



OPEN UNIVERSITY OF TANZANIA (OUT)

Digital Fluency Course

Module 1: Digital Fundamentals

This is the first in a suite of 5 openly licenced Digital Fluency modules developed at OUT in collaboration with OER Africa to address the needs of academic staff in the 21st century.

Preamble: What do we mean by Digital Fluency? Who should develop this skill, and why?

Our *motivation* for developing this course is to enhance the capacity of academic staff in Higher Education Institutions in sub-Saharan Africa and to increase confidence and competence in selecting and using appropriate digital technologies in an informed manner within their work environment.

The *aim of the course* is to progress beyond the conventional notion of digital or computer literacy – we would like to support you to become “fluent” in the digital workplace. The notion of fluency is often associated with language or numeracy skills development – we now also recognise its importance in preparing to engage in a digital world. The move from literacy to fluency encompasses effective and ethical online communication, good quality resource creation and curation, knowledge co-construction, and an understanding of using these abilities to “open up” education – with all these elements becoming increasingly standard and effortless over time.

The *overall objective* is to develop an ability to comfortably and ethically use digital technologies incorporating a variety of media types, both on- and off-line, to support your teaching and learning, research, and academic administrative duties. We believe that our 5 modules (Digital Fundamentals, Working with OERs, Learning Design and Development for Online Provision, Academic Integrity in a Digital Age, and Storage and Access of Digital Resources) shared openly, will support you in your journey towards this goal.

At the start of this Digital Fluency course you may like to reflect on your motivation for engaging with one or more of these 5 modules and ask questions such as:

- What do I hope to achieve personally by engaging with this course and its modules?
- To what extent are digital technologies and OER currently being used at my institution?
- Does my institution have policies and strategies in place for Quality Assurance (QA), ICT, eLearning, Intellectual Property (IP), and Open Educational Resources (OER)?

You should revisit these questions as you work through the modules, and perhaps even volunteer to serve as a champion in effecting positive transformation towards embedding and/or informing related policies, strategies, and practices at your institution and beyond.





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Course Code: ODF 001

Course Name: Academic Digital Fluency

Module Number: 1

Module Name: Digital Fundamentals

Module Description

Digital literacies are those capabilities that are necessary for an individual living, learning and working in a digital society (JISC, 2014). The use of digital technologies has become integral to every aspect of daily routines, including teaching and learning processes and academic administration. Accordingly, academic staff need to be digitally literate to work competently in this rapidly growing area. This module aims to provide skills, knowledge, and understanding of how to work in your digital environment in an academic context, and to enhance your skills to efficiently, critically, creatively, and safely work with digital technologies in your daily academic routine.

The first topic reminds us of basic computer concepts and operations. We then move on to internet fundamentals, which covers recommended techniques of searching for information, and introduces useful web-based applications. The third topic concerns making good use of your virtual learning environment, using Moodle as an example. Then we explore the fundamentals of multimedia, with the aim of developing the necessary skills to create and introduce engaging resources for your students. In the final topic, you have the opportunity to practice editing digital media.

Module Learning Objectives



Upon completing this module, learners are expected to have developed skills and knowledge related to:

- using a range of basic and emerging digital technologies and devices in academic duties;
- digital editing and reviewing techniques for digital documents;
- making use of available internet functions and web applications, social networks, communication tools, and search engines to facilitate academic work;
- efficient usage of the features, functionality, potential, and benefits of a Virtual Learning Environment; and





	<ul style="list-style-type: none">• demonstrating an ability to use freely available digital multimedia applications in developing, processing, and presenting information.
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**Module Topics, Teaching and Learning (T&L) Media, and Schedule**

Topic #	Topic Name	T&L Media	Expected Schedule
0	Start-up week: participants verify access to the virtual learning environment (VLE).	VLE; video; discussion forum; file download.	At least 1 hour: access the VLE, introductions, and orientation.
1	Basic Computer Concepts and Operations	Videos, quizzes, assignment, practicals.	At least 6 hours' engagement over a 1 week period.
2	Internet Fundamentals	Internet applications and security; search engines, social networks; using the internet as an educational resource; connecting tools.	At least 6 hours' engagement over a 1 week period.
3	Virtual Learning Environments.	Learning Management Systems and their environment.	At least 6 hours' engagement over a 1 week period.
Consolidation Break (enables reflection and catch up)			1 week
4	Multimedia Fundamentals	Web-page resources, multimedia authoring tools, animation practical.	At least 6 hours' engagement over a 1 week period.
5	Digital Editing	Tools for a digital editing environment.	At least 6 hours' engagement over a 1 week period.
	Wrap-up week: participants complete outstanding activities; goodbyes. Digital certificates and open digital badges are awarded.	VLE, discussion forum.	Ensure that all required activities are completed for certification.

Assessment Plan

Depending on an institution's purpose in offering this module, Module 1 could be assessed using formative and summative forms, as indicated below.

Formative Assessment	Summative Assessment
Level of learner interaction	Portfolio (formative 60%)
Self-assessment	Final assignment (40%)





Quizzes	
Activities, as specified	

Module Evaluation

A module evaluation should be conducted during and after each instance of running the module to effect improvement.

Certification / Accreditation

Completion of 80% of module activities contributes to an award / certificate and/or digital badge.

If this course is offered formally by the [Open University of Tanzania](#) (OUT), completion will result in module credit towards the Digital Fluency course (ODF 001).

Acknowledgements

This work is Module 1 of the Digital Fluency course created by the Institute of Education and Management Technologies ([IEMT](#)) staff and faculty at OUT, in collaboration with [OER Africa](#).

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Licensing



Except where otherwise noted, content in this module is licensed under a [Creative Commons Attribution 4.0 International license](#).

Every effort has been made to adhere to the licences of OER incorporated in the module. Should there be any queries around individual licensing of module components, please contact the Director of Quality Assurance at OUT: dqac@out.ac.tz





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List of Abbreviations

CMS	Course Management System
CPU	Central Processing Unit
DLE	Digital Learning Environment
DVD	Digital Versatile Disc or Digital Video Disc
GUI	Graphical User Interface
HCI	Human Computer Interface
ICT	Information and Communication Technology
ID	Identification
ISP	Internet Service Provider
LCMS	Learning Content Management System
LMS	Learning Management System
LP	Learning Platform





LSS	Learning Support System
MLE	Managed Learning Environment
OUT	Open University of Tanzania
PDA	Personal Digital Assistant
RSS	Really Simple Syndication
USB port	Universal Serial Bus port
VLE	Virtual Learning Environment
WIMP	Windows, Icons, Menus, Pointer





Self-Assessment of Prior Knowledge

Before embarking on this Digital Fundamentals module, you may like to take stock of what you already know, and identify skills you would like to develop in this area. The Open University, United Kingdom (OU UK, 2016) has developed a [set of four self-assessment activities](#) to assist you in ascertaining your familiarity and confidence with online tools and environments, and identify which activities can help you develop your skills further. The following self-assessment activities are available from the “Using” tab:

- Understanding Digital Practices
- Finding Information
- Using Information
- Creating Information

We suggest that you undertake these four self-assessment activities before beginning the module, to establish areas of personal focus for your learning. See Activity 2 for follow up.

Reference:

OU UK. (2016). Being Digital: Pathways. Retrieved from <http://www.open.ac.uk/libraryservices/beingdigital/pathways/13/14>



Topic 1: Basic Computer Concepts and Operations

Introduction

The aim of this module is to enable academics to grasp the concepts and operations of computers, and use them efficiently. It identifies and discusses the components of computer systems, how they are organised to perform specific tasks, the different types of computing devices, and emerging technologies and techniques in efficiently operating digital devices. Computer components are divided into two major categories, specifically: hardware and software. Academics today use different types of digital devices, among them desktops; laptops; handheld devices, such as smartphones; and tablets. Selecting which device to use depends on the tasks that need to be accomplished. These different computers operate via diverse technologies; hence the interaction and compatibility between different operating systems is an important consideration. This topic provides basic knowledge of computer technologies, and hence enhances the individual's ability to use them efficiently in daily activities.

Topic 1 Learning Objectives

	<p>At the end of this topic, the learner should be able to:</p> <ul style="list-style-type: none">● Describe range of digital devices, that is computers, and their usage in academia;● Identify the main functions of digital devices, specifically computer hardware;● Identify types of computers and their various forms;● Use emerging technologies for the task at hand;● Demonstrate the uses of educational computer programs;● Describe types of productivity programs and their use; and● Manage files and folders.
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1.1 Computers in Daily Activities

A computer is a programmable electronic device that can store, process, and retrieve data. Computers play an important role in our daily life: it is hard to pass a single day without using a computer system. Some daily activities involving computers are: topping up mobile phones, using online applications, searching academic documents, accessing academic resources, receiving and sending messages, broadcasting news, publishing and reviewing examination results, withdrawing money from bank ATMs, and accessing other business and entertainment activities. The ability to operate computer devices is crucial, as computers are now part and parcel of our life.

This topic focuses on type of computers that are used at a personal or individual level. Several types of such computers are available; these are categorised according to the tasks performed, their purposes, and size. For example, a computer used for weather forecasting or video editing needs a fast CPU and a high-quality display adapter. In academia, there are specific needs that should be considered: for example, selecting an operating system that supports all the applications in the curriculum. Tablets, smartphones, and other handheld devices may not support all the activities in the teaching and learning processes.

There are four main types of personal computing devices: desktop, laptop, handheld, and tablet (Houston Library, 2014). In addition, smartphones are now able to accomplish many of the daily personal tasks that previously were available only on the earlier larger devices.



Figure 1: Types of Computers.

Source: Google Images

1.2 Computer Components

By recognising these components and their related functions, you will become familiar with the common structure of digital devices, and maximise your capability to use them. Meaningful Volunteer (2016) provides a lesson on parts of the computer within the [Introduction to Computers course](#).

1.2.1 Hardware

Hardware refers to the physical parts (devices) of a computer system. Hardware can either be connected outside or within a computing device. Basically, computers and embedded devices perform five major operations: accepting data via input devices, processing data as required by user, storing data, providing output, and controlling all operations inside the computer. The computing devices that perform these operations are listed below.

- Input devices: such as a mouse, keyboard, finger print, webcam, or scanner;
- Output devices: a monitor, printer, or plotter;



- Central Processing Unit (CPU): Motherboard; Memory (Random Access Memory-RAM); Interface cards, such as sound or video cards; and
- Storage devices: hard drives, flash disks, and DVDs.

