

ICT Integration for Educators

DESIGN AND DELIVER LESSONS USING ICT APPLICATIONS

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Prologue

Integrating information and communication technologies (ICTs) across the education sector is a complicated process. After learning many lessons from pilot ICTs in education projects and reviewing local and international experiences, the Namibian Ministry of Education (MoE) worked with partners across the education sector to develop the *ICT Policy for Education* in 2005 and the corresponding Implementation Plan in 2006.

These **ICT Integration for Educators** training manuals have been developed in response to the expectations in this Implementation Plan. It aims to address the changing roles that educators are experiencing to better meet the needs of the information society in which we live. In order to guide learners to translate information into knowledge, educators need to be equipped with many skills that surround the uses and applications of ICTs. To effectively use ICTs in education, educators need to consider all areas of their professional roles. ICT literacy skills are needed to operate a variety of applications and equipment. Also, educators need to be able to apply these skills in designing lessons, assessments and evaluations; engaging in continuous professional development; and using ICTs to support inclusion of all learners in teaching and learning. In all these areas, educators also need to meet the social, legal and ethical requirements of using ICTs in education.

ICTs can be used to enhance teaching and learning and will allow an educator to move from a more traditional educational setting to a role of facilitation and guidance. As educators acquire new skills, classroom practices will also experience change. These manuals will help educators prepare for the challenges ahead. Using ICTs to enhance teaching and learning fits well with Namibia's learner-centred philosophy and its basis in constructivism. With the learner participating in the learning process, ICTs can help learners take control of constructing their understanding, acquiring new skills and allow them to respond to their own learning styles. ICTs allow better communication, collaboration, information access and creative expression of ideas.

Integrating ICTs in teaching and learning allows the educator to shift the pedagogical approach towards a balance between teacher-led and learner-centred collaborative problem solving and critical thinking.

Introduction

Welcome to the training manual *Design and deliver lessons using ICT applications*.

The purpose of this manual is to give you the knowledge and skills to design and deliver lessons using ICT tools.

As an educator in the 21st Century, you must become comfortable using technology in your teaching and learning activities. Technology is not only necessary for Namibian learners to become globally competitive professionals, but research has proven the effectiveness of using ICT in teaching and learning. This manual will take you through the phases of designing and delivering a lesson using ICT applications.

What is in this manual?

This training manual is divided into 4 sections:

- Section 1 Design lessons integrating ICTs
- Section 2 Prepare teaching and learning materials using ICTs
- Section 3 Manage resources and facilities
- Section 4 Deliver lessons integrating the use of ICTs

Each section starts with an introduction and explains the skills you will learn. At the end of the section you will have an opportunity to check your progress by answering some questions.

Skills you will learn:

After you have completed this manual, you will be able to:

- apply the procedures to design lessons integrating ICTs
- apply procedures to prepare teaching and learning materials using ICTs
- demonstrate procedures to manage resources and facilities
- demonstrate lessons integrating the use of ICTs.

How to use this manual

Work through the manual from the beginning. You know that it is divided into 4 sections. It is a good idea to complete a whole section in one go if you can. At the beginning of the section you will find a list of *skills you will learn*. Read these carefully and return to them when you have completed your work. It is important that you do not move

on, until you have learned all the required skills.

Read each section carefully. You may come across new words which you do not know. These should be explained in the *glossary* at the end of the manual. You will learn many new technical terms as you progress through this manual and it is important that you learn them all well.

At the end of each section, you will find an opportunity to '*Check your progress*'. These questions have been carefully designed to help you to see how well you have understood and learned the topic. The answers are given at the end of the manual. You can choose to look at the answers before trying to complete the question yourself, if you want to. But the only person you will be cheating is yourself. No-one will take in your manual and mark it for you. You yourself must judge how well you are doing.

You may also find some practical activities. You will need to collect the required equipment and carry out these activities. Your instructor or supervisor will assist you.

At the end of each section, you will find a *Summary*. Again, you should read it carefully to review what you have learned. It is a good idea to check the *Skills you will learn* at the start of the section again and make sure you have achieved them all. If not, you may need to revise the section again.

What these symbols mean

Symbols are placed in the left hand margin to draw attention to the type of information at that point. The symbols used in this manual are:



Read



Demonstrate/discuss - sometimes your instructor will demonstrate / discuss the use of equipment.



Check your progress - these are easy exercises to test your understanding of the theory you have learnt. Typical correct answers are provided at the back of the manual.



Practical activity - these activities help you to practise some of the theory you have learnt.



Learning activity - these activities help you to relate the knowledge and skills in the sections to your own work station.



Remember/Take Note



Revise

SECTION

1

Designing lessons integrating ICTs

Introduction

In this section of the training manual you will learn how to design lessons integrating ICT tools.

It includes the development of a lesson plan and a practical demonstration of the integration of ICTs into teaching and learning.

You will learn how ICT integration relates to various educational theories important in Namibia, and be given examples of how ICT is applied to those contexts. In addition, you will discover how ICT can help you address learning problems, including specific technology solutions, and why they can work. In addition to learning the process of ICT integration in designing a lesson, you will find examples that should spark your own thinking about using these tools with your learners.

Skills you will learn

By the end of this section, you will be able to:

- explain the benefits and challenges of using ICT in teaching and learning
- explain the relevance of ICTs in the application of different theoretical theories
- define and explain the term ICT integration
- describe and apply the process of selecting ICT applications in teaching and learning
- describe and apply the procedures to design a lesson integrating selected ICT applications.

Benefits and challenges of using ICT in teaching and learning

Information and Communication Technology (ICT) in education encompasses many technological resources and has many purposes.

For purposes of this manual, think of information and communication technology in educators as: *the use of technology to improve education.*

It is a systematic, repetitive process for designing instruction or training used to improve performance. Information and communication technology is sometimes also known as instructional technology or learning technology.



List as many reasons as you can, for using technology in an educational context.

The first question you may be asking yourself is ‘why use technology?’ There are a number of reasons for using technology for reading and learning:

- to develop knowledge-society attributes in learners and students in line with the goals of Vision 2030
- to prepare learners for an ICT-rich workplace and society
- to address deficits in the education system (e.g. lack of textbooks)
- to create greater efficiency throughout the school
- to influence learners’ motivation and attendance.



In order to justify the expensive and time-consuming tasks of integrating technology into education, you should understand the specific contributions that technology can and should make to education systems. Research has shown how and where ICT-based methods are effective.

Benefits for teachers

Using of ICTs to design and deliver lessons, has the following benefits for teachers:

- it facilitates sharing of resources, expertise and advice on a broader basis
- it allows you to produce better looking, more “learner-friendly” materials more quickly•gives you greater flexibility in when and where tasks are carried out
- it provides for electronic storage of lesson plans, worksheets and exams for efficiency and standardisation
- you can track learner progress to better assess and evaluate learners and yourself
- using visual and interactive features help to focus learners’ attention and encourages them to spend more time on learning tasks
- engages learners through production work promoting motivation, creativity and self-expression
- provides tools for simulation and demonstration for better understanding
- help to communicate more effectively with parents to encourage greater parental involvement
- improve learners’ behaviour patterns
- provides more accurate up-to-date information more quickly than traditional ways
- support a learner-centred education.

Benefits for learners

Similarly there are major benefits for learners in using ICTs, namely:

- encourages learners to take control of their learning and they can see the results of their own decisions and actions sooner
- produces higher quality lessons through greater collaboration between the teachers in planning and preparing resources
- teaching becomes more focused to each learner’s strengths and weaknesses, through better analysis of attainment data
- develops writing skills (spelling, grammar, punctuation, editing and re-drafting), and also fluency, originality and elaboration
- develops higher-order thinking skills
- links learners to information sources (primary source materials, with people and places that they could not otherwise have) as well as education sources (for distance learning)

- prepares learners to be globally competitive professionals by grooming technology literacy
- helps learners visualize problems and solutions
- more easily caters for learners with special needs
- develops presentation skills and using visuals to communicate
- increases self-esteem, improves behaviour and encourages teamwork skills.

Examples of the benefits of using educational technology

- *Simulation and visualisation:* Computers allow the direct manipulation of representations like changing variables in mathematical representations and immediately seeing the effects. Simulations can also be used in allowing learners to manipulate dynamic representations of real-world systems taught in science.
- *Concept mapping:* This computer software supports higher-level skills of analysis and evaluation through having to construct diagrams to represent the interrelationship of ideas. These tools, called concept mapping tools (see figure 1 below), can organise factors that influence or affect a problem and show how these factors interact with each other in cause-and-effect relationships. They can also be used for learners to construct well-reasoned arguments and prove their case with credible evidence.

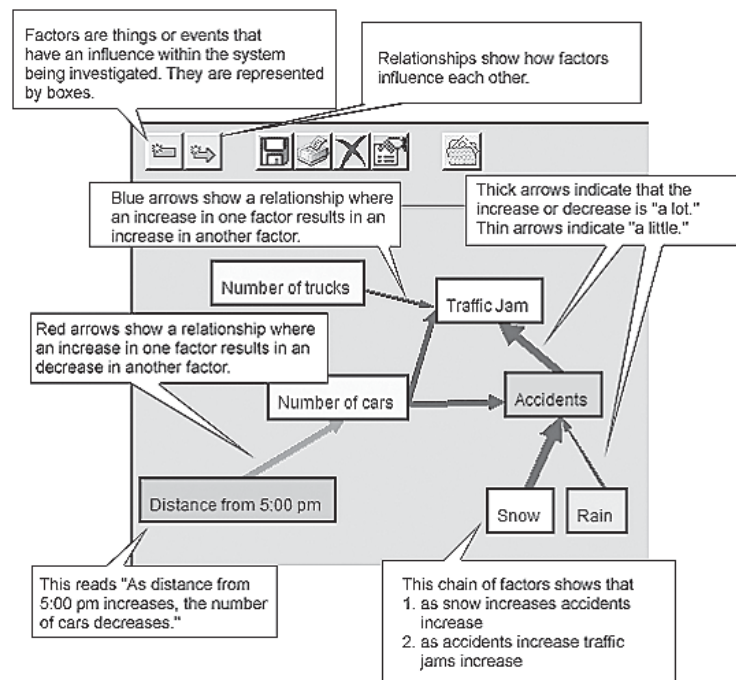


Figure 1: Example of Seeing Reason Tool, a concept mapping learning tool, from Intel Education

Challenges

Despite all these benefits to teaching and learning, you will encounter a number of challenges in integrating technology. Many are logistical issues, but some barriers will be within your ability to manage a whole new way of teaching and learning.

- *Your new role:* Using ICTs in teaching requires you to redefine your role as a teacher. Instead of being simply an instructor, you will become a constructor, facilitator, coach and creator of learning environments.
- *Time:* Effectively integrating technology requires your skill levels to be well developed in the ICT tools you decide to use. If your skills need improving, this will require time and energy on your part, and teachers 'spare' time is scarce. In addition, planning lessons integrating ICTs can take more time, particularly until you are more comfortable with using the technology.
- *Limited access to facilities and resources:* Access to ICTs may be restricted by demand of those facilities and tools by others at school (teachers and learners) and the lack of access outside of school. Supplemental facilities, such as Internet cafes, are only available in larger towns. Many areas in Namibia do not have such facilities. In addition, using these services will require money, which is perhaps another constraint.
- *Technical problems:* Technology can break. There will be times when a computer or TV will not work properly and you will not be able to fix it. In addition, power outages can and do occur, which leaves ICTs such as computers, TV, printers, etc, unusable. This can be extremely frustrating, especially when you have planned your day's lesson using that technology.

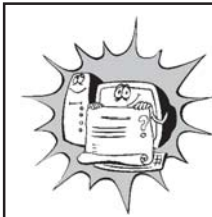


Figure 2: Students taking part in computer training.

- *Learner-computer ratio:* Let us say you have a computer lab of 10 computers and an average class size of 40 learners. This means that there will be 4 learners per computer. Not only is this a logistical challenge fitting them all in the lab, but it is also a classroom management issue as learners fight to use the equipment. Additionally, learners' skill levels, both with the computer and with the given subject, will vary and you need proactive strategies to address these. Subsequent sections of this manual will prepare you to tackle these issues.
- *Maintenance and Security:* ICTs are not cheap and, as mentioned earlier, can break. This means extra diligence is needed to ensure they are taken care of properly and made secure from damage and theft.

Relevance of ICTs in the application of different educational theories

The foundation policy in the Namibian education system is learner-centred education, which places the learners at the centre of education.



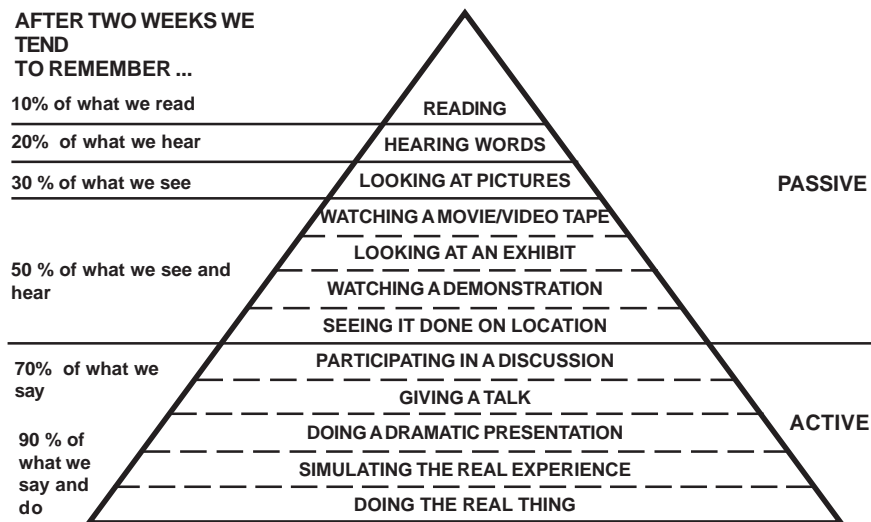
“Learner-centred education presupposes that teachers have a holistic view of the learner, valuing the learner’s life experience as the starting point for the studies....A learner-centred approach demands a high degree of learner participation, contribution and production ... (it) is based on a democratic pedagogy, a methodology which promotes learning through understanding and practice directed towards empowerment to shape the condition of one’s own life.”

Broad Curriculum for the BETD

This means that you put the needs of each learner at the centre of what you do in the classroom. This demands a high degree of learner participation, contribution and production.

Teaching and learning with ICTs align perfectly with this pedagogical view, if used properly. Learning in Namibia is seen as an interactive, shared and productive process, where teaching creates learning opportunities which will enable learners to explore different ways of knowing, understanding and developing the whole range of their abilities – both within and across subject areas of the whole curriculum.

The use of ICTs contributes to this vision as learners will engage with tools that develop higher-order thinking skills, encourage group work, and expose them to people, ideas and phenomena they would not otherwise have had the opportunity to experience.



Adapted from: Edgar Dale *Audio-Visual Methods in Teaching*, Holt, Rinehart and Winston.

Figure 3: Cone of Learning



Study the 'Cone of Learning' on the above, which shows the affects of passive and active learning on the retention of knowledge. Think about how and where ICT could fit in.

First and foremost, always remember that **you are** the most important element in the learning process. Technology **is not** here to replace you, but to provide you with tools to make your teaching more effective, interesting and valuable.

Using ICTs in education also **does not** mean that traditional methods of teaching are outdated. Proficient technology-oriented teachers must learn to combine directed instruction with constructivist approaches. The use of ICTs can be applied in different educational theories and practices in order to improve teaching and learning.

Behaviourism

Behaviourist pedagogy aims to modify observable behaviour and considers 'learning' as behaviour that shows the acquisition of skills. This model ignores any thought process occurring in the learner, regarding learning as a reflex to stimuli created by the teacher.

Instruction is carefully planned in a series of sequential steps to identify the desired behaviour such as skills or information, then to elicit the desired learner response. Learners are conditioned to being rewarded for correct answers until they learn the target skills or knowledge. As such, learning activities that foster higher-order thinking skills are not encouraged in behaviourism. Traditional drill and practice exercises are used instead.



Applying the use of ICT within this framework can be seen when educators make use of drill and practice approaches to teaching. This is typically seen for redressing deficiencies in basic skills (usually literacy and numeracy). For instance, learners can use a program that tests their knowledge of the multiplication table that simply asks the learner to provide answers to multiplication problems. The software will provide immediate feedback and the learner does the problems over and over again, until they eventually memorise all the problems. Keyboarding is another prime example of the drill and practice approach as learners spend time learning which fingers to use for which keys with the eventual goal of typing without looking at the keyboard.

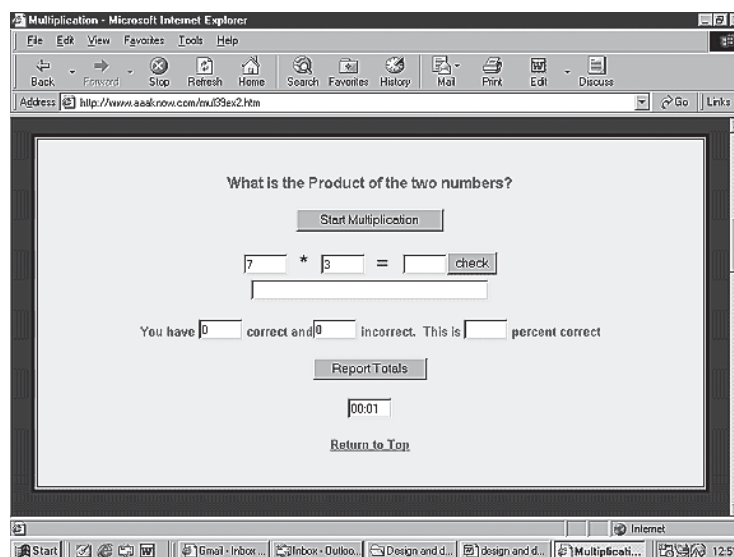


Figure 4: Example from <http://www.aaamath.com/> to help learners master multiplication tables.

Constructivism

Although there are numerous educational theories that can be applied to using ICTs in the classroom, research is increasingly linking constructivism with technology and learning. Constructivists believe that learning is a search for meaning and learners construct their own understanding of the world by reflecting on their experiences. The constructivist method focuses on learning through posing problems, exploring possible solutions, and developing products and presentations, rather than memorizing facts or reciting someone else's meaning. Education focuses on themes and concepts and the connections between them and, as such, learning is interdisciplinary and contextual.



In an ICT-rich learning environment, learners are presented with additional sources of knowledge and information, reducing the dependency of learners on the teacher. ICTs allow learners to control the pace of their learning, taking an active role, and constructing knowledge with understanding rather than taking the more passive role of receiving it. In addition, learners are encouraged through ICTs to be creative, self-analytical and to debate and collaborate with others.

Namibian education is grounded in Constructivist epistemology (the philosophical term of knowledge) with a learner-centred approach (where direct instruction is sometimes necessary). This makes an ideal background for using ICTs to support and improve teaching and learning. It can be used in many different ways and for various different reasons.

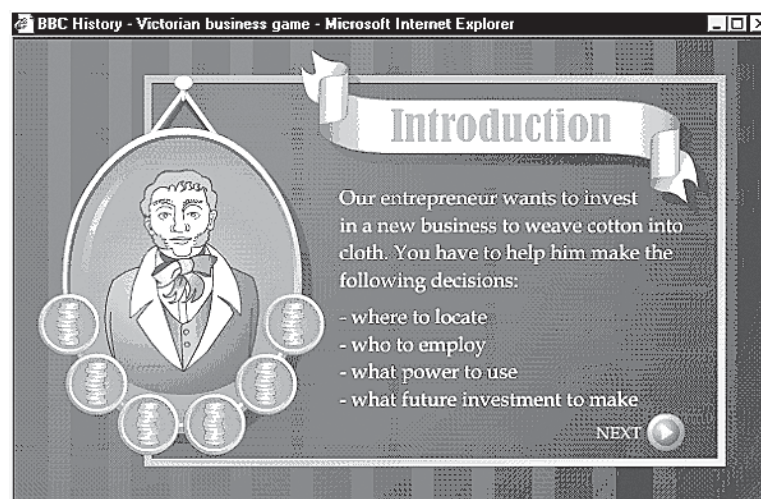


Figure 5: Example from http://www.bbc.co.uk/history/society_culture/industrialisation/. This interactive online game is a decision-making task: depending on the choices the learner makes, he or she will make money or end up bankrupt.

	Behaviourism	Constructivism
Classroom Activity	Lectures, demonstration, individual work and testing	Group work, discovery tasks and projects, reflection.
Teacher Role	Fact Teller Always expert	Facilitator Sometimes expert
Student Role	Listener Always learner	Collaborator Sometimes expert
Learning Goals	Demonstrated through mastery and behavioural competence in a scope and sequence	Demonstrated through learner's personal growth and ability to work independently and with others
Instructional Emphasis	Rote learning (memorising) Facts Memorisation	Relationships Inquiry and Invention
Concept of Knowledge	Accumulation of facts Quantity	Transformation of facts Quality of understanding
Assessment	Written tests matching set criteria Same measures for all learners Norm referenced	Performance assessments measuring quality by rubrics/ checklist Measure may differ among learners. Criteria referenced
Technology use	Drill and Practice <i>Example:</i> Instructional computer game for learning show to spell	Communication, Collaboration, Problem solving, Expression <i>Example:</i> group assignment to develop multimedia presentations

Table 1: Behaviourism versus Constructivism

To implement each of these strategies, you must select technology resources that meet your specific instructional needs. You should always make an effort to match ICTs to problems that you cannot otherwise address in easier or more interesting ways.

Bloom's Taxonomy

Bloom's Taxonomy is also relevant to the Namibian education system and using ICTs. Benjamin Bloom and his team identified three domains of educational goals and objectives: the cognitive, the affective and the psychomotor. Cognitive is for mental skills (knowledge), affective is for growth in feeling or emotional social areas (attitude), while psychomotor is for mental or physical aptitude (skills). For the cognitive domain, the team developed a six-level classification of intellectual behaviour that are important in thinking and learning.

Notice that the behaviours start with the lowest level of cognition, namely recognition of facts, and become increasingly more complex.

Knowledge	remembering of previously learned material; recall (facts or whole theories); bringing to mind.
Comprehension	grasping the meaning of material; interpreting (explaining or summarising); predicting outcome and effects (estimating future trends).
Application	ability to use learned material in a new situation; apply rules, laws, methods, theories.
Analysis	breaking down into parts; understanding organising, clarifying, concluding.
Synthesis	ability to put parts together to form a new whole; unique communication; set of abstract relations.
Evaluation	ability to judge value for purpose; base on criteria; support judgment with reason.



Look at Bloom's categories above and think of how ICTs could be used to bring about those skills. Check your answers with the table below.

Cognitive Process	Classroom example
Knowledge	Learners view a slideshow presentation that you have prepared on HIV/AIDS.
Comprehension	Learners research HIV/AIDS on the Internet, looking for relevant websites.
Application	In a spreadsheet, learners create their own graphs representing the rate of HIV/AIDS in Namibia over the past ten years.
Analysis	Learners use a concept-mapping software to understand the relationship between HIV/AIDS, their community and poverty.
Synthesis	Learners create a video project addressing the issue of HIV/AIDS in their community.
Evaluation	Learners create slideshow presentations on HIV/AIDS in the community, present it to the class and facilitate a question/answer session with you and their classmates.

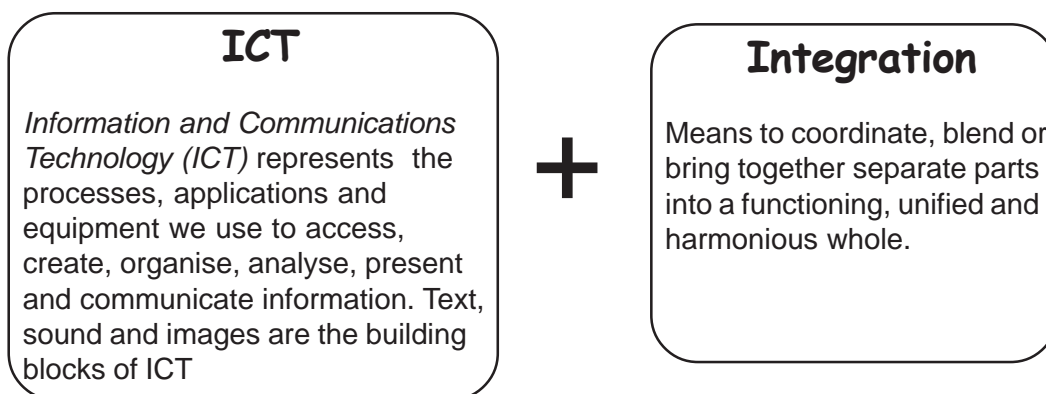
Table 2: Bloom's Taxonomy applications for ICT Integration

ICT can significantly assist in developing learners' higher-order thinking skills, those skills of analysis, synthesis and evaluation, by providing tools that better explain concepts, challenge traditional ways of thinking and access a wide range of information.

What is ICT integration

Before going any further, we should define what ICT integration actually means:

first, start by breaking up the word into its parts:



ICT integration then means to bring together existing subjects or tasks with the tools that ICT offers and blend them into a meaningful learning experience.

ICT integration is not ...the teaching of software and technical skills.

ICT integration is ... the use of technology as a tool for enhancing a teachers' professional performance and the learners achievements and preparation for the "real world."

ICT integration is not ...replacing teachers.

ICT integration is ...a new way of doing things – the processes, tools and techniques that change human activity.

ICTs will not enhance learner performance on their own. Your teaching practices and mastery of the given subject is the most important factor in the effectiveness of ICTs.

Of course you must possess the necessary skills to use and guide learners' usage of ICT tools, but this is just a prerequisite. The ability to integrate ICTs is about having the technical and cognitive proficiency to access appropriately, use, develop, create and communicate information using technological tools.



Learners should acquire their own ICT skills in their own subject, but they will also acquire these through regular use and exposure. Your job is to have learners develop their own ICT-integration skills. Learners can also demonstrate these skills by purposefully applying technology to solve problems, analyse and exchange information, develop ideas, create models and control devices.

Learners need to know *what* aspects of ICT are available to them, *when* to use them and *why* they are appropriate for the task. Lessons should not be technology-driven, but focused on clear teaching and learning objectives where ICT is used as a vehicle to support achievement of those objectives.

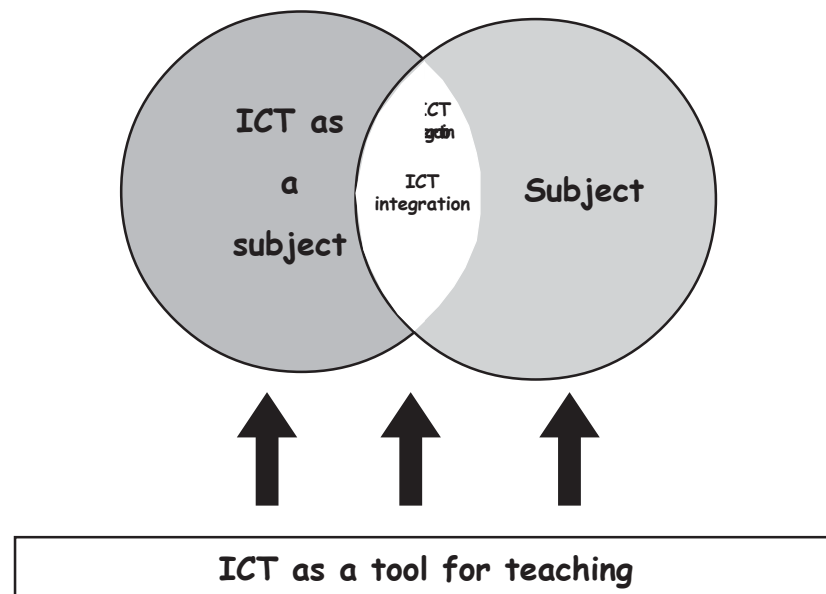


Figure 6: ICT Integration framework

Your lessons may involve little or no use of ICT by the learners, and thus, may do little to apply or develop their ICT skills. However, use of ICT as a medium of instruction can enhance and stimulate the learning experiences of learners and contribute to the achievement of the subject objectives. Recognise the different ways in which ICT can contribute to teaching and learning and acknowledge the importance of each.

Selecting an ICT application for teaching and learning

Now that you know that teaching with ICTs can enhance learning tremendously, you need to know how to start the process of integration to make education more efficient, exciting and successful.

Technology also creates needs that were not originally there. For instance, you may not have known that you needed faster communication until the fax machine, e-mail and cellular telephone became available.



Ask yourself:

- What am I teaching now that I can teach better with technology?
- What can I teach with technology that I could not teach before, but should be taught?

Identify a teaching or learning challenge

As an educator, you develop schemes of work (the other term for that is 'course outline heading plans') every year covering the relevant curricula and syllabi with themes and topics adapted to the local content. The first step in selecting an ICT tool to use in a lesson, is to identify the theme or topic to use it with. ICT should address a teaching or learning difficulty you experience in class. It could be a learning problem, like connecting subject matter to learners' lives, or a logistical problem, such as making it faster or easier to do things.



Think about the lessons you teach and identify some which are neither the best nor the worst. Look for areas of your teaching methods which are perhaps satisfactory, but which could improve with the introduction of an ICT-based component. Whether you use ICT or not in a lesson to support learning, is an important decision and not every lesson will lend itself to ICT integration. In general, the use of ICTs help when:

- you could not do a task otherwise - such as demonstrate the nature of alternating current by monitoring a fluorescent tube
- it enables you to do a task more efficiently such as search for information or do an experiment in half of the time
- it motivates learners to learn
- you have tried other ways and have not been successful.

List all ICT tools available

Once you have decided on a topic that ICTs can possibly help you to teach, list all the ICT tools that you have available for use. Do not just do this mentally – actually write down a list to help you to better remember what technology is at your disposal. Better yet, use a word processor! Do not forget even simple things like calculators, fax machines and cell phones. These are all ICT tools.



Brainstorm!

Now you need to think about how each tool could possibly be used to help address the challenge you identified in step one. Examine each tool carefully and think outside of the box. Even a school fax machine can be turned into a tool for learners to communicate with their parliamentarians. When evaluating hardware tools, be sure to think about all the software applications relevant to using that tool. For instance, when assessing the use of the computer lab, think about all the software that are available on the system.



Make a list of all ICT tools. Then compare it to the tools listed below.

Computer Hardware

- *Printer:* Print out any file from the computer. Make copies for handouts or post them on wall as visual aids.
- *Scanner:* Scan in pictures and text into your computer. Use these images in any programme, for instance, in a word processor to make a worksheet, or to a slideshow presentation.
- *CD ROM:* Play CDs
- *DVD drive:* Play DVDs
- *Data projector:* present and display information from computer to whole class

Computer Software

- *Word processor:* Write letters, stories, etc. Make handouts, worksheets, or tests. Insert images, graphs or tables.
- *Spreadsheet:* capture and model data.
- *Slideshow presentation:* Create a presentation on any topic insert images, photographs, graphs, or tables.

- *Multimedia*: Create audio and visual products.
- *Image*: Manipulation programme, such as Paint or similar which create a picture using various tools.
- *Database*: Create a database, including fields and making reports.
- *Internet/Email*: Research topics, give learners webquests, email people, use free education games and software on the Internet, wikis, blogs.
- *Educational software*: Exploit interactive features. Get lesson ideas and new ways to present information.

Other Hardware

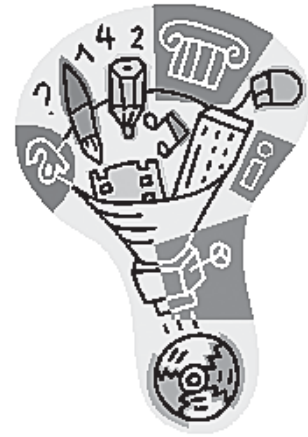
- *DVD player/recorder*: Play and record (burn) DVDs.
- *CR*: Play video cassette tapes.
- *Video camera*: Create your own video or have learners create their own.
- *Fax machine*: Fax government officials, learners from around the country or even world.
- *Digital camera*: Take photos for presentations or give learners assignments to take pictures themselves.
- *Radio*: With a transistor radio, receive programs from around the world.
- *CD player/recorder*: Play music, book excerpts. Create your own recordings.
- *Tape recorder*: Play music, book excerpts. Create your own recordings. Record and/or play broadcasts.
- *Overhead projector*: Make transparencies for a class/group presentation. Have learners do examples for class. Learners can also make transparencies for their own presentations.
- *Calculator*: Solve higher-order problems. Model and graph functions with scientific calculator.
- *Cell phone*: Use photo and video functions.
- *Photocopier*: Make copies of handouts/worksheets/letters to parents.

Television

- *NBC*: Watch local news and television shows.
- *DSTV*: Watch stations from all over the world. Specific stations for educational purposes.
- *Video tapes/DVD's*: Watch educational videos or popular films or shows.

Select the best idea to address the teaching/learning challenge

It is now time to select the tool that will best help you to address the challenge identified and to enhance teaching and learning. Carefully evaluate the ideas you come up with. Think of ways you could combine your ideas and tools in interesting and effective ways. In addition, you should consider the diverse needs of your learners when selecting. Think of how that tool can be used to address the different learning styles of learners, and how it can be used for remediation and enrichment.



Whatever you do, make sure you record these ideas in case you want to use them later or even in years to come.

Recall the Four Modes of Learning:

- Tactile learning: learning by touching things.
- Kinaesthetic learning: learning through holding things, moving things, manipulating things and transforming things.
- Visual learning: learning by seeing things (reading) charts, graphs, pictures, television, books, newspapers, environmental changes, etc.
- Auditory learning: learning by hearing things: music, speech, environmental sounds, etc.

Each learner has a preferred mode of perception and ICTs provide you with the opportunity to address each of these modes of learning in new and effective ways.



Look at the teaching/learning problems and ICT solutions in Table 3 on the next page. Which problem areas have you experienced with your learners so far? Did you solve it? If yes, how?

LEARNING PROBLEMS	TECHNOLOGY SOLUTIONS
PROBLEM: The topic is difficult for learners because concepts are new and foreign to their experience.	TRY: Simulation software, video-based problem solving BECAUSE: Visual examples make it easier to grasp the nature of systems, problems and applications.
PROBLEM: The topic is difficult for learners to learn because the concepts involved are abstract and complex.	TRY: Simulation software; spreadsheet examples; graphing calculator; math tools BECAUSE: More visual, graphic displays make abstract concepts more concrete; make it easier to manipulate and see relationships between variables involved in system.
PROBLEM: Learning objectives are high level, but time-consuming manual skills (e.g. handwriting, calculations, data collection) interfere with acquiring these higher level skills.	TRY: word processing, spreadsheet BECAUSE: Takes low-level labour out of doing complex task; allows learners to focus on higher level skills.
PROBLEM: Learners need skills practice, but find it uninteresting and/or tedious on paper.	TRY: Drill-and-practise software or instructional game software functions. BECAUSE: Combination of on-screen displays, interaction, and immediate feedback can combine to create motivating practice.
PROBLEM: Learners find their subject matter uninteresting or irrelevant to their lives	TRY: Videos, multimedia and Internet resources BECAUSE: Visual nature and real-world examples of these resources can make it easier for teachers to illustrate relevance.
PROBLEM: Learners fail to transfer skills they have learned to situations where they can use them.	TRY: Simulation and problem-solving software, video scenarios, development of audio and visual products BECAUSE: When used in project-based instruction, these resources can help make links to real-world problems clearer, more visual.
PROBLEM: Learners need help preparing and presenting written reports and presentations.	TRY: Desktop publishing, multimedia software, webpage production, blogs, wikis BECAUSE: Learners often find it motivating to prepare products that look professional.
PROBLEM: Learners need to learn to work as a group to create collaboratively and present products.	TRY: Develop audio visual products, webpage production BECAUSE: Learners can contribute to group products, using their individual strengths
PROBLEM: Learners need practise in skills that will make them technologically competitive as learners and as workers	TRY: All software tools and all communicating and presentation technologies. BECAUSE: Illustrates, simulates, and gives practise in skills and tools learners will need in work situations.

Table 3: Teaching/Learning problems and technology solutions

LOGISTICAL PROBLEMS	TECHNOLOGY SOLUTIONS
PROBLEM: There is not enough time for extensive, teacher-corrected practice which would leave limited time to help individual learners.	TRY: Drill-and-practise software BECAUSE: Learner feedback is immediate; teacher is freed for other tasks and individual remediation.
PROBLEM: Learners are capable of advanced instruction, but teachers are not available to teach them.	TRY: Tutorial software; self-instructional multimedia; distance learning courses BECAUSE: Can provide effective learning environments for capable learners.
PROBLEM: Teachers need to make time to spend on labour-intensive tasks (e.g. handwriting, calculations, data collection) more efficient for them and their learners.	TRY: Word processor, spreadsheet, database BECAUSE: Takes labour out of doing tasks and making changes to information; allows for better use of time.
PROBLEM: The school has insufficient consumable materials for many learning activities (e.g. science labs, workbooks).	TRY: Simulation software, CD-ROM-based texts BECAUSE: On-computer reading material and activities are more cost-effective since they are not consumed.
PROBLEM: To do required research, learners need information and expertise not locally available.	TRY: Internet and email projects; multimedia encyclopaedias and atlases BECAUSE: Information sources are easier and quicker to access.
PROBLEM: It is time consuming to make corrections to written products (e.g. composition, book reports, presentations)	TRY: Word processing, slideshow presentation, multimedia software, web pages BECAUSE: It is easier to make changes and add updates.

Once you have selected the 'problem area', listed the tools, and then brainstormed how each could be used, you need to select one tool. Look at Figure 7 on the next page for an example of the process.



Go through the same process as pictured in figure 7 with one of your own specific teaching/learning challenges.

SUBJECT TOPIC	ENVIRONMENTAL STUDIES CONSERVATION
Classroom challenge	Learners do not understand the link between humans, animals and the importance of preserving resources for the future.
ICT tools available	Computer: Internet, word processor, spreadsheet, database TV Video tapes/CDs Tape recorder
Ideas	<ul style="list-style-type: none"> • Internet – finding information about an endangered animal and make a presentation to the class • Video/CD – collect data from environmental video/CD about endangered species • Tape recorder – interview people to find out about their views on preservation of animals • Database – compile a database of 10 endangered animals, - name, habitat, population size, etc. • Word processor – Write a newsletter or report.
Selected idea	Tape Recorder Justification – students will write their own questions and can collect community views that could develop into a community awareness campaign. Activity could lead to many more follow-up activities that would involve students as part of a community, such as writing an environmental newsletter based on community issues and internet research.

Table 4: Example of selecting ICT tool for teaching and learning

Design lessons using an ICT application

If you have done the four steps described in the previous section, you are half-way to designing a complete lesson using ICT.

Steps for selecting ICT application in teaching and learning:

1. identify a teaching or learning challenge
2. list all ICT tools available
3. get creative!
4. select best idea to address teaching/learning challenge.

Like in any lesson planning process, you need to identify the topic from your scheme of work or syllabus, set specific lesson objectives, state the basic competencies to be achieved and design teaching and learning activities to address objectives. It is not necessary for the learners to use the technology; you may simply be using the technology as a preparation or presentation tool.

Which ever way you decide to integrate ICT into your lesson planning, your strategies should lend themselves to suit the pedagogical theories discussed so as to add value to teaching and learning.

ICTs will challenge the way you think about methods of teaching and you must be imaginative in your approach. Remember, ICT should motivate learners, support active learning, encourage collaboration and/or facilitate higher-order thinking skills.

Technology-enhanced learning environments should:

- allow learners to direct their own learning
- use real-world examples and contexts
- encourage collaboration, communication and group learning
- assess learning
- support active learning and exploration
- facilitate the sharing of knowledge and respect multiple perspectives
- reference what learners already know
- use primary sources of data when possible
- promote explicit thinking about errors and misconceptions
- encourage reflection.



Cross-curricular integration

ICTs are also great for cross-curricular integration. Integrating ICT tools into the learning process automatically links schools and society and learners can more easily comprehend the inter-relativity of subjects.

In addition, if the learners are the ones using the ICT in the integrated lesson, you need to ensure that they have the ICT skills to complete the activities. Communicate with other teachers and with the learners themselves to investigate what they have been taught in other classes. Many times learners, who are learning a new element of ICTs while also learning new subject content, will fail in both activities.

Ask yourself: Will the instruction be single subject or interdisciplinary?

Ask yourself: Should the instructional activities be individual, paired, small group, large group, whole class, or a combination of these?

Ask yourself: Should activities be behaviourist, constructivist, or a combination of these?

Ask yourself: What strategies should I use to integrally involve marginalised learners with the technologies?

Ask yourself: What sequence of activities should I teach?

Ask yourself: Have I allowed learners enough time to get used to materials before beginning a graded activity?

Ask yourself: Have I built in demonstrations of the skills learners will need to enable them to use both the equipment and specific software?



Look at the examples of ICT-integrated lessons on the next page. Are there any ideas here, that you could apply to adapt for your learners.

Subject	Lesson examples using ICT
Mathematics	<p>1. Fractions: Have learners look up map of Africa (on the Internet, Encyclopedia Encarta or other software). Have them determine which African countries have coastlines. Have them do this by region, then have them add up the total at the end.</p>
	<p>2. Pythagorean Theorem: Make a slideshow presentation explaining the Pythagorean Theorem (use AutoShapes to insert triangles). Have examples for learners to do throughout a lesson. Use chalkboard for further explanation if necessary.</p>
	<p>3. Data Handling: Before a lesson, have learners collect data (e.g. classmates favourite colours.) Take learners to a computer centre lab and have them enter the data into a spreadsheet. Have them create a chart/graph and discuss data analysis.</p>
English	<p>4. Synonyms/Antonyms: Have learners go to www.bbc.co.uk/learning/english and find lesson on synonyms/antonyms. Let them complete the lesson and mark the worksheet. Review common mistakes.</p>
	<p>5. Prepositions: Have learners go to LearnThings lesson on prepositions. First, go through the Teacher Activities with the whole class explaining the preposition. Then have the learners do Learner Activities in their groups on the computer. Walk around to ensure understanding and that mistakes are corrected.</p>
	<p>6. Letter writing: Have learners type a friendly letter to their regional councillor about environmental protection into a word processor. Explain proper formatting for letters. At the end of the lesson, have the learners print out their letters and send them out.</p>
Science	<p>7. Animals: Have learners watch videos about animals on Encarta, or similar other programme. Have a worksheet prepared with questions on what they will watch. Have the learners search for animal videos in programme, and then have them watch the assigned videos and answer questions. Follow up with independent research on a given animal, using the internet.</p>
	<p>8. Natural Disasters: Find pictures on the Internet or some software on the computer of natural disasters. Make a handout for learners to complement the lecture.</p>
	<p>9. Rainforests: Have learners go to lessons about ecosystems in LearnThings and direct them to the section on rain forests. Let them go through the unit, reading and answering questions in their groups. If learners finish, let them go to www.enchantedlearning.com/subjects/rainforest and do puzzles will have to answer questions about rainforests correctly to put together a puzzle.</p>

Social Studies	<p>10. Industrialisation: Have the learners go to www.bbc.co.uk/history/society_culture/industrialisation. This site has interactive, decision-making games related to the industrial revolution. Have the learners do the first game. If there are many learners, rotate groups at a computer so everyone gets a chance for decision-making. Have learners do the next game if time allows.</p>
	<p>11. SADC: Make a worksheet with a table that lists the first letter of each SADC (Southern African Development Community) country in one column and space for learners to record the GDP (Gross Domestic Product) for each country in the other. In groups, the learners will have to search for each SADC country's GDP (using the Internet or Encarta). Make a game to see which group can finish first to make it more fun!</p>
Arts	<p>12. World music: Play music from different parts of the world. Have them guess which country the music comes from. Have learners describe how the music makes them feel. You could have the learners type a report in a word processor for homework on the activity.</p>
Other Namibian languages	<p>13. Free writing: Send learners to the computer lab so that each has individual access to a computer. Have them write a paragraph in their home language about what they will do that weekend (or any other topic). Have them save the document and print it out.</p>
	<p>14. Dictionary: Have learners create a dictionary in a word processor. Provide them with a list of words to describe the meaning of. Have them create a table and build their own definitions.</p>

Table 5: Examples of ICT-integrated lessons

As an educator, you are probably wondering about what kind of assessment to use to properly evaluate the use of ICT in your lesson. You will definitely want to assess how ICT led to the achievement of the learning objectives and content material. Ask the learners how they felt about the lesson.

- Were the concepts made clear?
- Did they like using the technology?
- How did the technology help their understanding and knowledge construction?

Have the learners help identify the next steps in the learning process. Critically reflect upon the lesson and determine if you would use the same ICT the same way next time around.



