OPEN UNIVERSITY OF TANZANIA (OUT)

Digital Fluency Course

Module 3: Learning Design and Development
for Online/Blended Provision

This is the third 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 to increase confidence and competence in selecting and using appropriate digital technologies in an informed and 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 help 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 offline, to support your teaching and learning, research, and academic administrative duties. We believe that our 5 modules (Digital Fundamentals, Working with Open Educational Resources (OER), 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 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, such as embedding and/or informing related policies, strategies, and practices at your institution and beyond.

Course Code: ODF 001
Course Name: Academic Digital Fluency
Module Number: 3
Module Name: Learning Design and Development for Online / Blended Provision

Module Description

The learning-design module will expose you to a curriculum approach that integrates diverse learning principles, theories, and methodologies to enable you to design effective learning environments to achieve your intended learning outcomes. Learning design is a crucial element in the teaching and learning process, as the approach provides guidance and support using pedagogical strategies and techniques that motivate, engage, and excite learners.

This module explores five topics. The first topic addresses models, frameworks, and elements of learning design and development, focusing mainly on the 7Cs of learning design framework and the generic ADDIE model. The second topic, designing for learning, explains how you can design interactive and motivational activities and assessments, develop content for your online courses, and provide support and guidance for online learners. The third topic concentrates on matching technological tools to pedagogical purposes. The fourth topic explores modes of delivery in an online-learning environment. The fifth and final topic introduces the concept and benefits of learning analytics. It highlights the importance of maximising the effectiveness of the learning process by analysing data produced by the student during the online course and responding accordingly.

Module Learning Objectives

	On completing this module, learners are expected to have developed skills and knowledge related to: • identifying various models that can be integrated in learning design; • applying a framework for learning design, and creating interactive and motivational learning designs, including assessment and evaluation; • exploring trends and ICT tools that can be used to support appropriate learning design and developing content suitable for effective learning; • structuring various online learning-delivery modes appropriate for the teaching and learning context; and • describing the purpose and application of learning analytics.

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	Models, frameworks, and processes	VLE; discussion forum; spreadsheet; web hyperlinks.	At least 6 hours' engagement over a 1 week period.
2	Designing for learning	VLE; discussion forum; web hyperlinks, Linoit software (optional paper cards).	At least 6 hours' engagement over a 1 week period.
3	Digital learning development	VLE; discussion forum; web hyperlink; upload assignment.	At least 6 hours' engagement over a 1 week period.
	Consolidation Break (enables reflection and catch-up)		1 week
4	Modes of provision	VLE; web hyperlinks; download files; upload assignment.	At least 6 hours' engagement over a 1 week period.
5	Learning analytics	VLE; discussion forum; video web hyperlinks; upload assignment.	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 3 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 course 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.

Acknowledgements

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With support from:
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Brenda Mallinson, OER Africa / Saide.

Licensing

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

ADDIE	Analysis, Design, Development, Implementation, Evaluation - Model
AVU	African Virtual University
CC	Creative Commons
JISC	Joint Information Systems Committee
LA	Learning Analytics
LMS	Learning Management System
MIT	Massachusetts Institute of Technology
MOOC	Massive Open Online Course
OER	Open Educational Resources
OUT	Open University of Tanzania
Saide	South African Institute for Distance Education
UNESCO	United Nations Educational, Scientific and Cultural Organization
VLE	Virtual Learning Environment

Topic 1: Models, frameworks, and processes

Introduction

The process of designing learning for an online course involves several elements, including aspects of designing the learning pathway, materials, activities, assessment, and, ultimately, the quality of the work. There are instructional methodologies, frameworks, and models that have been developed because they offer systematic strategies and guidelines that inform the teaching and learning approach. There are several instructional and/or learning-design models in the educational field, including ASSURE, Dick and Carey, and the KEMP Design Model; however, in this topic only two of the contemporary models or frameworks will be discussed. The first of these is the 7Cs of Design and Delivery learning-design method developed by researchers at University of Leicester; the second commonly used model that will be explored is the ADDIE model. These two frameworks are focused on for specific reasons. Firstly, unlike many other learning-design methodologies, the 7Cs framework was developed to support online-learning environments. The ADDIE model, on the other hand, is a generic model that has been widely used and is easy to understand.

Topic 1 Learning Objectives

	At the end of this topic, the learner should be able to: - explain the concept of learning-design frameworks and models; - discuss the importance of applying learning-design frameworks and models; and - describe contemporary learning-design frameworks and models, including the 7Cs learning design framework and ADDIE.

1.1 The importance of Learning Design Frameworks

Instructional models and frameworks play a significant role in the learning process because they help bring about improved delivery of instruction, make the learning experience more meaningful, and ensure that information is presented in an appropriate style. When you apply a framework, it guides your work through planning issues, such as where to start with your course; assessing what learners need to learn; identifying the specific design process you will rely on; gauging your learners' understanding by creating relevant assessments; and, lastly, ensuring that you are producing a course of good quality. Learning models help us to understand how the learning process takes place for human beings. By using appropriate models in learning design, we can assist learners to learn successfully. The corollary is that learners do not learn well if learning design is informed by inappropriate models.

1.2 Types of instructional design models and frameworks

There are a variety of models of instructional design that are typically adopted for learning design. You can visit this website (http://www.instructionaldesign.org/models/) to learn more about different types of models. In this topic, however, only two will be discussed: the 7Cs of learning design framework, and the ADDIE model.

1.2.1 The 7Cs of learning design framework

This framework is called 7Cs because it comprises seven stages of learning design and development: conceptualising, capturing, creating, communicating, collaborating, considering, combining, and consolidating (Figure 1).
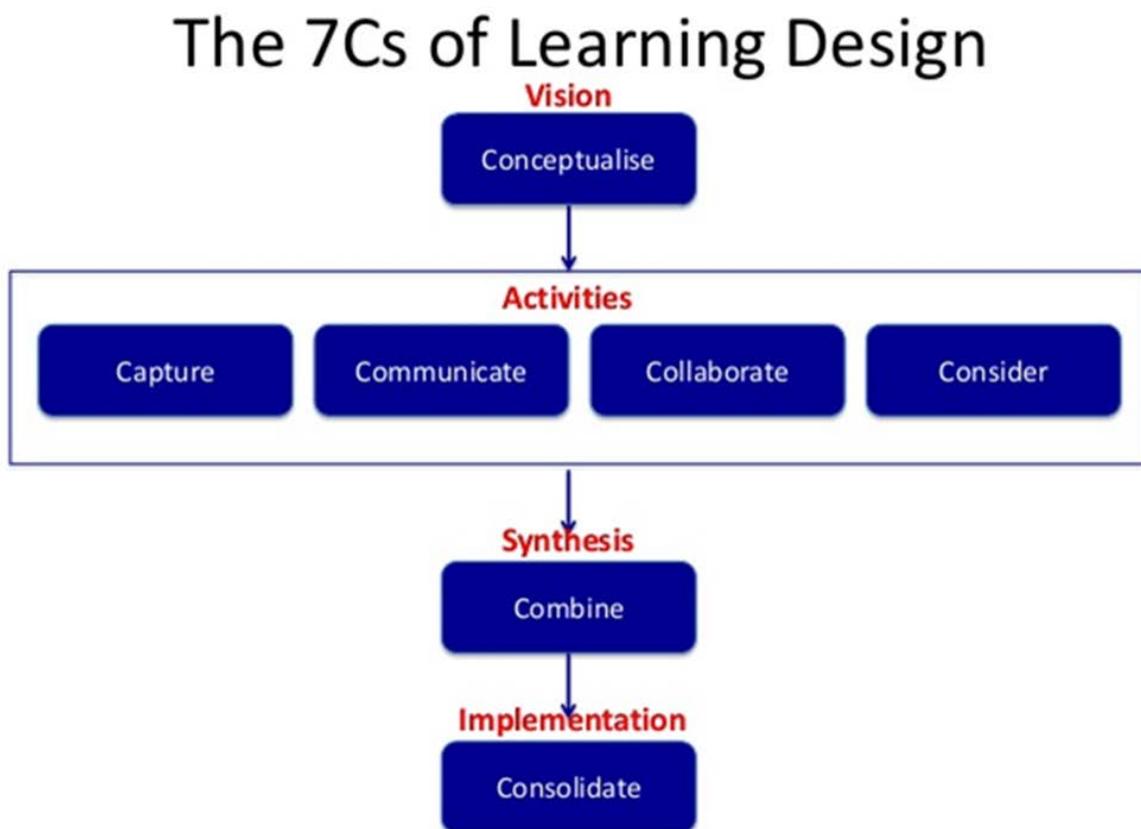
Figure 1: The 7Cs of Learning Design
Source: **Beyond Distance Research Alliance (BDRA) University of Leicester, UK** CC BY

During the initial stage of conceptualising your course, you, as a designer, visualise the learning intervention by determining who your audience is, the purpose of the learning intervention, and, lastly, deciding on the pedagogical approaches you will use. The main activities you are likely to be involved in will be formulating your course description; identifying the main features you will be using in your course; and creating a course map and an activity profile. This is illustrated by the template made available for use in Activity 1.

Activity 1: Create a description of your module or course

	Aim: To compile and share a description of the course that you will design.
	Motivation: To compile a course description that is focused on the course objectives, and provides realistic expectations and vision for the learners.
	Task: Create a description of your module/course.
	Duration: 80 minutes
	Tools: Discussion forum
	Resources: • Do you know how to use a discussion forum? You may like to view this explanation on How to post to a forum. (UMass Amherst, 2016) • Please adhere to your own institutional course outline and style template. **What to do:** Create a description of your module/course, including: • main topics & outcomes; • target audience (location, educational background, digital literacy skills); and • duration. **How:** • The task is to be completed individually and offline in a text file. • Share your course description with your fellow educators by attaching the file to your post in the discussion forum. **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, and make revisions. **Assessment:** • Completing this activity will count towards your course portfolio. **Note:** Adapted from the 7Cs of Learning Design toolkit (University of Leicester, 2012). CC BY

Determining *course features* is important because it affects how your course looks and feels, as well as the experience students will have when taking your course. Course features include a long list of suggested course elements, including those in Figure 2.