1.2.2 Software

Software is a set of computer programs developed to perform a certain task. A program is a sequence of instructions written to instruct a computer to solve a particular problem. There are two major types of software: system software and application software.

System software refers to a set of programs that control the computer's resources and their information-processing activities. It is more general than application software, and is usually independent of any specific type of application. System software programs support application software by directing the basic functions of the computer. For example, when you start your computer the initialisation program (a system program) prepares and readies all devices for processing (Turban et al, 2005). System software can be grouped into two major functional categories: system control programs and system support programs. *System control programs* manage the use of the hardware, software, and resources of a computer system. The most important of these programs is the operating system. The functions of operating systems are generally managed operations performed by monitoring functions, scheduling the input and output processes, CPU time allocation, memory location, and providing the interface between the user and the hardware by hiding the complexity of hardware. *System support programs* provide routine services to the other computer programs and users of a computer system. Examples of system support programs are system utility programs, libraries, performance monitors, and security monitors.

Application software enables users to perform specific functions. Application software includes proprietary application software and Open Source Software (OSS). Proprietary software is software developed commercially to serve a specific purpose for organisations or individuals. Examples of proprietary software applications are payroll software, student record management software, a productivity (office) suite, and income tax software. Examples of OSS are Open Office (productivity) and Moodle (learning management system). There are also applications that are free to use, although not OSS, so we often refer to FOSS – free or open source software. Examples of free (but not OSS) software are Dropbox and Twitter.

1.2.3 Graphic User Interface

The interaction between the user and their digital device is accomplished via the user interface. Most programs have a built-in Graphic User Interface (GUI) to enable the user to interact with the system visually. A GUI allows users to click and drag objects with a mouse, or touch a screen to select a program or option, instead of entering text in a command line.



The Graphical User Interface (GUI) is made up of four main elements, each denoting a style of interaction: Windows, Icons, Menus, and Pointer (sometimes referred to as WIMP), Figure 2.



Figure 2: WIMP Interface

Source: Dix et al (2016)

Activity 1: Match the Word to the Description



Aim: Ascertain your understanding of some basic computer concepts.

Motivation: Develop the capability to understand digital terminology and use the right applications and devices for the academic task at hand.

Task: Match the term with its description

Duration: 30 minutes

Tools: Automated quiz in the VLE;

Resources: Two lists, as provided.

What to do:

- List 1 contains descriptions of the terms in List 2.
- You are required to match the term in List 2 with the best corresponding description in List 1.

How: Undertake the automated quiz in your VLS/LMS.



<p>List 1 – Descriptions</p> <ol style="list-style-type: none">1. An output device used to display information2. Small device with easy touch input on display screen, suitable for collecting data in the field, or travelling.3. Keyboard, mouse.4. A program that allows the user to create primarily text documents5. Suite of programs that assist users to perform a variety of specific tasks, such as creating a text file, preparing presentation, recording marks, and so on.6. Enable user to interact visually with a system – – WIMP.7. The physical parts of a computer.8. Sequence of instruction to perform specific tasks.9. Hard drive, flash stick. <p>List 2 – Words / Terms</p> <ol style="list-style-type: none">a. Input devicesb. Hardwarec. Productivity softwared. Programe. Tabletf. Storage devices for digital information.g. Graphic User Interface (GUI)h. Word processori. Monitor / Screen <p>Feedback/Response: (automated)</p> <ul style="list-style-type: none">● If you are undertaking this quiz in Moodle, the system will automatically assess your responses and provide immediate feedback. <p>Assessment:</p> <ul style="list-style-type: none">● Completing this activity will count towards your formative assessment.

1.3 Productivity suites for teaching and learning

Productivity suites comprise basic useful software applications that can be used for work or personal purposes. There are both proprietary ([Microsoft Office](#)) and open systems ([Open Office](#)) available. Productivity suites provide a common user interface for their composite application programmes. Details on the applications making up an office suite follow below.

A *word processor* is an application that enables you to edit text in a document, and includes creating, displaying, saving, and printing documents. Being proficient in word-processing skills will equip you to use different programs on various types of digital devices. Meaningful Volunteer (2016) provides lessons on [Introduction to Word Processing](#). Once you have mastered





those basic skills, the organisation also offers lessons on [Word Processing Part II](#), which provide guidance on creating, formatting, and managing documents.

Presentation applications are used to present information in the form of slides. Like other productivity programs, presentation software includes several tools that can be used to add a variety of features, including sound, animation, and pictures. Before starting to work in a presentation application, make sure you are familiar with the array of tools and spend time exploring their functions. Access this [wiki space page](#) to learn how to work with presentations. Most presentation software also contains features that can take your presentation to a highly professional level. Access this lesson [here](#) for more information on adding sounds, narration, and music to your slides.

A *spreadsheet* application can be viewed as an automated ledger book, which comprises columns and rows. It can be used instead of a pencil, paper, and a calculator. A spreadsheet is ideal for preparing a budget, forecasting sales data, performing mathematical calculations, managing accounts, comparing financial alternatives, and converting numerical data into charts and graphs. In education administration, spreadsheets are used to record data, calculate averages, produce graphs, and print students' records. Click [here](#) to learn how to effectively manage your students' results. Activity 10 on the [wiki spaces repository](#) can also be useful to learn how to construct a mark sheet for keeping tracking of your students' marks.

A *publishing* application enables users to design posters, cards, brochures, newspapers, and so on, that contain a combination of text and graphics. Many of these tools are similar to those found in a word processor. In a publisher, you can use text, tables, and graphics to create a professional piece of work. GCF (2016a) provides free-to-use [tutorials on publishing](#), among other general office applications.

Database programs are used to store and manage data in a computer system. By using functions such as “query”, you can sort or search for information in a database. By using a form tool you can insert data, and by using a report tool you can retrieve information from a database. Database applications can be used to store an item's details, and create and manage a goods inventory, which can assist you in tracking items in your business. In an educational context, a database can be used to manage student records.

1.4 Educational Programs and their uses

Educational programs are built to support teaching and learning processes. There are thousands of educational software programs available, and the relevant ones should be selected for use in your particular context and environment. NCTE (2011) grouped these vast collections of educational software into two broad categories:





- Content-free software. This is flexible, as it provides teachers and students with the tools to create their own content. Examples are [Paint Shop Pro](#) (image editing), [Inspiration](#) (mind mapping), and [Moodle](#) (Learning Management System).
- Content-rich software. This is commercially produced educational software, where the content is pre-packaged and you are unlikely to be able to change it. An example is the set of [PhET](#) science animations from the University of Colorado (2016) that are freely available for reuse under a CC BY licence.

Educational platforms hosting content are known by various names: these include virtual learning management (VLE), course management system (CMS), learning content management system (LCMS), e-learning platform, and learning portal. They comprise components or features that enhance the teaching and learning process. EduTechWiki (2016) provides further information on the [components of an LMS](#).

1.5. Basic File Handling Operations

The common operations performed in both files and folders are create, rename, copy, paste, edit, save, and delete. Other operations allow the user to convert files from one format to another, and setting passwords for security purposes. Sometimes you will need to compress or zip a file or folder to reduce its size or send it as attachment via email. For further information on other file handling operations, access the [File Basics Tutorial](#) (GCF, 2016b).

For example, when saving a file, you need to consider the following.

- Locate the place you want to save your document. For example, My documents, My music, or My pictures.
- Assign the appropriate extension. Most documents will automatically have a set extension, according to the application you are using. For example, the Portable Document Format extension is .PDF; the extension for Word documents is .doc or docx; there are a large variety of multimedia file extensions depending on your application software; and image file extensions include .gif, png, or .jpg, among others.
- When you want to open a document, the operating system will pick the appropriate program associated with the file to display the content.

Activity 2: Basic Computer Actions

	<p>Aim: To enhance your use of computing applications.</p> <p>Motivation: To develop the capability to identify and use the right application and devices for the academic task at hand.</p> <p>Task: Undertake identified online tutorials.</p> <p>Duration: 2 hours (120 minutes)</p>
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<p>Tools: Discussion forum</p> <p>Resources:</p> <ul style="list-style-type: none">• Self-assessment activities (OU UK, 2016)• Parts of the Computer (MeaningfulVolunteer, 2016)• File Basics (GCF, 2016b) <p>What to do:</p> <ul style="list-style-type: none">• Complete the OU UK self-assessment activities, making a note of your current skills and identified areas for improvement.• Complete the two tutorials in the resources above. <p>How:</p> <ul style="list-style-type: none">• Convert your text notes to a PDF file using the “Save as” function in your word processor.• Attach your file to a forum post in which you list your most commonly used software applications. <p>Feedback/Response: (peer review)</p> <ul style="list-style-type: none">• Read and respond constructively to at least one other person’s contribution.• Read the other people’s responses to your own contribution. <p>Assessment:</p> <ul style="list-style-type: none">• Completing this activity will count towards your course portfolio.
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1.6. Technology Trends in Education

We have discussed the features that are common to digital devices. Nowadays, you will find a variety of digital devices. Collectively, these devices are known as Information and Communication Technologies (ICT). Anderson (2010) refers to embracing the many technologies that enable us to receive information and communicate or exchange information with others.



ICT

Figure 3: ICTs comprise many technologies for capturing, interpreting, storing and transmitting information

Source: Anderson (2010)

These technologies facilitate the teaching and learning process by facilitating the design, creation, organisation, and dissemination of the course content. Figure 3 shows the components that comprise ICT. All academics should be aware of and able to use some of these technologies, so that they can stay abreast of teaching and learning in their field.

The annual NMC (2016) Horizon Reports Higher Education Edition summarises an analysis of key technology trends, challenges, and developments in education (Figure 4). It is interesting to view these annual reports to see how the aspects compare on a year-by-year basis, and how the technologies advance, stall, or evolve over time.

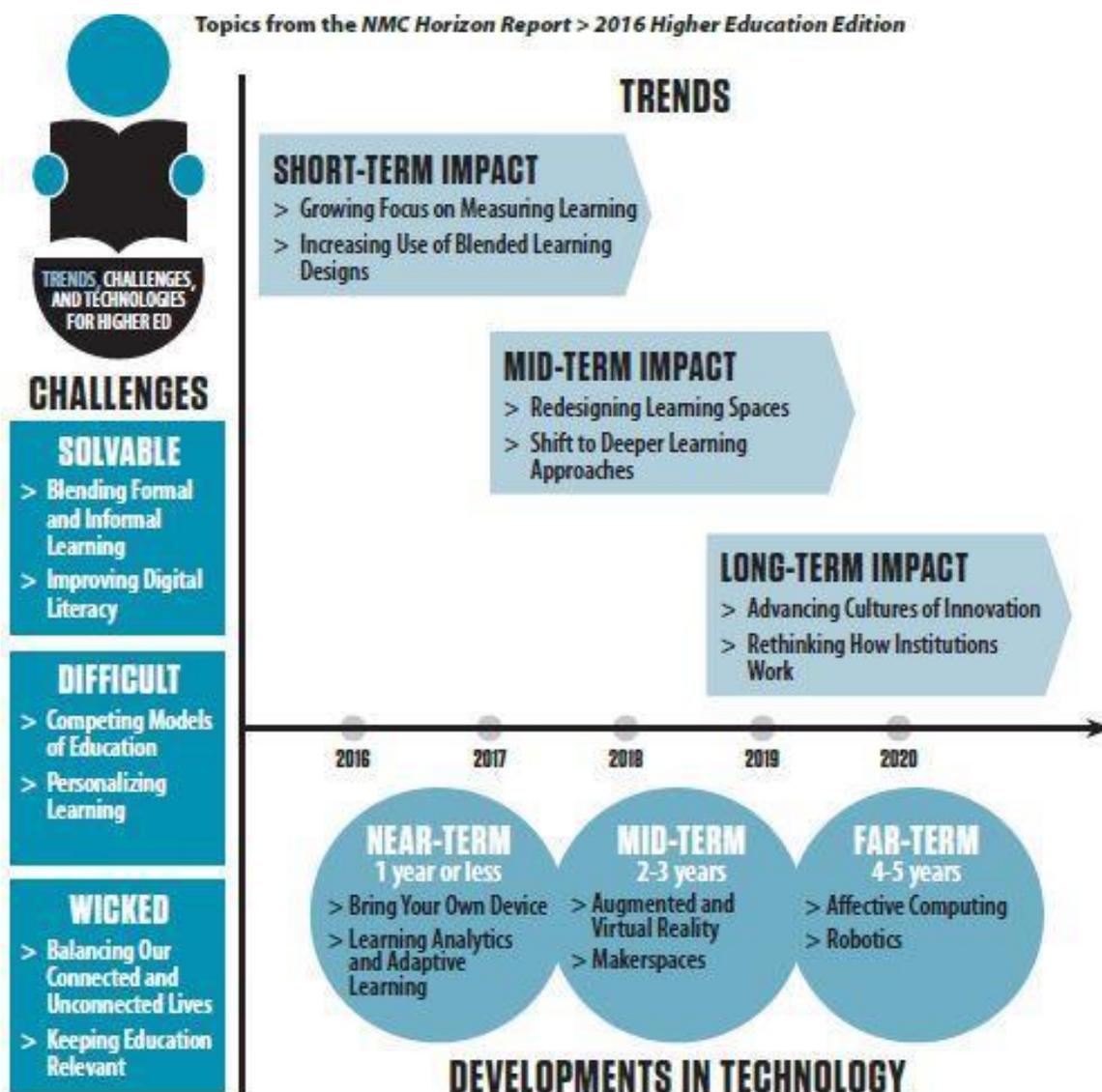


Figure 4: Key technology trends

Source: NMC (2016) CC BY

Activity 3: Technology Trends in Context

	<p>Aim: To establish the current trends in your teaching and learning environment.</p> <p>Motivation: Explore a wider global trend analysis to place your institution in context.</p> <p>Task: Analyse your own institution’s technology context.</p> <p>Duration: 1 hours (60 minutes)</p>
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	<p>Tools: Upload an assignment in the VLE;</p> <p>Resources:</p> <ul style="list-style-type: none">• Horizon Report – Higher Education Edition (NMC, 2016) <p>What to do:</p> <ul style="list-style-type: none">• Browse through the 2016 Horizon Report, paying special attention to the trends infographic, as depicted on page 2.• Follow up in the text on any specific trends challenges and developments that resonate in your context.• Make notes on your findings with respect to possible solutions or initiatives that are relevant to explore for your institution. <p>How:</p> <ul style="list-style-type: none">• Upload your notes to this assignment space in the VLE. <p>Feedback/Response:</p> <ul style="list-style-type: none">• Your tutor will provide individual feedback. <p>Assessment:</p> <ul style="list-style-type: none">• Completing this activity will count towards your course portfolio.
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Reflection

Please use the Moodle course blog facility to reflect on your experiences and engagement with this week's topic. (15 minutes)

Summary

	<p>Basic computer concepts and operations are some of the fundamental components in this digital literacy module. Before engaging with this topic, you assessed your current skills and identified areas of focus. This topic lays a foundation to building knowledge and practical skills, by describing types of common software applications and computing devices.</p> <p>In addition, you were guided towards annually compiled reports that explore trends, challenges, and developments in using technology in the higher education sector.</p>
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Review Questions

	<ol style="list-style-type: none">1. Identify and briefly describe software applications that are often used in academic tasks.2. Briefly discuss the current global trends and challenges in using technology in higher education.
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References



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Topic 2: Internet Fundamentals and Applications

Introduction

This topic introduces the individual to various internet-related technologies used daily for communication and research. You will be guided on how to use internet technologies and their applications in daily academic activities.

The internet is a global system of interconnected computer networks that links several billion devices worldwide. It is a network of networks that consists of millions of private, public, academic, business, and government networks, from local to global scope, which are linked by a broad array of electronic, wireless, and optical networking technologies. The internet carries an extensive range of information resources and services, such as the inter-linked hypertext documents and applications of the world wide web (www), the infrastructure to support email, and peer-to-peer networks for file-sharing and telephony. (Wikipedia, 2014)

Unlike online web services, which are centrally controlled, the internet is decentralised by design. Each internet-connected host computer is independent, but may be mirrored in different parts of the world. Its operators can choose which internet services to use, and which local services to make available to the global internet community. For individual access, it is usual to gain access through a commercial Internet Service Provider (ISP), be it via a mobile smartphone, tablet, laptop, or desktop (Webopedia, n.d.).

Topic 2 Learning Objectives

	<p>At the end of this topic, the learner should be able to:</p> <ul style="list-style-type: none">● Describe internet technology;● Identify types of internet connections;● Search for reliable information on the web;● Describe features of social networks;● Identify and describe internet applications; and● Identify internet ethics and security issues.
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2.1 Using the Internet

For a computer to access the internet, it needs to be connected via specific equipment and programs such as:

Access Devices: You can use any type of computing device, including laptops, tablets, and mobile smartphones to connect to the internet.



Specific Programs: You need a www browser (e.g. Google Chrome, Mozilla Firefox, or Internet Explorer) on your computing device to access the internet.

Internet Service Provider (ISP): An ISP is a company that gives you internet access for a fee. Many providers offer you a certain number of hours per day or month for a set fee, while other providers offer unlimited access to the internet for a set fee. Some ISPs provide access to information and services that are available only to their subscribers. [Tigo](#) and [Vodacom](#) are examples of such providers for smartphone users in Tanzania.

Internet access: This can be provided wirelessly or via fibre-optic cabling at universities and public institutions. Users usually must be authorised to use a wifi network, often by entering a password. However, increasingly, there is free and open wifi provided within public buildings, such as airports, and in inner city areas within well-connected countries.

Servers: These are where most of the information on the internet resides. Servers are specialised host computers that store information, share information with other servers, and make this information available to the general public, all using system software to facilitate the service.

2.2 Internet Applications

Internet applications hold great potential for education. They can be a platform for innovation in the education system, and make it more productive and efficient. In teaching and learning, the internet can be used to stimulate learners to learn actively and independently in a self-directed way and/or in collaboration with others (Googleusercontent, 2014).

Secondly, teaching/learning materials (syllabi, course outlines, lecture notes, seminars, and so on) can be provided for students online. Thirdly, this encourages the democratisation of education, that is, access to education for all. Every learner (able / disabled, adult / young, employed / unemployed) has access to education, anywhere (home, school, or offices), any time (24 hours/day and seven days/week). Of course, this depends on internet availability, and the quality and cost of connectivity.

For research, the internet provides wide opportunities for faster access to relevant and current literature, access to a wide range of survey instruments, online opportunities for collecting responses to surveys, simulations of ongoing research, and online statistical analysis.

2.2.1 Educational Resources on the Internet

The internet is a heterogeneous channel with vast resources. According to Monereo et al (2000), each of these resources has its own set of rules, but they relate to one another in several ways. Some of these are discussed below, and include communication services and content provision.





Electronic Mail (email): This is an instantaneous electronic message from a sender to recipient(s). It is the most-used application on the internet. Another variant of email is the list serve, through which a subscriber receives and participates in a discussion group via email. Email is relevant for communication between teachers and students, peers (teacher-teacher, student-student), and with parents.

Newsgroups: This is another type of discussion group found on the internet. A newgroup is devoted to the discussion of a specific topic and operates like a bulletin board. Members post and read messages at the newsgroup site, rather than having messages sent to their mail boxes, as with list serves.

Chat Rooms and Instant Messaging: Chat allows users on the internet to communicate with each other by typing in real time, and the messages will appear on the users’ monitors. Chat rooms usually have a topical focus.

Content provision: Educational and informational content can be provided on websites of educational institutions and organisations, or within an institution’s learning management system. For example, see <http://www.out.ac.tz> and <http://elms.out.ac.tz>.

2.2.2 Search Strategies for Educational Resources on the Internet

Given the vast resources available on the internet and its decentralised nature, searching or surfing for information can be a frustrating task. Accessing relevant information is an important and essential skill when using of internet.

The internet itself offers several search tools and applications that can assist a user to look for a particular document or particular information on a given topic (Monereo et al, 2000).

Search Engines: These are systems that can search the web using software robots/programs, read the entire text of the sites on the web, index them based on occurrence of the key words for each site, and enter them in a database. Table 1 summarises some of the popular search engines.

Activity 4 below provides some guidance and practice in searching efficiently for useful resources using the Power Searching with [Google](#) course.

Table 1. Examples of Internet Search Engines

Name & website	Notes / description
Google https://www.google.com (includes other useful, related tools, such as Scholar, Images, Translate, Maps, Photos, and so on)	Rated Top Search and Research Tool on Top 100 Tools for Learning , with Google Scholar rated 3rd. (Jane Hart, 2016)
Bing https://www.bing.com (includes other useful, related tools, such as Images, Maps, and	Owned by Microsoft .



so on)	
Yahoo https://www.yahoo.com	Globally known for its Web portal , search engine , and related services.
Duck Duck Go https://duckduckgo.com	Emphasises getting information from the best sources, rather than the most sources.
Ask Eric https://eric.ed.gov/	Known as one of the question and answer sites responsible for answering billions of user questions over the last 20 years.
Dogpile https://www.dogpile.com	A metasearch engine for information on the World Wide Web that fetches results from Google , Yahoo! and Yandex , and several other popular search engines , including those focusing on audio and video content.
Yandex https://www.yandex.com	Ranked as the fourth-largest search engine worldwide, based on information from Comscore.com .