CHECK YOUR PROGRESS 1

DESIGN LESSONS INTEGRATING ICTs

1. List 3 benefits of using ICT in teaching and learning for teachers

2. List 3 benefits of using ICT in teaching and learning for learners

3. List 3 challenges of using ICT in teaching and learning

4. Tick whether the following statements are true or false.

	True	False
a. ICT-integration easily lends itself to learner-centred education.	<input type="checkbox"/>	<input type="checkbox"/>
b. According to the 'Cone of Learning', after 2 weeks we remember 90% of what we say.	<input type="checkbox"/>	<input type="checkbox"/>
c. ICT in education means that traditional methods of teaching are outdated.	<input type="checkbox"/>	<input type="checkbox"/>
d. Drill-and-practice software is an application of ICT into the behaviourist pedagogical framework.	<input type="checkbox"/>	<input type="checkbox"/>
e. In behaviourism, learners are encouraged to control the pace of their own learning.	<input type="checkbox"/>	<input type="checkbox"/>
f. The benefit of ICT, through reduced learner dependency on the teacher is a constructivist view of education technology.	<input type="checkbox"/>	<input type="checkbox"/>
g. Synthesis is the latest classification of Bloom's Taxonomy.	<input type="checkbox"/>	<input type="checkbox"/>



CHECK YOUR PROGRESS 1

5. Find the words listed at the bottom.

A	I	E	C	C	T	I	N	T	E	G	R	A	T	D
E	N	I	T	O	O	N	M	E	A	N	S	T	O	E
B	G	A	E	A	N	I	N	G	T	O	G	E	T	V
H	E	N	L	R	C	T	E	X	I	S	T	I	N	E
G	C	U	A	Y	E	I	R	R	R	I	C	U	L	L
A	W	I	T	H	S	V	N	O	L	H	T	H	E	O
T	O	O	L	S	C	E	L	U	L	E	T	H	A	P
C	R	E	A	T	E	X	T	O	M	I	D	C	T	O
F	F	E	R	S	A	N	E	D	S	M	B	O	L	E
N	D	T	H	E	M	I	N	T	O	A	O	M	M	E
A	I	N	F	O	R	M	A	T	I	O	N	C	N	I
N	E	W	N	G	F	U	L	L	E	A	R	N	I	N
S	E	U	Q	I	N	H	C	E	T	G	E	X	P	E
R	I	E	N	C	E	Z	V	H	G	W	L	S	L	I
T	N	E	M	E	V	E	I	H	C	A	G	W	F	I

ACHIEVEMENT, ANALYSE, COMMUNICATE, CONTROL, CREATE, DEVELOP, EXCHANGE, INFORMATION, MODEL, NEW, SOLVE, TECHNIQUES



CHECK YOUR PROGRESS 1

ACROSS (Cont.)

18. A mode of learning by manipulating and transforming things
19. After you list all ICT tools, you should do this.

DOWN

2. A mode of learning
3. After identifying a teaching or learning challenge, list these
6. Video cassette recorder
9. Doing things in a faster, more timely way
10. Mode of learning by using music
14. Provides television stations from around the world
17. There are video and still photography versions of these

7. Fill in the blanks

Technology-enhanced learning environments should:

- a. Allow learners to _____ their own learning.
 - b. Use _____ examples and contexts.
 - c. Encourage _____, communication and group learning.
 - d. Support _____ learning and exploration.
 - e. Facilitate the sharing of _____ and respect for multiple _____.
 - f. Reference what learners already _____.
 - g. Use _____ sources of information.
 - h. Promote explicit thinking about _____ and misconceptions.
8. The following steps outline the process for designing a lesson using ICTs. Put them into the correct order.
1. design lesson plan
 2. select tools
 3. extract topic from scheme of work
 4. design assesment of ICT use in relation to achievement of objectives
 5. set specific lesson objectives



PRACTICAL ACTIVITY 1

DESIGN LESSONS INTEGRATING ICTs

1. Using a subject and topic of your choice, describe how you would go about deciding how to integrate ICT into a classroom activity for a lesson addressing your subject topic.
2. Walk around your institution and make a list of all the ICTs available to you.
3. Identify the particular institutional challenge you may have when using ICTs for/with your learners. List them and come up with some solutions. Discuss these with an appropriate member of the institution's management.
4. Design a lesson plan on the computer.

Summary

Well done! You have completed Section 1 on *Design lessons integrating ICTs*.

You should now be confident about what ICT integration means for you as an educator – the benefits and the challenges. You should know how ICT relates to particular educational theories and how you start the process of integration. This entails the method of selecting ICT tools for teaching and learning as well as the procedures for integrating that tool into the overall lesson plan.

If you feel confident that you have achieved the above, you can move on to the next section, where you will learn how to prepare teaching and learning materials using ICTs.

If you are unsure of any part, go back and revise or ask your instructor or supervisor for assistance.

Section

2

Preparing teaching and learning materials using ICTs

Introduction

In this section of the manual you will learn how to use ICT tools to prepare teaching and learning materials.

You will discover how specific tools can assist you in teaching and learning and how to properly evaluate each tool before deciding on which to use. This includes a specific portion on evaluating websites as they require extra scrutiny. In addition, you will be provided with tips on how to prepare certain materials and how to make sure that it will be there for you to use in the future.

Skills you will learn

By the end of this section, you will be able to:

- identify resources for use in preparing teaching and learning materials
- evaluate and select resources for use in preparing teaching and learning materials
- describe and apply the procedures for using ICT to prepare teaching and learning materials
- describe and apply the procedure for preparing an alternative/back-up plan
- describe and apply the procedure for storing, backing up and securing teaching and learning materials for further use.

Resources for teaching and learning

As a teacher in the digital age, you will have more and more teaching and learning resources available to you. Of course, you will still have various traditional materials, like textbooks, teacher handbooks, and other printed material at your disposal. Even these printed materials can assist you in an ICT-integrated teaching and learning environment.

A scanner, computer and printer, for instance, can be used to generate a useful, stimulating worksheet for your learners. You can scan pictures or diagrams into the computer and insert them into a word processor for an examination or handout, slideshow presentation or even use them in a overhead transparency.

A scanner is just one electronic resource that can be used for preparing teaching and learning materials. There are numerous other ICT tools that you can use to create an enhanced learning experience.

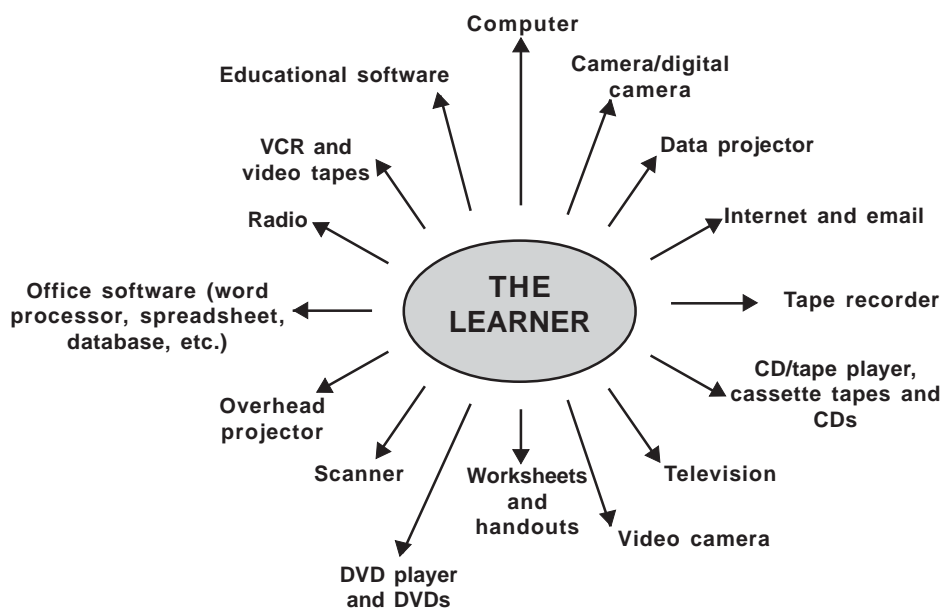


Figure 7: Instructional ICT resources in the classroom

Radio

A radio is one of the most affordable pieces of equipment that can be used in teaching and learning. An added advantage of the radio is that it is usually battery-operated, meaning power-outages will not affect the lesson plan.



Television

Television sets are obviously more expensive than radios, but also provide rich learning experiences for a group of learners. Unlike radios, however, they do require 220/230V AC current which may pose problems in some areas that experience frequent power supply problems. The national broadcaster, NBC provides some educational programming. DSTV and educational videos or DVDs are also available as resources.



Audio tape recorder/CD player

A small tape recorder is probably one of the easiest pieces of equipment to use. Most institutions should have at least one cassette player for listening to comprehension activities.



Your own materials can be recorded on cassettes or even CDs if you have access to that technology. You can use music recordings in your lesson or educational cassettes or CDs. This technology is also flexible in the sense that you can pause, rewind for reference and reinforcement, or fast forward to show certain sections. If your institution is able to purchase audio tape recorders, try and get ones with a counter so you can easily track your place.

Video Cassette Recorder (VCRs) / Digital Versatile Disc player (DVD player)



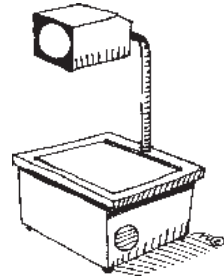
A VCR or 'DVD player is another potentially very useful electronic-based instructional resource. Although more expensive than an audio recorder, they are a valuable resource in any classroom because they are multi-sensory, combining sight and sound.

Most computers now come with their own DVD drives that will play DVDs and CDs. Video cassettes and DVDs can contain from educational videos to popular films. Like audio recordings, video cassettes can be stopped, rewound and forwarded.

Videos and DVDs are great because they can provide learners with information about places and situations outside their immediate learning environment.

Overhead projector

An overhead projector, a system that displays images to an audience, is an easy technological tool to use when wanting to present information to the whole class and is less prone to hardware failure. The projector allows both the presenter and the audience to see images at the same time, the presenter looking down as if writing, the learners looking forward at the screen or wall. Transparencies used with the overhead projector can be made in advance with just pens, or they can be made by printing content onto them through a computer and/or photocopyers.



Camera

There are several kinds of cameras to capture images and even video clips. Many cell phones today double as digital cameras, taking both pictures and short video clips. Digital cameras are a fantastic way to take pictures, because they appear instantaneously on your equipment (so you can decide whether to keep or delete it), can easily be uploaded onto your computer and printed from there. Conventional cameras, that require film, are also useful tools. You must however have the film developed and the photos printed.



Computer

Computers naturally lend themselves to the learning process as they provide information, allow for communication and allow you to create and store your own data. As mentioned, you can use the computer to create a number of teaching and learning materials, like examination tests, handouts, worksheets, graphs, and slideshow presentations.



In addition, there may be other software on your computer like educational software or internet resources specifically for teachers (e.g. EDSNET). Producing multimedia material is very different from playing it and you must have the relevant software if are you creating material on the computer.

Internet

With the use of a computer and connectivity, the Internet can be the most powerful resource available. Internet resources are often easier and cheaper to locate than print-based materials and may also be more up-to-date.



As a teacher you should take advantage of finding lesson plan ideas, and other teaching and learning materials that have been created by colleagues from around the world. They may not always be relevant to the Namibian context, but you can always adapt and mold them so that they are appropriate.

This manual will inevitably be outdated as soon as it is printed, because technology is developing at such a rapid pace. Remember that there are countless other possible resources for teaching and learning out there. The hope is that you will learn the knowledge, skills and attitudes to use other resources as you gain access to them.



Which of the above resources do you use regularly with your learners? Identify one that you have not yet used and that is available to you. Make a lesson plan incorporating its use.

Evaluate and select resources

In an ideal school and classroom environment, you would identify needed resources after deciding on the learning sequence. Unfortunately, reality does not allow this, and you must decide on what activities you and the learners can do in light of the resources available. Evaluation and selection of resources revolve around working within the constraints of the available hardware and software.

Given this, the learning outcomes of your lessons will determine what resources to use, when to use them and how to use them. For instance, if the learning outcome is related to information literacy skills, an open web search may be appropriate. If, however, the learning outcome is related to the curriculum and the information is needed to spur creative thought and acquire specific information, it may be more time- and cost-effective to pre-select sites for the learners.

A number of factors should be taken into consideration when evaluating whether a particular resource (such as a web site, software package, or video cassette) should be used for your lesson.

- Is the material of good quality? Is the source credible?
- Is it relevant to the topic and learning objectives? Does it fit within your existing curriculum and teaching plans?
- Is it easy to use?
- Does it cater for learner diversity in gender, values and culture?
- Does it cater for different learning styles, different abilities?
- Is it appropriate for the learners' ages?
- Is the language level suitable for the learners?
- Is it in a culturally and socially appropriate context for learners?
- What adaptations would need to be made to the resources to suit the needs of your learners?
- Does it promote learner-centred education? Does it encourage problem-solving skills and/or cooperative learning?
- Is the resource easily available and accessible?
- Are there requirements for ICT equipment, other resources, space, etc., that might limit how and where the lesson is taught?

Evaluating websites

Using the Internet as a resource to prepare teaching and learning materials requires careful analysis. First and foremost, you must be comfortable using the Internet. Next, because anyone anywhere in the world can publish information on the Internet, you must check certain criteria to ensure the websites you use present credible, unbiased and accurate information.

Ask yourself: What is the purpose of the site?

Why did someone publish that information for all to see?

Are they trying to convince you of something, for example, to buy something or to believe something?

Ask yourself: Is the site credible – such as believable and trustworthy?

Who wrote the information? Is it an individual, organisation or institution?

What experience or qualifications do they hold relative to the material they are providing?

What interests do they have in promoting certain information and points of view?

Ask yourself: How accurate and up-to-date is the information? When was the site published or last updated (usually located at the bottom of the page)?

*Copyright 1999 by Donald
Clark. Created June 5, 1999.
Updated July 5, 2001*

Is the resource topic likely to become outdated?

Could you validate the author's references/sources if needed?

Does the site have links to reliable content (other sites)?

Ask yourself: Does the website present a particular bias in the information it offers?

Sites promoting social biases (gender, racial, political, religious, etc.) can be considered useful if you are looking for that kind of information for a specific activity.

Ask yourself: How useful is the site design?
Is information easy to find?
Do images enhance the meaning of text?
Does the site have a search facility?
Does the site load relatively quickly?

In answering these questions, you might realise that more than one resource can address the teaching or learning challenge you have identified. Select the resource that will best help you achieve the learning objectives and enhance the learning experience.



To find suitable educational content, use approved sites, gateways and portals.

Using ICTs to prepare teaching and learning materials

The first step to using ICTs to prepare teaching and learning material is to find the resource that meets the requirements set in the evaluation process – credible, accurate, up-to-date, caters for learning diversity, promotes learner-centred activity, and most importantly helps achieve the learning objectives and enhance the learning experience.

After you have selected your resource, you will need to decide how to use the information. Will you be creating your own audio recording? Will you be using an education video? Will you be extracting content from a website for a worksheet or handout? Will the learner be doing research on the Internet? Will you present photographs in a slideshow presentation or will the learners be doing their own activity with digital cameras?

Preparation of ICT-enhanced lesson plans

All your lesson plans from now on should be computerised. As you now know, this is so that you can easily make changes if needed and store the lesson plan for future use and reference. Like all lesson plans, the material should aid the learning experience and encourage learner understanding of the given topic. The material should be properly prepared and be integrated into a staged action plan. The following guidelines will help you prepare teaching and learning materials using ICTs.

Preparation of printed material

You can prepare worksheets and handouts with various resources – word processor, spreadsheet, the Internet and educational software. You want your resource to be user-friendly for the learner. They should not puzzle over where to look next or not be overwhelmed by the quantity of ideas on the page or why they are there.

Tips to making a handout or worksheet:

- limit the font type to one or two types and make them easy to read by the learners
- make sure the font size is also appropriate for reading by learners; at least 12 point
- use bullets or numbering for lists
- avoid too much formatting of fonts such as italics or capitalisation of whole sentences

- allow for plenty of white space on your page, especially if a learner is to write in an answer
- ensure the spacing between lines is adequate
- where possible, use a 'landscape' layout of your page and be consistent with headings and text justification
- make sure headings and subheadings are well-defined
- make sure that images are clear and does not clash with text
- always use Print Preview to make sure your pages look the way you envision
- make sure there is enough printing ink so the printout does not appear too feint.

Overhead transparencies

As you know, the best thing about overhead transparencies is that you can prepare them before going to class. This includes creating a word-processing document and printing it on an overhead transparency.



