|  |  |
| --- | --- |
|  | EDUCATIONAL TECHNOLOGY |

Introduction to Educational Technology Module in the CPDC programme for teacher-educators

Click on [**DOCUMENT TYPE**] and type the ***description*** (e.g. course manual, self-study workbook, user guide) and ***not*** the course title.

Type in **all lower case**; the text will automatically appear in UPPER CASE. Please refer to the user guide for more information.

If your course does not have a sub-title, click on this field and press the <**Delete**> key.

National Commission for Colleges of Education & Teacher Development Programme (NCCE & TDP)

**⏵*Before going to the next page!***

Press <**Ctrl**>+<**A**>, then press <**F9**>. This will automatically insert text you have inserted in the form fields on this page throughout the entire manual in the relevant linked fields.



If you do not wish to include a school or department name, click on [**Add School/Department name here**] below and press the <**Delete**> key.

**Copyright**

**© National commission for Colleges of Education & Teacher Development Programme (NCCE & TDP), 2015**

**⏵**Guidance on copyrights is available in the COL Copyright Toolkit. You can download the toolkit from COL’s website. Click on: Resources > Publications > Training Toolkits and Manuals.

[](http://creativecommons.org/licenses/by/3.0/)

This work is licensed under a

[Creative Commons Attribution 4.0 License](http://creativecommons.org/licenses/by/3.0/)

Citation:

NCCE & TDP. 2015. *Introduction to Educational Technology. A module in the CPDC programme for teacher-educators*. Abuja: National Commission for Colleges of Education and Teacher Development Programme (NCCE & TDP).

**Acknowledgements**

|  |
| --- |
| This module was developed by   * Usman O. Isa FCE Katsina, Dept. English ([usmanoisah@gmail.com](mailto:usmanoisah@gmail.com) ) * ,Mbaba Awajiokinor Ekrrika ,I.K.C.O.E Dutsin-ma, Dept, Edu. Foundation Studies, ([okimba01@gmail.com](mailto:okimba01@gmail.com) ) * Hassan Usman, I.K.C.O.E. Dutsin-ma Dept: Chemistry ( [huscoe12@gmail.com](mailto:huscoe12@gmail.com) ) * Mohammad Maibeni, Jigawa State C.O.E. Gumel Dept: E.C.C.E. ([muhammmadmaibeni@gmail.com](mailto:muhammmadmaibeni@gmail.com) ) * Mark Toscanini T.D.P. Katsina ([mark.toscanini@tdpnigeria.org](mailto:mark.toscanini@tdpnigeria.org))   in conjunction with: |
| * the National Commission for Colleges of Education (NCCE), Abuja, Nigeria * the Teacher Development Programme (TDP, Abuja, Nigeria. * the South African Institute for Distance Education ([www.saide.org.za](http://www.saide.org.za)).   The module uses the instructional design template of:  Commonwealth of Learning (CoL) – the instructional design template is freely available, along with many other resources, from [www.col.org](http://www.col.org). |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |

Click on each of the fields above to acknowledge the *person/institute* giving assistance.

No need to delete unused fields—they will not print.

To add extra rows to this list click in the ***last row*** of the ***column on the right***and press the <**TAB**> key as many times as required.

Click on each of the fields above to acknowledge the *type* of assistance (input to course content, permission to use extracts from other course material, source of graphics, etc.)

Contents

**⏵Do not make manual changes to the Contents page!**

Click inside the contents list below (you will see grey shading) and press <**F9**>.This operation will automatically update the contents. Repeat this operation *at any point during the development of this course material* to update the Contents.

How the module fits into the programme 3

Overview of module 3

How the module is structured 8

Introduction to Educational Technology Module 9

Welcome 9

**Unit 1. Selection of appropriate educational technology for different class sizes** 10

1.1 Unit outcomes 10

1.2 Educational technology for different class sizes 11

1.3 Selecting appropriate educational technology for small class size 13

1.4 Selecting appropriate educational technology for large class size 16

1.5 Selecting appropriate educational technology for multi-grade classes 18

1.6 Summary 19

1.7 Self-assessment 20

1.8 Selected references 20

**UNIT 2: Selection of appropriate educational technology for different classroom needs 21**

2.1 Unit outcomes 21

2.2 Learners with different classroom needs 22

2.3 Appropriate educational technology for learners with different learning rates 23

2.4 Educational technology appropriate for learners with physical disabilities 26

2.5 Summary 27

2.6 Self-assessment 29

2.7 Selected references 31

**UNIT 3: Utilization of mobile learning technology for instruction 32**

3.1 Unit outcomes 32

3.2 Utilizing mobile learning technology for instruction 33

3.3 Instructional design recommendations and challenges 35

3.4 Instructional design principles and tips on how to start mobile learning 38

3.5 Summary: 42

3.6 Self-assessment 42

3.7 Selected references 41

**Unit 4. Accessing OER while using educational technology in teaching 42**

4.1 Unit outcomes 43

4.2 Understanding OER 43

4.3 Technical and legal frameworks involved in accessing OER 51

4.4 Modern technology used for accessing OER 55

4.5 Summary 57

4.6 Self-assessment 59

4.7 Selected references 60

**Unit 5. Identifying and overcoming challenges ……………………………………..61**

5.1 Unit outcomes ……………………………………………………………………...62

5.2 Challenges associated with the use of classroom technology ……………………..62

5.3 Challenges associated with use of higher education technology materials ………..63

5.4 Challenges associated with the use of distance learning technology ……………...65

5.5 Summary …………………………………………………………………………..67

5.6 TPACK as an organisimg framework for the module as a whole ………………...68

5.7 Self-assessment ……………………………………………………………………71

5.8 Selected references ………………………………………………………………..72

**Glossary ………………………………………………………………………………73**

# How the module fits into the programme

## Overview of module

This module prepares teacher-educators to face the changing and challenging situations in our school system. Most classrooms are over- populated, the facilities are inadequate or even lacking, the textbooks are expensive and other educational resources are inaccessible. Poor teaching and learning are the obvious consequences of these challenges. In order to overcome these challenges, teacher-educators need to update their knowledge and use of Educational Technology to enhance effective classroom instruction through the use of modern approaches; which include the use of online forums, mobile learning and accessing OER. These approaches will help ensure that students are properly engaged in practical activities embedded in this module.

As a teacher-educator on the CPD programme for pre-service teacher training, you will be actively involved in a learning process aimed at developing or improving your competence in respect of a range of areas relating to your profession as a teacher-educator in the school and college system. If you have already been involved in training teachers for a number of years, it is likely that you already have many examples of good practice related to curriculum development, curriculum design, educational technology, learning resource development, educational psychology etc used to improve teacher’s efficiency. Therefore, you will have historical evidence from previous work, as well as current evidence, which you will be developing as part of the educational technology programme. You will also have evidence that you generate in your daily work in the College while you are in the programme.

The question is then: How do you ensure that all the evidence you have (that reflects your competence in areas covered in the educational technology programme) is considered during the formal assessment? How do you compile all this evidence in a way that assessors will be able to use in determining whether you should be recognized as a competent teacher-educator in use of educational technology? This is where the portfolio comes in, and the aim of this module is to assist you to ensure that it contains relevant evidence of your competencies as a teacher-educator in relation to educational technology.

Exactly what is the portfolio that you will have to compile? Your portfolio will be a collection of evidence from diverse sources that you put together and submit to assessors who will use it to assess your competencies against the requirements specified in the form of exit level outcomes for this programme and module. Educational technology, also termed instructional technology, information and communication technology (ICT) in education, Edu-Tech, and learning technology, is "the study and ethical practice of facilitating learning and improving performance by creating, using and managing appropriate technological processes and resources."

A closely related term, [e-learning](http://en.wikipedia.org/wiki/E-learning), refers to the use of modern technology, such as computers, digital technology, networked digital devices and associated software and courseware with learning scenarios, worksheets and interactive exercises that facilitate learning.

**What is the purpose of this module?**

By the end of this module teacher-educators will have developed skills for selecting appropriate educational technology materials/media and demonstrated adequate introductory-level skills in using them for learner-centred and resource-based teaching and learning.

**Why have we included an Educational Technology module?**

Teacher-educators need to have the necessary skills to select appropriate educational technology for different classroom situations, to develop skills of using education technology equipment and materials and to access OER using educational technology materials for instructions for better teaching and learning. We cannot expect teacher-students to do this in the classroom unless they experience such practices during training at the college.

**What is covered in the module?**

This module comprises an introduction and five units as follows:

1. Selection of appropriate educational technology for different class situations.
2. Selection of appropriate educational technology for different class needs.
3. Utilizing mobile learning technology for instruction
4. Accessing Open Educational Resources (OER) using Educational Technology for Instruction.
5. Challenges that come with developing and using educational technology materials.

**How does this module relate to the rest of the CPD modules?**

The educational technology module is a foundational module.

##### Figure 1: Relation of module to programme

The module is related to all other modules because Ed-tech is useful as it facilitates the activities of other subject areas. Educational technology is relevant to the core unit standards of the TDP programme. This is because, the task of teaching large class, students with special needs in schools with inadequate facilities and poor infrastructure is made easier with the use of appropriate educational technology.

**How will this module be assessed?**

You will complete three assignments for the module which will contribute to your overall CPD portfolio.

**Learning time**

This module carries 1 credit. It should, therefore, take the average student approximately 40 hours to successfully complete the module. The 40 hours includes contact time, reading time, research time and time required to write assignments. Remember that about half of your time in this module will be spent completing practice-based activities in your college. This will often involve you in discussions with your colleagues. A more specific indication of time to be spent on each of these activities will be provided in each of the units that make up this module.

**Teaching and learning**

This module, like all other modules involves part-time study while you are working. Much of what you learn will therefore be dictated by your own effort and commitment. The most successful teacher-educators are not necessarily the cleverest or the most experienced but rather the ones who are most disciplined, most organized, most willing to reflect critically on their own learning and most able to apply theory to practice and manage time efficiently.

However, the module is also practice-based. This means that it does not only require you to read and write but also to **apply** what you have learnt, to reflect on the success or failure of the application and to learn from your mistakes. Learning is, therefore, not simply a theoretical exercise but also a practical as well as an experiential one, focussing on how to select appropriate educational technology and demonstrate adequate skills in using it for learner-centred instructions.In order to teach students to become effective new teachers or more effective existing teachers, teacher-educators need to communicate and model the curriculum in ways that exemplify the evolving nature of good practice. To help teacher-students most effectively, teacher-educators need to be able to answer a few key questions:

* What is the relative difference between education technology equipment used in large, moderate and small classrooms?
* What are the universal principles of mobile learning?
* How do you engage your students in mobile learning?
* Can/Does mobile learning make any difference in your lessons?
* What Ed-Tech resources are available to access OER in your college?
* How would your access to OER make you teach differently?
* What is the available technology in the schools where your students teach?
* Do you observe any challenges in developing or using technology in your class?
* To what extent does the challenge affect your teaching or reaching your students?
* What is the process of developing and using technology in the class?
* Why is educational technology important in the classroom?
* How can teacher-educators overcome challenges associated with educational technology in the class?