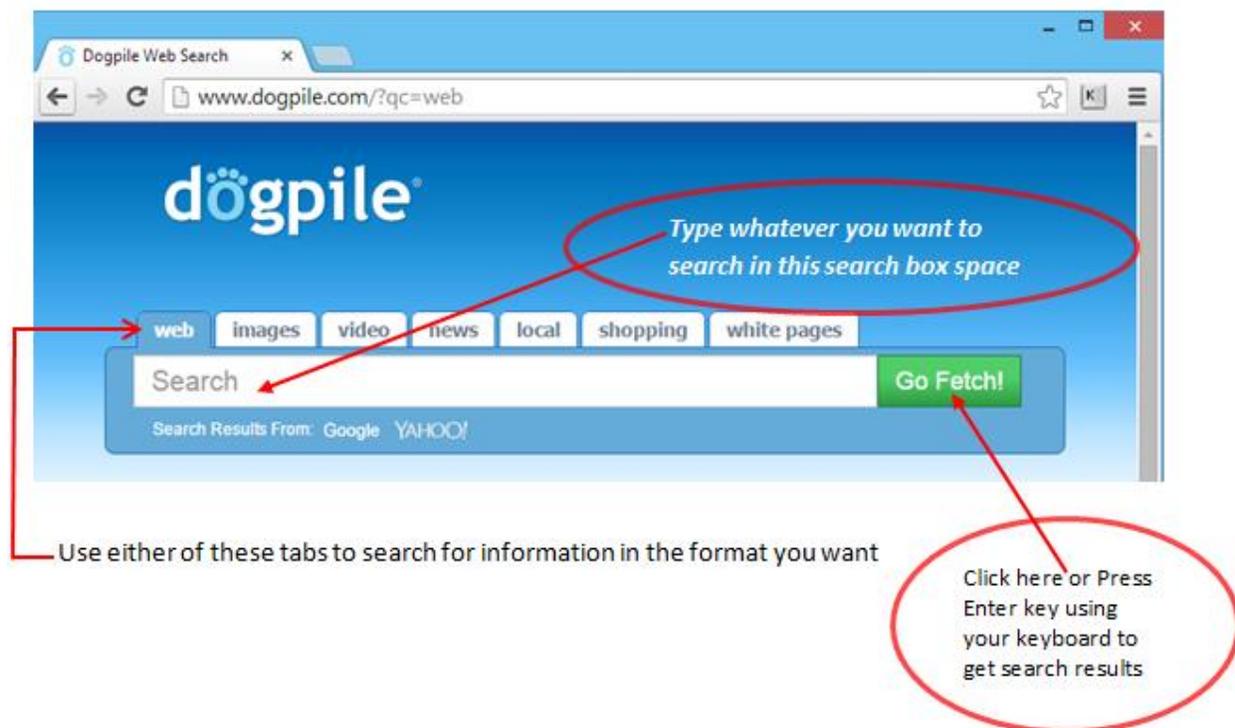


Figure 5: Dogpile search engine interface
 Source: Screenshot taken from Dogpile official website

The abundance and relevance of search results will depend on the approach used to search for information. Some important tips to note when searching for information using search engines:

- Using keywords is an effective way of searching information;
- Try to be specific with your searches;
- Make sure you spell the keywords correctly; and
- Try more than one search engine. Different search engines may come up with different results, so it makes sense to use more than one until you find the information that suits your purpose.

Activity 4: Online Searching Course: Power Searching with Google.

	<p>Aim: To assist in efficient searching and locating resources on the web.</p> <p>Motivation: Improve your searching skills for teaching, learning, and research.</p> <p>Task: Take the Power Searching with Google course.</p> <p>Duration: 45 minutes</p> <p>Tools: Discussion forum</p> <p>Resources: Power Searching with Google course</p> <p>What to do:</p> <ul style="list-style-type: none">● We highly recommend completing classes one and three from the Power Searching with Google course at this stage.● We suggest that you complete the remaining lessons in your own time.● Make notes on any particular techniques that you discover and think will be immediately useful to you. <p>How:</p> <ul style="list-style-type: none">● Contribute your notes to the discussion forum.● Write the useful technique discovered as your subject header, so that we can develop themed discussions. <p>Feedback/Response: (peer review)</p> <ul style="list-style-type: none">● Read and respond constructively to at least one other person's contribution.● Read the other people's responses to your own contribution. <p>Assessment:</p> <ul style="list-style-type: none">● Completing this activity will count towards your course portfolio.● If you complete the entire Google course, you will receive a certificate from Google that you can add to your portfolio.
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Activity 5: Practice efficient searching

	<p>Aim: To assist in efficiently locating resources to be used in your academic activities.</p> <p>Motivation: To use your new skills in power searching (Activity 4) to find a scholarly article on a specific theme.</p> <p>Task: Search for and locate a specific resource, as described below.</p> <p>Duration: 45 minutes</p> <p>Tools: Internet; search engine; Web browser.</p> <p>Resource: Power Search with Google course skills explored in Activity 4.</p> <p>What to do:</p> <ul style="list-style-type: none">● Find a resource that emphasises the importance, challenges, and drawbacks of using ICT for visual impaired students in higher education institutions; OR● Identify a particular area of research where you need to find a useful article, and undertake a search using appropriate keywords.● Make a note of your challenges in locating the suitable article/s, and record the URL of the article/s you have located. <p>How:</p> <ul style="list-style-type: none">● Use the resources, techniques, and searching skills you accessed and learnt in the Power Searching with Google course.● Use the Google Scholar search facility to find downloadable article/s of interest to you.● Contribute your notes by posting to the discussion forum. <p>Feedback/Response: (peer review)</p> <ul style="list-style-type: none">● Read and respond constructively to at least one other person's contribution.● Read the other people's responses to your own contribution. <p>Assessment:</p> <ul style="list-style-type: none">● Completing this activity will count towards your course portfolio.
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2.3 Web 2.0 applications for learning

Web 2.0 technologies can be used in learning institutions to improve knowledge sharing, collaboration, communication, and opportunities to access more information and knowledge. For example, you can use a wiki tool for developing shared content by several participants. A blog can be used for learners and teachers to share experiences. Tools such as social bookmarking or Facebook can be used to exchange information, photos, video, audio, and multimedia content.

Web 2.0 allows the sharing of and collaboration on information or content online. It represents the transition from static pages to dynamic pages with applications that allows user to create, share, and collaborate on online contents (O'Reilly, 2009). Examples of web 2.0 include social

networking sites such as Facebook and Twitter; video sharing sites, such as YouTube; blogs; wikis; and more.

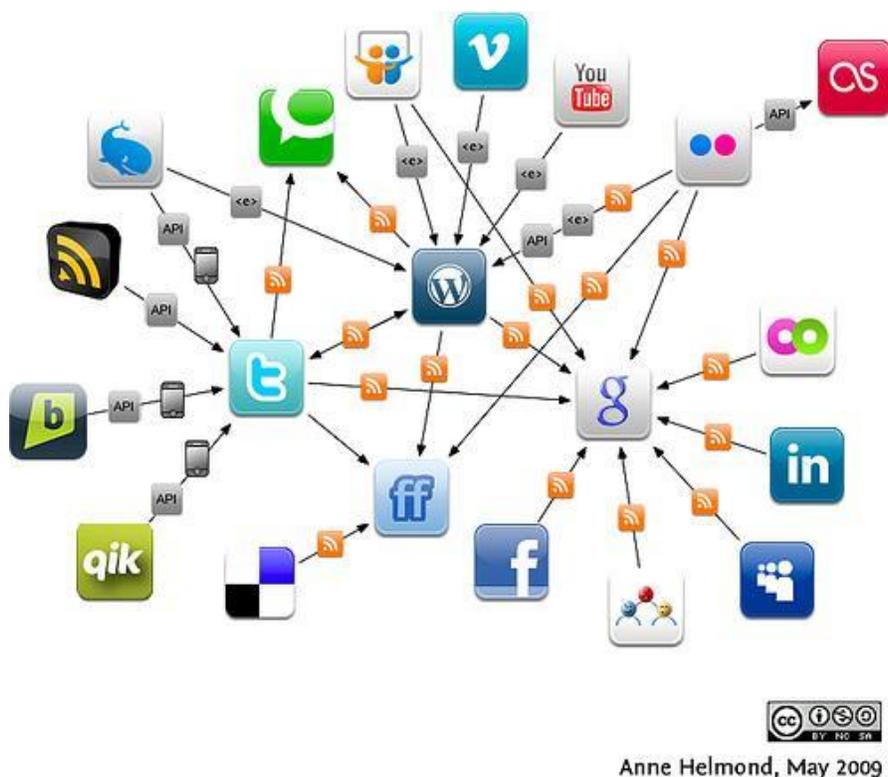


Figure 6: Data flows within personal social media landscape

Source: Helmond (2009) CC BY NC SA

2.3.1 Blogging

A blog is sometimes referred to as an online personal journal. It is a site designated for an individual to write about his/her daily experiences, and often aims to elicit thoughts or comments from readers. Blogs are also used by organisations to convey information in an informal and timely manner. The term is a shortened form of weblog. Authoring a blog, maintaining a blog, or adding content to an existing blog is referred to as blogging.

A blog is similar to an empty book: it is how we use the book that turns it into something. This book can be anything we want it to be, from a sketchbook, a diary, or a dictionary to a writing portfolio: it depends on the content that we put into this book. Individual articles on a blog are referred to as blog posts, posts, or entries, and the person who created the blog post is often called a blogger (Consortium, 2015).



Blogs offer the ability to archive content that is posted by date. The commenting feature of blogs allow for immediate feedback on a posting. Content that can be posted to a blog can be text, images, files, audio, and video. Publishing posts to an intranet or the internet can be done quickly and easily. (D’Souza, 2007)

Examples of web 2.0 blogging tools are [Blogger](#) and [WordPress](#). For teaching and learning purposes, blogs:

- can be used for discussions: you can comment on the posted topic;
- allow you to search for and access relevant learning information;
- provide information on news or events; and
- can be used to reflect on your own ideas, experiences, and expertise on a given topic.