Revise the tips for creating transparencies in the manual "Operate ICT applications in an education context".

Internet to word processor integration

If you are using the Internet, you will inevitably find information (text, pictures, etc) that you will want to put into teaching and learning materials. You should always cite the sources of your information. Whether you are copying text or a picture from a website to a word processor, you should always insert a footnote.

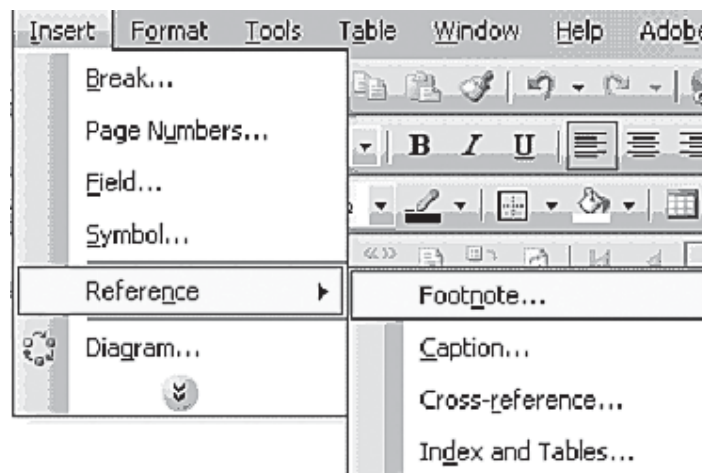


Figure 8 : Use a footnote to cite your sources.

You can also consider creating a hyperlink to the source website in the footnote so that the learner can find the source if they want more information. Make sure you write the full address out if you have prepared a printed handout



It is not acceptable practice to simply copy and paste whole passages from the Internet or any other source. This is plagiarism (stealing).

Preparation of slideshow presentation

These are tips for creating a slideshow presentation. Remember, you can also make printouts of the slideshow presentation, with space for taking notes, to the learners.



Revise presentation of slides in the manual 'Operate Technology applications in an educational context'. Here is a brief summary.

Tips for Preparing slideshow

- **Font size at least 30 points**
- **Arial or Comic Sans are good to use**
- **Only one topic per slide**
- **Avoid blocks or capital letter text as it is hard to read**
- **Use bullets and numbers generously, rather than continuous prose. Six bullet points is ideal**

Tips for Preparing slideshow

- Use phrases rather than sentences
- Use the same background colour throughout the presentation
- Avoid patterned backgrounds as they are distracting
- Use one or two animation or transition effects throughout presentation

Tips for Preparing slideshow

- Use a dark background and light text for dark rooms
- Use a light background and dark text for light rooms
- Do not use colour to convey meaning as some learners may have visual difficulties such as red/green colour blindness

Preparation of audio-visual materials

Creating your own audio recording, photographs or video material requires a different type of presentation than for a slideshow presentation.

- Make sure you know how to use the equipment. Ask if you need help – from teachers and learners!
- Before you start, think about what message you want to communicate through your material. Use a storyboard technique to plan out the key requirements for each scene or clip.
- Be aware of copyright requirements and ask permission before filming or recording people.
- If you create an audio clip, speak slowly and clearly.
- Review all material that you have created. Ensure that the video and/or sound qualities are adequate for the learners to hear and see everything clearly.
- Carefully edit your material, deleting any unnecessary portions.
- Save all your materials, back-up if possible and label all for future retrieval.

Recording (other) audio-visual material

With the proper equipment, you can record programmes on the radio or television.

- Again, make sure you know how to use the equipment and get help if you do not.
- Have a recordable audio or video tape ready. Be careful not to record over something you want to keep.
- Before recording, label the tape with the name of the programme, the date and preferably when you want to use it. If you share tapes, make sure that you also put your name on the tape.
- If you are taping a television show from DSTV, make sure the tape recorder is set accordingly. Ideally, you should be present to guarantee that the recording starts on time.
- After the programme, check that you have recorded the correct programme you wanted and that the quality is satisfactory.



Detailed information for recording audio/visual clips is given in the manual “Operate technology applications in an educational context”.

Preparing to use audio-visual material

- Carefully review the material. If necessary, identify portions of the material that are relevant. For instance, what track(s) do you want the learners to listen to (versus the entire CD) or what titles do you want the learners to look at (instead of entire DVD/video)
- Cue all material to starting point. Class time should not be wasted finding the desired section of an audio tape or video cassette for your lesson. Take note of counters, if appropriate.
- Prepare handouts or worksheets to be used in conjunction with audio-visual material accordingly. For instance, you usually want to give questions to the learners before watching a video so they know what to watch and listen for.
- Know where you will stop the video or audio tape to probe the learners.
- If the learners are using equipment for an activity, make sure photos, recordings, etc. are saved somewhere safe. Make back up copies of, for instance, information on computer hard drives in case they accidentally delete it.

Preparation of Internet materials

If the learners are doing open research on the Internet, you will want to familiarise yourself with what the learners will be investigating. You should think of search words and phrases to help them in case they get stuck. If the lesson is related to a specific topic, identify appropriate sites beforehand. This process will involve the evaluation process describe previously. Bookmark every webpage that you or the learners will be using for easy retrieval.



You may want to design a 'WebQuest' for the learners. This is an inquiry-oriented activity in which generally all information used by the learners is drawn from the Web. WebQuests are designed to use learners' time well, focusing on using information rather than looking for it, and to support learners' thinking at the levels of analysis, synthesis and evaluation. You would prepare a worksheet for the learners with questions that they need to answer, and a list of Internet resources from which they will find the answers and put in some suggested webquest sites.

Generally, a worksheet is an ideal resource to prepare when directing Internet research, so learners know what information to find. You should know exactly where on a specific website they will find required information, so you also need to prepare yourself well.

It is a very good idea to preload webpages, especially those heavy in graphics that may take time to load. If the learners are doing an activity or game online, you should know how the activity works and its possible outcomes. This means you should do the game or activity several times beforehand and make notes about what happened, how you will guide the learners. You should also anticipate and prepare for possible questions from the learners.

Preparation of educational software

When using educational software with the learners, you need to know exactly how to locate the specific content you want to use and how you will use it. Review all the content you will use to ensure that it will be understandable, and anticipate difficulties. This will also allow you to pre-teach unfamiliar terms they will encounter, and contextualise cultural references and language differences.

Until the learners get familiar with the software, it may take time for them to navigate around until they get to the right spot. It is usually a good idea to write the path on the chalkboard or whiteboard for ease of reference.

You can also extract content from educational software into a worksheet or handout. Most software will allow you to copy and paste both text and images into a word processor document and manipulate them as you wish. This can be especially useful in localising content, such as making your own examples referencing Namibia.

Learning sequence

Integrating technology often means coordinating resources both inside and outside the classroom.

Therefore, it may be useful for you to sketch out a daily or weekly sequence of anticipated activities to help you determine which instructional activities will require technology resources and which days these resources will be required.

You should also build in time for teaching any technical skills learners will need in order to use both the equipment and any specific software for the lesson, as well as time for them to get used to the materials before beginning with a graded activity.

Alternative back-up plan

Nearly all modern-day technology needs some sort of power source to use, whether it is batteries, electricity, or even the sun (solar energy).

This inevitably means that sometimes technology will fail you as power can go out, batteries can die and the Internet goes down and websites might be non-operational.



Because of these possibilities, you always need to have a back-up plan. If the electricity does go out, making your computer-enhanced lesson temporarily impossible, what will you do for the class period?



Have you had an experience when ICTs failed you? How did you cope with it?

You can also turn these potential catastrophes into learning experiences for your learners by involving them in on-the-spot troubleshooting. In a way, this can allow them to become more familiar with the technology they are using and will use in real-life, and develop critical thinking skills as they try to identify and solve the problem.



Make a list of possible back-up plans. Compare your list with the one below.

Possible back-up plans:

- worksheets
- paper version of text (a hand copy)
- library - research
- discussion activities
- alternative topic / focus.

Save, store, back-up and retrieve lessons and resource materials

It is important that you save your teaching and learning materials. This is the beauty of technology – you can save it and use it tomorrow, next week or next year.

Electronic files

All electronic files (worksheets, slideshow presentations, spreadsheets) must be saved in a retrievable location on your computer. It is also necessary to back-up your work on an external storage device or on another computer, as computers themselves can crash and lose all information stored on them. Depending on the size of your file(s), you can use a floppy disk, a blank CD-ROM, or even a memory stick for backing up large amounts of information. It is also wise to print a hardcopy (when applicable) to store as well, in case the computer does crash.



You will need a good file naming system so you will always be able to find the relevant documents / relations.

Overhead transparencies

Some transparencies you will possibly not use again, especially those that you create in class with the learners. However, be sure to take note of what was written on them for reference of topics or certain areas learners needed extra help with. If you are going to keep transparencies, it is worth storing them carefully in dust-free covers. One method is to store transparencies in clear plastic sleeves that can be filed in a ring binder.

Other audio-visual material

Any audio-visual material you have created should be stored appropriately so that you can use it again at any time. Audio recordings and videos should be clearly labelled and kept in a safe place. Photographs should also be stored safely out of sunlight, because they can fade. Make sure that you save all digital pictures on the computer and/or external storage device.



CHECK YOUR PROGRESS 2

PREPARE TEACHING AND LEARNING MATERIALS USING ICT TOOLS

1. *Word Search:* Look for examples of ICTs and learning materials. How many did you find?

P	W	D	M	T	Z	S	L	O	C	Y	T	R	T	N
Z	O	C	I	O	E	I	E	A	I	E	R	A	P	O
W	R	D	F	G	A	E	S	T	S	D	P	H	L	I
O	D	P	V	M	I	S	H	A	I	E	A	S	Q	S
R	P	L	E	D	E	T	B	S	R	S	R	R	C	I
K	R	A	P	T	P	A	A	E	D	E	B	A	D	V
S	O	Y	T	O	T	L	C	L	T	A	N	E	S	E
H	C	E	V	A	T	O	A	U	C	N	E	E	W	L
E	E	R	D	C	R	P	P	Y	E	A	K	R	L	E
E	S	D	V	D	R	M	A	R	E	Z	M	I	P	T
T	S	P	E	H	O	J	W	L	G	R	U	E	U	S
A	O	R	V	C	P	R	O	J	E	C	T	O	R	H
T	R	A	N	S	P	A	R	E	N	C	I	E	S	A
T	E	N	R	E	T	N	I	T	U	O	D	N	A	H
S	H	P	A	R	G	O	T	O	H	P	W	H	V	C



CHECK YOUR PROGRESS 2

2. List 10 factors that you should consider when evaluating a resource

- a. _____
- b. _____
- c. _____
- d. _____
- e. _____
- f. _____
- g. _____
- h. _____
- i. _____
- j. _____

3. Match the preparation tip to the correct resource. Write the correct letter next to the preparation tool. (Some tips will have more than one answer.)

(a) printed material (b) overhead transparencies (c) Internet (d) slideshow
(e) audio-visual material (f) educational software

- a) Do not record over something you want to save _____
- b) Allow plenty of white space _____
- c) Use at least 20 point font size _____
- d) Text should be left-justified _____
- e) Review to anticipate learning difficulties/challenges _____
- f) Try to limit slides to one idea or concept _____
- g) Ideally typed rather than handwritten _____
- h) Use at least 30 point font _____
- i) Avoid blocks of capital letters _____
- j) Write down navigation path _____



CHECK YOUR PROGRESS 2

- k) Use same background colour throughout _____
 - l) Use at least 12 point font size _____
 - m) Prepare WebQuest for more directed learning activity _____
 - n) Speak slowly if creating such a clip _____
 - o) Ensure line spacing is adequate _____
 - p) Bookmark important sites for easy retrieval _____
 - q) Prepare handout/worksheet to accompany computer work, when applicable _____
 - r) Know where to stop material and quiz learners _____
 - s) Preload webpages _____
 - t) Save for future use and/or reference _____
4. Why do you need to prepare a back-up plan when integrating ICT into your lessons?
- _____
- _____
- _____
- _____
5. Enter the correct word into the blank space.
- a). All electronic files should be _____ in a retrievable location.
 - b). _____ all your work on an external storage device.
 - c). _____ a hard copy to store as well in case the computer _____.
 - d). Store overhead transparencies in _____ when possible.
 - e). _____ all audio-visual material after use.
 - f). Keep photographs out of the _____.



PRACTICAL ACTIVITY 2

PREPARE TEACHING AND LEARNING MATERIALS USING ICT TOOLS

You want to design an ICT enhanced lesson plan to teach your learners about a certain topic.

You have access to a 10 station computer lab with word processor, spreadsheet, database and educational curriculum software.

You also have a VCR, an array of videos and a digital camera.

How would you go about deciding which resource to use and how you would use it in your lesson?

Summary

Well done! You have completed Section 2 on *Prepare teaching and learning materials using ICT tools*.

You should now be confident that you know the various resources available to you to prepare teaching and learning material. You should also be able to evaluate and select the best resource and use it to prepare teaching and learning material. You should now be aware of the importance of having a back-up plan, as well as how to store, backup and retrieve your materials for future use.

If you feel confident that you have achieved all the above, you can move on to the next section, where you will learn how to manage resources and facilities.

If you are unsure of any part, go back and revise or ask your instructor or supervisor for assistance.

Section

3

Managing resources and facilities

Introduction

In this section of the training manual you will learn how to manage ICT resources and facilities.

Important considerations in using technology will be discussed for you to think about and apply in your ICT-integrated lessons. You will also learn about the logistics involved in preparing equipment and ICT resources for use in your lessons.

Skills you will learn

By the end of this section, you will be able to:

- explain the reasons for resource and facility management
- identify and apply the procedures for resource and facility management
- describe and apply the procedures for preparing equipment and checking functionality
- apply procedures for managing facilities and resources.

Reasons for resource and facility management

ICT-integrated lessons present you with a new set of circumstances when preparing your lessons. The use of technology requires different considerations to ensure that the lesson goes smoothly and effectively. This will take practice, so do not worry if you do not get it right the first, second or tenth time. You will - practise makes perfect!

Organisational considerations

You will need to think of how best to manage learners in each environment, because you will probably not be in your traditional classroom, but most likely in a computer lab, a room for watching television or even outside. Learners may also not be ideally accommodated by the facilities as you might have many learners and few resources (computers, cameras, etc). You will need to think through grouping strategies (if used) and learner access to facilities after class, if necessary.



Access considerations



Knowing the procedures for getting access to the facilities and resources available to you is also essential. Timetabling may restrict you in some ways, especially if you have to use the facilities and/or resources more than one day for one lesson.



Find out the lab/ICT resource timetable procedures at your institution.

Safety and security considerations

Most technology is harmless, however, precautions must be taken, just in case. Some of this equipment is very heavy (e.g. computers, televisions) and you and your learners should know how to handle all the equipment you and they may use. Moreover, most of this equipment is expensive and you and learners need to know the procedures for securing them from theft and damage.





Find out about security issues at your institution. Who has keys, access, etc. Are the precaution good enough? Have you had any trouble?

Social, ethical and legal considerations

You must also consider all the social, ethical and legal implications of both you and your learners using technology. This includes the implications of technology on society and how people live and interact, locally and globally. Both you and your learners should know what technological issues have ethical and legal implications as well. You will cover this topic in depth in a separate manual, but you must start thinking about these issues, what they mean to you and your learners.



