MODULE

MicroLEARN

The Modular Approach

Basic Level

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SUMMARY OF ICONS

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1		Learning outcome
2		Think-Pair-Share
3		Reflect
4		Choose the correct answer
5		List and verify
6		Compare and contrast
7		Brainstorm
8		Question and Answer
9		Buzz group
10		Self-reflection
11		Peer collaboration
12		Video extraction
13		Chunking
14		Practice
15		Individual practice
16		Online search
17		Group works
18		Recall
19		Explore
20		Class discussion
21		Jigsaw
22		Demonstration

Module Objectives

The Basic Level

At the end this basic modular approach module, you will be able to:

- design and develop learning materials in your subject matter based on the knowledge and skills learnt in the area of the Modular Approach.
- disseminate the knowledge and skills learnt in the area of Modular Approach at department / school / faculty levels.

Basic Modular Approach Curriculum Mapping

Learning Outcome	Content/ Topic	Strategy or Activity	Assessment Method	Learner's Learning Time (hour)	
				F2F	SL
LO1: Basic Principles of Modular Approach	Definition of Modular Approach	• Peer Collaboration • Recall	Assessment on activities participation	3	10
	Advantages of Modular Approach	• Class Discussion • Buzz Group	Assessment on activities participation		
LO2:Theory of the Modular Approach	Learning Theories	• Class Discussion • Explore • Reflect	Assessment on activities participation	3	10
	Relevant Learning Theories of Modular Approach	• Brainstorm • Jigsaw	Assessment on Modular Approach underlying learning principles table		
LO3: Conducting Task Analysis	Identifying the Learning/ Performance Gaps	• Think-pair-share • Reflect	Assessment on the student learning gaps	6	20
	Content Structure of Learning Gaps	• Think-Pair-Share • List and Verify • Compare and Contrast • Brainstorm • Question and Answer • Reflect	Assessment on proposed instructional strategies		
LO4: Designing and Developing Specific Components of Modular Approach	Structure of the Modular Approach	• Think-Pair-Share • Practice	Assessment on Modular Approach structure		
	Preface	• Think-Pair-Share	Assessment on preface		

	Learning Outcomes	• Think-Pair-Share • Self-Reflection • Buzz Group • Reflect • Peer Collaboration	Assessment on learning outcomes	18	70
	Concept Maps	• Reflect • Think-Pair-Share • Group Discussion	Assessment on concept maps		
	Introduction	• Think-Pair-Share • Brainstorm	Assessment on introduction		
	Chunking	• Practice • Peer Collaboration	Assessment on learning material segmentation		
	Writing Styles	• Practice • Brainstorm • Think-Pair-Share • Reflect • Peer Collaboration	Assessment on writing styles		
	Graphic Visualisation	• Think-pair-share • Brainstorm	Assessment on graphics		
	Activities	• Think-Pair-Share • Reflect	Assessment on learning activities		
	Feedback	• Online Search • