal why they should introduce an online learning platform into your school. Which one of the following is the best description of an online learning platform?
    a. It is a tool for managing the school budget.
    b. It is a tool for storing student test results.
    c. It is a tool for managing class timetables.
    d. It is a tool for managing the learning process.

3. Create a course of your choosing in an online learning platform.

4. Create a user in an online learning platform.

5. Assign a user to a course of your choosing in an online learning platform.

6. Add some course content for example a file, folder, existing content, label, page or URL to a course page.

7. Delete some course content from a course page.

8. Add a forum to an online learning platform.

9.4 REFERENCES AND FURTHER READING

- Ofsted (2014), Virtual Learning Environments: resources for providers, available: https://www.gov.uk/government/publications/virtual-learning-environments-resources-for-providers [accessed 05/04/2017]
- Moodle website, 'Moodle demonstration site', for a demonstration of the latest version of Moodle, available: https://moodle.org/demo/ [accessed 15/04/2017]
- Moodle website, 'Managing a Moodle course', version 2.8, available: https://docs.moodle.org/28/en/Managing_a_Moodle_course [accessed 05/04/2017]
- Moodle website, 'Moodle 2.8 documentation', available: https://docs.moodle.org/32/en/Main_page [accessed 05/04/2017]

ICDL Syllabus

Ref	ICDL Task Item	Location
1.1.1	Understand that ICT used in Education can consist of computers and devices, networks, applications/tools, and digital content.	*1.1 Overview of ICT in Education*
1.1.2	Outline the benefits of using ICT to support and enhance teaching.	*1.2 Benefits for Teachers*
1.1.3	Outline the benefits of using ICT to support and enhance learning.	*1.3 Benefits for Learners*
1.1.4	Outline the benefits of using ICT to support and enhance assessment.	*1.4 Benefits for Assessment*
1.1.5	Outline barriers to using ICT to support and enhance teaching, learning and assessment.	*1.5 Potential Challenges*
1.2.1	Outline how ICT can support different learning styles.	*3.1 ICT and Learning Styles*
1.2.2	Outline how ICT can support different teaching/learning strategies.	*3.2 ICT and Teaching / Learning Strategies*
1.2.3	Outline how ICT can support different learning environments.	*3.3 ICT and the Learning Environment*
2.1.1	Outline steps involved in planning an ICT-enhanced lesson.	*4.1 Lesson Planning*
2.1.2	Recognise that planning an ICT-enhanced lesson includes the selection of ICT for lesson preparation, teaching activities, learning activities, assessment activities.	*4.2 Lesson Considerations*
2.1.3	Outline practical considerations when planning an ICT-enhanced lesson.	*4.3 Practical Considerations*
2.1.4	Understand the importance of ensuring equal access to ICT for all students. Identify some options for enhancing accessibility.	*4.4 Access Considerations*
2.1.5	Create a lesson plan for an ICT-enhanced lesson.	*4.5 Creating an ICT-Enhanced Lesson Plan*
2.2.1	Understand the concept of an acceptable use policy (AUP).	*2.1 Acceptable Use Policies*
2.2.2	Understand the importance of educating students and parents about safe and responsible Internet use. Outline some potential risks for students using the Internet.	*2.2 Potential Online Risks*
2.2.3	Outline ways to minimise risks for students using the Internet.	*2.3 Minimising Online Risks*
2.2.4	Be aware of the importance of protecting student data by implementing relevant data protection laws. Understand the teacher's role and responsibilities in implementing data protection policies.	*2.4 Data Protection*
2.2.5	Recognise some methods for protecting data on computers and devices.	*2.5 Data Security*
2.2.6	Recognise some ways to help ensure teacher and student well-being while using a computer or device.	*2.6 Well-Being*
3.1.1	Identify types of digital content that can be used to support and enhance teaching and learning and outline their key features.	*5.1 Digital Content*
3.1.2	Identify communication tools that can be used to support and enhance teaching and learning and outline their key features.	*5.2 Communication Tools*
3.1.3	Identify online collaboration tools that can be used to support and enhance teaching and learning and outline their key features.	*5.3 Online Collaboration Tools*

Ref	ICDL Task Item	Location
3.1.4	Identify productivity tools that can be used to support and enhance teaching and learning and outline their key features.	*5.4 Productivity Tools*
3.1.5	Identify image, audio, video tools that can be used to support and enhance teaching and learning and outline their key features.	*5.5 Image, Audio and Video Tools*
3.2.1	Identify on-screen assessment tools that can be used to support and enhance assessment and outline their key features.	*7.1 On-Screen Assessments*
3.2.2	Identify electronic survey/voting tools that can be used to support and enhance assessment and outline their key features.	*7.2 Survey Tools*
3.2.3	Understand the term electronic portfolio and how it can support and enhance assessment. Identify tools for supporting the use of electronic portfolios and outline their key features.	*7.4 Electronic Portfolios*
3.2.4	Understand how ICT can support and enhance collaborative assessment.	*7.5 Collaborative Assessment*
3.2.5	Identify tools that can be used to support the management and administration of assessment and outline their key features.	*7.3 Assessment Management Tools*
3.3.1	Identify sources of ICT resources.	*8.1 Sourcing Suitable ICT Resources*
3.3.2	Understand the importance of evaluating ICT resources using a systematic approach such as an evaluation matrix.	*8.2 Evaluating ICT Resources*
3.3.3	Be aware of the importance for teachers and learners of critically evaluating digital content. Recognise appropriate criteria for evaluating digital content for effective use in education.	*8.2 Evaluating ICT Resources*
3.3.4	Recognise appropriate criteria for evaluating applications/tools for effective use in education.	*8.2 Evaluating ICT Resources*
3.3.5	Understand the terms copyright, intellectual property rights, plagiarism, Creative Commons licenses. Recognise the need to acknowledge sources, seek permission to use digital text, images, audio, video, as appropriate.	*8.3 Using Online Resources Responsibly*
3.3.6	Be aware of the importance of using licensed software. Outline types of software licenses: end-user license agreement (EULA), multi-user license, open source, shareware, freeware.	*8.3 Using Online Resources Responsibly*
3.3.7	Evaluate an ICT resource to determine its effectiveness in supporting and enhancing teaching, learning and assessment.	*8.4 Evaluate an ICT Resource*
4.1.1	Understand the concept of an interactive whiteboard and outline its key features.	*6.1 Interactive Whiteboards*
4.1.2	Understand the purpose of a digital projector in the classroom and outline its key features.	*6.2 Digital Projectors*
4.1.3	Understand the purpose of a digital visualiser in the classroom and outline its key features.	*6.3 Digital Visualisers*
4.1.4	Understand the concept of screen sharing tools and outline their key features.	*6.4 Screen Sharing Tools*
4.1.5	Understand the concept of mobile learning and outline the key features of mobile devices.	*6.7 Mobile Learning*
4.1.6	Understand the terms 1:1 computing and Bring Your Own Device (BYOD).	*6.8 Mobile Computing Solutions*

Ref	ICDL Task Item	Location
4.1.7	Identify equipment used in teaching, learning and assessment to support the creation and use of image, audio and video files and to support communication and online collaboration.	*6.5 Image, Audio and Video Equipment* *6.6 Communication and Collaboration Equipment*
4.2.1	Understand the concept of a learning platform and identify its key features.	*9.1 Learning Platform Features*
4.2.2	Create a course in a learning platform: set the category, name, start date, number of weeks/topics. Delete a course.	*9.2 Using a Learning Platform*
4.2.3	Create a user. Assign, unassign users to a course in a learning platform.	*9.2 Using a Learning Platform*
4.2.4	Add content to, delete content from the course page in a learning platform like: file, folder, existing content, label, page, URL.	*9.2 Using a Learning Platform*
4.2.5	Be aware of available communication/collaboration activities in a learning platform. Create, edit, remove a communication/collaboration activity like: forum, wiki, chat.	*9.2 Using a Learning Platform*

Congratulations! You have reached the end of the ICDL ICT in Education book.

You have learned about the key skills relating to key ICT in Education activities, including:

- Understand the key concepts and benefits of using ICT to support and enhance teaching, learning and assessment in the classroom.
- Outline considerations for planning an ICT-enhanced lesson.
- Understand safety, security and well-being considerations when using ICT in education.
- Outline ICT resources that can be used to support and enhance teaching, learning and assessment.
- Understand how to source and evaluate ICT resources to support and enhance teaching, learning and assessment.
- Outline the key features of classroom technologies.
- Use the key features of a learning platform.

Having reached this stage of your learning, you should now be ready to undertake ICDL certification testing. For further information on taking this test, please contact your ICDL test centre.

SNDK INVESTMENT

Pwani
P.O Box 57 Kibiti
Tanzania
icdlafrica.org