Maintenance and sustainability considerations

ICT equipment is expensive, so both you and the learners should know how to best maintain it, protecting it from things like dust, water and lightning. Also, there are issues of conservation as you will be using potentially limiting resources like paper and electricity/batteries. Always think of ways of conserving re-usable resources. Make sure you leave resources in a usable state for the next person. Start a log for any ongoing maintenance issues, if necessary.



Facility and resource management

There are several logistical matters that you must observe when you integrate ICTs into your lesson.

Organisation

You may most likely not have access to the ideal amount of equipment, numbers of resources or optimum facility layout. If so, you will need to plan accordingly. The success will be determined by how you have planned your activities such as, individually, pairs, groups or the whole class of the organisation.

Ask yourself: How many computers and copies of software will be needed to carry out the teaching/learning activities?

How many computers and copies of software are available?

Ask yourself: If demonstrations and learning stations are to be used, will projection devices be needed?

Ask yourself: How will I arrange the facilities and group learners to best accommodate the whole class?

Access

Some schools schedule a period per week/cycle for each teacher to use the computer lab with their learners. Some schools have a sign up sheet and work on a first-come, first-serve basis. Think about what works best at your school.



Ask yourself: Am I adhering to the procedures for scheduling to use facilities and/or equipment?

Over what time period and for how long will technology resources be needed?

Ask yourself: What is the procedure for getting access to the facilities, resources, or equipment?

Do you have to sign out keys?

Who has the keys?

Ask yourself: Have I made all the necessary access provisions for learners with physical disabilities?

Safety and Security

Most institutions protect facilities with burglar bars and lock everything up when not in use. Procedures for signing out equipment or to use resources and facilities also help to determine accountability as it is documented who used what and when.

Ask yourself: How does the school protect the facilities, resources, and/or equipment from theft and damage?

Is this enough?

Have you transmitted the importance of and the procedures for safekeeping to the learners?

Ask yourself: Have you provided for learners' safety and privacy?

Social, ethical and legal considerations

Some institutions have user-right agreements for learners if these are going to use equipment, the computer network and/or the Internet. If your school does not, you might suggest one is implemented so that all users know their responsibilities with regards to ICT.

Ask yourself: Have I checked the legality of what I want to do with the resources?

Ask yourself: Are the learners aware of proper social, ethical and legal uses of the technology they will use? Have they signed user-right agreements if the school requires them?



Let learners in your class draw up a list of responsibilities.

Maintenance and Sustainability

Ask yourself: How does the school protect facilities, resources, and/or equipment from malfunctioning? Do you replace protective covers on equipment after use?

Ask yourself: If the equipment breaks, who is responsible for repairing or replacing it? Who do you report facility and resource failure to? Have you become familiar with the troubleshooting procedures specific to the piece of hardware or software package being used?

Ask yourself: Do you conserve and/or recycle paper? Do you turn equipment off when not in use (as not to waste energy)?

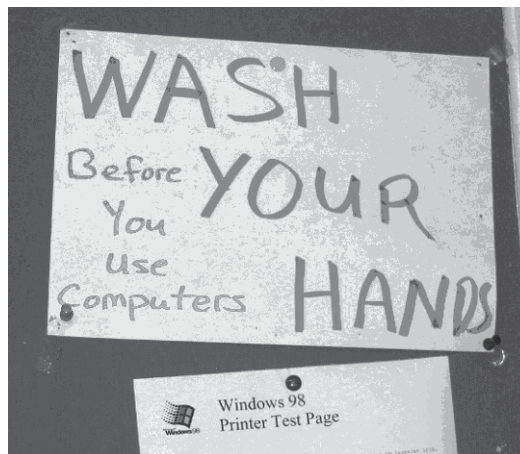


Figure 9 : Keep the computer lab dirt-free

Beware of dirt!

One reason for technical problems is dirt. Here are some tips to keep the computer lab as dirt-free as possible.

- Make sure the cleaning personnel include cleaning the computer lab in their routine and that they know how to do it.
- Have learners wash their hands before they come into the computer lab. A bucket with water outside the lab for this purpose may be a good idea.
- Make dust covers for the monitors and keyboards. This could be a great class project!

Preparation of equipment

When you use ICTs in your lessons, you will need to prepare the equipment and the facility that you are using in advance.

Check functionality

Make sure everything is in working order. Check that the computers are working. If there are stations that are not working, mark them as such so the learners do not go to them. Make sure TV/VCR/DVD is working properly and that DSTV is coming on without disruption. Ensure that batteries are charged and replace dead batteries if needed. As such, you or the school should always have spare batteries in store in case. Check the power - is the electricity working? Is it wired on?

Cue materials

Make sure that all teaching and learning materials that you are using are ready for immediate use. If you are using a tape or video cassette, make sure it is at the spot/point where you want to start. Do not spend class time fast-forwarding or rewinding as this should be done beforehand. If you are using a data projector and presentation, set this equipment up before class so the learners are not waiting for the computer.

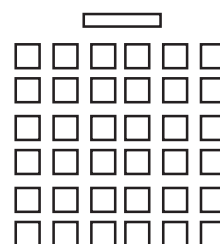
If you are using the Internet, check any sites your learners may need to access are still there and have the content you expect. Load webpages that the learners will be using on all computer workstations. This will save much time as Internet connection in Namibia can be slow and webpages take time to load, especially those heavy in graphics.

Seating Arrangements

Depending on what resources and material you are using and how, you will have different seating arrangements. Will the learners be using the equipment individually, in pairs, in groups or as an entire class?

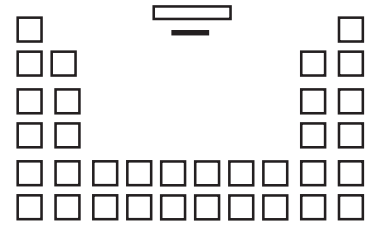
Traditional classroom

This kind of seating arrangement works best when giving a presentation with laptop and projector, an overhead projector or when you are using a TV, (with a VCR/DVD). Check that all learners can hear and see what is being presented. Make sure those who cannot see or hear well are seated in front.



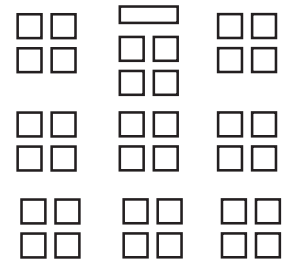
Horseshoe

This seating arrangement might work best when you are using an audio recording to enhance your lesson. By putting the equipment in the centre of the room, more learners can be closer to ensure better hearing.



Pods

Pods are great for group work. The ideal group size is 4-6 learners. This arrangement is also good if your lesson is planned for activity centres where groups of learners rotate from activity to activity. Each pod should contain the activity and the learners will move after a given time.



Always remember your learners with special needs. If a learner has difficulty seeing or hearing, make sure he or she is near the TV or computer monitor. You may even decide to allow that learner to use the computer individually to best accommodate his or her needs. If a learner has trouble working with others, you may also have him/her work alone to avoid disruption.

However you decide to arrange learners for the lesson activities, you must prepare the seating, preferably before the lesson begins to allow for maximum teaching and learning. For instance, if you are using the computer lab, decide how learners will be arranged around each station. Remember, all learners should be able to see the monitor at all times. Make sure that learners take turns in using the equipment. Depending on what the facility allows, you may have two learners sitting and two standing behind them at each computer; or there may be room to have three learners sitting and able to see the monitor at the same time.

Often you may be limited to the extent in which you can rearrange equipment and seating. TVs will typically be immobile and computer lab equipment largely unmovable. As classroom goals and teacher pedagogies vary widely, there is no "ideal" seating arrangement. Be flexible and take an active role, whenever possible, to effect design and technology decisions.



CHECK YOUR PROGRESS 3

MANAGE RESOURCES AND FACILITIES

1. List the five logistical considerations of ICT resource and facility management and briefly describe what they refer to.
 - a) _____
 - b) _____
 - c). _____
 - d). _____
 - e). _____

2. Determine which area of resource and facility management each statement refers to:

(a) organisation (b) access (c) safety and security (d) social, ethical and legal (e) maintenance and sustainability

 - a). Set seating arrangement for ICT teaching activity _____
 - b). Check procedures for scheduling to use facility and/or equipment ____
 - c). Check the number of computers available for your planned learning activities _____
 - d). Give user-right agreements to learners _____
 - e). Store the laptop computer and data projector in their cases after use _____
 - f). Ensure learners wash their hands before using computer/cameras _

 - g). Enlarge font on software for a visually-impaired learner _____
 - h). Lock the burglar bars after using computer lab _____
 - i). Check the procedures for getting keys to the facility and/or equipment _____
 - j). Turn off the tape recorder in between classes _____



CHECK YOUR PROGRESS 3

- k) Make sure all cords are concealed properly _____ .
- l) Check copyright of software used _____ .
- m) Tell the computer lab facilitator that the computer network is down
_____ .

3. State whether True or False

- | | True | False |
|---|--------------------------|--------------------------|
| a). Check if the equipment is working once the learners come to class | <input type="checkbox"/> | <input type="checkbox"/> |
| b). Charge camera batteries before learners use cameras | <input type="checkbox"/> | <input type="checkbox"/> |
| c). Fast-forward educational video so it is ready for use once class starts | <input type="checkbox"/> | <input type="checkbox"/> |
| d). Use traditional seating when learners are working in groups | <input type="checkbox"/> | <input type="checkbox"/> |
| e). All learners should arrange themselves when the class activity involves listening to a CD | <input type="checkbox"/> | <input type="checkbox"/> |
| f). All learners should be able to clearly see the computer monitor when using it | <input type="checkbox"/> | <input type="checkbox"/> |
| g). There is always an ideal seating arrangement when integrating ICTs into your lesson | <input type="checkbox"/> | <input type="checkbox"/> |
| h). Preload webpages that you know learners will be using | <input type="checkbox"/> | <input type="checkbox"/> |



PRACTICAL ACTIVITY 3

MANAGE RESOURCES AND FACILITIES

1. Imagine that you are planning a lesson that involves showing the learners a video about human rights. How would you plan the use of the facility and resource for this lesson?

A day before you are going to present this lesson, you learn that the tape you wanted to use cannot be found. You decide to use content on LearnThings, an educational software, about human rights instead. What would you have to do to arrange this new lesson?

2. Find examples of acceptable use policies (see schoolnet examples), and user contracts. Could your institution learn from these?
3. Find out the procedures for reporting maintenance issues at your institution. Create a log if none exists.

Summary

Well done! You have completed Section 3 on *Manage resources and facilities*.

You should now understand the reasons why resource and facility management is so important to using ICT and be able to follow the correct procedures to implement it. In addition, you should now be able to implement the procedures for preparing equipment and checking functionality.

If you feel confident that you have achieved the above, you can move on to the next section, where you will learn how to demonstrate lessons integrating the use of ICTs.

If you are unsure about anything, go back and revise or ask your instructor or supervisor for assistance.

Section

4

Deliver lessons integrating the use of ICTs

Introduction

In this section of the training manual you will learn how to demonstrate lessons integrating the use of ICTs.

You will discover different grouping strategies depending on the teaching or learning activity, and how to ensure that all learners are engaged with the ICTs used. You will also learn time-management skills particular to using ICT in lessons and how to evaluate the success of an ICT-integrated lesson.

Skills you will learn

By the end of this section, you will be able to:

- explain various options for managing learner arrangements according to ICT usage
- explain and apply different strategies for including and engaging learners in the use of ICT tools
- explain and apply different strategies for managing the time allocated versus ICT lesson activities
- describe and apply the procedures for reflecting on and evaluating the use of ICT applications in lesson delivery.

Manage learner arrangements for ICT usage

As mentioned in the previous section, the ICT chosen for your lesson and how you use it, will affect how learners should be arranged. If you are enhancing a lesson with ICT for whole-class instruction, the seating arrangement should be fairly straightforward. Again, just make sure that all learners can see and hear.

The following issues will determine how learners will be arranged:

- the type of facility
- the number of resources
- the availability of both the above
- the number of learners.

One-computer classrooms

Although not an optimal situation, you might be faced with a classroom full of learners, but only one computer. Know how to manage the learning experience appropriately. Learners can rotate, as individuals, pairs or groups, to complete an activity on the one computer. If you have access to a projection system, you might project the monitor onto a screen so that the whole class can see.

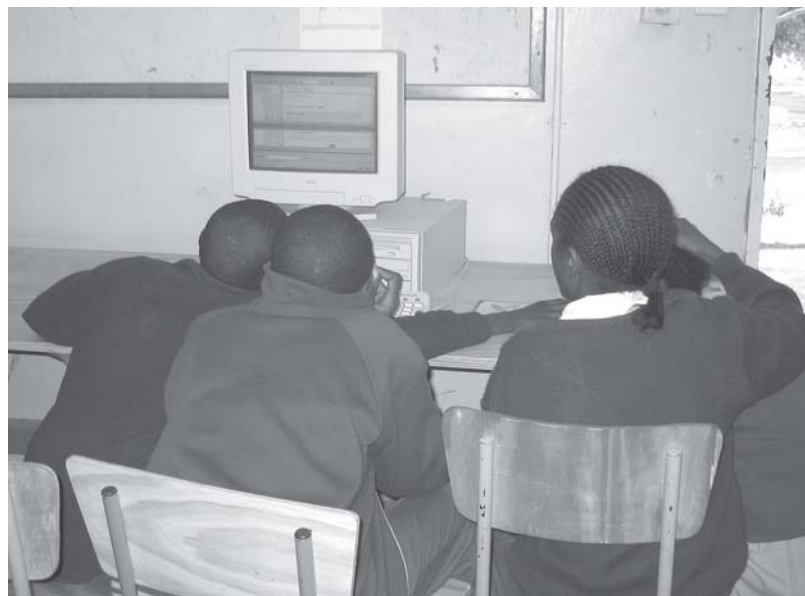


Figure 10: One-computer classroom



Figure 11: A computer workstation

Computer workstations

Some classrooms are equipped with two or four computers that share peripherals like scanners and printers. Each computer in the workstation can be set up for a different phase in the development of a product or with different research tasks (e.g. one with Internet, one with encyclopaedia, one with word processor and graphics). Again, this situation lends itself to group work.



Figure 12: A computer lab

Computer labs

Having all computers in a computer lab is the most common setup of Namibian institutions. This setup is typically used when the whole class needs to be working on the computers at the same time. Individual, pair or group work can be used in this circumstance as well.

As you now know, ICT-enhanced lessons lend themselves ideally to group work. With limited equipment, group work may be the only way to include all learners in one activity. Group work allows learners to collaborate, share knowledge and problem-solve together – all elements of learner-centred education. But how should groups be formed? When should you use them and how? Here are examples of how learners can be grouped in a learner-centred way:

- *mixed ability groups*: slower and faster learners are placed in one group
- *social groups*: learners with the same or mixed backgrounds are grouped together, boys and girls mixed
- *interest groups*: all learners show interest in the same activity or topic
- *peer groups*: friends who like to work together are placed in the same group
- *random groups*: learners are chosen in no particular order
- *pair grouping*: two learners work together
- *learner-chosen groups*: learners are allowed to choose their own group.

Depending on the lesson activities, you should carefully consider how you want your learners to be grouped, to ensure that learners get the most out of the lesson.

Include and engage learners in the use of ICTs

Learners should always understand why they are using ICTs in the lesson and how this contributes to achieving the lesson objectives. In addition, you need to instill in the learners how the technology has relevance to their future as professionals and lifelong learners.