As noted above, this module is divided into **five units**, each of which addresses the above questions, from a different perspective. Although the themes can be studied separately, they should be read together to provide comprehensive guidance in answering the above questions.

Unit 1: **Selection of appropriate educational technology for different class situations.**

This unit provides teacher-educators with the necessary skills to select appropriate educational technology for different class situations**.** The need to select an appropriate educational technology to suit the various purposes for different class sizes has been emphasized in many teacher education programmes in Nigeria. Classrooms in various schools in Nigeria are of different sizes, some classes are small with student populations of 30 – 40 students. This class size can be considered a small size classroom. Others are very large classrooms with capacity of 150 – 200 students. The teacher educator needs to consider these class sizes in selecting appropriate educational technology for learner-centred learning.

Unit 2: **Selection of appropriate educational technology for different class needs.**

This unit prepares teacher-educators to select appropriate educational technology for different class needs. Our classrooms are characterized by different categories of learners with different learning needs such as learning speeds (fast, intermediate and slow), physical challenges (visually impaired, physical disabilities, hearing difficulties etc). These call for a careful selection of appropriate educational technology for effective instruction in such classes.

Unit 3: **Utilizing mobile learning technology for instruction**

This unit enhances the skills of teacher-educators to effectively utilize mobile learning technology for teaching. Mobile phones are tools for designing and delivery of lessons. Teaching, training and learning can be supported with mobile technology. These devices are playing an increasingly important role in redefining how information is shared. Mobile phones are best way of ensuring that classes are not overstressed because they enable students to have easy access to classroom activities and information outside the classroom. However, most teacher educators do not have the pedagogical and technical skills to develop plan and deliver their lessons through mobile technology. Thus, there is need to explore the use of such technology for effective learning.

Unit 4: **Accessing Open Educational Resources (OER) using Educational Technology for Instruction.**

This unit enhances the ability of teacher-educators to access Open Educational Resources (OER) using Educational Technology for more effective teaching and learning. Resource-based or activity-based approaches require ability to access Open Educational Resources (OER) using Educational Technology. Most teacher-educators today were trained to use analogue facilities to teach thereby leaving them under-prepared for the contemporary digital classroom environment in which, if not all, learners have direct access to the internet. The face-face or class-based instruction is no longer optimally productive in the face of current numerous instructional challenges thwarting effective teaching and learning, especially in Africa. These include over-crowded classrooms, poor infrastructure, inadequate facilities, and poor teaching among others. Therefore, teacher-educators need to acquire the necessary skills and knowledge to use appropriate educational technology to access OER for more effective teaching and learning.

**Unit 5: Challenges that come with developing and using educational technology materials.**

This unit supports the teacher-educators to overcome challenges that come with developing and using educational technology materials. All over the world there has been a deliberate effort put in place to ensure integration of technology in teaching and learning. However, in a developing nation like Nigeria, integration of technology in teaching and learning has generated a lot of challenges for the teachers and the teacher-educators. In spite of the challenges associated with the development and use of educational technology/ materials, the push to provide technology in schools has been increasingly successful in recent years. For example within the teachers’ training colleges, most schools have computer labs with teachers’ owning personal laptops while some have multimedia projectors for classroom presentation of lectures. Research has shown that more than 90 percent of all teachers’ training schools in Nigeria are connected to the Internet. Yet teacher-educators admit that they are not making much use of technology in their lesson delivery. What then are the challenges of teacher-educators? As a teacher-educator, do you have adequate knowledge and skills required to select, design and use technology optimally in your teaching? Do you have a technology coordinator in your school? Do the technology coordinators in your school readily assist you in using technology in your class? Are there electricity and standby generators for continuous use of technology in your school? To what extent do your students use computers and what programmes are they acquainted with in learning? Have you been engaged in software development for the teaching of any course? These are the kinds of questions explored in this unit.

## How the module is structured

The module consists of the following:

* Welcome to the module
* Module outcomes.
* Content of the module, divided into units.
* A module summary.
* Self-assessment
* References (source of materials).

# Introduction to Educational Technology Module

## Welcome

**⏵See Richard Freeman’s handbook, *section 3.3: Setting aims and objectives for your course.***



The picture above illustrates the kind of interaction we hope to foster in the CPD programme.

Each teacher-educator enters the CPD programme with a wealth of prior knowledge and experience. We want to create spaces for the sharing of this accumulated wisdom in responding to the new challenges of changing times and curriculum reform.

## Unit 1. Selection of appropriate educational technology for different class sizes

#### Introduction

The need to select an appropriate educational technology to suit the various purposes for different class sizes has been emphasized in many teacher education programmes in Nigeria. Classrooms in various schools in Nigeria are of different sizes, some classes are small with student populations of 30 – 40 students. This class size can be considered a small size classroom. Others are very large classrooms with capacity of 150 – 200 students. The teacher educator needs to consider these class sizes in selecting appropriate educational technology for student-centred learning.

**This unit will probably take about 8 hours to complete.**

## 1.1 Unit outcomes

Upon completion of the unit, you will be better able to:

|  |  |
| --- | --- |
| Outcomes  Outcomes | * Demonstrate how to select appropriate Educational Technology for different class sizes. * Organise group work and discuss the selection of appropriate educational technology for different class sizes * Classify and brainstorm on the appropriate educational technology for different classroom sizes. |

## 1.2 Educational technology for different class sizes

|  |  |
| --- | --- |
| Activity 1a | Purpose This activity will help you to select appropriate Educational Technology for different class sizes.  **Time needed**  This activity should take about 2 hours.  Read the argument made at the following site:  <http://www.edutopia.org/technology-integration-introduction>  To what extent do you agree/disagree?  Now watch the video on blended learning at:  <http://www.edutopia.org/tech-to-learn-classroom-technology-resources>  Did watching the video change your mind at all? |

|  |
| --- |
|  |
| Discussion |

#### Discussion

Hassan has been teaching a class of only 20 students using resources such as charts, flash cards and textbooks to teach English Language for many years. In subsequent admissions, the number of his students has risen to 140 students. It therefore became difficult for Hassan to use the same instructional materials (charts, flash cards and textbooks) that will be sufficient for effective classroom instruction. As a consequence, the performance of his students started degenerating. He decided to complain to the school authorities about his predicament. The principal of the school urged Hassan to use his many years of experience to proffer solutions to the problem.

Answer the following additional questions in your workbook:

1. Which educational technology is more appropriate for Hassan’s classroom instructions now?
2. What other criteria should Hassan consider to select Educational technology to teach his class?
3. Which kind of Educational technology would Hassan prefer for **small**, **medium and large classes?**

You should engage with other teacher-educators in group brainstorming and discussion during a contact session based on the following scenario:

*A particular village had a high increase in its student population, but the school had no furniture, no electricity and the building was dilapidated.*

a) What educational technology will be appropriate for effective instruction in such a situation?

b) What could be your alternative option when what you intend teaching needs to be visualized but there is no power, slide projectors, multimedia projector etc available for use in your school/college?

c) At what point and under what conditions do you think mobile learning could be important and relevant for delivery of your lesson?

(d) During a contact session, brainstorm with other teacher-educators in groups and select appropriate educational technology for teaching in:

Class with few students

Class with moderate population

Overpopulated class.

Class without furniture, chalkboard or power

Class without basic learning resources.

Also, proffer solutions to the following situations:

Considering the inadequacies in schools, how can you design, develop and produce instructional materials for teaching a topic in your teaching specialty?

How do you/could you incorporate either online asynchronous or synchronous forum (chat) in your teaching approach?

Various Educational Media/Instructional media are used nowadays to impart knowledge to different learners in various class sizes. Some of these media require Educational Technology equipment and include both projected and non-projected instructional media. The projected media include the multimedia projectors overhead projectors, slide projectors, filmstrip projectors, opaque projectors, 16mm and 32mm cinema projectors.

The non-projected include the radio, the television, computers, prints, cartoons, posters, newspapers, magazines, bulletin boards, magnetic boards, graphs, charts, textbooks, maps, globes, charts, resources in the community, and public address systems.

How do we choose resources and technology that will be appropriate for context?

## 1.3 Selecting appropriate educational technology for small class size

Stop a moment and think about your own practice.

What educational technology do you most often use in your own teaching?

Does class size impact on the decisions you make about **what** educational technology to use and **how** to use it?

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Activity 1b | **Purpose**  This is to help you to appropriately select educational technology for a small class size  **Time**  The activity should take about 2 hours.  Read the argument on class size made at:  <http://www.salon.com/2011/08/06/good_school_excerpt/>  To what extent do you agree/disagree?  Now consider the ideas about small class/seminar teaching at:  <http://www.fctl.ucf.edu/TeachingAndLearningResources/LearningEnvironments/smallclass.php>  Which techniques/strategies could you employ in your own tutorials?  **Now select appropriately which Educational Technology may be applied most effectively in small class/seminar settings.**   |  |  | | --- | --- | | Educational Technology | State for which purpose in instruction | | **Textbooks** |  | | **Cartoons** |  | | **Charts** |  | | **Bulletin Boards** |  | | **Maps** |  | | **Computer-Assisted Instruction** |  | | **Programmed learning** |  | | **Slide projection** |  | | **Filmstrip projection** |  | | **Individualized learning** |  | |

|  |
| --- |
|  |
| Discussion |

#### Discussion

Small class size consists of 20 – 40 students group in a particular class. The teacher-educator needs to have a clear purpose or objective before selecting an appropriate educational technology for small class size.

Some of the educational technology equipment and materials appropriate for small class size can include both print and non-print material and equipment. Selecting the appropriate technology may also require the teacher-educator to consider the individual difference of class members and consider which educational technology will be useful for which topic. For example, print media like posters, textbooks, charts, graphs, newspapers, cartoons, graphs, bulletin boards, maps etc could be used effectively in small classes for which few copies are then needed. Also, the non-print resources and technology can include computer or computer assisted instruction or programmed learning or individualized learning programmes. Others include filmstrip and slide projection to cover a specific lesson content area. While posters, for example, could be used in both small and large classes, the teacher would need many more copies for a large class if all the learners are to be able to see the poster. For a large class, the teacher would probably do better to scan the poster and either project a large version which all learners can see or provide digital copies for each group clustered around a device such as a laptop or tablet.

Selecting the appropriate educational technology depends on the topic to be taught, age grades, the availability of the resources or the instructional materials and the school facilities for teaching and learning. Teacher-educators should be able to discuss the appropriate educational technology for small class sizes and justify the purpose of their selection.

Teacher-educators should proffer a solution on wrong selections of educational technology for small class sizes.