The purple card in Figure 2 represents possible course features that will enable reflection and demonstration activities. The pink card displays features that will ensure guidance and support in your course. The card in blue will help you populate your course with features that support content and learner experience. The course features displayed on the green card will help you enrich your course with collaboration and communication activities. As a course designer, you will then categorise the features into three broad categories as follows:

1. Main or key features of the course;
2. Minor course features; and
3. Features that will not appear in the course. This category will help you identify undesirable course features to be avoided.
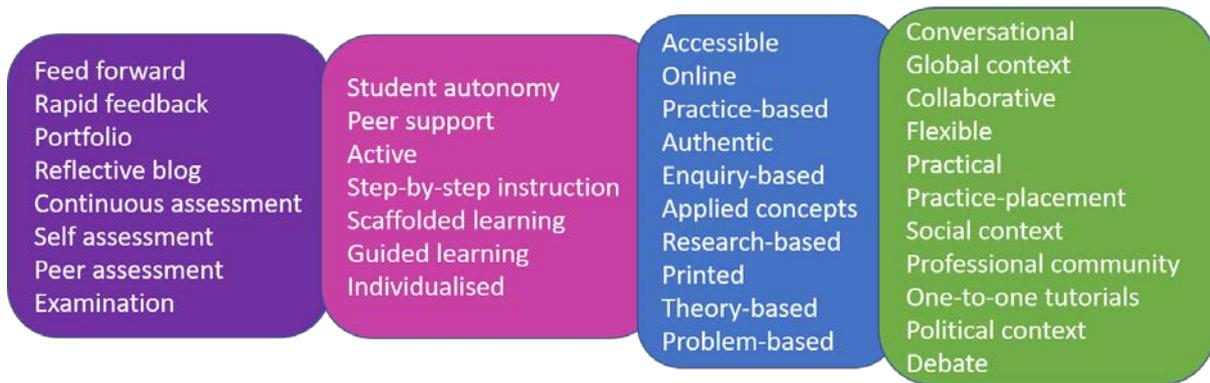
Figure 2: Course Features: The 7Cs of Learning Design
(Adapted from 7Cs Toolkit, University of Leicester, 2012) CC BY

Within the 7Cs of Learning design framework, developing a *course map* is the third activity during the first stage of conceptualising your course. Creating a course map helps define the learning experience and the relationship between the teacher, learners, and materials. The key and minor features that you identified during the course-feature exercise are now divided into quadrants representing:

- Guidance and support (pink feature cards);
- Content and the learner experience (blue feature cards);
- Reflection and demonstration (purple feature cards); and
- Communication and collaboration (green feature cards).

Developing a course map assists you to elaborate on your identified features by articulating how they will manifest in your course. While we will not undertake this exercise within this module, you should develop your course map using the guidance provided in the 7Cs of Learning Design Toolkit (University of Leicester, 2012).

After creating your course map, you need to develop an *activity profile* for your course, which will help you consider your learners' workload by determining the balance between the types of activities included in your course. There are various types of activities that can be included in your course; each type ensures a different outcome, as reflected in Table 1.1.

Table 1: Types of activities (7Cs)
(University of Leicester, 2012) CC BY

Category	Process outcomes (learners will...) examples
Assimilative	*read, watch, listen, think about, access, observe, review, study*
Finding and handling information	*list, analyse, collate, plot, find, discover, access, use, gather, order, classify, select, assess, manipulate*
Communication	*communicate, debate, discuss, argue, share, report, collaborate, present, describe, question*
Productive	*list, create, build, make, design, construct, contribute, complete, produce, write, draw, refine, compose, synthesise, remix*
Experiential	practise, apply, mimic, experience, explore, investigate, perform, engage
Interactive/ Adaptive	explore, experiment, trial, improve, model, simulate
Assessment	(summative/graded only) write, present, report, demonstrate, critique

Working within the overall time allocated for the course, there are three phases through which you need to progress as you create the activity profile for your course.

Phase 1: Calculate the time or percentage of time that you think students will spend on each activity type.

Phase 2: Review your module guides, assessment guides, timetables, and module hand books to determine the actual time that students will to complete each activity.

Phase 3: During this phase, merge your initial predictions with the guideline documents and formulate the actual plan that will be carried out in terms of activity types.

Activity 2: Develop your Activity Profile

	Aim: To consider the balance of activity types that will be included in your module/ course.

Aim: To consider the balance of activity types that will be included in your module/ course.

Motivation: Ensure that your course activity types and quantity are appropriate.

Task: To determine the ideal balance of the activities in your course.

Duration: 60 minutes

Tool: Discussion forum.

Resources: Activity Profile Interactive Sheet (University of Leicester, 2012)

What to do:

- Use the spreadsheet functionality to balance your activity types and time as appropriate for your course.
- Fill in the spreadsheet, indicating the time spent on each activity type, either in hours or as percentages of the whole course.

How:

- This is an individual activity.
- Establish how many hours are available for the students to engage in course activities.
- Access the Activity Profile spreadsheet template and complete the cells as indicated.
- Save your completed spreadsheet and attach it to your discussion forum contribution, providing helpful information to those viewing the post.

Feedback/Response: (peer review)

- When you have finished, have a look at the Activity Profiles developed by other participants / groups to see how the nature of their profile compares to yours.
- Provide constructive feedback on the profile activity of one of your peers by replying to their post in the discussion forum.

Assessment:

- Completing this activity will count towards your course portfolio.

Note: Adapted from the 7Cs of Learning Design toolkit University of Leicester (2012). CC BY

According to the 7Cs of learning design framework (University of Leicester, 2012), the subsequent stages run concurrently. These include capturing, communicating, collaborating, and considering. During these stages, you are no longer concentrating on aspects of conceptualising the course, but are now focusing on elements that promote and facilitate activities within your course. The *capture* stage helps the designer determine the Open Educational Resources that are being used, as well as other resources that need to be developed. The main activities at this stage involve finding and creating interactive materials, as well as planning for the creation of multimedia content.

During the *communication* stage, the designer decides on the types of communication that learners will use. Tools are identified and designed to facilitate effective online moderation. The *collaboration* stage enables the designer to use various tools to foster a collaborative environment in which learners will be engaged. The final stage of the activity's level is the *consider* stage, during which the designer decides on the forms of reflection and demonstration activities to be included in the learning process. The designer must also ensure that the learning outcomes are mapped to the activities and assessment of the course.

The next stage that follows in the 7Cs learning-design framework is the *combine* stage. During this stage, the main activities include creating a storyboard and a learning pathway. In the former, the sequence of activities in your course is determined, whereas the latter deals with the learning-design sequence. The final stage of this learning design framework is the *consolidate* stage, which concerns evaluating how effective the learning design is and whether the components fit well together. At this stage, the design is put in practice and an effectiveness evaluation process is implemented. For example, the various components of the courses that need to be evaluated can be formulated into an online-survey activity. The course is then tweaked, based on the feedback gathered from the evaluation process.

1.2.2 ADDIE Model

In the previous section, we discussed the 7Cs learning-design framework. This section deals with another well-known learning-design framework, known as the ADDIE model. ADDIE is a generic instructional-design framework that consists of five cyclical stages: Analysis, Design, Development, Implementation, and Evaluation, hence, ADDIE.

Analysis phase
The first phase of the model concentrates on analysing three areas, including:
- the learners;
- knowledge gap; and
- instructional process.

The online course designer needs to gather knowledge about the students' prior learning experience when analysing the learners. The social and cultural background of the learners also needs to be ascertained. Another element to be analysed is the learning styles of learners. This objective can be achieved by using online tools, such as surveys or quizzes, at the beginning of the programme.

Activity 3: Considering Learning Styles

	Aim: Identify your learning style, and deepen your understanding of this factor.
	Motivation: Understand the existing learning styles of your potential learners.
	Task: Explore the concept of learning styles.
	Duration: 45 minutes
	Tool: Discussion forum
	Resources:
	• What is your learning style? (Education planner, 2011)
	• Learning Styles Survey (Institute for Learning Styles Research, n.d.)
	What to do:
	a) Take one or more of the online Learning Styles surveys, and take note of your results.
	b) Then reflect on learning styles, guided by answering the following questions:
	• How might an understanding of the different learning styles be helpful in your course?
	• To what extent do the learning resources in your course reflect the range of learning styles?
	• Where are the gaps?
	How:
	• This is an individual activity.
	• Make a note of your reflections and share a paragraph on what you have discovered about learning styles in the discussion forum.
	Feedback/Response: (peer review)
	• Comment constructively on a peer's post on their understanding of learning styles.
	• Read and reflect on other participants' responses to your own post.
	Assessment:
	• Completing this activity will count towards your course portfolio.

The designer of the course also needs to be aware of the knowledge gap that exists; that is, they need to compare the existing knowledge that students have with what they are required to know. The ADDIE model also recommends that the course designer should analyse the instructional process by determining the current instructional practices and the learning context, as well as the available resources.

Design Phase

The second phase of the ADDIE model addresses design issues. During this stage, the course designer needs to identify the learning objectives by determining how content will be organised; which activities will be used; support strategies that will be implemented; and the assessment activities that will be incorporated in the learning process. The online environment offers a host of content options, including case studies, simulations, e-books,

online libraries, demonstrations, video and audio, and glossaries and dictionaries, as well as other web-based content. With regards to activities the online designers can draw from a variety of options, such as discussions forums, wikis, blogs, games, quizzes, concept maps and mind maps, e-portfolio, and so on. Online assessment activities can also be developed using online tools such as quizzes, essays, and surveys. These assessment tools can be integrated with effective online-assessment strategies, such as developing rubrics, providing timely feedback, ensuring authentic experiences, and facilitating peer or self-assessment.

Development Phase

This stage of the ADDIE model is also known as the production phase, because this is when all learning material that was identified during the design phase is created. In an online setting, the designer will be involved with processes of finding material by searching for web-based resources designed for educational purposes; customising and assembling existing content for online provision; and finally, creating content in a virtual learning environment.

Implementation Phase

During the implementation phase, all the planning and development activities that have taken place in the previous stages are now put to action. In an online environment, students need to be taught how to use virtual learning management systems through training workshops or user guides. The course designer now assumes the role of a facilitator, or a facilitator is assigned to the course. They ensure that the learning expectations and objectives are clearly articulated; peer collaboration and learner-to-facilitator communication is encouraged; and feedback is provided promptly, and that it is constructive. The additional role of the facilitator at this stage is to spearhead the instructional process by presenting updated learning material and resources, providing guidance, and stimulating recall of prior learning. During the implementation stage, the facilitator also needs to create and maintain a lively online environment by encouraging active learning, directing the students' attention to online activities, and assessing the performance of the students.

Evaluation Phase

During the evaluation phase the designer follows a systematic approach of evaluating the learning process. The evaluation process occurs at two levels: the formative and summative levels. Formative evaluation is an ongoing process that occurs at every stage of the ADDIE cycle, while summative evaluation happens at the end of the instructional process. When conducting the evaluation, there are four angles, including:

1. The learning process: The designer evaluates the effect of the learning process on learners' motivation levels, communication, and problem-solving skills. In an online setting, it is important to evaluate the learners' emotional response to the e-learning environment.

2. The tools: When evaluating an e-learning course, the designer should also pay attention to how issues of access or user interface are affecting the learning process.

3. Validation: During the evaluation process, the course designer needs to ensure that the processes and approaches being used are appropriate and up to date, and that they meet to the standards required.

4. Modification: As the evaluation process is carried out, any necessary modifications are taken on board and improvements are made.

Reflection

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

Summary

It is important to anchor your learning design process within an instructional design framework or model because this offers a systematic approach to developing learning. Two modern frameworks have been expanded on: the 7Cs learning-design framework and the ADDIE model. The 7Cs framework entails stages of conceptualising, capturing, communicating, collaborating, considering, combining, and consolidating the learning process. The ADDIE model involves processes of analysing, designing, developing, implementing, and evaluating the learning process. Although the two approaches are different, they also contain certain generic features that overlap.

Review questions

1. Why are learning design frameworks and models important for the learning process?
2. Critically analyse the differences and similarities between the 7Cs learning design framework and the ADDIE model.

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Topic 2: Designing for learning

Introduction

This topic provides guidance on how to design your learning process. The initial step of analysing the learner and instructional methodologies has already been adequately covered in topic 1. The subsequent steps of developing storyboards, designing interactive and motivational activities and assessments, developing content for your online course, and providing support and guidance for your learners will all be addressed in this topic.

Topic 2 Learning Objectives

	At the end of this topic, the learner should be able to: • create storyboards; • design interactive and motivational activities and assessments; • develop content for your online course; • explain the principles of support and guidance for online learners; and • provide support and guidance for online learners.

2.1 Developing storyboards

When you are designing your learning process, it is helpful to create visual or written instructions of the plans and sequence of events for your online course; this is known as storyboarding. Creating a storyboard for your course is beneficial because it helps you identify any loopholes in your learning design. It also provides stakeholders with the bigger picture or vision of how things are going to proceed; this, in turn, provides an opportunity for inputs and improvements to the plan. The storyboard you develop should promote an alignment between the learning outcomes of the course and the assessments, content, and activities that have been designed.

This storyboard, a visual representation of a plan or sequence of events for the learning-design process, is typically constructed by starting with main headings (topic or timeframe), that can be used to determine the chronology or sequence of the learning process. For example, the timeframe or topic of the learning process, and subsequently the learning outcomes, assessments, content, and activities, are arranged across the identified timeframes or topic, as indicated in Figure 3.

Sequence structure:	e.g. Day 1 / Topic 1	or e.g. Week 2/ Topic 2
Learning Outcomes	Outcome 1	e.g. Outcomes 2 & 3
Assessment	Assessment activity for Day / Topic 1	Assessment activity for week 1
Content	Content for Day/Topic 1	Topic 1 for week 1
Activity	Learning activity for Topic 1	Learning activity for Week 1

Figure 3: Storyboarding
Adapted from 7Cs Learning Design (University of Leicester, 2012) CC BY

The arrangement of learning outcomes, assessments, content, and activities can be moved around as many times as necessary until the order is most suitable for the designer. Before you storyboard the learning outcomes, you first need to make sure that they are clear, relevant, and measurable. During the storyboarding process, the designer can include dynamic techniques for presenting content, including demonstration techniques and a storytelling or scenario-based approach. To learn more about storyboards visit the eLearn Hub (2013).

Activity 4: Practice Storyboarding

Aim: Learn how to design a storyboard.

Motivation: Develop a storyboard for your course in which the learning outcomes are aligned with the assessment events, contents, and activities.

Task: Design a storyboard for a real course.

Duration: 75 minutes

Tools: Discussion forum; internet

Resources: 7Cs learning design storyboard example. (University of Leicester, 2012)

What to do:

- Develop a storyboard for your course.
- Work on a large sheet of flipchart paper using coloured sticky notes or cards.
- You could also use the free Linoit software if you prefer. (Requires registration)

How:

- Please undertake this task individually. However, if you have an institutional team working on the same course, you may work together with them.
- Start by indicating the time frame or structure for your module/course in days or weeks, phases, or topics, horizontally across the top in one specific colour (for example, white).
- In the next row, use a different colour sticky note to represent the learning outcomes for that column (for example, pink).
- In the third row, use a different colour sticky note to represent the assessment events (for example, yellow).
- If assessment occurs only at the end of the module/course, you should just have a single sticky note with a description of the assessment at the end of the storyboard.
- If assessment events occur during the module/course, please use a separate sticky note (all with the same colour) for each one. Indicate how each assessment event addresses the course outcomes.
- In the following row, divide the content into a series of separate chunks, and label each. (Use one colour of sticky note, for example, blue).
- Rewrite and move the post-it notes around until you are satisfied.
- The next step for the last row is for you to add possible learning activities appropriate to each section using a different colour post-it note, for example, green.

	• Paste these sticky notes in the appropriate section of the storyboard. On each post-it note, at this stage, simply write the purpose of each activity.
	Response/Feedback: (peer review)
	• Take a photograph of your storyboard and upload and share the storyboard with your peers in the discussion forum for this activity.
	• Comment constructively on other educators who may have used a different approach from yours in terms of timeframe or topic.
	Assessment:
	• Completing this activity will count towards your course portfolio.
	Note: Adapted from the 7Cs of Learning Design toolkit University of Leicester (2012). CC BY

2.2 Design interactive and motivational activities and assessments

Activities in an online course are designed to serve at least three main purposes: to promote interactivity, encourage lively communication and collaboration, and ensure an effective assessment processes. All activities should be strongly linked to the learning outcomes. In this section, we are going to address the design of assessment activities first, then redirect our focus to activities that enhance interaction, communication, and collaboration. Effective assessment strategies stem from a well-organised assessment plan. Activity 5 will assist you to develop an assessment plan for your course.

2.2.1 What is assessment?

Assessment can be defined as the method of obtaining feedback on the learners' level of understanding or a means of establish the effectiveness of the instructional methods. Lack of a physical place and face to face contact in an online learning context highlights the need for a proper mechanism of assessing the knowledge gained and involvement of the learner in a particular course. This can be carried out by providing graded activities and assignments.

Formative assessment may occur as an ongoing process during the learning process, whereby the information or data obtained serve as feedback to the instructors of the course. On the other hand, summative assessment is conducted at the end of a learning process.

2.2.2 Principles of Assessment

The important principles of assessment that need emphasis include the items below.
- Assessment tools and activities should correspond to the learning objectives of the course and the knowledge required of the learner;
- The assessment incorporated within a course should help learners to evaluate themselves, discover areas for revision and re-establish objectives of a topic;
- Assessment should be put into consideration the special needs and the nature of the learner; and
- Online courses should be accessed easily and enable learners to give feedback on the course content and instructions.

Activity 5: Develop an Assessment Plan

	Aim: To create an assessment plan.
	Motivation: Learn how to create an assessment plan for your course incorporating good practice.
	Task: Plan your assessment in alignment with the course outcomes.
	Duration: 1 hour (60 minutes)
	Tools: Course Blog; Discussion Forum
	Resources: Effecting Sustainable Change in Assessment Practice and Experience – the ESCAPE project (Russell and Bygate, n.d.)
	What to do: • Consider the learning outcomes of your course. • Read the resource provided and any additional assessment resources to which you may have access. • Access the discussion forum on assessment, and share your thoughts on planning assessment. • With reference to your own course, develop your own assessment plan.
	Planning Questions: • What must be assessed? • Which ways will be used to assess? (for example, through an exam, assignment, or another method) • Which forms of assessment will be avoided? • Which technological assessment tools will be explored for formative and summative assessment (for example, setting up a multiple-choice exam on your VLE, or using a stand-alone, web-based tool) • What formative feedback will be offered by tutors and peers?
	Response/Feedback: (Self-assessment) • Evaluate the extent to which you have followed the recommended assessment plan principles and procedures in the article provided. • Your reflection should be posted in the weekly blog.
	Assessment: • Completing this activity will count towards your course portfolio.
	Note: Adapted from the 7Cs of Learning Design toolkit University of Leicester (2012). CC BY

The essence of conducting assessment is to judge the learners' engagement and understanding of the content delivered, as well as to measure whether the learning outcomes have been achieved. In an online environment, this objective can be reached by using different assessment strategies, such as self-assessment exercises, discussion analysis tools, group assessments techniques, reflective exercises, and rubrics.

Activity 6: Creating engaging assessment

NB: Please undertake only one of EITHER Activity 6 OR Activity 7

Aim: Explore assessment strategies for your course.

Motivation: Learn how to create engaging assessment activities for your online course.

Task: Design an online assessment activity for your course or module.

Duration: 50 minutes

Tools: Course blog

Resources:
- Developing Interactive e-Learning Activities (Watkins, 2005)
- Activity Design Structure (Mallinson, 2016)
- Advanced Online Assessment Techniques (eLearning Faculty Modules, 2016)
- Online Assessment Techniques (Bonk and Dennen, n.d.)

What to do:
- Select one of the following assessment strategies:
  - Self-assessment exercises;
  - Discussion analysis tools;
  - Group assessments techniques; or
  - Reflective exercises and rubrics.
- Using the selected strategy, design and evaluate an online assessment activity for your course.

How:
- This is an individual activity.
- Read the resources provided.
- Design an activity using the information gained from the resources.
- Evaluate your activity objectively according to the guidelines.

Response/Feedback: Self-assessment
- Evaluate the assessment activity you have designed.
- Your reflection should be posted in the weekly blog.

Assessment:
- Completing this activity will count towards your course portfolio.

As well as containing assessment activities, your online course needs to be enriched with stimulating learning activities that will keep the learners interactive and motivated. As a course designer, you need to ensure the designed activities are in alignment with your storyboard and course map. Furthermore, you need to take principles of good practice into account. There are several strategies for designing online activities that are engaging, including creating ice breakers; developing learner-led activities; making use of games and simulations; designing group activities; developing reflective activities; and creating authentic activities. Table 2 displays some of the examples of online engaging activities.

Table 2: Examples of online engaging activities

Source: Engaging Interactions for eLearning: 25 Ways to Keep Learners Awake and Intrigued. (Schone, 2007).

Examples of online activities	How to design the activities	Matching tools
Fix it	A problem is outlined to the students and they are asked to solve it based on their prior knowledge.	Video, essay tools
Story-based questions	Students watch or read a story and react to it.	Video, PPT, text document
Incomplete stories	An incomplete story is provided to the learners and they have to fill in the missing aspects.	Essays tools, wikis
Scattered steps	Provide the learners with the steps of a specific process in a scattered form and let him or her order them correctly.	Wikis
Read watch and reflect	Let the students read or watch a topic and then have them reflect.	Video, discussions
Game interactions	Games can be used to test the learners' factual knowledge.	Video, simulations
Teach back	The learners are given an opportunity to teach others what they have been taught.	Discussion forms, videos
Myths and facts	The learners are given false and true statements and tasked with sorting them out.	Wikis, discussion forums

2.3 Developing content for your online course

The first step in the development process of online content is to conduct a resource audit, which will help you determine the existing material you possess, as well as any additional resources required. View Activity 7 to gain a better understanding of how to conduct resource audits.

Activity 7: Perform a Resource Audit

NB: Please undertake only one of EITHER Activity 6 OR Activity 7

	Aim: Conduct a resource audit for your online course.
	Motivation: To decide how you will source the content for your module/course, including the possibility of incorporating OER produced elsewhere.
	Task: Assemble the available resources and identify resource gaps in your course.
	Duration: 50 minutes
	Tools: Assignment upload; and/or discussion forum;
	Resources: **Carpe Diem Resource Audit** University of Leicester (2012)
	What to do: • Brainstorm ideas for gathering or creating content for your course. • Fill in your Resource Audit, using the Carpe Diem Resource Audit template. **How:** • This is an individual activity. • When you are finished, please upload it as an attachment to the discussion forum or upload as an assignment.
	Response/Feedback: (self / peer review) • View the resource audit templates that your peers have created and comment constructively. • Take a look at the feedback that you have received from your peers. • Seek out additional resources that could be useful to your course that you might have missed in your resource audit exercise.
	Assessment: • Completing this activity will count towards your course portfolio.
	Note: Adapted from the 7Cs of Learning Design toolkit University of Leicester (2012). CC BY

When you have completed the resource-audit activity, you can then advance to the step of finding additional learning resources. Content can be developed from scratch, bought ready-made, or outsourced using OER channels. Module 1 provides an exercise on how you can use OER repositories to search for content. In Module 2 you will also find valuable information and readings on a basic guide to OER, Creative Commons (CC) licensing, and OER for beginners. These resources will guide you in finding additional resources required, as identified by your resource audit.

2.4 Principles of support and guidance for online learners

Online learners require both pedagogical support and technical support. In terms of pedagogical support, the student should be provided with learning outcomes, as well as a good learning pathway developed around key activities. This pathway should relate a coherent and cumulative sequence of events. In addition to a properly designed learning environment, students also require strong support from the facilitators, in terms of their

creating and facilitating an interactive environment with regular, built-in feedback. Students can be provided with online survival strategies, such as the ones summarised on the Online Learning Insights blog (Morrison, 2012).

In terms of technical support, learners need to be provided with an enabling and suitable environment in terms of access to infrastructure. Where a learning management system is being used, the students should be provided with training, supplemented with user guides, so they can carry on by themselves without the constant need of technical administrators' support. For difficult situations that students cannot handle, a helpdesk support structure needs to be put in place to address students' needs.

Reflection

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

Summary

	This topic has addressed four main areas of learning design. Firstly, we have concentrated on the process of creating storyboards, which are essential for providing a visual presentation of the course sequence. Secondly, we have discussed how to design interactive and motivational activities and assessments in an online environment. Thirdly, we have highlighted the development process for online content. Lastly, we have also dealt with the basic principles of supporting and guiding online learners.

Review questions

	1. What kind of support structure needs to be put in place for online learners?
	2. What is the essence of storyboarding, and what does it entail?
	3. Provide examples of various activities that can be used in an online environment.
	4. How can one go about conducting a resource audit?
	5. Describe the purpose of an assessment plan.

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Topic 3: Digital Learning Development

Introduction

Pedagogical purpose should drive your design, development, and presentation of the content and interaction of your courses, using available digital functionality. Learning Management Systems (LMS) or Virtual Learning Environments (VLE), such as Sakai and Moodle (both Open Source Software) and Blackboard (proprietary), are means of hosting the teaching and learning on a single integrated digital platform. On the other hand, a variety of free-to-use digital tools can also be used to enhance the teaching and learning experience, both integrated within the LMS or available on general web-based platforms. The choice of a particular platform or set of tools depends upon various factors, such as institutional support, readiness of the teachers and learners, nature of the courses provided, and the number of potential users.

Topic 3 Learning Objectives

	At the end of this topic, the learner should be able to: • identify and use tools and features of a LMS; • explore a variety of Free and Open Source Software (FOSS) tools; and • develop a Learning Activity, Resource, or Assessment, selecting and using an appropriate software tool that supports your pedagogical purpose.

3.1 Learning Management Systems, their Tools, and Pedagogy

A Learning Management System (LMS), sometimes known as a Course Management System (CMS) or a Virtual Learning Environment (VLE), is an online software application/system that facilitates the teaching and learning in academic institutions or organisations. An important aspect of an LMS is that it enables preservation of a secure environment for a group of students by providing password access to an online course. The students engage within a closed virtual classroom environment, where they can express their opinions in relative safety, such as that which may exist in a face-to-face situation. They can also get to know their tutor and fellow participants and work through the course activities and resources in a collaborative and supportive manner.

Through this system, a tutor can use a variety of built-in tools and carry out tasks such as those described in the CMS Features and Criteria Matrix (Edutools, 2013). Please examine this resource carefully at this point, so as to understand what you should expect from your LMS. Basic features include:

Upload course content. The content can be uploaded using tools appropriate to different formats, such as Word files, PowerPoint, Excel, PDFs, and text, images, audio, or video.

Provide assignments to the learners. Through creating and uploading assignments, it is possible to evaluate the learners' participation on the course.

Initiate and facilitate a discussion forum. The instructor can make the learning interactive and engaging by including a discussion forum, to which learners will be required to contribute.

Communicate with learners. Communication tools within the online system will enable the tutor to communicate with learners.

Secure storage. Learners can store their documents and assignments safely on the server.

Course analytics. The instructor can access a list of users of the course, and see how much time they spend logged in.

Consider Figure 4, which shows a model of learning-activity design, to see how the tools, pedagogy, and context enhance the learning process.
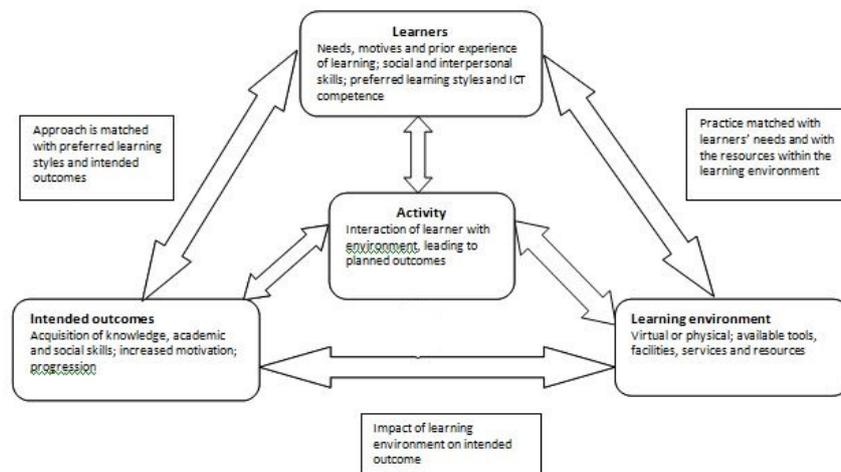
Figure 4: A specification for learning activities
(Adapted from Beetham, 2004)

Activity 8: Exploring your Learning Management System (LMS)

	Aim: To understand the use of the LMS tools in relation to materials management and interactive teaching & learning.
	Motivation: Discover different tools in the LMS, their usage, and how powerful they are with respect to the teaching and learning practices.
	Task: Explore the functionality of your LMS/VLE.
	Duration: 45 minutes
	Tools: Assignment upload
	Resources: • Investigating Undergraduates' Perceptions and Use of a Learning Management System: A Tale of Two Campuses (Lonn et al, 2009) • Faculty Perceptions and Use of a Learning Management System at an Urban, Research Institution (Little-Wiles et al, 2012) • Course Management System Features and Criteria (Edutools, 2013)
	What to do:

<table>
<tr><td></td><td>

1. Develop a table defining the following tools found in the LMS:
   - Announcements;
   - Assignments;
   - Chat;
   - Forums;
   - Gradebook;
   - Messages;
   - News;
   - Calendar; and
   - Syllabus.
2. Categorise each of the tools defined above in terms of whether they support materials management or interactive teaching and learning.

How:
- This is a group activity. Directions for forming the groups will be provided by your tutor.
- Provide your group's responses to the questions by uploading your group document in online assignment 3.1.
- Only one person in a group will submit the response file, but please remember to record the names of all group members at the top of your submission.
- The aim is to arrive at a common understanding of the definition and categorisation of the tools.

Response/Feedback:
- The contributions of each group will be shared by the tutor.
- Then in the online discussion forum, discuss further individually leading to agreement of how to categorise the tools.

Assessment: Completing this activity will count towards your course portfolio.

</td></tr>
</table>

3.2 Online system tool guides for instructors

Functionality within VLEs can be thought of in terms of two aspects: the technology to be used and the pedagogical purpose, which is based on what is to be accomplished by undertaking the activities using the resources provided. In a system such as Moodle, course developers are supported in their task with the possible pedagogical purpose of the tool being described within the tool selection dialogue window. A full description of available functionality with respect to adding resources and activities (Moodle 2016) to your course should be explored in depth before proceeding further.

Choosing the appropriate tool for your pedagogical purpose can be guided by considering factors such as ease of use (set up), teaching and learning purpose, and mapping available functionality in your LMS/VLE to a hierarchy such as Bloom's Taxonomy of Educational Objectives (remember, understand, apply, analyse, evaluate, and create). A valuable resource to explore in depth is the Moodle 2 Tool Guide for Teachers (Henrick, 2012). While this excellent resource was originally built with Moodle in mind, it can be applied equally to other LMS/VLE systems or web applications. It should be noted that the original resource Moodle Tool Guide for Teachers was developed by Seitzinger (2010) and shared widely as an OER, then later adapted and extended for a later version of Moodle by Henrick (2012).

For more detail on using Bloom's Taxonomy to guide your learning design with respect to the level of thinking for your learners, see Objectives and Assessment (eduScapes, 2016).

3.3 Web 2.0 Tools for Learning

Effective use of technology for quality learning and teaching involves collaboration and communication, critical thinking, social presence, and active participation. While an LMS can provide much of this functionality using internal tools, various tools outside your LMS may also be relevant to your course for particular purposes. Many of these tools, which have become known as Web 2.0 tools, are freely available, and can be used in conjunction with or separately from your LMS to enhance your teaching and learning experience.

The wiki tool in Moodle is an example of a Web 2.0 tool that has been integrated in an LMS/VLE. These tools actively involve learners in the process of content creation. Effective use of technology for quality learning and teaching involves collaboration and communication, critical thinking, social presence, and active participation.

Useful lists of Top Tools for Learning are compiled annually by the Centre for Learning and Performance Tools (C4LPT, 2016), which elaborates on tools for specific learning purposes including personal learning, workplace learning, and education. These tools are categorised into Instructional, Content Development, Social, Personal & Professional, and Content Aggregators. In 2016, Moodle once again topped the list in the Best of Breed (LMS & Learning Platforms), ahead of all open source and proprietary systems.

Activity 9: Exploring Tools outside your LMS

Aim: To explore a selection of web-based, free-to-use tools outside the LMS.

Motivation: To make an informed selection of online tools for use in your course.

Task: Investigate tools for learning outside your LMS.

Duration: 60 minutes (1 hour)

Tools: Upload assignment; other tools as identified

Resources:
- Web 2.0 Criteria (adapted from Online Learning Consortium, 2014)
- Finding the Right Tool (TES, 2016)
- What Technology Can I Use For...? (Phoebe Project, 2009)
- Moodle 2 Tool Guide for Teachers (Henrick, 2012)
- Activity Design Structure (Mallinson, 2016)

What to do:
- Consult the resources provided to select suitable tool/s for your pedagogical purpose in a particular activity in a real course.
- Identify one particular tool and describe how you will use it in an online activity or assessment.

How:
- This is an individual activity.

- Use the Activity Design Structure provided to flesh out the specification for the activity.
- Provide your responses in an online-assignment tool.

Response/Feedback:
- Upload your response file in this online assignment
- You will receive feedback from your tutor.

Assessment:
- Completing this activity will contribute to your course portfolio.

3.4 Using Digital Tools to support Assessment

This section is largely derived from the resource 'Using ICT to Enrich Teaching and Learning, Module 3: How to use ICTs to Enhance your Teaching and Learning' (AVU & COL, 2015). CC BY SA.

Assessment is frequently a source of anxiety for educators undertaking online or blended courses. Many of the issues are exactly the same as for face-to-face courses, but they require solutions that take the online and distributed environment into account. The responses to these concerns depend largely on the context and environment within which the assessment takes place. It is useful to understand what is possible, and by exploring some opportunities in online assessment and evaluation, we may find a way forward that best suits our own context. There is a trend to develop a portfolio of evidence for evaluation / assessment rather than undertake a summative test. In informal courses, one may attain acknowledgement for completion (as in this module), rather than undertake a formal assessment.

Online assessment can be automated to a greater or lesser extent, with a large variety of question types available both for automated and tutor marking. Your virtual learning environment (VLE) should have built-in assessment and activity / assignment types – see an example of question types that Moodle offers and also Edutools CMS Features and Criteria. In addition, there are also a variety of standalone freely available online tools for assessment, surveys, and scheduling, such as Google Forms, Hot Potatoes, and Doodle Poll. See the resource list in Activity 10.

Individualised assessment on demand is also possible and is practiced at some open and distance learning (ODL) higher education institutions. This requires that a bank of similar (equivalent) categorised questions are available to the examiner, and the assessment may be generated automatically, resulting in each instance of the assessment being not only different, but available to the learner when they decide they are ready to undertake it.

Peer assessment can be supported online very effectively, with the system allowing online access to the submission, online entry of marks, and then automatic collation to arrive at a final grade. Peer assessment can be particularly useful for managing large groups such as in a MOOC. Some VLEs have this facility built in, others have a combination of an automated and manual approach. The main advantage is that it is easy to make the submission designated for peer-review / assessment available to multiple parties when working online.

Activity 10: Develop a Digital Resource, Activity, or Assessment using a FOSS tool

Aim: To practice designing and developing a useful resource for your own course using FOSS.

Motivation: Discover how easy/difficult it may be to use an appropriate FOSS tool in your teaching and learning.

Task: Build your own FOSS resource.

Duration: 80+ minutes

Tools: As selected from the resources; discussion forum.

Resources: A variety of FOSS tools may be used, including:
- Screencast-o-matic (online screen capture recording);
- YouTube (video publishing & storage);
- Make Beliefs Comix (online Cartoon Maker);
- SlideShare (slide sharing site);
- Google Forms (Online Survey / Evaluation);
- Survey Monkey (Online survey and questionnaires);
- Doodle (Scheduling, registration needed);
- Hot Potatoes (Quiz Tool); and
- Other similar communication and collaboration functionality found within your own community's or institution's VLE/LMS

What to do:
- Develop an assessment, activity or resource for use in your own course using a FOSS tool.
- Should you not have access to a tool, you may use or adapt an OER rich media resource such as a video, slides, or an image that you have located online, and incorporate this in your new course resource.

How:
- This is an individual activity.
- Please refer to the tool identified by you in Activity 3.2, and also refer to the Activity Design Structure provided.
- While you are working, make notes about any particular features of your activity or resource that you would like to highlight and any difficulties experienced.
- Don't forget to include information about word limits, file size and types, recommended amount of time to be spent, and how performance will be assessed, if at all. See activity design structure template.
- Once completed, you are required to demonstrate your learning activity or resource, and/or make it accessible to the wider group.
- In the discussion forum provided for this activity, share your recorded observations / notes about developing your digital resource, using a subject header that indicates which tool/technology you have used.
- If necessary, you should include a link to your resource from within your forum post.

	Response/Assessment: (peer review) • After you have completed this task, take a look at some of the other contributions described in the forum. • Provide constructive feedback to at least one other participant by responding to their forum contribution. • Read the feedback provided by others to your own activity / resource and refine it accordingly. • You may choose to provide the link to your revised activity / resource to the group. **Note**: This activity has been adapted from the resource 'Using ICT to Enrich Teaching and Learning MOOC, Module 3: How to use ICTs to Enhance your Teaching and Learning'. AVU and COL (2015) CC BY SA

Reflection

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

Summary

	Learning Management Systems are rich in different tools that can be used to improve the teaching and learning process. Most of the tools for instructors are simple to use with practice. When selecting tools for effective learning, an instructor needs to assess three areas: whether they meet the learning goals for the course; whether the tools used are accessible by both instructors and learners; and whether they provide a means of collaboration. A tool should be able to be used easily by both instructors and learners, with minimum supervision of the students required, to enable them work independently. There should be an agreement by both instructors and learners on the type of tools to be used, especially when the tools are from outside the LMS. The tools selected must enhance a team work and sharing and improve communication among the learners, as well as the instructors.

Review Questions

	1. What is an LMS, and how can it be used? 2. Describe four built-in tools in an LMS, and their roles. 3. Mention two aspects to consider when selecting online tools.

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Topic 4: Modes of Provision

Introduction

With the increasing availability and adoption of Information and Communication Technologies (ICT) to support teaching and learning in the Higher Education (HE) sector, the variety of modes of education provision has expanded rapidly. The move towards blended and online course delivery needs to be carefully considered to preserve the integrity of the teaching and learning environment. In particular, the factors influencing the choice and extent of the blend should be identified and explored to maximise the benefit afforded by the new teaching and learning environment, while maintaining a pragmatic approach within a given context. (Mallinson, 2013)

Topic 4 Learning Objectives

	At the end of this topic, the learner should be able to:
	• explore the dimensions of blended modes of provision;
	• demonstrate awareness of the factors influencing choice of mode; and
	• determine an appropriate mode of provision for a module or course.

4.1 The nature of this topic

This is a self-study topic involving reading, reflecting, and then practical application. You are required to read the resources in Activity 11, reflect on them with reference to providing your own module or course, and then undertake a practical, phased activity to construct an appropriate mode of provision for a particular course in your own context.

Naturally, one has also to operate within the policies and strategy of your institution, and you may need to provide motivation for changes that you are keen to implement. Due consideration should be given to institution implications if the mode of provision is to be changed. In Activity 12 you are asked to read the resource provided, and explore insitutional implications with respect to quality assurance, faculty professional development, and learner support, among other considerations.

Activity 11: Exploring Modes of Provision

	Aim: To enable informed decision-making in mounting your course online.
	Motivation: Increase your understanding of the elements influencing the choices in aligning modes of provision to your teaching and learning environment.
	Task: Develop an appropriate mode of provision for your course.
	Duration: 120 minutes (2 hours)

	Tools: Access web resources; upload an assignment;
	Resources: • Modes of Delivery in Teaching in a Digital Age.(Chapter 9) (Bates, 2014) • Exploring Modes of Educational Provision in a Digital Age. (Mallinson, 2013) • Ready to Teach Online? A Continuum Approach. (Young and Chamberlin, 2006) **What to do:** • Identify a particular course with which you are involved. • Keeping this course in mind, read and reflect on the texts provided. • Ascertain where the course is situated on the dimensions of geographical distribution and location of learners, and level of possible and appropriate ICT support. • Which other factors do you need to consider for your course provision? • Identify the most appropriate mode of provision for the course, writing a full motivation for all aspects of your choice. **How:** • This is an individual activity. • Upload your report by submitting the file to this assignment. **Response/Feedback** • You will receive individual feedback from your tutor/facilitator. **Assessment**: • Completing this activity will contribute to your course portfolio.

Activity 12: Institution implications for expanding modes of provision

	Aim: To enable informed decision making in embarking upon institutional change.
	Motivation: Increase your understanding of the institutional implications for expanding modes of course provision. **Task:** Develop an understanding of differences in supporting teaching and learning for different modes of provision at an institutional level. **Duration:** 60 minutes (1 hour) **Tools:** Access web resources; discussion form. **Resources:** • Pushing the Boundaries: Migrating Online in a Developing Context (Aluko et al 2016) • Asynchronous & Synchronous E-Learning (Hrastinski, 2008) **What to do:** • Identify all the modes of provision currently practised at your institution. • Read and reflect on the texts provided. • What are the considerations around Quality Assurance, Learner Support, and

	Faculty professional development?
	• Which other factors do you need to consider for an institutional change of mode?
	• Record your thoughts with reference to your own institution.
	How:
	• This may be an individual or group activity, if you have someone from your institution that is willing to work on this with you.
	• Share your recorded thoughts in the discussion from.
	Response/Feedback
	• Read and respond constructively to at least one other participant's contribution.
	Assessment:
	• Completing this activity will contribute to 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

	It is clear that there is no single blend for delivery mode, but rather an infinite number of ways that one can deploy a course or programme. The factors or aspects that should be taken into consideration include class size, learner demographics, and the pedagogical approach, among others. The related continua of spatial and ICT dimensions prompt careful consideration of the relevant aspects that affect education provision in the blended and online mode. A visual representation of where a course is located on this grid could assist in determining exactly how a course is currently delivered, as well as strategically planning where the course should best migrate to within the delivery context (Mallinson, 2013).

Review Questions

	1. Elaborate on your understanding of the term "blended learning".
	2. Describe three (3) important factors influencing decisions around appropriate modes of provision for your institution.
	3. Compare and contrast synchronous and asynchronous learning.

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Topic 5: Learning Analytics

Introduction

The advent of new technologies has increasingly enhanced the connection between human beings and digital devices and resources. This connection has led organisations and individuals to depend on gathering digital data for decision-making and determining strategies – a powerful influence on the future development of organisations and individuals. This topic introduces the concept of using analytics for learning, which is described by UNESCO (2012) as follows:

> *"Learning analytics has emerged as one of the most common terms for the community seeking to understand the implications … for how we analyse learning data, and improve learning systems through evidence-based adaptation. The emerging conversation goes far beyond technologists (academic and commercial), to include researchers in education, leaders and policymakers, educational practitioners, organisational administrators, instructional designers, product vendors, and critically, the learners themselves (who are often the first adopters of new cloud applications, many of which make data available, and who are the primary consumers of certain kinds of learning analytics)."*

This topic will enable academics and higher education institutions to understand the concept of Learning Analytics (LA); how it works in the learning process; how to apply it in the learning process; methods of Learning Analytics; and the software used to conduct LA. The concepts of assessment and evaluation will also be discussed in this topic.

Topic 5 Learning Objectives

	At the end of this topic, the learner should be able to: • describe the meaning, purpose, and potential effect of Learning Analytics; • identify the various levels on which Learning Analytics operate, and explain how analytical tools or reports can be used to support learners through instruction or intervention; • identify tools available within a Learning Management System for data analysis and discuss the relationship between Learning Analytics and evaluation; and • design an assessment structure that fits with the outcome of the course; identify principles and types of assessment and evaluation; design tools for evaluating online courses; and explain the purpose of conducting course evaluations.

5.1 Learning Analytics (LA) and Related Concepts

Emerging technologies have resulted in the potential for increased data, platforms, and services, that is all learning processes conducted via digital technologies. The explosion of online technology platforms and services provide new opportunities for learning and generating new forms of data about those processes (SOLAR, 2014). Ifenthaler (2014) explains that LA uses dynamic information about learners and learning environments, assessing, eliciting and analysing it, for real-time modelling, prediction and optimisation of learning processes, learning environments and educational decision-making.

For our purposes, Learning Analytics is simply defined as the interpretation of a wide range of data produced by and gathered on behalf of students to assess academic progress, predict future performance, and identify potential issues (NMC, 2016). The NMC Horizon Reports Higher Educations Editions, show movement of Learning Analytics from Time-to-Adoption 2-3 years in 2012, through to 2016 where the timeframe is then adjusted to 1 year to adoption, as the complexities of implementation are realised.

Various levels of analytics have been defined, with Siemens (2011) differentiating between "Academic" (Institutional, Regional, National, International) and "Learning" analytics (Course-level, Departmental). Siemens (2011) also elaborated on the value of analytics for Higher Education, and explains the relationship between Learning Analytics and the LMS as a convenient data-gathering tool.

5.2 How Learning Analytics works in learning processes

For a deeper understanding on how learning analytics works in the learning process, read the article Open Learning Analytics: an integrated & modularized platform (SOLAR, 2011). The authors explain that Learning Analytics refers to an educator's analysis of data drawn from their interactions with other people, with content, with technological tools, and with their respective organisation as a whole. This data range is then interpreted through technological tools, and the appropriate action is taken to improve teaching and learning processes.

Data is gathered from learners when they are engaged in the learning process, for example actions such as completing assignments and taking examinations, socialising online, accessing the Learning Management System, taking quizzes, engaging in discussion forums, and so on. Learning Analytics are conducted using Learning Management Systems (LMS) that have been integrated with LA applications that record the learner's login sessions, track individual participation in specific tasks, and monitor the time students spend interacting with online resources or fellow learners.

Figure 5 illustrates the four functions of LA applications with regards to generating data, analysing data, generating reports, and enabling interventions (NMC, 2016), while Figure 6 illustrates a pathway to improve student performance.
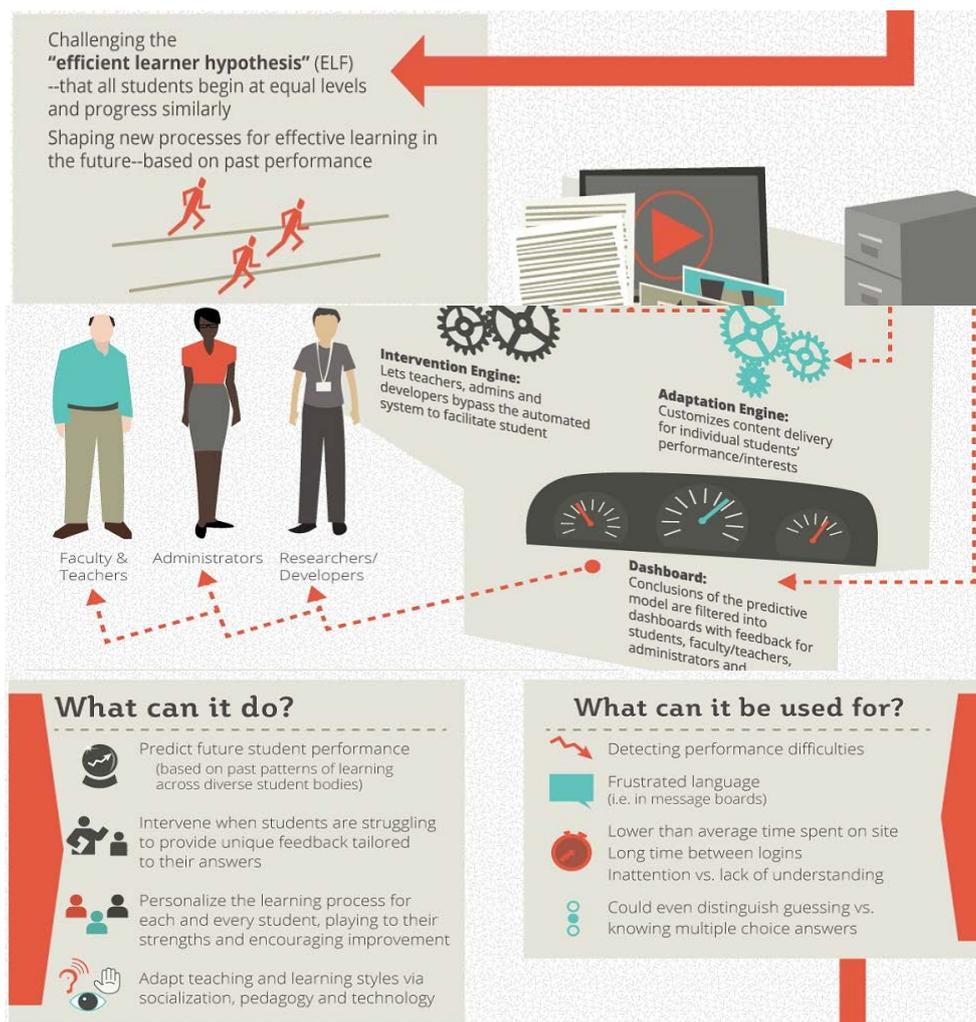
Figure 5: Infographic illustrating what LA is and how it works.
(Pinantoan, 2012)

Figure 6: Data-driven model used to predict students' performance.
(Pinantoan, 2012)

5.3 Applying Learning Analytics in the learning process

Using learning analytics enables monitoring of the learning process and produces early alerts prompting interventions to improve the learning process. Siemens et al (2011) argue that Learning Analytics comprise four integrated toolsets, which work together to enhance decision-making in the learning processes:

- the Learning Analytics engine;
- the Adaptive Contents engine;
- the Intervention engine; and
- the Dashboard, Reporting, and Visualisation.

Once the student joins an academic institution their details are registered on a Learning Analytics System. The Learning Analytics System uses tools, such as the dashboard, to provide progress reports or feedback. The system is integrated with a variety of online resources used in the learning process, including social sites, Google Scholar, Wikipedia, social learning sites, the Learning Management System, forums, and so on. The dashboard provides statistics according to the following factors: the learner's lecture attendance, engagement in online activities, participation rates in forums, and pass rates for the online tests and quizzes, as well as the learner's marks for the formal written assignments and exams (Siemens et al, 2011).

Each of these activities measure a particular competence, such as communication skills, ability to find and select information, creativity, collaboration, critical thinking, and evaluation, all of which can be determined by assessing the learner's habits during the learning process (ibid). The skills measured through the LA process also serve as evidence of competencies that are often sought after by prospective employers of the learners.

The intervention engine tracks the learner's progress and provides feedback using the prediction model in the analytics engine. The feedback is categorised according to the way it is requested, which can be at individual or peer-group level. The system displays the requested scores accordingly. When the learner underperforms, the system proposes a measure to be taken: this can be a notification to the learner regarding the specific deficiency; if there is no response despite the notification, then the intervention engine sends a message to teacher informing them to contact the learner (ibid).

Activity 13: Investigate the potential benefits of Learning Analytics

	Aim: Understand the role of Learning Analytics in Higher Education
	Motivation: To be able to analyse data in a higher learning institution context to promote learner success.
	Task: Investigate the benefits of deploying LA in higher education.
	Duration: 70 minutes
	Tools: Video; discussion forum.
	Resources:

<table>
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- Learning and Knowledge Analytics – Definitions, Processes and Potential (LearningAnalytics.net, n.d.)
- Moodle Learning Analytics Video (3:43 mins) (CSUN, 2014)

What to do:
- View the short video: Moodle Learning Analytics (CSUN, 2014)
- Read the other textual resources provided.
- Discuss why education institutions should invest in learning analytics infrastructure? OR
- Explain the application of Learning Analytics in education.

How:
- This is group activity. Please form groups as directed by your tutor.
- Share your online responses in the designated discussion forum to work towards a common understanding, and explore environmental differences.

Feedback/response: (peer review)
- Comment constructively on at least one other forum contribution.
- Read the responses to your own group's contribution, and identify further points for general discussion.

Assessment:
- Completing this activity will count towards your course portfolio.

</td></tr>
</table>

5.4 The Role of Learning Analytics

Learning Analytics provides different roles when operating at different levels. Figure 7 depicts the different levels of Learning Analytics and the stakeholders associated with the process. The stakeholders include the institution, learner, teacher, and so on. UNESCO illustrates the Learning Analytics levels as Macro, Meso, and Micro; each one of these levels is important to enhance the teaching and learning process.
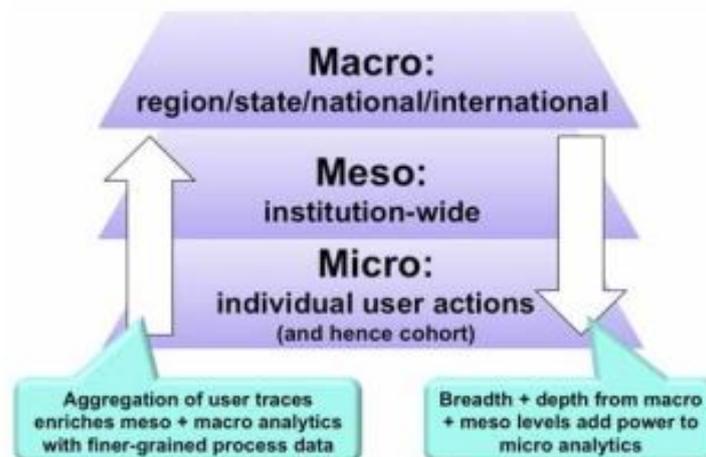

Figure 7: The Convergence of Macro, Meso and Micro-level Analytics
UNESCO (2012)

In addition, Infethaler (2014) introduces a Mega-level that allow cross-institutional analytics by integrating a range of data from other lower levels, such as Macro, Meso, and Micro. The range of data enables the identification and validation of patterns within and across institutions and, therefore, provides valuable insight for policy-making purposes.

Macro-level analytics is commonly used in cross-institutional analytics, but with the focus of providing institution-wide analytics that are used to better understand learner cohorts; allocate critical resources; reduce dropout; and monitor retention, as well as success rate.

Meso-level analytics operate at institutional level and enables educators to oversee learning design, students' progress, and identify at-risk students by using predictive models. The results can be used to enhance and improve the quality of the course material (Marrison, 2012; Infethaler, 2014).

Micro-level analytics support the tracking and interpretation of process-level data for individual learners and groups. This data can provide a fine level of detail for those responsible for learner success and includes: online activity (click by click), physical activity such as geolocation, library loans, and interpersonal data, such as that from social networks. The process-level data is linked with education data to predict the student's performance (UNESCO, 2012).
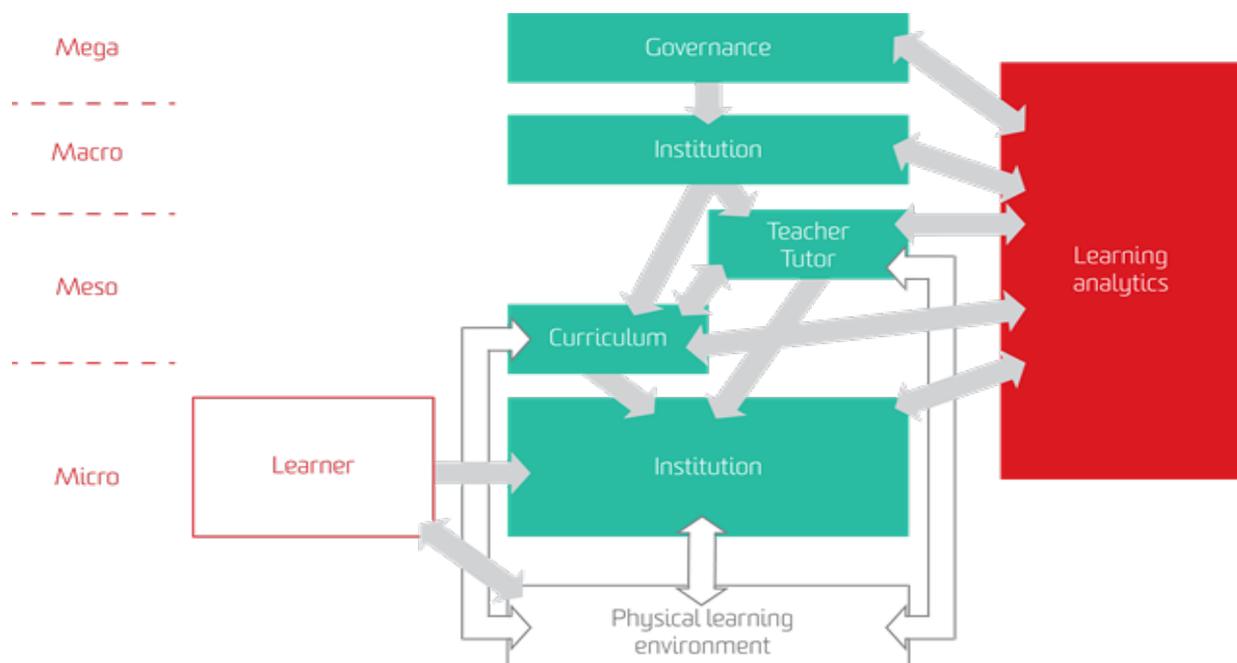

Figure 8: How Learning Analytics associates with stakeholder levels.
(Infethaler, 2014)

Activity 14: Applying Learning Analytics in your course

	Aim: Investigate the Learning Analytics available in your own LMS, such as Moodle.
	Motivation: Prepare to use Learning Analytics in your own course or module.
	Task: Plan to apply Learning Analytics in your course
	Duration: 70 minutes
	Tools: Upload assignment.
	Resources: • Analytics Recommendations Block in Moodle (Moodle.org, 2016a) • Learning Analytics Enriched Rubric in Moodle (Moodle.org, 2016b) • Course Reports in Moodle (Moodle.org, 2016c)
	What to do: • Browse through some of the Learning Analytics functionality available in Moodle, using the resource links above (or within your own LMS). • Choose one particular LA function to reflect on. • Plan how you could apply this in your own course, making sure to highlight the associated benefits.
	How: • This is an individual assignment. • Upload a file containing your reflection and plan as an online assignment.
	Response/Feedback: • You will receive individual feedback from your tutor.
	Assessment: • Completing this activity will count towards your course portfolio.

5.5 Learning Analytics related to Assessment and Evaluation

LA is involved with evaluation and assessment via several different processes: descriptive measures, which describe what has happened; diagnostic measures, which highlight why events happened the way they did; predictive measures, which give an indication of what will happen; and, lastly, prescriptive measures that analyse what should be done. See the MIT teaching and learning lab (MIT, n.d.) definitions of assessment and evaluation for elaboration.

Assessment can be defined as the way of obtaining feedback on the learner's level of understanding, or a means to establish the effectiveness of the instructional methods in achieving the desired learning outcomes. We can use LA to capture formative assessment data as an ongoing process during course implementation. On the other hand, summative assessment is conducted at the end of a learning process or programme, and related LA could be acted upon only after conclusion of the course.

To gather meaningful learner data, the important principles of assessment should be adhered to:

- Assessment tools and activities should correspond to the learning objectives of the course and the knowledge required of the learner;
- The assessment incorporated within a course should help learners to evaluate themselves, discover areas for revision and re-establish objectives of a topic;
- Assessment should be put into consideration the special needs and the nature of the learner; and
- Online courses should be accessed easily and enable learners to give feedback on the course content and instructions.

5.5.1 Assessment categories used to analyse online Courses

Three broad categories can be highlighted in online course assessments, namely:

I. Assessment Types

There are three types of assessment, namely: diagnostic, formative, and summative

- Diagnostic Assessment: This occurs before the actual learning starts. It will help determine the skills and knowledge of the learner and, hence, provides a good opportunity to plan the course contents and instructional methods properly.
- Formative Assessment (ongoing evaluation during learning): Formative assessment normally takes place during the teaching and learning.. This helps the instructor to improve or adjust the contents, and/or to measure the learner's understanding of the lesson.
- Summative Assessment (after learning): Summative assessment focuses on the final outcome of the course. It is normally conducted based on the whole course, to be able to draw conclusions about how successful the activities and course contents were in relation to the learning objectives.

II. Group and Individual assessment

- Individual Assessment (Self-Assessment)
- Team Assessment (Assessment in collaborative learning)

III. Assessment Instrument / Method

Some basic assessment instruments or methods include essays, exams, quizzes, discussions, project, simulation, case studies, reflection exercises, portfolios, and peer evaluations. Rubrics are also used as assessment instruments. The following useful links were created by the Center for Distributed Learning (CDL, 2009) to showcase best practice in reviewing an online course: Course rubric or Module rubric.

5.5.2 Why conduct a course or module evaluation?

There are several reasons or purposes for conducting evaluation, including:

- to improve the course design, mode of delivery, and course management;
- to be able to revise the course in terms of context and outcomes; and

- to deliver an efficient and superior course that meets the goals and learning objectives.

Activity 15: Course Evaluation exercise

	Aim: Practice evaluating a course.
	Motivation: Develop expertise in course evaluation to improve your own courses.
	Task: Use the CWSEI inventory to evaluate a course.
	Duration: 45 minutes
	Tool: Upload assignment
	Resources • CWSEI Teaching Practices Inventory (UBC, 2016) • Teaching Practices Inventory – Fast and easy! (Anderson, 2015)
	What to do: • Select a course to evaluate – you could even choose this one. • Complete the CWSEI Teaching Practices Inventory anonymously, and take note of the ETP (extent of use of research-based practices) score obtained. • Copy the results page into a text document. • Make a note of any aspect that you would like to highlight or explore further, regarding the evaluation tool, or where the course itself is lacking.
	How: • Upload your results document and comments as an online assignment.
	Response/feedback: • Your tutor will provide individual feedback.
	Assessment: • Completing this task will count towards your module portfolio.

Reflection

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

Summary

	This topic has introduced you to Learning Analytics and assessment / evaluation and the reasons why they are important. You have discovered that Learning Analytics interprets a wide range of data produced by students within LMSs and automatically gathered by these systems to assess academic progress, predict future performance, and highlight potential issues. Four tools have been presented that work together to facilitate decision-making in learning processes, namely a: Learning Analytics engine, Adaptive Content engine, Intervention engine and Dashboard (user interface: presenting the report). The benefits of analytics can be

identified at various levels in which it operates; these include Mega, Macro, Meso, and Micro.

In addition, through the assessment/evaluation content, you were able to learn that the value of any online course depends on whether the assessment and evaluation are properly planned, to make sure that the target and objectives are accomplished.

Evaluation of a course is conducted to ensure the course goals and objectives are met, and to ascertain whether improvement is needed to ensure that the course outcomes are achieved with respect to content, method of instruction, and expectations of the learner. Assessment and evaluation can be summative and/or formative.

Review Questions

1. Define Learning Analytics.
2. Briefly explain the functions of the four integrated tools of Learning Analytics.
3. Explain in detail how the Micro-level works.
4. Briefly explain when to conduct formative and summative assessment.

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Glossary of Terms

ADDIE: The foundational Instructional Systems Design model: Analysis, Design, Development, Implementation, and Evaluation. Source: http://www.isitedesign.com/services/e-learning/e-learning-glossary

Communication: This refers to the act of passing information from one source another. Source: Naidu, (2006). E-Learning: A Guidebook of Principles, Procedures and Practices. 2nd Edition. Commonwealth Educational Media Centre for Asia. http://cemca.org.in/ckfinder/userfiles/files/e-learning_guidebook.pdf

Collaborative learning tools: These are learning aides, instruments, and strategies that are designed to optimise engagement in group-based learning activities. Source: Naidu, (2006). E-Learning: A Guidebook of Principles, Procedures and Practices. 2nd Edition. Commonwealth Educational Media Centre for Asia. http://cemca.org.in/ckfinder/userfiles/files/e-learning_guidebook.pdf

E-learning: This refers to all organised learning activities under the influence of an educational organisation that are carried out with the help of information and communications technologies. Source: Naidu, (2006). E-Learning: A Guidebook of Principles, Procedures and Practices. 2nd Edition. Commonwealth Educational Media Centre for Asia. http://cemca.org.in/ckfinder/userfiles/files/e-learning_guidebook.pdf

Feedback: This refers to information that is gathered or received on the effects of a specific object, programme, or process. Source: Naidu, (2006). E-Learning: A Guidebook of Principles, Procedures and Practices. 2nd Edition. Commonwealth Educational Media Centre for Asia. http://cemca.org.in/ckfinder/userfiles/files/e-learning_guidebook.pdf

Instructional design: This refers to the planning of learning and teaching activities that are associated with the pursuit of intended learning outcomes. Source: Naidu, (2006). E-Learning: A Guidebook of Principles, Procedures and Practices. 2nd Edition. Commonwealth Educational Media Centre for Asia. http://cemca.org.in/ckfinder/userfiles/files/e-learning_guidebook.pdf

Interactivity: This refers to all forms of transactions between and among learners, as well as between the learners and the learning resources. Source: Naidu, (2006). E-Learning: A Guidebook of Principles, Procedures and Practices. 2nd Edition. Commonwealth Educational Media Centre for Asia. http://cemca.org.in/ckfinder/userfiles/files/e-learning_guidebook.pdf

Learning designs: These are plans and models for approaching the acts of learning in uniquely different ways. Source: Naidu, (2006). E-Learning: A Guidebook of Principles, Procedures and Practices. 2nd Edition. Commonwealth Educational Media Centre for Asia. http://cemca.org.in/ckfinder/userfiles/files/e-learning_guidebook.pdf

Learning Management System (LMS): These are software applications that comprise an integrated suite of tools to enable online-learning interventions. Source: Naidu, (2006). E-Learning: A Guidebook of Principles, Procedures and Practices. 2nd Edition. Commonwealth Educational Media Centre for Asia. http://cemca.org.in/ckfinder/userfiles/files/e-learning_guidebook.pdf

Multimedia: This refers to the presentation of information and instruction through a combination of graphics, audio, text, and/or video. Multimedia instruction is often interactive. Source: Glossary of Online Learning Terms (2016). The eLearning Coach. http://theelearningcoach.com/resources/online-learning-glossary-of-terms/

Online learning: This refers to all learning activities that are carried out over an electronic-networked environment, such as an intranet or the internet. Source: Naidu, (2006). E-Learning: A Guidebook of Principles, Procedures and Practices. 2nd Edition. Commonwealth Educational Media Centre for Asia. http://cemca.org.in/ckfinder/userfiles/files/e-learning_guidebook.pdf

Peer feedback: This refers to all forms of responses and reactions to a group member's work from fellow members of the group. Source: Naidu, (2006). E-Learning: A Guidebook of Principles, Procedures and Practices. 2nd Edition. Commonwealth Educational Media Centre for Asia. http://cemca.org.in/ckfinder/userfiles/files/e-learning_guidebook.pdf

Social media learning: The acquisition of information and skills through social technologies that allow people to collaborate, converse, provide input, create content, and share this content. Social-media learning can occur through online social-networking platforms, blogs and microblogs (such as Twitter), online talk radio, and wikis. Source: Glossary of Online Learning Terms (2016). The eLearning Coach. http://theelearningcoach.com/resources/online-learning-glossary-of-terms/

Self-assessment: This refers to attempts at ascertaining learning achievement by oneself, usually with the help of automated marking schemes and feedback. Source: Naidu, (2006). E-Learning: A Guidebook of Principles, Procedures and Practices. Commonwealth Educational Media Centre for Asia. http://cemca.org.in/ckfinder/userfiles/files/e-learning_guidebook.pdf