Please also take some time to look through the resource [Keeping up-to-date using Blogs](#) from OU UK (2016b).

2.3.2 Social Bookmarking

Social bookmarking is the way of storing your bookmarks (your favourite websites) to the web, but not on a web browser. You can easily share your social bookmarks online with others through tagging. Social bookmarks include description keywords called “tags”, which can be easily found by users of the social-bookmarking site when they search for the same keywords. Users can make their bookmarks public for others to find, or private, and share them only with certain people. You can add your bookmarks by registering on a social bookmarking site (Lomas, 2009).

Free-to-use social bookmarking applications include [Diigo](#) and [Pinterest](#). You can keep track of several sites on a topic or theme, search for the most popular or recently added tags, and make connections with other users on just about any topic.

In teaching and learning, social bookmarking allows users to:

- form a group based on common interests, where you can share links;
- rate and review resources or information from other people;
- develop an online database of relevant materials;
- obtain information from other people’s tags on a similar concept; and
- create a group tag, through which you can share educational resources.

2.3.3 Wikis

A wiki is an application, typically a web application, which allows collaborative modification, extension, or deletion of its content and structure (Wikipedia, 2015a).



Wikis are similar to blogs in terms of structure and logic; however, this type of platform allows visitors to change the original posted material, unlike blogs, where only individual authors have the rights to edit, delete, and modify the contents. Wikis allow group collaboration and communication across the internet. Wiki pages have built-in web browser editing tools that allow you to edit and modify the web contents. Posted information can easily be seen by others, who can add their modifications or make corrections. The best-known example of a wiki is [Wikipedia](https://en.wikipedia.org/wiki/Main_Page), which is a user-generated encyclopaedia of information. Wikis can:

- be used to share information on topics;
- allow collaboration with others;
- allow your information to be improved upon by others; and
- offer relevant and useful information.



Figure 7: Example of a wiki.
Screenshot taken from the Wikipedia website.

2.3.4 RSS

RSS stands for Really Simple Syndication. RSS is XML-formatted text commonly used for distributing weblogs, news, or other content that is updated frequently. (Computer Hope, 2016). RSS can organise different web pages in one place, so you can receive updates of news and headlines without visiting each individual site. It provides the easiest way of following syndicated information to which you have subscribed. It gives user the flexibility of managing sites and receiving of information. You can receive sports headlines, politics, weather, business headlines, and any other of your favourite news or information on your computer in a simplified form.



There are a number of RSS feeds and other aggregator software that collect news from different sources and provides it to you via simple software. Two examples are Feed Reader (Windows) and Liferea (Linux). There are also RSS-enabled web-based feeds, for example, My Yahoo.

2.3.5 Social Networking

A social network is a web application that allows you to create a profile page and share web resources, such as photos, with other users with a common interest (Newrly et al, 2011). This [video](#) (1:34 minutes) (Common Craft, 2016) introduces you to the basics of social networking and its applications in the real world.

Social networking allows users to upload photos, music, and video to their social networking profile. It allows users with the same interests to become connected. Users can share their information in public for others to find and see. Social networking sites also allow you to control who you share your information with, or who may view it. On some social-networking sites you can set your profile to private and limit your information to a private network. Social networking contains a range of tools that offers different functions, among them [Facebook](#) and [Twitter](#), and:

- allows you to create connections, both professionally and personally;
- allows you to form or participate in a shared community with a common educational interest;
- allows communication with your colleagues. You can discuss and exchange ideas, and support each other on topics of interest; and
- can be used by institutions to provide information, for example, announcing offers and services.

2.3.6 Google Drive in learning

[Google Forms](#), as well as Google Docs, Sheets, and Slides, provide access to a free, [web-based word processor](#), a [spreadsheet](#) program, and a presentation program, respectively. They are all part of an office-type suite offered by [Google](#), within its [Google Drive](#) service. This suite of programs allows users to store, create and edit documents online, while collaborating with other users live. Google provides this service free for its users, and it has been adopted for use as a learning tool. [Using Google Forms](#), teachers or student can very easily, and without the need for any advanced technology knowledge, create and analyse all kinds of online survey forms, from contact forms to quizzes and polls. (Educatorstechnology, 2015)

Activity 6: Using Google forms



	<p>Aim: To experience a Web 2.0 tool by using Google Forms.</p> <p>Motivation: Learn how to use a useful Web 2.0 tool as a participant.</p> <p>Task: Respond to a Web 2.0 and social networking quiz online that was set up using Google Forms.</p> <p>Duration: 30 minutes.</p> <p>Tools: Internet; web browser; discussion forum.</p> <p>Resources: Web 2.0 and Social Networking Quiz</p> <p>What to do: Complete the online quiz.</p> <p>How:</p> <ul style="list-style-type: none">• Access the quiz by clicking on the link provided.• Contribute your results by posting to the forum. <p>Feedback/Response: (automated)</p> <ul style="list-style-type: none">• The quiz will provide you with automated feedback. <p>Assessment:</p> <ul style="list-style-type: none">• Completing this activity will count towards your course portfolio.
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2.4 Internet Ethics and Security

In computer security, a threat is a possible danger that might exploit a vulnerability to breach security and thus cause possible harm. A threat can be either “intentional” (that is intelligent, for example, an individual hacker or a criminal organisation) or “accidental” (for example, the possibility of a computer malfunctioning, or the possibility of a natural disaster, such as an earthquake, a fire, or a tornado) or otherwise a circumstance, capability, action, or event. (Matwyshyn et al, 2010). Password protection is an essential way to ensure security of your information. That is, it is good practice to change your password regularly, and never share it with any other person under an circumstances. For example, using a combination of letters, numbers, and special characters, improves the strength of a password. See more on [Computer Security](#) from the Houston Library (2014), and then take the [Computer Security Quiz](#).

Ethical rules for computer users: Some of the rules that individuals should follow while using a computer are listed below: (Infosecawareness, 2015) (Wikipedia, 2015b)

- Do not use computers to harm other users.
- Do not use computers to steal others’ information.
- Do not access files without the permission of the owner.
- Do not copy or use copyrighted software without the author’s permission.

- Always respect copyright laws and policies.
- Respect the privacy of others, just as you would expect the same from others.
- Do not use other users' computer resources without their permission.
- Lay a complaint about illegal communication and activities, should they occur, to Internet Service Providers and local law enforcement authorities.
- Users are responsible for safeguarding their user ID and passwords. The password should not be obvious (for example, date of birth), and it should preferably not be written down in a location close to where your device is used.
- Users should not use computers to retrieve or modify the information of others, which may include password information, files, and so on.

You can find out more about internet ethics and security in Digital Fluency Module 4: Academic Integrity in a Digital Age.

Reflection

Please use the Moodle course blog facility to reflect on your experiences and engagement with this week's topic. (15 minutes)

Summary

	<p>In this topic, we have looked at the fundamentals of internet tools, how they can be used on daily basis for research, the impact of social networks, and some guidelines for ethical behaviour and security awareness online. We have seen how email can be used for electronic messaging via the internet with people globally and how to use the internet for communicating for research purposes.</p> <p>We have also discussed the ways a user can join discussion groups, newsgroups, or chat rooms on the internet to meet people with similar interests. In addition, we have addressed how web 2.0 technologies can be used in education, and, furthermore, the way computers can be used to access the internet using specific equipment and programs to get connected.</p>
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Review Questions

	<ol style="list-style-type: none">1. Outline the importance of using the internet, along with its disadvantages in an academic setting.2. What is the effect of social networks and the internet in teaching and learning?3. List at least three actions you can take to protect your information and computing device against threats.
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Topic 3: Virtual Learning Environments

Introduction

Following the emergence of the internet in the early 1990s, many new tools and products have been developed to exploit its benefits fully. Since the mid-1990s, education community software products called Virtual Learning Environments (VLEs) or Learning Management Systems (LMS) have been developed, with the aim of supporting learning and teaching activities across the internet (Ramsden, 2014).

Commercial VLEs currently used in education include Blackboard (proprietary) and Moodle and SAKAI (both open source). Most of these systems are intended not simply to reproduce the classroom environment online, but to use the technology to provide learners with tools to facilitate their learning (O’Leary, 2002). These systems aim to accommodate a wider range of learning styles and goals, to encourage collaborative and resource-based learning, and to allow greater sharing and re-use of resources.

Topic 3 Learning Objectives

	<p>At the end of this topic, the learner should be able to:</p> <ul style="list-style-type: none">● Identify and describe common features of Virtual Learning Environments;● Identify social features in Virtual Learning Environments; and● Use a Virtual Learning Environment for teaching and learning.
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3.1 Basics of Virtual Learning Environment

Virtual Learning Environments (VLEs) can be explained as a type of information system that synthesises the functionality of computer-mediated communications software (email, bulletin boards, newsgroups), providing course materials to students via the web, and active learning.

These systems can also be called Learning Management System (LMS); Course Management System (CMS); Learning Content Management System (LCMS); Managed Learning Environment (MLE); Learning Support System (LSS); Learning Platforms (LP); and Digital Learning Environments (DLE).

A VLE includes assessment, student tracking, resource provision, links to outside resources, and collaboration and communication tools. They can be accessed both on and off campus, meaning that they can support students’ learning outside the lecture hall, 24 hours a day, seven days a week. This enables institutions to teach not only traditional full-time students, but also those who cannot regularly visit the campus due to geographic or time restrictions, for example, those on distance learning courses, taking evening classes, or workers studying part-time. In general, VLE



users are assigned either a teacher ID or a student ID. The teacher sees what a student sees, but the teacher has additional user rights to create or modify curriculum content and track student performance.

3.1.1 Advantages and disadvantages of using Virtual Learning Environments

As with any other technology used in teaching and learning, VLEs act as hosts, and have no intrinsic educational value in themselves, other than providing enabling functionality. The way in which online courses and online activities are designed and delivered can add value and increase effectiveness. Table 3 shows some common perceived advantages and disadvantages of using Virtual Learning Environments.

Table 2. Advantages and Disadvantages of using a VLE.

Source: O’Leary & Ramsden (2002)

Advantages	Disadvantages
Easy online delivery of materials.	Can become a “dumping ground” for materials not designed to be delivered online.
Easy to use for both students and lecturers.	Copyright and IPR of materials need to be considered.
Widens student access on and off campus to learning materials and resources.	Off campus access to hardware and networks can be problematic for both students and educators and raises issues of equality. Disability legislation and accessibility to online materials also need to be considered.
Offers flexible support for educators who do not need to be in a fixed time or place to support and communicate with students.	Need to plan online support carefully to avoid overload.
Has the potential for new ways of learning and teaching, such as active and independent learning, which make use of online communication, online assessment and collaborative learning.	Such independent learning still needs to be guided and supported. Appropriate training and ongoing support is still needed for both students and educators.