They should also understand from the beginning what their level of interaction with the technology is. Learners get very excited about using technology and you need to set parameters to avoid initial chaos. Learners should always walk (not run!) into the facility and never argue over using the equipment. Assigning duties can be an effective way to control learners.

When using ICTs, there is often not enough equipment to have a 1:1 ratio of equipment-to-learner. This, of course, means the learners must share and this is why grouping strategies are so important. Assigning duties to various group members is a perfect way to ensure that all learners are engaged with the technology (if this corresponds with your learning activities and objectives). Certain skills can be enhanced through a group activity, such as:

- *group leader*: opportunity to develop leadership skills
- *scribe*: opportunity to develop writing skills
- *timekeeper*: opportunity to become more aware of and develop a respect for time
- *reader*: opportunity to develop reading and comprehension skills
- *technology master*: opportunity to develop ICT skills (e.g. mouse skills, camera skills)

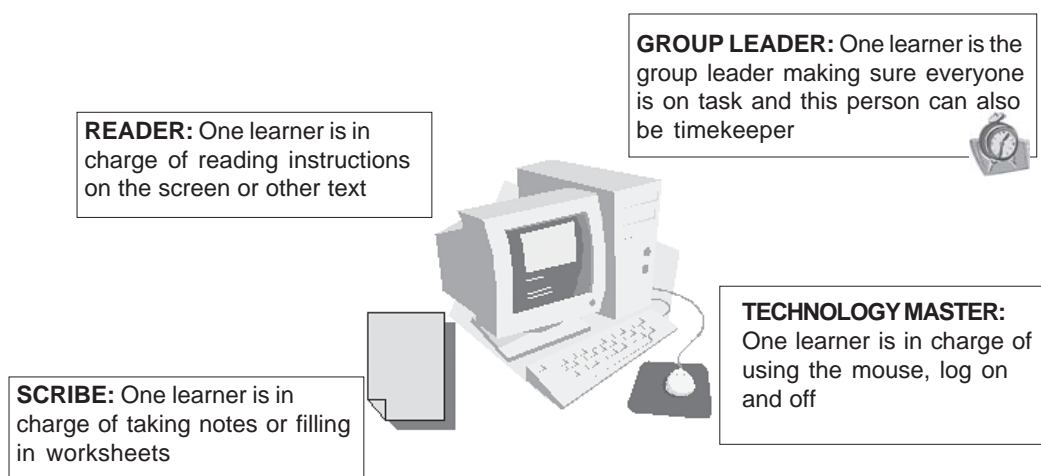


Figure 13: Example of a computer-based grouping.

It is essential that you rotate the responsibilities amongst the learners so that each of them gets an opportunity to do different tasks and to develop new skills. When using ICT in lessons, it is good to include in every group at least one learner who is comfortable with using the selected technology and can help the others along. You do not want a group left behind simply because no one knows how to search the Internet or use the zoom on the camera. This is the perfect opportunity for peer learning.

ICT as a teaching tool

If you are using ICT to present information, like a TV/ DVD, make sure that all learners are engaged in the material. Pausing the recording or your speech to ask questions and ensure comprehension, is always a good idea.



ICT as a learning tool

When the learners are actually engaged with the ICT tool, you should constantly walk around the room to make sure learners are on the task, all having access to the technology and comprehending the content. As ICT usually entails active learning, you will need to closely monitor their level of understanding, provide positive feedback and guide learners to self-correct. Many disruptions arise, because learners do not understand the task, are not being given a chance to engage with the technology, or are finished with the given task.



Figure 14: ICT as a learning tool

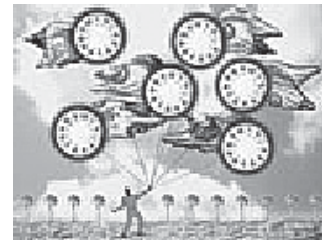
Depending on the chosen group strategy, you may already know groups that will need some extra attention and those that may need extra activities. If you have chosen same ability groups, you will want to monitor slower groups more carefully. On the other hand, you will need enrichment activities for groups of faster learners who finish activities ahead of allocated time. For instance, have a group that has completed the lesson activity on educational software, research the Internet about the lesson topic. You can also reward faster groups with the chance of playing (educational!) games when they are finished.

Although the idea is that learners should acquire their ICT skills in a separate subject devoted to this, this will not always be the case. Nonetheless, learners catch on very quickly. The first time you use new material or resources use the entire lesson to work carefully with the learners until the task is complete. Even if they know how to use the technology, they will be using it in a different context and need support accordingly.

Manage time for ICT activities

The organisation of time is another important element of an effectively managed lesson. Maximise learning time and minimise time wasted on activities like taking attendance, cueing your ICT material or grouping learners. Learners should be engaged with the technology as much as possible. Do all work that can be done in a traditional classroom in a traditional classroom. Do not waste time in an ICT-integrated lesson teaching concepts on the chalkboard or lecturing. Maximise the use of ICT tools and resources.

In addition, maximising learning time means learners should know the lesson agenda, which group they are in beforehand and ideally, which workstation they are using, if applicable.



Allocating time to each activity is something you do in each of your lesson plans, but when integrating ICTs, this may take some practice and more preparation time. Some considerations to keep in mind are:

- if the computers are not logged onto to the network, this will take extra time for the learners to do. Will you make time for the learners to log-off?
- internet connection may be slow and webpages may take time to load. (Remember to pre-load webpages!)
- learners' typing skills will vary. Beginners will take considerable time typing large amounts of text until they become more familiar with the keyboard
- know how long your audio/visual excerpt runs. Plan for pausing the audio/visual player to ask questions
- keep in mind how familiar learners are with certain programmes and equipment. How familiar are they with using a camera? How long will it take them, for instance, to navigate to the appropriate place in an educational software? Will they need help?



Do not give up - time management gets better with time.

Look at table 5 below for an example of ICT time planning

Time allocated to activity	Teacher activity	Learners' activity
5 minutes	Tell learners agenda of lesson, while passing out worksheets	Learners listen and accept worksheets
7 minutes	Play first section of video then pause	Learners watch video (and answer questions on worksheet) Many require separate timing
5 minutes	Ask learners questions about what they have just heard and watched	Learners respond to questions
5 minutes	Play second part of video, then pause	Learners watch video (and answer questions on worksheet)
5 minutes	Ask learners questions about what they have just heard and watched	Learners respond to questions
6 minutes	Play third part of video, then pause	Learners watch video (and answer questions on worksheet)
10 minutes	Tell learners to get in assigned groups, share answers from worksheets and think of the purpose of watching the video. Monitor learner activity and group participation among learners	Learners get in groups and share answers. One member of group should be scribe and write down their ideas of the purpose of watching the video.
3 minutes	Facilitate groups sharing answers with the whole class.	Group leader shares group answer (of purpose of watching video) with everyone

Table 5: Example of time management planning

Reflect on and evaluate ICT use in teaching and learning

Reflection is a part of any lesson, not just those that involve ICT. The tools that you use in the ICT-integrated lesson will probably be new to you, it is very important that analyse whether the lesson objectives were met and how ICT did or did not contribute to this. Remember, the whole point of integrating ICTs into your lessons is to enhance the quality of the learning experience.

Use table 6 below to help you judge if everything went according to plan:

<p>Classroom management This is always the most obvious area to observe if things went wrong and should be the easiest to correct.</p>	<p>Were the learners focussed on the task? Was the class setup appropriate for the activity/lesson? Was time allocated to activities appropriate?</p>
<p>Interest It is easy to see whether participating learners are engaged in an enhanced lesson.</p>	<p>Were the learners engaged in their learning? How did the use of ICT affect learner motivation? Were the faster learners being challenged? Were you able to give the slower learners the right level of attention?</p>
<p>Learning styles Be aware that ICT use may lend itself to learners becoming distracted from the task because they spend all their time typing in data, changing fonts and layout, and not really thinking about the content involved at all.</p>	<p>How did ICT affect the pace of learning? Did the use of technology increase learners' abilities to work independently? Did secondary issues (e.g. formatting font or finding the right webpage) distract the learner from achieving the learning objectives?</p>
<p>ICT skills</p>	<p>Were the learners' ICT skills adequate for the task? Did ICT get in the way of making progress? Were you able to support the learners' ICT skills development adequately for and during the lesson?</p>
<p>ICT integration There are lots of ways to tally what counts as ICT helping learners to learn, such as improved attendance and confidence, as well as enhanced knowledge and skills.</p>	<p>How did the use of ICT help learners better progress towards achieving the learning objectives? Did the use of ICT support learner-centred education?</p>

Table 6: Issues for evaluating use of ICT in lessons

Also think about these questions:

- what knowledge or skills have you gained and furthered in teaching this lesson?
- have you solicited feedback from the learners to improve activities?
- have you used instruments to collect data on the impact of the activity? Did you review the data and learner comments to determine if the strategy has solved the learning problem?
- what adaptations would you make to the lesson and the resources to suit the needs of the learners?



CHECK YOUR PROGRESS 4

DEMONSTRATE LESSONS INTEGRATING THE USE OF ICTs

Mixed ability groups Same ability groups Social groups
Gender groups Interest groups Peer groups
Random groups Pair grouping Learner-chosen groups

Pick the right grouping strategy that describes the situation below.

1. The boys and girls are separated. _____
2. Two learners work together. _____
3. All learners in a group progress at more or less the same pace.

4. All learners show interest in the same activity or topic.

5. Slower and faster learners are placed in one group.

6. Friends, who like to work together, are placed in the same group.

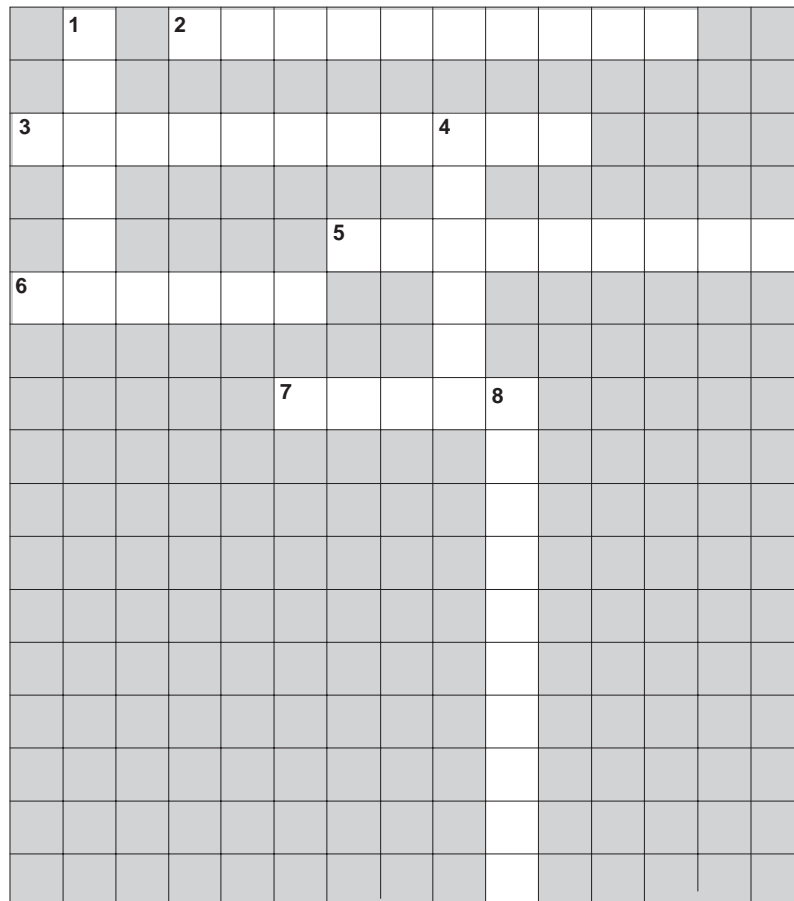
7. Learners with the same or mixed backgrounds are grouped together.

8. Learners are chosen in no particular order. _____
9. Learners are allowed to choose their own group.



CHECK YOUR PROGRESS 4

10. Crossword puzzle or Fill-in-the-Blank



ACROSS

2. This duty gives the learner the opportunity to develop a respect for time
3. This duty gives the learner the opportunity to develop leadership skills
5. The technology master duty allows the learner the opportunity to develop these
6. The opportunity to develop reading and comprehension skills is present in this duty.
7. This VCR function allows you to stop and ask questions regarding a particular section of a video tape

DOWN

1. This duty gives the learner the opportunity to develop writing skills
4. Assigning these can be a way to avoid learners' arguing over the equipment
8. Allowing learners to do research on the Internet, after finishing their assignment to do research on the Internet is an example of this kind of activity



CHECK YOUR PROGRESS 4

11. **State whether True or False**
- | | True | False |
|--|--------------------------|--------------------------|
| a) Familiarity with the keyboard does not affect time management | <input type="checkbox"/> | <input type="checkbox"/> |
| b) You should maximise the use of ICTs during class | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Take half of the time in the computer lab explaining the learning concept on the chalkboard | <input type="checkbox"/> | <input type="checkbox"/> |
| d) It is OK to estimate how long the video you are using will run | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Logging on and off the network should be figured into the time management of the lesson | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Learners not knowing how to navigate a particular software should be considered when planning your lesson | <input type="checkbox"/> | <input type="checkbox"/> |

12. Fill in at least two things you should think about for each category of evaluation

Classroom management	
Work ethos	
Learning styles	
ICT skills	
ICT integration	



PRACTICAL ACTIVITY 4

DEMONSTRATE LESSONS INTEGRATING THE USE OF ICTs

You decide to have learners do a WebQuest and then create a presentation about a topic of your choice. There are only 15 computers in the computer lab so learners will have to share.

Decide how you will group the learners and how you will ensure they are all engaged and included in the lesson. Be sure to account for your learners with disabilities. How much time do you anticipate this activity will take and what will you need to cover before they begin their group work? You should also design an assessment tool that includes the evaluation of the use of technology in a lesson.

Summary

Well done! You have completed Section 4 on *Demonstrate lessons integrating the use of ICTs*.

You should now be confident that you have the knowledge and skills to group learners appropriate to the ICT being used in your lesson, and apply the suitable grouping strategy. Also, you should now be able to manage your time, bearing ICT in mind, as well as reflect upon the success of integrating ICT in each lesson.

If you feel confident that you have achieved the above, - congratulations! You have successfully completed the manual *Design and deliver lessons using ICT applications*.

If you are unsure about anything, go back and revise or ask your instructor or supervisor for assistance.

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Glossary

- Behaviourism : A theory of learning that aims to modify observable behaviour and considers learning behaviour that shows the acquisition of skills.
- Bookmark : They perform the same function as traditional bookmarks in a book. On the Internet you can set a bookmark for web addresses for easy access should you want to visit the page again.
- Constructivism : A theory of learning based on the idea that knowledge is constructed by the knower based on mental activity. Learners are considered to be active organisms seeking meaning.
- Download : When you download something from the Internet you receive data, software, email, etc. The reverse process is called *uploading*.
- Education technology : The use of technology to improve education. It is a systematic, repetitive process for designing instruction or training used to improve performance. Educational technology is sometimes also known as instructional technology or learning technology.
- Higher order level thinking : Refers to the thinking that takes place at the higher levels of abstraction where analysis, critical interpretation, creative application and reason evaluation occur. Higher order thinking is promoted by teaching which encourages learners to reflect on how they learn and what has been learnt.
- Hyperlink : Links are text or pictures that connect Web pages. When you click on a link with your mouse you either go to a different website or to a different place on the same webpage.
- Internet : The Internet (also the Web or the Net) is a network of computers linked together for the exchange of information.