Teacher educators should also be able discuss the implications of improper selection for small class sizes e.g. there is little value in investing in a PA system for small class sizes! On the other hand, it might be affordable to invest in a set of ten tablet computers which could support 30 learners with one tablet shared between 3 learners. It might not be affordable or manageable to buy 60 tablet computers to support a class of 180 learners – and clearly 1 tablet shared between 18 learners also will not work …

## 1.4 Selecting appropriate educational technology for large class size

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Activity 1c | Purpose  This is to help you make an appropriate selection of educational technology for large class size.  **Time:** Time needed for the activity is about 2 hours  Browse the following website:  <http://serc.carleton.edu/NAGTWorkshops/earlycareer/teaching/LargeClasses.html>  Then download and skim read the following resources:  <http://www.ascilite.org.au/conferences/singapore07/procs/oliver.pdf>  <http://www.cdtl.nus.edu.sg/technology-in-pedagogy/articles/Technology-in-Pedagogy-12.pdf>  **Now indicate the teaching skills you will need to use each of the listed educational technology resources for large class size, as follows:**   |  |  | | --- | --- | | Educational Technology Resources | Teaching skill you need in large class size | | Print |  | | I.C.T applications |  | | Project |  | | Demonstration |  | | Team teaching |  | | Class activities |  | | Building models |  | | Radio |  | | Television |  | | Resources in the community |  | |

|  |
| --- |
|  |
| Discussion |

#### Discussion

The most effective strategy for selecting educational technology for large class size is to design active cooperative learning activities and then select the educational technology resources that will enable these. Student learning should be tilted towards learner-centred approaches by providing a lot of process, manipulative and social skills though educational technology.

A large class is assumed to be a class which contains 150 – 200 learners.

The teacher-educator should select appropriate educational technology through the utilization of projects (individual and group), demonstration, class activities, ICT application, team teaching, active learning strategies and investigation/exploration. The resources to be selected include both print and non-print media to take care of the learning in a large class. However, the selection of the resource depends on the objective of the lesson, the age-grades of the learners, the topic to be treated and the available resources to select from.

For example, if a school could afford to buy only 10 tablet computers to support 30 learners at a time, sharing 1 tablet between 3 learners, there would need to be differentiated learning activities. We would need to ensure that during the course of 6 lessons over a period of a week, in a large class of 180 learners, each learner gets some time to work directly with a tablet computer. It is not impossible, but it does require some careful forward planning.

In addition, the classroom may lack adequate seats with children varying in abilities and interest.

Teacher-educators should be able to discuss and demonstrate the teaching skills needed in using each educational technology resource listed in activity 1c.

## 1.5 Selecting appropriate educational technology for multi-grade classes

|  |  |
| --- | --- |
| Activity 1d | Purpose: This is to help you make an appropriate selection of educational technology for a multigrade class  Time needed for this activity is about 2 hours.  Skim through the following resources (you do not need to read in detail at this point):  NTI Guidelines school organization and classroom management at:  <http://bednti.blogspot.com/>  Managing a multi-grade primary classroom (click on the link and download the resource) at:  <http://www.oerafrica.org/resource/lead-and-manage-subject-learning-area-or-phase-ace-school-management-and-leadership-word>  Managing ICTs in schools (click on the link and download the resource)  <http://www.education.gov.za/LinkClick.aspx?fileticket=4rn8m810sXw%3D&tabid=452&mid=1036>  Discuss and write responses to the following questions.   1. How can learning be best managed in a multi-grade classroom? 2. Google the term “flipped classroom”. How could a flipped classroom approach address the issues raised in response to question 1? 3. How could digital learning resources enable a multi-grade, flipped classroom approach? 4. What is an alternative approach for a classroom in which students do not have access to PCs and the internet. |

|  |
| --- |
|  |
| Discussion |

#### Discussion

Multi-grade classes are generally in rural schools with fewer than 150 pupils per class. The teachers in multi-grade classes work with small groups of children of different class levels in the same classroom using multi-grade teaching approaches. The teacher-educator as a facilitator, resource person and manager of the learning process must develop a wide range of educational technology resources and classroom management techniques.

In Nigeria the teacher-educator should note that in the teacher training institutions teachers are generally not trained to work in multi-grade classes. Multi-grade classes should be considered as classrooms where one teacher for the most of the day facilitates two or more adjacent grade levels in one classroom. Teaching in multi-grade classes requires lots of educational technology resources and techniques in bringing out effective learning. The teacher-educator should select the most effective resources to enable effective learning.

One of the most effective ways to teach multi-grade classes is to use instructional groupings and select an educational technology strategy which will enable independent learning, freeing the teacher to become a facilitator and a guide to the learning. A multi-grade teaching strategy may include the whole class, individual teaching and small group teaching. The teacher-educator should select the appropriate educational technology useful for mixed ability groupings, same age groups, social groups, and same ability groups to involve learners in activity-based learning. Learners are free to work at their own individual pace and time. The Khan Academy is an example of what has come to be called the ‘flipped classroom’ (<https://www.khanacademy.org>). Learners do much of the learning and practice outside the classroom because they can work independently at their own pace. This means that classroom contact time can be used for more interesting things than instruction and drill, for example solving of more complex problems. Freed from delivering the content, the teacher can spend more time working with individual learners needing support. Teacher-educators should be able to discuss the selection of the appropriate educational technology useful for mixed ability group, same ability groups and share his ideas with other learners on line.

A core message that runs across the discussions in this unit is that educational technology must be chosen that is fit for purpose, context and audience. First, we need to decide what activities learners to be engaged with in order to learn. Only then can we decide which resources and educational technologies can best support the learning process.

## 1.6 Summary

In this unit, we have learnt about educational technology available for different class sizes and have also learnt to identify suitable ways of selecting appropriate educational technology for small, medium and large class sizes. Finally, we can also describe the suitable ways of selecting appropriate educational technology for multi-grade classrooms. Teachers, and their teacher-educators, are challenged to use a greater variety of educational technology and resources across all classroom environments to ensure that learners develop and sustain interest in what, they are learning. However, most teachers have been trained to work in small classes and to use teacher-centred methods which are ineffective in supporting high level learning. Selection of appropriate education technology supports the use of active learning in large classes and in multi-grade classes by putting the emphasis on **what the learners do**. Learners are enabled to carry on learning while the teacher is busy helping out other learners when needed. If learners are not dependent on the teacher all the time to supply content and instructions, they can work at their own pace.

## 1.7 Self-assessment

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Assessment | Tick the boxes to assess whether you have achieved the outcomes for this unit. If you cannot tick the boxes, you should go back and work through the relevant part in the unit again.  I am able to:   | # | Checklist | 🗹 | | --- | --- | --- | | 1 | Demonstrate how to select appropriate Educational Technology for different class sizes. | ❑ | | 2 | Organise group work and discuss the selection of appropriate educational technology for different class sizes | ❑ | | 3 | Classify and brainstorm on the appropriate educational technology for different classroom environments. | ❑ | |

## 1.8 Selected references

|  |  |
| --- | --- |
|  | Bialobrzeska, M. & Coehn, S. (2005). *Managing ICTs in South African Schools: A Guide for School Principals.* Braamfontein: Saide.  Darling – Hammond, L & Liberman, A. (Eds.). (2012)  *Teacher Education around the World.* New York: Routledge.  Department of Education (DoE). (2008). Manage a subject, learning area or phase. Pretoria: DoE.  Kauchak, D & Egren, P. (2011). *Introduction to Teaching.* (4th ed.)  U.S.A Pearson, Education Inc.  NTI. (c2014). Guidelines on school and classroom management in relation to the BEd. Accessed at: <http://bednti.blogspot.com/> 16/07/2015 |

## UNIT 2: Selection of appropriate educational technology for different classroom needs

#### Introduction

Most of our classrooms are characterized by different categories of learners with different learning needs and experiences. These range from learners of different learning rates; fast and slow, to learners with different physical challenges; visually impaired, physical disabilities, hearing difficulties etc. as discussed in the core module on *Special Educational Needs*. Research has shown that incorporation of the above categories of learners in more inclusive mainstream classrooms poses great challenges to the majority of teachers in regular schools. Responding appropriately to the challenge calls for a careful selection of appropriate educational technology to support effective teaching and learning.

This unit will take about 8 hours to complete.

## 2.1 Unit outcomes

|  |  |  |
| --- | --- | --- |
| Outcomes  Outcomes | | By the end of this unit you should be able to:   1. Identify the learners with different classroom needs. 2. Explain appropriate educational technology for the gifted and slow learners. 3. Discuss appropriate educational technology for learners with physical disabilities. |
|  |  | |

## 2.2 Learners with different classroom needs

|  |  |
| --- | --- |
| Activity 2a | Purpose  The activities in this unit will help you in identifying the learners with different classroom needs and how to make a careful selection of appropriate educational technology for each group of the learners.  **Time needed**  This activity should cover a period of two (2) hours.  Skim through the following resources:   1. The CPDC core module on Special Educational Needs. 2. The CPDC core module on Teaching and Learning Methods 3. The CPDC core module on Learning Resources; and 4. Special Needs Education at: <http://oer.avu.org/bitstream/handle/123456789/157/SPECIAL-NEEDS.pdf?sequence=1>   Answer the following questions in your work book:   1. Identify the range of different barriers to learning that may need to be overcome in a typical Nigerian classroom. 2. Explain how classroom environments can respond to individual differences and needs. 3. Identify what educational technology can be used to help address these needs and how the technology could be used. |

|  |
| --- |
|  |
| Discussion |

#### Discussion

Common classroom conditions can and do affect many students adversely- to some degree, at one time or another, in one way or another-but, some students are especially vulnerable to barriers to effective learning (e.g., children of poverty, non-native speakers, those with attention deficits). Students with learning disabilities are among the most vulnerable and may be at chronic risk for "not learning" under the aforementioned conditions. This can result in long-term academic and social problems. Classrooms can be problematic for vulnerable learners in a number of ways: crowded classrooms, busy spaces, time-constrained teaching, a blurring of public and private spaces through social media, as well as overuse of teacher talk as a teaching and control mechanism can all militate against provision of the more individualized support needed by vulnerable learners. It has been stated in the national policy of education that education is the right of every child irrespective of his differences but how does a teacher manage this in practice?

#### During a contact session, discuss with other fellow teacher-educators the various challenges that militate against successful learning. Then for each problem, think of a way in which an appropriate educational technology used in an appropriate way could remediate the problem.