3.1.2 Comparison with traditional classrooms

Virtual classrooms or remote instructor training delivery is one of the fastest growing training modalities for education. Table 4 provides comparative information for traditional and virtual classrooms.

Table 3. Comparison with traditional classrooms.

Source: Jobanputra (2015)

Traditional classroom	Virtual classroom
Schedule is fixed and pre-decided. Students and teachers have little say in this decision.	Schedule can be flexible, according to the needs of both teacher and students.
Class duration is fixed and usually not extendable, as the next class waits to use the classroom.	Class duration is easily extendable, instructor and student time permitting.
While extra classes can be scheduled, they're often impractical and usually result in low attendance.	Schedule extra classes at a convenient time and study from the luxury of home.
Students can be a homogenous group, sharing overlapping social circles and customs.	Students can be a heterogeneous group, even global, with a variety of non-intersecting (and perhaps conflicting) social circles and customs.
Students typically fall within a similar age, profession, or academic background.	Student composition may vary greatly in age, profession, and academic background.
Classes are typically teacher-driven and teacher-centric.	Classes can be technology-driven and learner-centric, with the teacher as a facilitator. Teachers have better teaching tools to effectively engage learners. Virtual classrooms allow students more freedom to create, experiment, explore, and steer the class.
Traditional teaching tools are used, such as lecture notes, charts, blackboard writing, showing physical models, laboratory experiments, and so on.	Modern teaching tools are used, such as multimedia, animation, 3D modelling, and so on.
Learning environment can be dull, and fun in class is kept to a minimum to avoid disciplinary issues.	Learning environment can be stimulating and fun. Moderation tools allow the teacher to easily control the class, just in case things get out of hand!
Teacher and students collaborate in the physical classroom.	Teachers and students collaborate online via audio, video, and text chat.



It's hard to address the needs of different levels of learners in a single class. If there aren't additional resources available for particular groups, such as slower or gifted students, they often have to make do with a one-size-fits-all average class.	It's easier to work with different learner types. Divide a single virtual classroom into breakout sessions, and let students of different levels work at their own pace, while the teacher moderates and facilitates.
Usually one teacher per class. Difficult to bring in guest speakers due to physical and travel constraints	Easier to involve multiple teachers, and to bring in guest speakers from anywhere in the world
Class is held, and if you forget to note something down or can't attend, you've missed it.	Classes are recorded, including audio, video, and even the presentation screen. Students can review the instructor's exact explanation and methods, and administrators can review both the instructor's and students' performance.
Setting up classroom infrastructure is expensive.	A computer, a basic internet connection, a headphone, and a web camera (optional) are less expensive.
Buses, cars, and other travel methods have to be used to get students to and from school.	No travel costs. Teach and learn from anywhere.

Activity 7: Virtual Learning Environment systems

	<p>Aim: Identify the availability of a VLE available to you (for example, the Open University of Tanzania's Learning Management System, Moodle).</p> <p>Motivation: Make sure that you are aware of the existence or otherwise of a VLE at your institution.</p> <p>Task: Investigate the availability of a VLE/LMS at your institution.</p> <p>Duration: 45 minutes</p> <p>Tools: Google docs and Google forms.</p> <p>Resources:</p> <ul style="list-style-type: none"> • LMS / VLE Flow chart diagram <p>What to do:</p> <ul style="list-style-type: none"> • Identify a Learning Management System to use for this activity. • Study the flow chart diagram, and trace through it with your LMS in mind. • You can also answer the questions in the survey. • Make a note on challenges and drawbacks faced when using the Learning Management System in a course or module you teach. <p>How:</p>
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	<ul style="list-style-type: none"> • Contribute your notes by posting to the forum. <p>Feedback/Response: (peer review)</p> <ul style="list-style-type: none"> • Read and respond constructively to at least one other person’s contribution. • Read the other people’s responses to your own contribution. <p>Assessment:</p> <ul style="list-style-type: none"> • Completing this activity will count towards your course portfolio.
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3.2 Effective usage of Virtual Learning Environment

Virtual learning environment users are divided into two main classes: students and tutors/facilitators. While facilitators have a similar view of the system to students, they will usually have additional tools and privileges that allow them to add materials, create conferences, and track student progress (Ramsden, 2014).

Table 5 highlights how a VLE can be an important enabler of student-facilitator communication when implemented and used effectively in learning.

Table 4. The importance of implementing VLE systems in learning

Source: JISC (2013)

Encourage student-staff contact	A VLE can help contact between tutors and their students through its communication tools. Students can post messages at a time and place convenient to them. Tutors can set up a question and answer area on the discussion board (in some VLEs this could be anonymous), which tutors read and respond to on a regular basis.
Encourage co-operation among students	The discussion tools can be used to encourage student co-operation in small or large groups, face-to-face, or online. Areas can also be created in a VLE for students to share work. For example, groups of students can have a private area where they develop their group presentation. They may choose to work together face-to-face and then load their work onto the VLE for others, including the tutor, to review.
Encourage active learning	Through careful course design, focusing on student activities, you can encourage active learning. Before loading materials into the VLE, think about what you want the students to do and how these activities will help fulfil the learning outcomes. For example, if you want them to review a poem from World War 1, you would divide the class into groups and ask them to review the poem from different perspectives: from the reader’s, the poet’s, and the narrator’s. These discussions could all be housed in the VLE, with groups commenting on each other’s work.



Give prompt feedback	The assessment tools, including quizzes and the assessment DropBox, assist timely feedback. Quizzes can provide a wealth of feedback for students. Not only can students be immediately informed if their answers are correct, but quizzes can provide pointers to further study, hints and tips, and links to additional readings.
Use time for task	By using a VLE to link to library resources and online resources, students can spend time working through activities that you have developed, rather than searching through shelves and surfing the web. This means they focus on the task, rather than on sourcing the materials for the task.
Communicate high expectations	As the tutor, you can use a VLE to show what you expect of your students. With agreement from past students, you can use examples of their work to show the level of work that you expect and why.

Britain and Liber (n.d.) list the features and functionality of a VLE system as generally including a Noticeboard, Course Outline, Email, Conferencing Tools, Class List & Student Homepages, Metadata, Assignments, Assessments, Synchronous Collaboration Tools, Multimedia Resources, File Upload Area, Calendar, Search Tools, Bookmarking, and a Navigation Model. While these features are generally components of current architecture of VLEs, this may change in the future as the systems evolve.

Activity 8: Investigate the Features of an LMS / VLE / CMS

	<p>Aim: Become familiar with the features and criteria available within an LMS.</p> <p>Motivation: To assist in developing an understanding of the functionality of your VLE system.</p> <p>Task: Identify and explore the functionality within your VLE.</p> <p>Duration: 45 minutes</p> <p>Tools: Google docs, upload assignment, discussion forum.</p> <p>Resources:</p> <ul style="list-style-type: none"> • Features and Criteria of a CMS (EduTools, 2013) <p>What to do:</p> <ul style="list-style-type: none"> • Study the Edutools document provided. • Make a note of the categories and functions supported by your own LMSs. <p>How:</p> <ul style="list-style-type: none"> • Contribute your notes by uploading your file via the assignment link. • Your tutor will make the files available to the group. <p>Feedback/Response: (peer review)</p> <ul style="list-style-type: none"> • Read and respond constructively to at least one other person’s contribution.
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	<ul style="list-style-type: none"> • Read the other people’s responses to your own contribution. <p>Assessment: Completing this activity will count towards your course portfolio.</p>
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3.3 Example of a Virtual Learning Environment

Moodle, which is an acronym for modular object-oriented dynamic learning environment, is an example of an open-source Learning Management System that has gained traction at educational institutions as a learning platform for course development and management.

It is a [free and open-source software](#) system designed to provide educators, administrators, and learners with a single robust, secure, and integrated system to create personalised learning environments. It has customisable management features, and is used to create private websites with online courses for educators and trainers to achieve their learning goals.

The Open University of Tanzania (www.out.ac.tz) is an example of an institution that has adopted and customised Moodle as one of the major tools in providing online courses to its students. To learn more about tools and features available in the Moodle virtual learning platform click on this link: <https://docs.moodle.org/31/en/Features>.

Even though using a Learning Management System may be deemed desirable in the education sector, there are still several challenges to successful implementation. These may include reliable internet bandwidth availability, blended / online mode of provision, access to and availability of the LMS, availability of trained e-learning experts, and IT staff with expertise in maintaining and updating the LMS server.

Activity 9: Using Moodle in Teaching and Learning

	<p>Aim: To investigate the Moodle Learning Management System as a tool for teaching and learning.</p> <p>Motivation: Increase your awareness of the variety of opportunities offered by a VLE.</p> <p>Task: Practice using some of the functions in Moodle.</p> <p>Duration: 80 minutes</p> <p>Tools: Moodle VLE; discussion forum.</p> <p>Resources:</p> <ul style="list-style-type: none"> • Mount Orange School Moodle Demo site <p>What to do:</p> <ul style="list-style-type: none"> • Click on the above website and login as a teacher, as directed.
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	<ul style="list-style-type: none">• Undertake the setup of the two activities below in your teacher role.<ul style="list-style-type: none">◦ Set up a Discussion Forum to engage students with a particular topic.◦ Set an assignment and submission deadline for students to complete. <p>How:</p> <ul style="list-style-type: none">• Take a screenshot of each of your activities;• Attach the screenshot to a forum post; and• Describe the challenges you experienced. <p>Feedback/Response: (peer review)</p> <ul style="list-style-type: none">• Read and respond constructively to at least one other person's contribution.• Read the other people's responses to your own contribution. <p>Assessment:</p> <ul style="list-style-type: none">• Completing this activity will count towards your course portfolio.
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Reflection

Please use the Moodle course blog facility to reflect on your experiences and engagement with this week's topic. (15 minutes)

Summary

	<p>In this topic, we have looked at the basics of Virtual Learning Environments, their features, and how they can be used in education. We have seen that the systems can include student tracking, online support for both teacher and student, electronic communication (e-mail, threaded discussions, chat, web publishing), collaborative activities, engaging learning objects, and internet links to outside curriculum resources.</p> <p>We have also noted how Virtual Learning Environment users are divided into main classes that include students and tutors. Whilst tutors have a similar view of the system to students, they will usually have additional tools and privileges that allow them to add materials, create conferences, and track student progress.</p>
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Review Questions

	<ol style="list-style-type: none">1. Elaborate on the advantages and disadvantages of using a VLE for teaching and learning.2. Describe some of the common features of a VLE and their pedagogical purpose.
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References





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Topic 4: Multimedia Fundamentals

Introduction

Multimedia is described as a collection of elements that uses a variety of media to convey information. These elements can include text, audio, graphic, animation, video, and interactivity. The elements can be integrated to develop multimedia applications or products that use multiple media sources to present information in various fields including, art, education, entertainment, engineering, medicine, mathematics, business, and scientific research (Chikalimba-Gama, 2006). This topic equips participants with the ability to use multimedia-based computer tools to perform the task at hand.