- Metacognition : Means thinking about thinking. It is an active attempt on the part of the learner to reflect on the thinking process in order to gain more control over their learning. It includes the use of thinking strategies and thinking tools.
- Multimedia : The combination of different media, including text, graphics, audio, video and animation, in one program or technology.
- Webpage : Webpage is anything that is accessible on the Internet.
- WebQuest : Is an inquiry-oriented activity in which most or all of the information used by learners are drawn from the Web. WebQuests are designed to use learners' time well, to focus on using information rather than looking for it, and to support learners' thinking at the levels of analysis, synthesis and evaluation.
- Websites : A collection of Web pages form a website. An individual or a corporation can design a website and upload to the web.
- Simulation : An activity that imitates a real life situation.
- Visualisation : Putting a process or activity in visual terms (as apposed to writing).



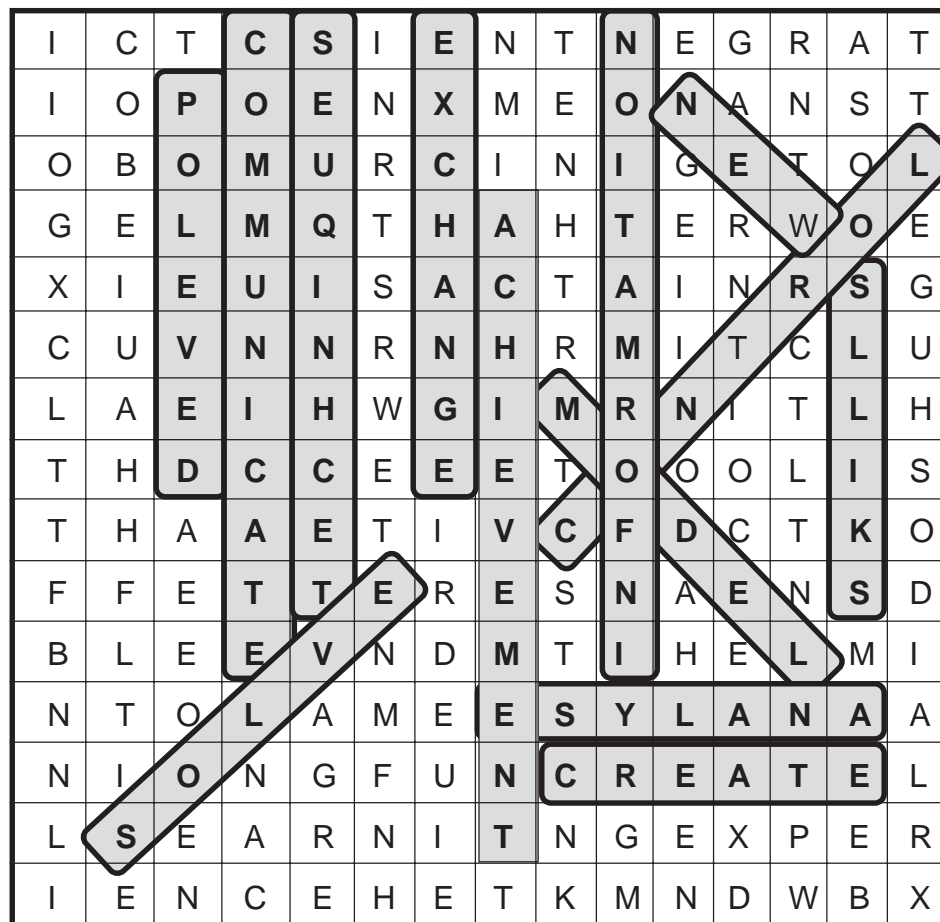
Write down additional words that you do not understand.
Ask your instructor to explain the meaning of those words.

Answers to check your progress

Check your progress 1

1. Benefits of using ICT in teaching and learning for teachers (any three):
 - Facilitates sharing of resources, expertise and advice
 - Allows you to produce better looking, more “learner-friendly” materials more quickly
 - Gives you greater flexibility in when and where tasks are carried out
 - Provides for electronic storage of lesson plans, work sheets and exams for efficiency and standardisation
 - Can track learner progress to better assess and evaluate learners and yourself
 - Use visual and interactive features that help focus learners’ attention and encourage them to spend more time on learning tasks.
 - Engages learners through production work promoting motivation, creativity, and self-expression
 - Provides tools for simulation and demonstration for better conceptual explanation
 - Can help communicate more effectively with parents to encourage parental involvement
 - Can improve learner behaviour
 - Provides more accurate information more quickly
2. Benefits for learners of using ICT in teaching and learning (any three):
 - Encourages learners to take control of the learning and they can see the results of their own decisions and actions.
 - Produces higher quality lessons through greater collaboration between the teachers in planning and preparing resources
 - Forces teaching to become more focused to each learner’s strengths and weaknesses, through better analysis of attainment data
 - Develops writing skills (including spelling, grammar, punctuation, editing and redrafting), and also fluency, originality and elaboration
 - Develops higher order thinking skills
 - Links learners to information sources (primary source materials, with people and places that they could not otherwise have) as well as education sources (for distance learning)
 - Preparing learners to be globally competitive professionals by grooming technology literacy

- Helping learners visualise problems and solutions
 - More easily caters to learners with special needs
 - Develops presentation skills and use of visuals to communicate
 - Increases self-esteem, improves behaviour, and cultivates teamwork skills
3. Challenges of using ICT in teaching and learning (any three):
- Your new role
 - Time
 - Limited access to facilities and resources
 - Technical problems
 - Learner : computer ratio
4. True or False
- 4.1. True, 4.2. False, 4.3. False, 4.4. True, 4.5. False
4.6. True, 4.7. False
5. Find the words.



6. Crossword Puzzle

ACROSS

- | | |
|------------------|----------------|
| 1. DVD | 4. Recorder |
| 5. Scanner | 7. Motivate |
| 8. Challenge | 11. Calculator |
| 12. Radio | 13. Overhead |
| 15. Software | 16. Select |
| 18. Kinaesthetic | 19. Brainstorm |

DOWN:

- | | |
|--------------|--------------|
| 2. Visual | 3. ICT Tools |
| 6. VCR | 9. Efficient |
| 10. Auditory | 11. DSTV |
| 17. Cameras | |

7. Technology-enhanced learning environments should:

- Allow learners to control their own learning
- Use real-world examples and contexts
- Encourage collaboration, communication and group learning
- Support active learning and exploration
- Facilitate the sharing of knowledge/ideas and respect for multiple perspectives
- Reference what learners already know
- Use primary sources of information
- Promote explicit thinking about errors and misconceptions

8. Steps for designing a lesson using ICTs:

- Extract topic from scheme of work
- Set specific lesson objectives
- Select tools
- Design lesson plan
- Design assessment of ICT use in relation to achievement of objectives.

learning?

- Is the resource easily available and accessible?
- Are there requirements for ICT equipment, other resources, space, etc. that might limit how and where the lesson is taught?

3. Match preparation tip to the correct resource:

a) = e	b) = a	c) = b	d) = a, d	e) = e, f
f) = b, d	g) = b	h) = d	i) = d	j) = f
k) = d	l) = a	m) = c	n) = e	o) = a, d
p) = c	q) = e, f	r) = e	s) = c	
t) = a, b, c, d, e, f				

4. You need to prepare a back-up plan when integrating ICT into your lessons because technology fails, for example, batteries die, electricity goes out, and you need to know what to do with the class in case this happens.
5. Fill in the blank
- All electronic files should be saved in a retrievable location.
 - Back-up all your work on an external storage device.
 - Print a hardcopy to store as well, in case the computer crashes.
 - Store overhead transparencies in dust-free covers when possible.
 - Store all audio-visual material after use.
 - Keep photographs out of the sun.

Check Your Progress 3

1. Logistical considerations of ICT resource and facility management and a brief description what they refer to:

- **Organisational considerations**

You will need to think of how best to manage learners in each environment, because you will probably not be in your traditional classroom, but most likely in a computer lab, a room for watching television or even outside, . Learners also may not be ideally accommodated by the facilities as you might have many learners and only few resources such as, computer, cameras, etc. You will need to think through grouping strategies if used and learner access to facilities after class if necessary.

- **Access considerations**

Knowing the procedures for getting access to the facilities and resources available to you is also essential. Scheduling may restrict you in some ways, especially if you have to use the facilities and/or resources more than one day for one lesson.

- **Safety and security considerations**

Most technology is harmless, however, precautions must be taken just in case. Some of this equipment is very heavy (e.g. computer, televisions) and you and your learners should know how to handle all equipment. Moreover, most of this equipment is expensive and you and your learners need to know the procedures for securing it from theft and damage.

- **Social, ethical and legal considerations**

You must also consider all the social, ethical and legal implications of using technology for you and your learners. This includes the implications of technology on society and how people live and interact, locally and globally. Both you and your learners should know what technological issues have ethical and legal implications as well.

- **Maintenance and sustainability considerations**

Because this equipment is expensive, both you and the learners should know how to best maintain it, protecting it from things like dust, water and lightning. Also, there are issues of conservation as you will be using potentially limiting resources like paper and electricity/batteries.

2. Statements refers to:

- a. Organisation
- b. Access
- c. Organisation
- d. Social, ethical and legal
- e. Safety and security; maintenance and sustainability
- f. Maintened and sustainability
- g. Access
- h. Safety and security
- i. Access
- j. Maintenance and sustainability
- k. Safety and security.
- l. Social, ethical and legal
- m. Maintenance and sustainability

3. True or false:
 - a. Check if the equipment is working once the learners come to class - False - you should check the equipment before the learners come.
 - b. Charge camera batteries before learners use cameras – true.
 - c. Fast-forward educational video so it is ready for use once class starts –true
 - d. Use traditional seating when learners are working in groups – False. In general, learners should be grouped around equipment.
 - e. All learners should arrange themselves when the class activity involves listening to a CD – False. You should seat them to ensure all can hear and see properly.
 - f. All learners should be able to clearly see the computer monitor when using it – True.
 - g. There is always an ideal seating arrangement when integrating ICTs into your lesson – False. Be flexible and adapt to each new situation.
 - h. Preload webpages that you know learners will be using - True.

Check Your Progress 4

1. The boys and girls are separated: **Gender groups**
2. Two learners work together: **Pair grouping**
3. All learners in a group progress at more or less the same pace: **Same ability groups**
4. All learners show interest in the same activity or topic : **Interest groups**
5. Slower and faster learners are placed in one group: **Mixed ability groups**
6. Friends, who like to work together, are placed in the same group: **Peer groups**
7. Learners with the same or mixed backgrounds are grouped together: **Social groups**
8. Learners are chosen in no particular order: **Random groups**
9. Learners are allowed to choose their own group: **Learner-chosen groups.**

10. Crossword

Across

2. Timekeeper
3. Groupleader
5. ICTskills
6. Reader
7. Pause

Down

1. Scribe
4. Duties
8. Enrichment

11. **State true or false:**

- a) Familiarity with the keyboard does not affect time management – **False**. Typing will take more time until learners get comfortable with the keyboard.
- b) You should maximise the use of ICTs during class – **True**
- c) Take half of the time in the computer lab explaining the learning concept on the chalkboard – **False**. Always explain traditional concepts in a traditional classroom. Maximise use of ICT tools while in the lab.
- d) It is OK to estimate how long the video you are using will run – **False**. Know exactly how long your material is before using it.
- e) Logging on and off the network should be figured into the time management of the lesson – **True**.
- f) Learners not knowing how to navigate a particular software should be considered when planning your lesson – **True**.

12. You should have at least two of each in each box:

<p>Classroom management This is always the most obvious area to observe if things went wrong and should be the easiest to correct.</p>	<p>Were the learners on task? Was the class setup appropriate for the activity/lesson? Was time allocated to activities appropriate?</p>
<p>Work ethos</p>	<p>Were the learners engaged in their learning? How did ICT the use of affect learner motivation? Were the brighter learners being challenged? Were you able to give the slower learners the right level of attention?</p>
<p>Learning styles Be aware that ICT use may lend itself to learners being distracted from the task as they spend all their time typing in data, changing fonts and layout, and are not really thinking about the subject involved at all.</p>	<p>How did ICT affect the pace of learning? Did the use of technology increase learners' abilities to work independently? Did secondary issues (for example, formatting font or finding the right webpage) distract the learner from achieving the learning objectives?</p>
<p>ICT skills</p>	<p>Were the learners' ICT skills adequate for the task? Did ICT get in the way of making progress? Were you able to support the learners' ICT skills development adequately for and during the lesson?</p>
<p>ICT integration There are lots of ways to tally what counts as ICT helping learners to learn such as improved attendance and confidence as well as knowledge and skills.</p>	<p>How did the use of ICT help learners better progress towards achieving the learning objectives? Did the use of ICT support learner-centred education?</p>

Bibliography

Bubbenzer & Giannini (2004) "E-learning Development and Implementation".
Tele-Akademie-Common Sense

Guskey, T.R. (2000) Evaluating Professional Development. California: Corwin Press

Ministry of Basic Education, Sport, and Culture & Ministry of Higher Education, Training, and Employment Creation (2005) ICT Policy for Education. Windhoek, Namibia: MBESC & MHETEC.

NETA (2006) ICT Integration Manual for Schools in Namibia

NIED (1999) *Towards Improving Continuous Assessment In Schools: A Policy And Information Guide*

NIED Broad Curriculum

NIED Teacher's Basic Competencies Manuals 1-10, Ministry of Basic Education and Culture

WEBSITES:

<http://creativecommons.org/>

<http://edublogs.org/>

<http://elearning.polytechnic.edu.na>

http://en.wikipedia.org/wiki/Main_Page

<http://freespeech.sourceforge.net>

<http://kewl.polytechnic.edu.na>

<http://learninfreedom.org/ed-newsgroups.html> <http://www.ci.bryanisd.org/1Vision/Teacher%20Podcasts/Teacher%20Podcasts.html>

<http://www.aaamath.com/>

http://www.bbc.co.uk/history/society_culture/industrialisation

http://www.bbc.co.uk/history/society_culture/industrialisation/

<http://www.becta.org.uk/>

<http://www.berghuis.co.nz/abiator/lsi/lsiframe.html>

<http://www.cs.corness.edu/home/raman/emacspeak/>

<http://www.curriculumsupport.education.nsw.gov.au/>

<http://www.doe.mass.edu/lawsregs/603cmr7.html?section=08>
www.noodletools.com

<http://www.edchange.org/multicultural/sites1.html>

<http://www.edsnet.edu.na>

<http://www.eklhad.net/linux/jupiter/>

<http://www.enchantedlearning.com/subjects/rainforest>

<http://www.engr.ncsu.edu/learningstyles/ilsweb.html>

http://www.essentialschools.org/cs/resources/view/ces_res/225

<http://www.kieczka.de/daniel/linux>

<http://www.learningtimes.org/>

<http://www.math.com/teachers/centers/profdev.html>

<http://students.msbcollge.edu/elearning/assessment/> <http://www.ncrel.org/sdrs/areas/issues/educatrs/profdevl/pd500.htm>

<http://www.school.za/PILP/>

<http://www.strategictransitions.com/>

http://www.techlearning.com/db_area/archives/WCE/archives/kasse.htm

<http://www.thirteen.org/edonline/concept2class/>

http://www.trace.wisc.edu/world/computer_access/unix/unixshar.html

<http://www-4.ibm.com/software/speech/dev/>,

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