## 2.3 Appropriate educational technology for learners with different learning rates

|  |  |
| --- | --- |
| Activity 2b | **Purpose**  This activity will help you to think about the appropriate educational technology for learning.  **Time**  The activity should take about 2 hours  Read the materials developed by:  Neven, J. (2015). Using educational technology with gifted students, available at: <http://www.educationworld.com/a_curr/technology-gifted-students.shtml>  Jamshed, N.L. (2013). Technology in the classroom. Available at: <http://www.teach-nology.com/tutorials/techinclass/> ; and  Kessler, S. (2010). 8 ways technology is improving education. Available at: <http://www.slideshare.net/WeiLiang1/article-1-8-ways-technology-improves-education>  Then:  Suggest the strategies you would adopt to integrate educational technology to cater for the needs of gifted and slow learners in your classroom. |

|  |
| --- |
|  |
| Discussion |

#### Discussion

Learners of high learning ability often referred to as gifted students (fast learners), present a unique challenge to teachers. They are usually the first to finish an assignment or those who continually ask for more creative and interesting work. This category of learners needs exciting activities as well as energising projects that call for a creative curriculum within the framework of the regular classroom programme. Contrary to these are those with low learning abilities often referred to as slow learners. A “slow learner” is a term people use to describe a student who has the ability to learn necessary academic skills, but at a rate and depth below average as same age peers. In order to grasp new concepts, a slow learner needs more time, more repetition, and often more resources from teachers to be successful. Reasoning skills are typically delayed, which makes new concepts difficult to learn. A slow learner does not meet criteria for an Intellectual Disability (also called mental retardation). However, she/he learns slower than average students and will need additional help to succeed (Neven, 2015).

The increasing rate of technology use in the classroom has the potential to help teachers more effectively meet the needs of both gifted and slow learners without sacrificing their efforts to help other students. Some of the ways educational technology can be used to help gifted learners are: content differentiation, differentiated assignments, enabling interest-based choices and communication tools. Also, the following educational technology could be applicable to both slow learners and gifted: simulations and models, e-books, epitemic games, story-telling and multimedia, more efficient assessment, probes and sensory-virtual manipulatives, as well as global learning (Sarah, 2010).

During a contact session, discuss various strategies of integrating educational technology into the classroom to cater for the needs of gifted and slow learners. e.g. simulations and models, virtual manipulative, content differentiations, differentiated assignment etc. (Jamshed, 2013 & Kessler, 2010). Share examples of where teacher-educators have modelled such approaches with their own teacher-students.

## 2.4 Educational technology appropriate for learners with physical disabilities

|  |  |
| --- | --- |
| Activity 2c | Purpose  This activity will help you to identify appropriate educational technology for learners with physical disabilities.  **Time**  This activity should take about 2 hours.  Read the material developed by Hasselbring and Williams Glaser (2000). Use of computer technology to help students with special needs. It is available at: <http://www.jstor.org/stable/1602691?seq=1#page_scan_tab_contents> (You need to register and then you can read the article online for free.)  Then,  Analyse various educational technology resources you would consider more appropriate to cater for the needs of the physically disabled learners. |

|  |
| --- |
|  |
| Discussion |

#### Discussion

Students with physical disabilities are of different groups. For some, mobility is the greatest barrier they face. For others, caring for their personal needs is a tremendous challenge. Still others face overwhelming obstacles in communication. Fortunately, a variety of new technologies have been developed to help individuals with physical disabilities overcome their challenges and function well in school, work, and home environments. For example, switches can be activated by almost any part of the body, allowing students with physical disabilities to control many aspects of their environment independently—from using a toy or radio for their own entertainment, to communicating with their nondisabled peers in the classroom, to controlling a computer or other high-tech or AAC device. Today, switches can be used with a number of adaptive devices that enable students with severe physical disabilities to successfully operate a computer independently, including turning the power on and off, inserting and removing a disk or CD from a drive, copying files, accessing a modem, and using a keyboard. A number of alternative input devices can be connected to a standard computer to assist or replace the use of a traditional keyboard, which is often the greatest barrier to computer use for students with physical disabilities. Adaptive keyboards, infrared sensors, and voice recognition systems are highly effective in helping students with severe physical disabilities use computers to participate in many educational activities that would not be available to them through other means. The previously mentioned technologies have grown increasingly sophisticated and are becoming more familiar in classroom settings, and still other technologies are being developed for use in the near future. For example, a number of research labs are examining the use of devices such as robotic arms, which can help individuals who are physically disabled accomplish such daily activities as eating, retrieving objects, turning pages in books and magazines, and even playing cards. Although it may be years before these technologies become commonplace, some robotic devices are already in use, and more sophisticated devices are continually under development. In time, they too may be commonplace, and technologies that have yet to be envisioned for use by students with severe physical disabilities will be moving into the limelight (Hasselbring & Williams Glaser, 2000).

During a contact session, identify the various educational technology appropriate for learners with physical disabilities.

## 2.5 Summary

In this unit, we have identified the learners with different classroom needs. Also, we were able to explain the appropriate educational technology for gifted and slow learners. Finally, we discussed the appropriate educational technology for the learners with special disabilities.

On the next page is a nice poster summary for this unit. (You can find and download the whole book from which it comes at: <http://www.kiwanja.net/miscellaneous/Education-For-a-Digital-World-Collaborative-Book-(Full).pdf)>.



#### Figure 2: Education Technology to support Special Educational Needs

Source: Boskic, N., Starcher, K., Kelly, K.,& Hapke, N. 2008. Accessibility and Universal Design in BCCampus & Commonwealth of Learning. 2008. *Education for a Digital World: Advice, Guidelines, and Effective Practice from around the Globe.* Vancouver: BCCampus & CoL, 143–180.

## 2.6 Self-assessment

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Assessment | Tick the boxes to assess whether you have achieved the outcomes for this unit. If you cannot tick the boxes, you should go back and work through the relevant part in the unit again.  I am able to:   | # | Checklist | 🗹 | | --- | --- | --- | | 1 | 1. Identify the learners with different classroom needs in your own classroom. | ❑ | | 2 | 1. Briefly explain any two (2) educational technology resources you consider you would adopt to cater for the needs of gifted and slow learners. | ❑ | | 3 | Briefly discuss the appropriate educational technology for learners with physical disabilities. | ❑ | |  |

## 2.7 Selected references

|  |  |
| --- | --- |
|  |  |

Erin,N & King, E.S. (2015) FAQ Parents ask about struggling (slow)

learners. Retrieved 14/1/2015 from <http://schoolpsychologistfiles.com/>

Hasselbring, T & Williams Glaser, CH. (2000). Use of computer technology to help students with special needs. Journal Issue: Children and Computer technology 10(2). Retrieved 16/07/2015 from <http://www.jstor.org/stable/1602691?seq=1#page_scan_tab_contents>.

Jamshed, N. L. (2013) Technology in the classroom.retrieved 14/1/2015 from <http://www.teach-nology.com>

Kessler, S. (2010) 8 ways technology is improving education. Retrieved

14/1/2015, from <http://mashables.com>

Neven, J. (2015). Using educational technology with gifted students.

Retrieved 14/1/2015, from <http://www.educationworld.com>

## UNIT 3: Utilization of mobile learning technology for instruction

#### Introduction

Mobile phones are tools for designing and delivery of lessons. Teaching, training and learning can be supported with mobile technology. These devices are playing a large role in redefining how information is shared. Mobile phones are probably the best way of ensuring that classes are not overstressed because they enable students to have easy access to classroom activities and information even outside the classroom. However, most teacher-educators do not have the pedagogical and technical skills to develop, plan and deliver their lessons through mobile technology. Thus, in this unit we are going to identify the likely challenges hindering effective integration of mobile learning and adequately engage you in activity-based mobile learning to expose you to the principles needed in putting together an ideal mobile learning experience. See the cartoon below:

#### Figure 3: Connected learners

## 3.1 Unit outcomes

Upon completion of the unit you will be better able to:

|  |  |
| --- | --- |
| Outcomes  Outcomes | * Explain the need, reason and effectiveness of mobile technology in distance learning. * Identify the instructional design principles for mobile technology. * Demonstrate practical steps for the kick up of mobile learning in any institution. * Identify the universal instructional design recommendation on mobile instruction. * Demonstrate skills in designing mobile learning instruction. * Identify the challenges associated with the design of mobile instruction. |

## 3.2 Utilizing mobile learning technology for instruction

|  |  |
| --- | --- |
| Activity 3a | Purpose  This activity will help you to recall the need to utilize and take advantage of the availability of various kinds of hand-held phones.  **Time needed**  This activity should take about 30 minutes.  Read the following extract with reference to the cartoons below, suggest other challenges and ways forward not mentioned in the newspaper: NCC report on Nigeria smart phones subscribers in Nigeria. Vanguard news of 16/07/15 <http://www.vanguardngr.com/2013/06/ncc-says-34-5m-subscribers-in-nigeria-use-data-on-internet/> and punch news of 16/07/15, <http://www.punchng.com/business/technology/25-of-nigerian-mobile-subscribers-use-smartphones-tns/> |
|  | Answer the following questions   1. To what extent do you think mobile technology can enhance learning and bridge the gap of distance? 2. How efficient and effective is the use of mobile technology in your college? 3. Considering the availability of different kinds of mobile phones in your college and among your teacher-students can you design instructions for mobile learning? 4. What extra skills do you need to help kick-start mobile learning in Nigeria? 5. With 34.5m subscribers of smart phones in Nigeria what is your expectation on the potential of mobile learning? |
|  |  |

|  |
| --- |
|  |
| Discussion |

#### Discussion

25 per cent of Nigeria’s over 105 million mobile telephone subscribers use smart phones, TNS, has said in a report entitled, ‘Navigating growth in Africa. The report, which was authored by the Chief Executive Officer, TNS Africa and Middle East, Mr. Kim Macllwaine, and 12 other market research experts, including Mr. Aggrey Maposa, Melissa Baker and Mr. Nick Hills, revealed that Nigeria was the second biggest Smartphone market in Africa, closely following South Africa not to talk of blackberry, android and window phones. Mobile technology is able to bridge the challenge of distance and accessibility; based on the availability, skills required, cost effectiveness etc. With mobile technology students can engage in both synchronous and asynchronous on line discussion, it requires less power (electricity) to use than a laptop or tablet. The teacher is able to connect to more content than an ordinary class could contain.

.In spite of the country’s Smartphone penetration, the report revealed that 59 per cent of Nigerian phone users were still using only basic feature phones, while only 16 per cent used advance feature phones. Indicating that usage of mobile phones in learning has been mainstreamed, even when phones are available in a reasonable quantity. However, the mobile phone is able to facilitate and enhance effective learning because it is easy to use in sending small message services (sms) teleconference, internet connectivity, sharing of videos, mp3 sound etc. Students can work and learn at the same time at an individual pace. The skills needed for mobile learning is just what every person can easily learn, these skills include opening an email box, making phone calls, sms texting, browsing the internet etc. Thus this unit shall be looking at instructional design principles and challenges with practical activities that can ensure effective usage.