Topic 4 Learning Objectives

	<p>At the end of this topic, the learner should be able to:</p> <ul style="list-style-type: none">● Identify multimedia elements and applications;● Create a simple multimedia application;● Insert multimedia files in presentations; and● Record and edit video files.
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4.1 Multimedia Elements

The major elements of multimedia include text, audio, graphics, video, and animation. Text and graphics are known as static multimedia elements, while audio, video and animation are dynamic multimedia elements. Interactivity is sometimes also considered as a multimedia element; an interactivity multimedia comprises a collection of media elements that are arranged either singly or together in a relationship that can be controlled by the user. As explained above, multimedia is used in various fields to present certain information. This topic focuses on one of the elements (animation) and identifies the way it can provide benefits in teaching and learning processes. Some elements are explained briefly, but to become proficient in creating animations, you will need to perform a specified task to complete this topic.

Text: Text is the basic element of multimedia. When using text in multimedia applications, you need to consider font size and general style. The source of text can be from a keyboard, speech input, optical character recognition, or data stored on disk.

Graphics: Graphics are created by the using objects such as lines, circles, polygons, arcs, and curves. Graphics are used to illustrate ideas via still pictures or photographic images.



Audio: Audio can be in the form of speech, music, and sound effects. Audio can be in an analogue or digital format. Analogue audio has a continuous signal, known as actual sound. To be used in multimedia, it has to be digitised via a process known as sampling.

Video: This technology comprises the capturing, recording, processing, transmitting, and editing of moving pictures. Of the all elements discussed above, video is the most demanding in terms of hardware and storage space. Transferring video files can take time if there is not enough bandwidth.

Animation: Animation is the process of creating the illusion of motion by constructing a consecutive display of static images. Digital animation can either be in 2Dimension (2D) or 3Dimension (3D).

4.2. Multimedia Applications in Education

Multimedia applications are used in several fields to convey information. Some of the common use of multimedia applications are in entertainment, education, medicine, business, and other fields. In terms of education, the animation element of multimedia can be integrated into instructions and simulations showing a process or path. A good example of the use of multimedia animation in education can be to present complex cases in medical education, enabling the learner can be taught to perform medical operations through simulation.

4.3. Multimedia Development Environments

Multimedia documents and applications create big files, and the computers used to create multimedia files need to have high processing power to deal with large amounts of data. A multimedia-capable file system is needed to deliver timeline information. Beyond these requirements, other elements to consider in relation to the hardware of a multimedia development platform include the operating system, peripherals, and ancillary storage.

The operating system used should be compatible with multimedia applications. The other peripheral and ancillary storage requirements are detailed below.

Capture devices: video camera, video recorder, audio microphone, keyboards and so on.

Storage devices: USB flash drives, hard disks, CD-ROMs, DVD-ROMs, and so on.

Communication networks: Local network, intranet, internet, fibre-optic network.

Computer systems: Multimedia desktop machine.

Display Devices: Quality speakers, HDTV, SVGA, hi-res monitors, colour printers, and so on.





The software used for creating interactive multimedia comprises both basic tools and authoring tools. Basic tools are software dealing with creating, editing, and playing various media files. Authoring tools are used to bring the various components together into an integrated format.

Basic tools include:

- Painting and drawing – For simple drawing and painting, Paint can be used. But for professional work use sophisticated tools, such as Fireworks, Freehand, Photoshop, Photoshop Elements, Illustrator, and Gimp.
- Image acquisition, editing, and optical character recognition (OCR) – scanners and digital cameras are tools that can be used.

[C4LPT](#) (2016) provides a list of the top 100 tools for education, and categorises them according to genre. Authoring tools enable you to create a final application by integrating multimedia elements, without any programming skills being required. Commonly used authoring tools include [Camtasia](#), [Articulate](#), [Adobe Captivate](#), and [iSpring](#), although all of these are commercial tools, they offer free trails to users. A free open source authoring tool [eXe](#) is also available.

Figure 8 depicts the categories of educational software, and identifies the tools in each category. These tools can be blended in single software as a package, or each used as an individual unit.

- Virtual Learning Environments (VLE) are a set of learning and teaching tools that facilitate the learning experience through digital devices and internet.
- Content Authoring is a software application used to create multimedia content for uploading onto the internet.
- The Assessment/Evaluation/Survey set of tools can be used to obtain feedback to improve the teaching and learning process.
- The Social Media category features tools that enhance communication and can be used to exchange knowledge, or for conferencing, social events, and so on.

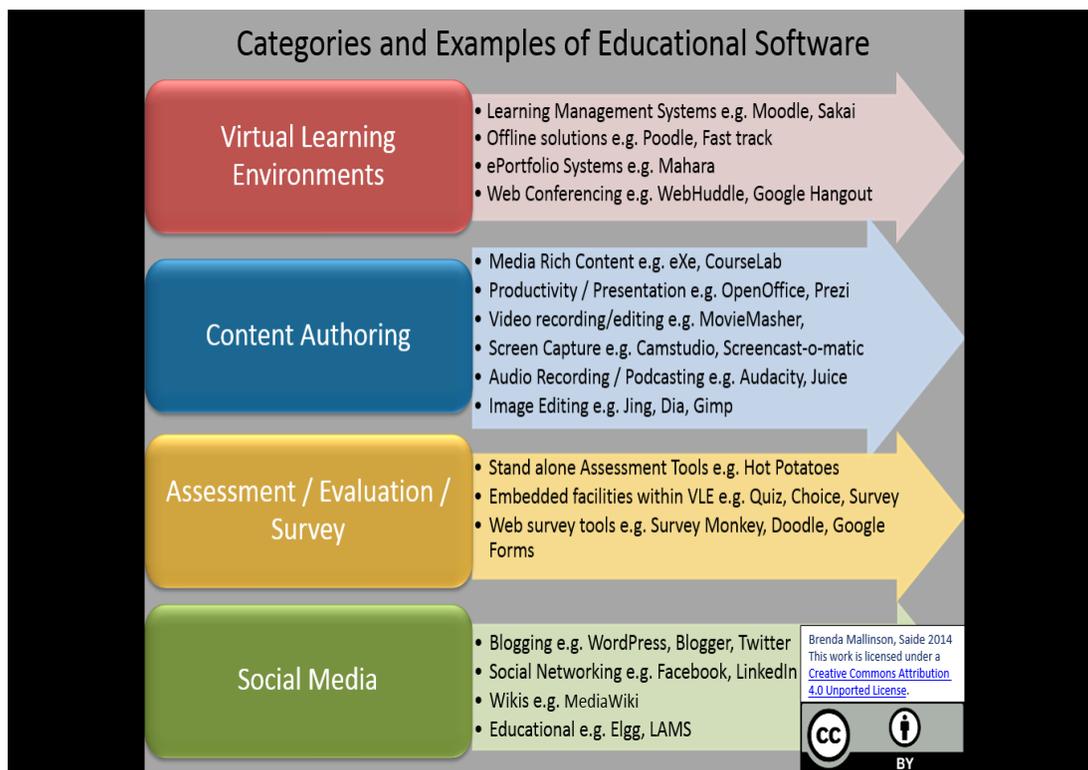


Figure 8: Categories of Educational Software

Source: Mallinson (2014)

4.4. Basic Multimedia Production

This section describes the basic production techniques, media selection, equipment characteristics, general requirements, and steps needed to design multimedia document.

The individual needs to be able to use basic applications such as a word processor (including tools such as colour, fonts, and so on), web browser, simple graphic tools, e-mail, and equipment such as a camera (able to take professional pictures).

Hardware devices with the capacity to capture multimedia elements, including text, audio, graphics, video, and animation, are also needed.

Activity 10: Multimedia fundamentals

	<p>Aim: To learn techniques to embed video and animate PowerPoint presentations.</p> <p>Motivation: Become familiar with embedding video in PowerPoint presentations, as well as with the techniques used to animate slides.</p>
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<p>Task: Work with various media to enhance your presentation.</p> <p>Duration: 2.5 hours (150 minutes)</p> <p>Tools: MS PowerPoint (or any other presentation software); video clip.</p> <p>Resources:</p> <ul style="list-style-type: none">• How to Embed Video in PowerPoint (WikiHow, n.d.)• How to Add Animation Effects in Microsoft PowerPoint (Lowe, n.d.)• How to Record Voice Narration in your PowerPoint (Weverka, n.d.) <p>What to do:</p> <ul style="list-style-type: none">• Study the guiding resources provided.• Select one of your existing Power point files.• Select a video online and follow the steps to embed it in the presentation.• Identify an object to animate within your slides.• Follow the steps to animate the object.• Then record a voice narration for your presentation.• Make a note of successes and challenges experienced. <p>How:</p> <ul style="list-style-type: none">• Share your slides by attaching the file to your post in the discussion forum.• In the body of your post, share your notes on your experience. <p>Feedback/Response: (peer review)</p> <ul style="list-style-type: none">• Read and respond constructively to at least one other person’s contribution.• Read the other people’s responses to your own contribution, and improve your slides accordingly. <p>Assessment:</p> <ul style="list-style-type: none">• Completing this activity will count towards your course portfolio.
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Reflection

Please use the Moodle course blog facility to reflect on your experiences and engagement with this week’s topic. (15 minutes)

Summary

	<p>In this topic, we introduced you with multimedia technology, and discussed the hardware and software used to develop the multimedia applications. Then we introduced you to the basic tools used to draw, edit, and so on, as well as authoring tools that enable you to create a final application by integrating multimedia elements. We also explored resources that can be used to develop a simple multimedia document. Overall, we explored how multimedia applications can be deployed in the teaching and learning process.</p>
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Review Questions

	<ol style="list-style-type: none">1. Define the word “multimedia”.2. Identify at least two fields where multimedia applications are most likely to be used, and explain how and why.3. Explain how you can animate an image, with step-by-step instructions.
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References

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Topic 5: Digital Editing

Introduction

For material to be fit for your academic purpose, some editing of digital resources in a variety of formats may be necessary. When using the term “editing” in the digital content, the process involves the editing software environment, software tools, and particular techniques. Knowledge of and expertise in digital editing is essential in various fields, including education, entertainment, business, and advertising. In this topic, you will explore digital editing for educational purposes, as well as some editing tools commonly used in academia.

Topic 5 Learning Objectives

	At the end of this topic, the learner should be able to: <ul style="list-style-type: none">● Identify common digital editors and their environments; and● Demonstrate digital editing ability using a variety of media.
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5.1 Digital Editing Overview

While being a digital editor can be an area of expertise specific to a particular format, some basic general digital editing skills are useful for everyone working in education. Editing work can require working on digital text, video, audio, graphics, or images. Once the information (text, audio, video, or images) is captured, is it uploaded onto a computer or any capable digital device and is ready to be edited using digital-editing software.

5.2 Digital Content and Media

Digital content is defined as data or information products supplied in digital format. Sometimes it is defined as information, resources, or learning objects available for download or distribution via electronic media, such as email, mp3s, software, streamed films, e-books, online games, and apps (Shefford, 2014). In this topic, digital content is categorised as elements (files) that can be digitally presented in form of text, video, animation, images, and graphics. Zazzle Media (2016) shares of list of [101 Types of Digital content](#) that can be used for purposes such as entertainment, education, persuasion, and conversion. Many media available in one format can be converted to another format if the software allows it. For example, later version of MS Word can now open Adobe PDF documents, and MS Word documents can be saved as PDFs.

5.3 Digital editing tools



Digital content can be created, edited, or modified by using software tools (applications), known as digital editors. The purpose of editing in the academic field is to present selected information in a specific format for teaching and learning purposes. Table 5 depicts some of the various digital content / media types, capturing tools, editing tools, and the environment in which editing can be performed.

Digital editors are software that are used to edit digital content; the task is performed via your computing or smartphone device. Some devices use touch screens instead of keyboards. Most of the recent portable devices, such as tablets and smartphones, use touch screens, keyboards, and intelligent digital pens (stylus), for working with editing software. Most of the high-end software with advanced features are commercially available, at a cost. However, free-to-use digital editors, such as Windows Movie Video, provide similar functionality to commercial editors.

Table 5: Content types and their related editing features, tools, and environment

Type of Content	Editing Actions	Editing Features	Capturing Tools	Editing tools and Environment
Text	The process of entering and manipulating text, saving, formatting, etc in a digital text file.	Layout, styles, referencing, font size, type, and colour, grammar and spell checking, comparing file versions.	Keyboard Mouse Touch screen Stylus Scanning (OCW - optical character recognition)	Word processor, capturing tool/s, display screen or monitor, scanner, printer, and operating system.
Video	The process of rearranging, adding, and/or removing sections of video clips, and/or associated audio. Applying filters, colour correction, and so on.	Trim, cut, delete parts of a scene, add titles, add transitions between clips, add subtitles, and add special effects.	Digital camera, web cam, or smartphone.	Final Cut Pro and Adobe Premier Pro - both full professional commercial products. Windows Movie Maker and other free-to-use products associated with standard devices and/or operating systems. Free screen capture tools such as Screencast-o-matic.
Images	The process of manipulating an image by either resizing, adjusting colouring, cropping, or altering as desired.	Resize, crop, rotate, change resolution.	Digital camera, web cam, or smartphone. Online web-based tools.	Paint (comes free with Windows), other free and easy to use tools available, such as Pow Toon and Make Belief Comix.
	The process of	Improving audio	Microsoft Sound	Audacity; speakers,





Audio	manipulating audio to alter speed, length, volume, and so on.	quality, cutting segments, and so on.	Recorder and free apps available for your smartphone.	microphone. Free to use tools, such as Voci.
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Activity 11: Editing Digital Text

	<p>Aim: Create and edit a text file.</p> <p>Motivation: Enhance your knowledge of text editing to produce high quality documents.</p> <p>Task: Learn to touch type and practice text editing.</p> <p>Duration: One hour (60 minutes)</p> <p>Tools: Word processor; the internet; assignment upload.</p> <p>Resources:</p> <ul style="list-style-type: none">• Your own word processor or text editor (e.g. MS Word or Open Office Word)• Basic Word Processing Skills (CTDLC, 2016) CC BY ND• Typing Lessons (typing.com, n.d.) – requires registration <p>What to do:</p> <ul style="list-style-type: none">• Work through the word-processing lesson provided as a resource (45 minutes).• Practice typing using all your fingers using the free typing lessons.• Open your word processor, create a new document, add text and format it, as per instructions below. <p>How:</p> <ul style="list-style-type: none">• In your new text document, type your name and press enter.• Type a heading “My Editing Experience”, followed by two paragraphs describing any previous or desired editing experience (+-100 words).• Highlight the title with a yellow marker.• Change the font size of the title to 12, then make it bold and underlined.• Indent the first line of each paragraph and double space the text.• Insert a page number in the bottom right corner of your document.• Add a border to your document.• Save and upload your document in this assignment within the LMS. <p>Feedback/Response:</p> <ul style="list-style-type: none">• You will receive individual feedback from your tutor. <p>Assessment:</p> <ul style="list-style-type: none">• Completing this activity will count towards your course portfolio.
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5.4 Content Development Tools

On an annual basis, C4LPT (2016) rates lists of software tools used for learning. One such list on the site is [Top 100 tools for Education](#) including both proprietary and free-to-use tools. In particular, the [Best of breed](#) sections on instructional content development tools and course authoring tools list an interesting variety of useful digital tools to explore for ease of use at low or no cost. Please explore these lists and identify useful tools for your own context.

Activity 12: Editing Digital Audio



Aim: Create and edit digital audio

Motivation: Develop the skills required to record lectures or podcasts, and edit the resulting audio file.

Task: Record and edit digital audio, and upload to the LMS.

Duration: 1.5 to 2 hours (90 to 120 minutes)

Tools: Discussion forum; microphone; speaker.

Resources:

- Microphone and speakers (built in or external)
- Audacity software: <http://audacity.sourceforge.net/>
- Audacity guides:
 - http://www.library.kent.edu/files/SMS_Audacity_Basics.pdf
 - <http://ctl.jhsph.edu/help/views/tutorials/audacity/GuideToUsingAudacity.pdf>

What to do:

- Download and install the Audacity software on your computing device OR if you have a smartphone, download an audio recording app.
- Set up your mic (built in or external) for recording, (ask IT support if you are having difficulties with this).
- Read your editing experiences written in Activity 4 out loud, making sure that your device is recording. Listen to your recorded audio.
- Edit your recording using Audacity, trimming unwanted portions, and reducing outside noise.
- Save the file as an mp3.

How:

- Learn how to use Audacity by working through the web resources provided above.
- Create the audio as described above.
- Post your audio file to the discussion forum.
- In your post, share your challenges in undertaking this task.

Feedback/Response: (peer review)

- Read and respond constructively to at least one other person's contribution.
- Read the other people's responses to your own contribution, taking note of possible improvements to your audio.

Assessment:

- Completing this activity will count towards your course portfolio.

Reflection

Please use the Moodle course blog facility to reflect on your experiences and engagement with this week's topic. (15 minutes)

Summary

	<p>In this topic, you have learned some basics of digital editing. The topic starts by identifying the components of digital contents. The topic highlights that content-editing skills need to be developed to ensure work is of a high academic quality. Content needs to be edited on a digital device that has the relevant software installed. Editing software can be manipulated via different technologies, for example, a keyboard and mouse, touch screen, or stylus.</p>
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Review Questions

	<ol style="list-style-type: none">1. Describe the term “editing” in a digital context.2. Explain the purposes of digital editing in the academic arena.3. List the different types of digital content and explain how each can be captured.4. Describe the different tools you would use to edit text, images, or video files.
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References

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Glossary of Terms

Asynchronous conferencing: This term is used in computer-mediated communication to describe technologies where there is a delay in interaction between contributors. Source: Wikipedia, (2016). Asynchronous conferencing. Retrieved from https://en.wikipedia.org/wiki/Asynchronous_conferencing

Bandwidth: Tim Fisher defines bandwidth as the volume of information per unit of time that a transmission medium, such as an internet, connection can handle. Source: Fisher, T (2013). What is Bandwidth. Retrieved from <https://www.lifewire.com/what-is-bandwidth-2625809>

Digital technologies: These are electronic tools, systems, devices and resources that generate, store, or process data. These include social media, online games and applications, multimedia, productivity applications, cloud computing, interoperable systems, and mobile devices. Source: State Government of Victoria, Australia. (2017). Victoria, Education and Training (2017). Teaching with Digital Technologies. Retrieved from <http://www.education.vic.gov.au/school/teachers/support/Pages/elearningcurriculum.aspx>

Moodle: Stands for Modular Object Oriented Dynamic Learning Environment. It is an open source learning platform or course management system, used to provide an organised interface for learning over the internet. Source: TechTerms. (2017). Moodle. Retrieved from <https://techterms.com/definition/moodle>

Information processing: Refers to as the acquisition, recording, organisation, retrieval, display, and dissemination of information. In recent years, the term has often been applied to computer-based operations specifically. Source: Slamecka, V. (2017). Information processing. Retrieved from <https://www.britannica.com/topic/information-processing>

Robot: A reprogrammable, multifunctional manipulator designed to move material, parts, tools, or specialised devices through various programmed motions for the performance of a variety of tasks. Source: Kapila, V. (2013). Introduction to Robotics. Retrieved from <http://engineering.nyu.edu/mechatronics/smart/pdf/Intro2Robotics.pdf>

Virtual Learning Environments: A Virtual Learning Environment (VLE) is a system for delivering learning materials to students through the web. These systems include assessment, student tracking, collaboration, and communication tools. They can be accessed both on and off-campus, meaning that they can support students' learning outside the lecture hall 24 hours a day, seven days a week. Source: Oxford University Press. (2016). Learn about Virtual Learning Environment/Course Management System content. Retrieved from <http://global.oup.com/uk/orc/learnvle/>

WiFi: Wireless Fidelity – generally referring to a Wireless Local Area Network (WLAN). Originally designed for cable replacement, now used widely. Varma, V.K. (2012). Wireless Fidelity. Retrieved from <https://www.ieee.org/about/technologies/emerging/wifi.pdf>