## 3.3 Instructional design recommendations and challenges

**⏵See Richard Freeman’s handbook, *section 6.4: Planning and writing tutor-marked assignments.***

**⏵See Richard Freeman’s handbook, *section 6.3: Planning and writing assessments.***

|  |  |
| --- | --- |
| Activity 3b | **Purpose**  This activity will help you to think about and identify the prevailing challenges and the universal recommendation for the design of m-learning.  **Time**  The activity should take about 30 minutes  Read the extract from Tanya Elias (2011) Universal instructional principles of mobile learning at  <http://www.irrodl.org/index.php/irrodl/article/view/965/1792>  **Engage in synchronous online discussion in your group and answer the following questions:**   1. What does Elias suggest are the “universal instructional design recommendations for m-learning”? 2. Discuss the design challenges. What are the possible solutions? 3. What are other challenges not mentioned in the text and how can these be overcome?.   . |

|  |
| --- |
|  |
| Discussion |

#### Discussion

The following principles have been developed to build flexibility of use into both the instructional design and operating systems of educational materials so that they will be appropriate to the widest range of students. These form the recommendations stated below

1. equitable use;
2. flexible use;
3. simple and intuitive;
4. perceptible information;
5. tolerance for error;
6. low physical and technical effort.

These principles can be elaborated as follows:

**Equitable use**. Course content should be accessible to people with diverse abilities and in diverse locations.  With respect to m-learning, this involves developing content and assignments that can be accessed on a wide variety of devices.  As a result, to develop accessible m-learning, one ought to do the following:

* Short messaging systems (SMS) or texting technology is indeed cost effective. It has high levels of usage universally. Mitchell (2002) notes the asynchronous nature of SMS, which gives people time to reflect before responding to a message. Although it poses all kinds of physical and usability barriers to disabled learners, the motivation for using it is sufficiently high that there are few who do not actively manage to master it to some extent. There are numerous ways to address these accessibility issues.  Developing primary content using SMS can be a simple yet elegant way of ensuring that diverse learners have access to required materials.
* Given the small storage capacity of most handheld devices, file-storage sites may offer users the same level of flexibility in completing assignments as is available to those with more sophisticated hardware and/or connectivity.  A study at a South African high school, for example, indicated that only 33% of students had access to phones with substantial internal and flash-card memory.  This led “to the regular deletion of older content in order to make room for new material” (Kreutzer, 2009, p. 69).  Using external storage sites would enable these students to save more information, develop more complex projects, and engage more fully in learning.

**Flexible use.** According to this UID principle, course design should accommodate a wide range of individual abilities, preferences, schedules, levels of connectivity, and choices in methods of use. In contrast to traditional teaching environments where instructors are predominantly responsible for incorporating the real world into the classroom, mobile devices have the potential to transfer that responsibility to the learners themselves.  Using phones with cameras/video capabilities, students can capture their own materials and instantaneously transfer them to other students and instructors and/or upload them for storage.  Discussion could then revolve around “real-world” examples defined by the learners.

**Simple and intuitive.** Unnecessary complexity should be eliminated and course design rendered simple and intuitive.  As already mentioned, the simplest mobile delivery system is currently SMS.  To post and share their own multimedia content, however, learners must access multimedia messaging systems (MMS), email, and/or a mobile Internet service.  When developing and/or selecting existing sites for use, the following guidelines are useful:

* Keep code simple.  Sites that use HTML provide a simple and relatively accessible content delivery system with useful features, including the ability to link between pages and sites.  Use of simple coding minimizes file sizes, increases download speeds, and is better supported on feature phones that may not give good support for cascading style sheets and other advanced programming functions.
* Open sites and software help to ensure that learners have lower costs and ongoing access to resources.  Ford and Leinonen (2009) state that this facility “stimulates the local IT sector in a country, which is crucial in developing countries to ensure full participation in the information society” and “allows software to be customized to local conditions by the communities themselves”.  The use of open-source products, therefore, advances not only simple access to content, but also (relatively) simple access to m-learning development tools.

With respect to this UID principle, one of the recommendations for online learning is to add captions, descriptors, and transcriptions using SMS.  Nevertheless, it is likely that not all student-posted materials will be accessible to all users.

Tolerance for error.  UID principles also minimize hazards and adverse consequences of errors in software operation by designing learning environments with a tolerance for error.  While m-learning errors are likely to be similar to those encountered in traditional online learning, an additional m-learning-specific recommendation may be identified:

**Low physical and technical effort.** As with online learning, m-learning should be developed requiring a low physical and technical effort.  The physical effort related to inputting text into devices is therefore a primary concern.  Clearly, answering test essay questions on such a device would be tedious if not impossible.  As indicated in relation to SMS usage, the difficulties associated with inputting text data into mobile devices poses the challenge of developing new, authentic, and inclusive forms of assessment. For example, we might share a mathematics problem and then provide multiple possible solutions labelled a, b, c or d. Learners need then type in only 1 letter, having working out the correct answer using pen and paper or by working on another device.

#### Instructional design challenges

1. Device variability among handheld phones with different applications, poses a challenge for design. Is it possible to design a learning experience that will work on ANY device?
2. In many m-learning pilot projects, this challenge has been overcome by distributing to learners a specific mobile device and designing for that device.  Students, however, generally want to learn on their *own* mobile devices
3. Slow download speed and limited Internet access.  Despite advances in the delivery of mobile cellular broadband this remains a challenge. This means dividing the learning into smaller. More easily downloadable chunks e.g. 15 2-minute video clips rather than 1 30-minute video clip.
4. Small screen sizes with poor resolution, colour, and contrast.  On hardware designed to fit in a pocket, small screen size continues to be a defining feature of handheld mobile devices.  A typical screen size is 8-12 cm long and 6-8 cm wide, with the presentation usually being in portrait mode but sometimes in landscape.  Resolutions vary and may or may not involve back-, front-, or side-lit images. This implies the need to keep visual material for module fairly simple in design and with limited text.
5. Awkward text input.  Regardless of the device being used, inputting text data into small devices also presents challenges for the user.  Inputting information into a device using a numeric (0–9) keypad on a feature phone continues to be tedious and time-consuming.  Again, the more sophisticated the device, the better its input capabilities.
6. Limited memory. Handheld phones have limited internal information storage capacity or memory.  Extra random access memory (RAM) for the storage of programs and files may be added to devices from external memory sticks or cards.

## 3.4 Instructional design principles and tips on how to start mobile learning

Read the extract “learning solution” and answer the questions below, then engage in group practice on designing mobile instruction: Designing for mobile learning, Clark and Mayer principles applied:

<http://www.learningsolutionsmag.com/articles/222/designing-for-mobile-learning-clark-and-mayers-principles-applied/page2>

Now watch the following PowerPoint slide on multimedia principles:

<http://www.slideshare.net/murrypryor/multimediaprinciple?qid=b4e37fa5-de13-4c2f-a745-71ed351430f8&v=default&b=&from_search=2>

|  |  |
| --- | --- |
| Activity 3c | Purpose  This activity will help you to reflect on the instructional principle and also give room for practical experience. .  **Time**  This activity should take about **40 minutes.**  **Activities**   * 1. Explain how you can apply multimedia and redundancy principles in your mobile learning instruction.   2. Recommend any other solutions or possible ways the principles can be applied effectively in mobile learning.   3. With the tip on how to kick start mobile learning, write a detailed approach on how these tips can enhance your quick start of mobile learning in your study and that of your students.   4. Make your own summary of the key points in the content of this unit and share with other teacher-educators through mobile phone, with a good consideration of the principles you have just learned.   5. Using the principle of multimedia, develop and design a mobile learning experience with multimedia tools for your students. |

|  |
| --- |
|  |
| Discussion |

#### Discussion

The multimedia principle is about building a mental connection between verbal (the written words) and pictorial representations (graphics, animations**). Clark and Mayer** found tha**t** words supported by pictures benefit learning more than words alone. In our mobile device world, there may be a problem in implementing this. The PDA, handheld or smart phone devices with only 128 x 160 pixels resolution (using a two-inch-wide display) will most certainly not be the best medium. The instructional designer will have to create smaller text blocks and use illustrations with popup text if possible. However, using popups may be an issue as they are not Section 508 compliant (accessibility).

#### *Solution 1 — Multimedia principle applied to m-Learning*

* Create content using smaller chunks of text;
* Use images with popups; and
* Limit scrolling to the very minimum. The modality principle (see below) does provide additional solutions when space is limited.

The modality principle is concerned with the type or mode of media presentation for various types of content. Clark and Mayer recommend using audio instead of written words in order to obtain significant gains in learning. Today audio may be delivered alone via mobile devices, for Podcasting, or may be integrated with other learning content. Using audio to deliver information will leave more display room for other types of content (text and graphics), which is a good thing for m-Learning designers.

Clark and Mayer also recommend having words in audio format instead of visual text on screen when presenting graphics and words simultaneously. They advise caution for situations where words are necessary either for memorization of steps in a procedure, or with complex functions such as mathematical formulas.

Because of space limitations, the m-Learning designer should use words as audio whenever possible. If the learner is located in an airplane or any public area, there will be a need for a headset to listen to the audio.

#### *Solution 2 — Modality principle for m-Learning*

* Use words as audio instead of text, whenever possible;
* Keep narration short to ease-up on download time; and
* Provide headsets to your users.

#### *The contiguity principle*

In general, Clark and Mayer (2010) recommend keeping text close to its corresponding graphic or part of a graphic. In some instance, one can use text or caption labels to identify an action or a state depicted in an illustration on a screen. A mouse-over event would trigger this additional information. On the small displays found on PDAs or cell phones, one of the best methods to implement these popups may be Flash Lite or similar technologies (provided the devices your learners have support the technology).

Another finding by Clark and Mayer indicates that you will obtain better results when feedback appears on the same page with the activity questions. without opening a new window for feedback, so keep practice opportunities with the corresponding exercise. These recommendations are centred on cognitive load theory, which suggests that separating elements of learning may create cognitive overload and would therefore not be conducive to learning. Using your own mobile phone design or prepare a mobile lesson in your discipline for your students, ensuring that the Contiguity principle is observed through the flowing steps below:

* Use Flash Lite (Adobe) or similar technologies to implement popup text over images; and
* Keep feedback with the question.
* Do not separate naturally linked content.

#### *The redundancy principle*

The redundancy principle calls for eliminating redundant messages in various formats simultaneously. The redundancy principle entails avoiding having text and narration together, if the narration simply reads back the exact same text showing on screen. Using a mobile device, there is often not enough space to have long texts without scrolling. Based on both the redundancy principle and the modality principle, it is preferable to have text narrated only, which helps us when designing for the mobile device. The drawback is that it may not be convenient or possible to download large audio files to a mobile device. In some situations, redundant text could be necessary.

#### *Here are a few pointers to get you started with m-Learning*.

1. Discuss m-Learning opportunities with colleagues. You will soon find out that m-Learning can be useful in multiple areas of your work. Whether for inducting new staff members, educating potential students on your programme offerings, reviewing procedures, or supporting learning for students on teaching practice, m-Learning can be helpful.
2. Get your instructional development group to acquire a mobile device and start designing your first m-Learning course.
3. Test your course with a selected group and acquire feedback.

Design the same content and make it fit for any device, including the desktop. You will experience the challenges of designing for different screen sizes and various audio, video, and text capabilities. Note your findings, and go back to your discussion group to map the way forward.

## 3.5 Summary:

In this unit we have identified the need for, reasons and effectiveness of mobile learning especially in our Colleges of Education in Nigeria.

* We demonstrated practical steps to the kick up of mobile learning.
* We also studied and identified the instructional design principles that are ideal for designing instruction, using mobile technology.
* The universal instructional design recommendation for mobile learning was also studied.
* We have learnt and acquired the skill in use in designing mobile learning instruction.
* We have studied the challenges associated with the design of mobile instruction.

## 3.6 Self-assessment

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Assessment | Tick the boxes to assess whether you have achieved the outcomes for this unit. If you cannot tick the boxes, you should go back and work through the relevant part in the unit again.  I am able to:   | # | Checklist | 🗹 | | --- | --- | --- | | 1 | Discuss the reasons and need for the adoption of mobile learning in Nigeria teacher training colleges. | ❑ | | 2 | Demonstrate practical steps for the kick up of mobile learning. | ❑ | | 3 | Identify the instructional design principles that are ideal for designing instruction, using mobile technology | ❑ | | 4 | Identify the universal instructional design recommendation for mobile learning. | ❑ | | 5 | Demonstrate skills in designing mobile learning instruction. | ❑ | | 6 | Identify the technological challenges associated with the design of mobile instruction and the possible solution. | ❑ | |

## 3.7 Selected references

|  |  |
| --- | --- |
|  | Key references and useful further reading includes:  Clark R. and Mayer (2008) e-learning and the science of instruction, access from [www.bookfi.org/science](http://www.bookfi.org/science)  Tanya Elias. (2011) Universal Instructional principle of mobile learning <http://www.irrodl.org/index/php/irrdl/article/view/965/1675>  Learning solution: Designing for mobile learning: Clark and Mayer’s principles applied. [www.learningsolution.com/article/222/design-for-mobile-learning-clark-mayer-principles-applied/page2](http://www.learningsolution.com/article/222/design-for-mobile-learning-clark-mayer-principles-applied/page2). |

## 4. Accessing OER while using educational technology in teaching



#### Figure 4: The power of OER

#### Introduction

Resource-based or activity-based teaching and learning requires ability to access Open Educational Resources (OER) using Educational Technology. Most teacher-educators today were trained to use analogue facilities to teach thereby making them inadequately prepared for the contemporary digital classroom environment. The face-face or class-based instruction is no longer productive in the face of current numerous instructional challenges thwarting effective teaching and learning, especially in Africa. These include over-crowded classrooms, poor infrastructure, inadequate facilities, and poor teaching among others. Therefore, teacher-educators need to acquire the necessary skills and knowledge to use appropriate educational technology to access OER to support more effective teaching and learning. The nature of OER is explored in the companion module on learning resources. In this module we focus on the technology-related implications of OER.

**This unit will probably take about 6 hours to complete.**

## 4.1 Unit outcomes

**⏵Use taxonomy verbs. See Richard Freeman’s handbook, *section 3.3.3: Bloom’s taxonomy, section 3.3.4: Other taxonomies, section 3.3.5 Learning objectives and learning outcomes*.**

Upon completion of the unit, you will be better able to:

|  |  |
| --- | --- |
| Outcomes  Outcomes | * Discuss critical issues surrounding accessing OER for instructional purposes. * Identify the technical and legal framework involved in accessing OER. * Use modern technology for accessing OER. |

## 4.2 Understanding OER

|  |  |
| --- | --- |
| Activity 4a | Purpose  This activity will help you to effectively access OER using Educational Technology.  **Time needed**  This activity should take about 30 minutes.  **R**ead extracts below concerning some critical issues surrounding accessing OER and respond to the following questions individually or with your colleagues:   1. What are Open Educational Resources (OER)? 2. Is OER the same as e-learning? 3. Is OER the same as open learning/open education? 4. How open is an open licence? 5. How can education benefit by harnessing OER? 6. Is OER really free? 7. Where do you find OER? 8. How can you share your OER with others? 9. How much can you change OER for your own purposes? |

|  |
| --- |
|  |
| Discussion |

#### Discussion

#### *The material below was Prepared by Neil Butcher for the Commonwealth of Learning & UNESCO. Edited by Asha Kanwar (COL) and Stamenka Uvalic´-Trumbic´ (UNESCO) CC-BY-SA (share alike with attribution)*[*http://creativecommons.org/licenses/by-sa/3.0*](http://creativecommons.org/licenses/by-sa/3.0)*. Carefully read through it and critically reflect on the questions that precede each section.*

#### What are Open Educational Resources (OER)?

Open Educational Resources (OER) can simply be described as any educational resources (including curriculum maps, course materials, textbooks, streaming videos, multimedia applications, podcasts, and any other materials that have been designed for use in teaching and learning) that are openly available for use by educators and students, without an accompanying need to pay royalties or licence fees.

The term OER is largely synonymous with another term: Open CourseWare (OCW), although the latter may be used to refer to a specific, more structured subset of OER. An Open Course Ware is defined by the OCW Consortium as ‘a free and open digital publication of high quality university-level educational materials. These materials are organized as courses, and often include course planning materials and evaluation tools as well as thematic content’

OER has emerged as a concept with great potential to support educational transformation. While its educational value lies in the idea of using *resources* as an integral method of communication of curriculum in educational courses (i.e. resource-based learning), its transformative power lies in the ease with which such resources, when digitized, can be shared via the Internet. Importantly, there is *only* one key differentiator between an OER and any other educational resource: its *licence*. Thus, an OER is simply an educational resource that incorporates a licence that facilitates reuse, and potentially adaptation, without first requesting permission from the copyright holder.

#### Is OER the same as e-learning?

OER is *not* synonymous with online learning or e-learning, although many people make the mistake of using the terms interchangeably Openly licensed content can be produced in any medium: paper-based text, video, audio or computer-based multimedia. A lot of e-learning courses may harness OER, but this does not mean that OER are necessarily e-learning. Indeed, many open resources being produced currently –while shareable in a digital format – are also printable. Given the bandwidth and connectivity challenges common in some developing countries, it would be expected that a high percentage of resources of relevance to higher education in such countries are shared as printable resources, rather than being designed for use in e-learning.

#### Is OER the same as open learning/open education?

Although use of OER can support open learning/open education, the two are not the same. Making ‘open education’ or ‘open learning’ a priority has significantly bigger implications than only committing to releasing resources as open or using OER in educational programmes. It requires systematic analysis of assessment and accreditation systems, student support, curriculum frameworks, mechanisms to recognize prior learning, and so on, in order to determine the extent to which they enhance or impede openness.

Open learning is an approach to education that seeks to remove all unnecessary barriers to learning, while aiming to provide students with a reasonable chance of success in an education and training system centred on their specific needs and located in multiple arenas of learning. It incorporates several key principles:

* Learning opportunity should be *lifelong* and should encompass both education and training;
* The learning process should *centre on the learners,* build on their experience and encourage independent and critical thinking;
* Learning provision should be *flexible* so that learners can increasingly choose, where, when, what and how they learn, as well as the pace at which they will learn;
* *Prior learning, prior experience* and *demonstrated competencies* should be recognized so that learners are not unnecessarily barred from educational opportunities by lack of appropriate qualifications;
* Learners should be able to *accumulate credits* from different learning contexts;
* Providers should create the conditions for a *fair chance* of *learner success.* (Saide, n.d.)

As this list illustrates, while effective use of OER might give practical expression to some of these principles, the two terms are distinct in both scope and meaning

#### How open is an open licence?

A common misconception is that ‘openly licensed’ content belongs in the public domain, and that the author gives up all of their rights to this material. This is not so. In fact, the emergence of open licences has been driven strongly by a desire to *protect a copyright holder’s rights* in environments where content (particularly when digitized) can so easily be copied and shared via the Internet without asking permission.

A broad spectrum of legal frameworks is emerging to govern how OER are licensed for use. Some of the legal frameworks simply allow copying, but others make provision for users to adapt the resources that they use. The best known of these is the Creative Commons licensing framework (see www.creativecommons.org). It provides legal mechanisms to ensure that authors of materials can retain acknowledgement for their work while allowing it to be shared, can seek to restrict commercial activity if they wish, and can aim to prevent people from adapting it if appropriate. Thus, an author who applies a Creative Commons **(CC)** licence to their work specifically seeks to retain copyright over that work, but agrees – through the licence – to give away some of those rights.

A bit about Creative Commons **(CC):**

* The CC approach provides user-friendly open licences for digital materials and so avoids automatically applied copyright restrictions.
* The CC licences take account of different copyright laws in different countries or jurisdictions and also allow for different language versions.
* To make the licensing process as simple as possible for users, the Creative Commons site makes use of a licence generator that suggests the most appropriate licence based on a user’s response to specific questions regarding how their work can be used.
* All of the CC licences include basic rights that are retained by the authors, asserting the author’s right over copyright and the granting of copyright freedoms.
* Within this framework, the CC licences allow authors, in a user-friendly way, to grant other people the right to make copies of their work and, if they wish, to allow other people to make changes to their work without seeking permission.
* The CC licences also allow users to apply some restrictions on these permissions, for example, requiring attribution of the authorship of the original work, or restricting reuse of the resource for commercial purposes.

#### How can education benefit by harnessing OER?

The most important reason for harnessing OER is that openly licensed educational materials have tremendous potential to contribute to improving the quality and effectiveness of education. The challenges of growing access, combined with the ongoing rollout of ICT infrastructure into educational institutions, indicates that it is becoming increasingly important for them to support, in a planned and deliberate manner, the development and improvement of curricula, ongoing programme and course design, planning of contact sessions with students, development of quality teaching and learning materials, and design of effective assessment – activities all aimed at improving the teaching and learning environment while managing the cost of this through increased use of resource-based learning.

Given this, the transformative educational potential of OER revolves around three linked possibilities:

1. *Increased availability of high quality, relevant learning materials can contribute to more productive students and educators.* Because OER removes restrictions around copying resources, it can reduce the cost of accessing educational materials. In many systems, royalty payments for text books and other educational materials constitute a significant proportion of the overall cost, while processes of procuring permission to use copyrighted material can also be very time-consuming and expensive.
2. *The principle of allowing adaptation of materials provides one mechanism amongst many for constructing roles for students as active participants in educational processes,* who learn best by doing and creating, not by passively reading and absorbing. Content licences that encourage activity and creation by students through re-use and adaptation of that content can make a significant contribution to creating more effective learning environments.
3. *OER has potential to build capacity by providing institutions and educators access, at low or no cost, to the means of production to develop their competence in producing educational materials and carrying out the necessary instructional design* to integrate such materials into high quality programmes of learning.

Deliberate openness thus acknowledges that:

* Investment in designing effective educational environments is critically important to good education.
* A key to productive systems is to build on common intellectual capital, rather than duplicating similar efforts.
* All things being equal, collaboration will improve quality.
* As education is a contextualized practice, it is important to make it easy to adapt materials imported from different settings where this is required, and this should be encouraged rather than restricted.

#### Is OER really free?

The issue of freedom and its definition has been widely debated since the advent of open licences, possibly most significantly in the Free and Open Source Software environment. Open Source and Free Software definitions specify four types of freedom:

* The freedom to run the programme, for any purpose (freedom 0).
* The freedom to study how the programme works, and adapt it to your needs (freedom 1).
* The freedom to redistribute copies so you can help your neighbour (freedom 2).
* The freedom to improve the programme, and release your improvements to the public, so that the whole community benefits (freedom 3).

Similar considerations apply when considering licences for OER. However, there is another specific dimension of OER ‘freedom’ that warrants explicit discussion, and that is the notion of *cost*. Many proponents of OER advocate that a key benefit of open content is that it is ‘free’ (i.e. it does not cost anything to download – leaving aside costs of bandwidth, of course – and use). This is literally true: by definition, open content can be shared with others without asking permission and without paying licence fees. However, simplistic assertions that OER is free – and by extension that use of OER will cut costs of educational delivery – mask some important cost considerations.

Educational institutions that are serious about teaching and learning will need to ensure that their spending on personnel and other related expenses reflects a sustained effort to invest in creating more effective teaching and learning environments for their students. This will require investment in, among other things, the following:

* Developing and improving curricula.
* Ongoing programme and course design.
* Planning of contact sessions with students.
* Development and procurement of quality teaching and learning materials.
* Design of effective assessment activities.

Many educational institutions do not yet make such investments in a planned and deliberate way, but it is an essential part of their core function.

So, how does this relate to OER? As educational institutions make strategic decisions to increase their levels of investment in design and development of better educational programmes, the most cost-effective way to do this is to embrace open licensing environments and harness existing OER

#### Where do you find OER?

In order to find appropriate OER, the searcher will need to employ a number of search strategies:

1. ***Use a specialized OER search engine***: While search engines such as Google and Bing are a good general starting point for finding content online, there are also some specialized search engines that search specifically for OER. Their listings, however, are selective based on different search criteria so it is a good idea to try more than one. Here are a few of the popular ones:

* Global Learning Objects Brokered Exchange (GLOBE) Alliance: [www.globe-info.org](http://www.globe-info.org).
* Folksemantic: [www.folksemantic.com](http://www.folksemantic.com).
* DiscoverEd: <http://discovered.labs.creativecommons.org/search/en>.
* Creative Commons Search: <http://search.creativecommons.org>.
* Open Courseware Consortium: [www.ocwconsortium.org/courses/search](http://www.ocwconsortium.org/courses/search).

2**. *Locate a suitable OER repository*:** Searchers should also access the major OER repositories to search for OER. Most are institutionally based, focusing on the materials released by that organization. A famous example is the Massachusetts Institute of Technology Open Courseware Repository (MIT OCW). Some repositories, such as MedEd PORTAL, have a specific subject focus, in this instance, medical photos and multimedia. Below are a few of the more significant OER repositories.

* OpenLearn: <http://openlearn.open.ac.uk>.
* MedEd PORTAL: <http://services.aamc.org/30/mededportal> (medical focus).
* MIT OCW: <http://ocw.mit.edu>.
* China Open Resources for Education (CORE): [www.core.org.cn/en](http://www.core.org.cn/en).
* AgEcon Search: <http://ageconsearch.umn.edu> (agricultural focus).
* Teacher Education in sub-Saharan Africa: [www.tessafrica.net](http://www.tessafrica.net) (teacher education focus).
* OERAfrica, TESSA, OER4schools, OER@AVU as well as a growing number of institutional repositories such as NOUN, Kwame Nkrumah National University of Science and Technology, Open Unisa, University of the Western Cape *…*

3**. *Use OER directory sites*:** There are many sites that have a search facility whose results point to places elsewhere on the Internet where resources match search criteria. They themselves do not act as a repository, but have identified quality resources and store them in a database of web links. Their databases usually have a particular focus. In the case of OER Africa, for example, they highlight quality resources developed in and about Africa.

* OER Commons: [www.oercommons.org](http://www.oercommons.org).
* Commonwealth of Learning: [www.col.org/OER](http://www.col.org/OER).
* OER Africa: [www.oerafrica.org](http://www.oerafrica.org).

#### How can you share your OER with others?

Once a resource has been developed and an open licence has been selected, the resource will need to be stored in an online repository in order for others to access it.

There are various options with regard to where these resources might reside:

1. ***Use the institutional repository*:** Many organizations, and especially universities, are setting up their own collections and making them available online as OER or OCW. If the writer or developer works for such an institution, the expectation will be that OER developed under the auspices of that institution should reside within their repository. Seek guidance from the repository administrator.

2. ***Select an open repository*:** Various repositories welcome contributions from multiple locations. JORUM ([www.jorum.ac.uk/share](http://www.jorum.ac.uk/share) ), for example, welcomes submissions that support the British curriculum at further and higher education levels. OER Commons has a facility ([www.oercommons.org/contribute](http://www.oercommons.org/contribute) ) to allow users to contribute materials. Generally, open repositories require the person submitting the resource to register and log in before uploading the resource. They will also require information about the resource to allow it to be catalogued and tagged. This is necessary in order to allow search facilities to find it. The submitted resource will be vetted by a review team to ensure quality before being added to the repository’s database.

3. ***Build the OER online*:** It is also possible to build a resource online. A few sites encourage development of OER within their online environments. They can then automate processes such as acquiring a Creative Commons licence and adding the resource to the database. One such example is Connexions (<http://cnx.org>), which allows teams to develop modules of learning on their site. Users open an account, develop the materials online, and then publish them once they are satisfied. WikiEducator (<http://wikieducator.org> ) uses a similar method to allow educators to develop teaching materials collaboratively online.

4. ***Exploit social networks*.** The world of social networking has also opened new possibilities for publishing OER online. A site such as Flickr ([www.flickr.com](http://www.flickr.com) ) allows its users to publish photographic materials with Creative Commons licenses, while YouTube ([www.youtube.com](http://www.youtube.com) ) allows the same for digital video materials. Networks like Twitter and Facebook can be used to spread awareness of the materials posted on the Internet by sharing the links.

#### How much can you change OER for your own purposes?

In most instances, a user has enormous latitude to adapt OER to suit contextual needs where the licence allows adaptation. If, however, the licence restricts adaptation (as, for example, the Creative Commons licence with a ‘No Derivatives’ restriction does), others may not alter the resource in any way. It has to be used ‘as is’. This right is not reserved often in OER.

The vast majority of published OER welcome users to adapt the original resource. Common ways in which OER can be changed include the following:

• ***Mixing:***A number of OER are mixed together and additional content is added to create an altogether new resource. This is common when course designers need to develop materials and resources to match a local curriculum or programme. A common concern is that it is rare to find existing OER that fit perfectly ‘as is’.

• ***Adaption****:* This occurs when one OER is used and multiple adaptations are developed to suit multiple contexts. It could be that the language is translated into others but usually adaptation requires local case studies/examples to be added to make the materials relevant to students in a particular context.

• ***Asset extraction****:* It is also possible to extract only some of the assets of a resource or course and use them in a completely different context. This is especially true of media elements such as photos, illustrations, and graphs, as developers often lack the skills or resources to develop their own versions of commonly used visual aids. In many ways, the fact that changes may be made to the original is what makes OER – compared with other forms of copyrighted materials – especially useful to programme developers The questions you have just brainstormed were the kinds of questions that were asked during the CPD programme design stage. The sections that follow provide insight into the decisions that were made. These are not ‘right’ answers but rather the decisions made by the programme design and development team. You may have identified additional issues that will need to be addressed in a follow-up CPD programme.

## 4.3 Technical and legal frameworks involved in accessing OER

In this section we explore the technical and legal frameworks involved in assessing OER.

|  |  |
| --- | --- |
| Activity 4b | Purpose  This activity explores several critical questions related to intellectual property.  Time  This activity will take about 30 minutes.  Write answers to the questions in your workbook.  Read the extract below and critically reflect on the following questions**:**   1. What are the Technical and legal frameworks involved in accessing OER? 2. List the open licences you know and state their legal implications. 3. Which of the open licences are most popular and why? |

|  |
| --- |
|  |
| Discussion |

#### Discussion

#### Creative Commons Licences ([www.creativecommons.org](http://www.creativecommons.org) )

The most developed alternative licensing approach is that developed by Larry Lessig of Stanford University in 2001, called Creative Commons (CC). The CC approach provides user-friendly open licences for digital materials and so avoids the automatically applied copyright restrictions. The popularity of CC licences has grown incrementally since its launch in 2002 and by 2006 it was estimated that 45 million web pages had been licensed with a CC licence (Smith & Casserly, 2006). Liang (2004, pg. 78) describes the philosophy of Creative Commons as follows:

*Inspired by the free software movement, the Creative Commons believes that a large vibrant public domain of information and content is a pre-requisite to sustained creativity, and there is a need to proactively enrich this public domain by creating a positive rights discourse. It does this by creating a set of licenses to enable open content and collaboration, as well as acting as a database of open content. Creative Commons also serves to educate the public about issues of copyright, freedom of speech and expression and the public domain.*

The CC licences take account of different copyright laws in different countries or jurisdictions and also allow for different language versions. To make the licensing process as simple as possible for users the Creative Commons site makes use of a licence generator that suggests the most appropriate licence based on a user’s response to specific questions regarding how their work can be used. In order to facilitate searching for resources licences in a particular way, the CC licence is expressed in three versions:

* *Commons deed:* this is a plain language version of the licence, with supporting icons (see table below);
* *Legal code:* the legal fine print that ensure the licence is recognised in a court of law; and
* *Digital code:* a machine readable translation that allows search engines to identify work by its terms of use (‘About–Creative Commons’; Liang, 2004).

All CC licences include ‘Baseline Rights’: the rights to copy, distribute, display, perform publicly or by digital performance, and to the change the format of the material as a verbatim copy (Hofman & West, 2008, p. 11). In addition, all CC licences assert the author’s right over copyright and the granting of copyright freedoms and require licensees to:

* Obtain permission should they wish to use the resource in a manner that has been restricted;
* Keep the copyright notice intact on all copies of the work;
* Publish the licence with the work or include a link to the licence from any copies of the work • Not change the licence terms in anyway;
* Not use technology or other means to restrict other licences’ lawful use of the work (Liang, 2004, p. 82).

#### Licence Conditions

Creators choose a set of conditions they wish to apply to their work.

******

#### The Licences

The following are the key CC licences:

*** cc by-sa***

This licence lets others remix, tweak, and build upon your work even for commercial reasons, as long as they credit you and license their new creations under the identical terms. This licence is often compared to open source software licences. All new works based on yours will carry the same licence, so any derivatives will also allow commercial use.

******Attribution No Derivatives cc by-nd

This licence allows for redistribution, commercial and non-commercial, as long as it is passed along unchanged and in whole, with credit to you.

**Attribution Non-Commercial *cc by-nc***

This licence lets others remix, tweak, and build upon your work non-commercially, and although their new works must also acknowledge you and be non-commercial, they don’t have to license their derivative works on the same terms.

**Attribution Non-Commercial Share Alike *cc by-nc-sa***

This licence lets others remix, tweak, and build upon your work non-commercially, as long as they credit you and license their new creations under the identical terms. Others can download and redistribute your work just like the by-nc-nd licence, but they can also translate, make remixes, and produce new stories based on your work. All new work based on yours will carry the same licence, so any derivatives will also be non-commercial in nature.

**Attribution Non-Commercial No Derivatives *cc by-nc-nd***

This licence is the most restrictive of our six main licences, allowing redistribution. This licence is often called the “free advertising” licence because it allows others to download your works and share them with others as long as they mention you and link back to you, but they can’t change them in any way or use them commercially.

#### CC Licensing Considerations

The aspect of CC licensing that is most controversial is the *non-commercial* (NC) clause (Commonwealth of Learning, 2007; Hofman & West, 2008; Rutledge, 2008). There are several reasons for this, including at the most basic level, what ‘non-commercial’ in fact means. Since CC licences are a new phenomenon within copyright law, little previous case history exists to assist in interpreting this clause. The most extreme interpretation of non-commercial is that no money should change hands as part of the process of using of the materials. However, Hofman and West (2008) note that this is not how non-commercial is usually interpreted. A transaction is not commonly seen as commercial when it includes refunding for expenses such as travel, for example. The transaction becomes commercial when making a profit is the purpose of the transaction. Similarly, writing from the CC perspective, Rutledge notes that:

*CC considers intent to be the primary test of whether a use is non-commercial. If the intent of a particular use is to generate profit, that use is commercial. Under this reasoning, cost recovery per se is not a commercial use (Rutledge, 2008).*

*ACIVITY: If you find material with any of the licenses below on it, explain what you are allowed to do with the material so that you will not be found wanting of any copyright offences?*

#### Figure 5: Creative Commons licences for OER

## 4.4 Modern technology used for accessing OER

By the end the section, you will have demonstrated a good skill for using modern technologies to access OER.

|  |  |
| --- | --- |
| Activity 4c | Purpose  This activity provides an opportunity to reflect on some technology implications of OER.  Time  This activity will take about 30 minutes.  Write answers to the questions in your workbook.  Read the extract in the **Discussion** below *taken from a report written by Neil Butcher for the Global e-Schools and Communities Initiative (GeSCI) African Leaders in ICT (ALICT) capacity-building programme* and discuss the follow questions:   1. Which Technology applications can you remember using for accessing information on the internet? 2. Which of the applications outlined below are you conversant with? 3. Do you think these technology applications can improve your search for information? 4. What challenges do you experience using any of the applications? |

|  |
| --- |
|  |
| Discussion |

#### Discussion

• **Social network sites** – social network sites are web-based services that allow people to construct a public or semi-public profile within a bounded system, define a list of other users with whom they share a connection, and view and traverse their list of connections and those made by others within the system. Possibly the most well-known of these sites are Facebook and MySpace, although many such sites exist. Some also focus on specific dimensions of social networking. For example, social bookmarking sites such as Del.icio.us allow people to save bookmarks to websites and tag them with keywords, generating community-driven, keyword-based classifications known as ‘folksonomies’. Likewise, photo-sharing websites such as Flickr allow people to upload, tag, browse, and annotate digital photographs, as well as participate in self-organizing topical groups. While social networking sites have massive potential for influencing the way in which we organize and find information and how we interact with people, it is important to note that the for-profit sector is selling itself as the provider of choice for these Web 2.0 collaboration capabilities, predominantly in an effort to create new platforms for funding consumers and selling advertising.

• **Blogging** – blogging is remarkable for the speed with which it has grown as an online communication vehicle. Blog is an abbreviated version of ‘weblog’, which is a term used to describe websites that maintain an ongoing chronicle of information. A blog is a frequently updated, personal website featuring diary-type commentary and links to articles or other websites (and, in the case, of video-blogging, video). Given the personal perspectives presented on blogs, they often generate ongoing discourse and a strong sense of community. Blogs provide diverse, alternative sources of information for higher education, as well as providing tools that can be used by academics and students for a wide range of educational purposes.

• **Wikis** – a wiki enables documents to be written collaboratively, in a simple mark-up language using a web browser. A defining characteristic of wiki technology is the ease with which pages can be created and updated. This ease of interaction and operation makes a wiki an effective tool for mass collaborative authoring, the most famous example of which is Wikipedia, an online phenomenon that has played a massive role in challenging notions of what constitutes ‘expertise’ and about reliability of information. Wikis are already extensively used in many higher education programmes for educational purposes, and are one of the authoring tools being used to generate ‘open’ content (see below).

• **RSS** – Real Simple Syndication (RSS) is a protocol that allows users to subscribe to online content by creating lists of preferred sources of information in a ‘reader’ or ‘aggregator’ that automatically retrieves content updates, saving users time and effort. RSS feeds can be very helpful in managing information and undertaking ongoing research.

• **Podcasting** – ‘podcasting’ refers to any combination of hardware, software, and connectivity that permits automatic download of (usually free) audio and video files to a computer, smart phone, or MP3/MP4 player to be listened to or watched at the user’s convenience. This is typically done by subscribing to an RSS feed linked to the specific podcast, so that when new editions of a podcast are made available, they are automatically downloaded by podcasting software. Podcasting has made available a very broad spectrum of educationally useful audio and video material, including radio programmes from around the world, lectures, conference speeches, and custom-produced podcasts created by enthusiasts. Growing numbers of universities and academics are making lectures available as podcast series, usually making these freely available to anyone around the world with Internet access.

• **Virtual Worlds** – virtual worlds are immersive online environments whose ‘residents’ are avatars representing individuals who participate via the Internet. Some, such as the very popular **World of Warcraft**, are explicitly focused on gaming and entertainment. However, possibly the most well-known of these from an educational perspective is Second Life, a fully three-dimensional world where users with many varying interests interact, but within which many universities and businesses are now constructing virtual campuses for their students Voice-Over Internet Protocol (VOIP) – VOIP is a protocol optimized for the transmission of voice through the Internet or other packet-switched networks. VOIP is often used abstractly to refer to the actual transmission of voice (rather than the protocol implementing it). VOIP facilitates applications such as Skype, which allow users to make free telephone calls between computers.

• **Instant messaging (IM)** – IM is a form of online communication that allows real-time interaction through computers or mobile devices. It is often bundled into applications such as Skype and social networking sites, so that it can be used seamlessly while within those applications. It has become such an integral part of students’ lives that many universities are working to move IM beyond the social sphere into teaching and learning.

• **Online applications** – these are web-based programmes that run in web browsers and typically replicate the functionality currently available on desktop-based applications. A good example is Google Apps, which provides access to office productivity, communication, and file storage tools. Another more specialized example is Lulu, which offers online access to the tools one needs to design, publish, and print original material, facilitating inexpensive production of publications. The online nature of such tools is intended also to facilitate collaboration, peer review, and collective generation of knowledge.

• **Wielding the applications** – by drawing on the potential of the above technologies, several new possibilities are emerging that are worth documenting:

**• Mashups,** which are web applications that combine data from more than one source into a single integrated tool. The power of mashups for education lies in the way they help us reach new conclusions or discern new relationships by uniting large amounts of data in a manageable way. Web-based tools for manipulating data are easy to use, usually free, and widely available.

• **Digital storytelling**, which involves combining narrative with digital content to create a short movie or presentation.

**• Data visualization**, which is the graphical representation of information to find hidden trends and correlations that can lead to important discoveries.

**• Open journaling,** which manage the process of publishing peer-reviewed journals online, allowing authors to track submissions through the review process, which creates a sense of openness and transparency uncommon in traditional, peer-reviewed publications.

• **Google jockeying**, involves a participant in a class surfing the Internet during the class for terms, ideas, websites, or resources mentioned by the presenter. These searches are then displayed simultaneously with the presentation. • Virtual meetings, which are real-time meetings taking place over the Internet using integrated audio and video, chat tools, and application sharing.

**• Grid computing,** which uses middleware to coordinate disparate IT resources across a network, allowing them to function as a virtual whole, providing remote access to IT assets and aggregating processing power.

## 4.5 Summary

Having browsed through the links provided in the internet and discussed in group during contact sessions you can now clearly define OER and fully discuss critical issues surrounding accessing OER. You are aware of the technical and legal framework involved in accessing OER. Finally, you are acquainted with modern technology media and materials used for accessing the OER, especially in your college.

Resource-based learning has become the norm in the information age as our ability to access multiple sources of information continues to increase. Students will engage with a selection of relevant resources linked to key learning and assessment activities designed as part of an accessible online Learning Pathway. Wherever possible, suitable Open Education Resources (OER) are identified, adapted as necessary, and used. Students will have access to three main categories of resources:

* Primary resources are available on the LMS and include, for example, core readings, videos, teleconferencing with selected experts.
* Secondary resources are listed as supplementary information.
* Online resources: Students search for their own resources on the Internet as the need arises. They build up their own set of supportive resources which they can share with their peers

The use of multiple resources encourages teacher-students to deepen their understanding of their learners and how they can improve their response to and support of them. Appropriate support is embedded in the Learning Pathway across modules to strengthen the students’ ability to learn from a variety of resources. The students will experience technology supported learning by engaging with different kinds of activities online and through mobile technology. However, at least in the initial phases, technology will be a complementary rather than a central element.

## 4.6 Self-assessment

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Assessment | Tick the boxes to assess whether you have achieved the outcomes for this unit. If you cannot tick the boxes, you should go back and work through the relevant part in the unit again.  I am able to:   | # | Checklist | 🗹 | | --- | --- | --- | | 1 | Discuss critical issues surrounding accessing OER for instructional purposes. | ❑ | | 2 | Identify the unique challenges of my colleges with regard to access to OER | ❑ | | 3 | Describe technical and legal frameworks involved in accessing materials online. | ❑ | | 4 | Teach differently because of my ability to access OER | ❑ | | 5 | Use the digital technology and the network digital devices available for my instruction. | ❑ | | 6 | Discuss whether resource-based instruction can be effective in Africa. | ❑ | |

## 4.7 Selected references

|  |  |  |  |
| --- | --- | --- | --- |
|  | |  |  | | --- | --- | |  | Key references and useful further reading includes:  N, Butcher **(2011) A Basic Guide to Open Educational Resources** (OER) *Edited by Asha Kanwar (COL) and Stamenka Uvalic´-Trumbic´ (UNESCO)*  *CC-BY-SA (share alike with attribution)http://creativecommons.org/licenses/by-sa/3.0* | |
|  |  |
|  |  |
|  |  |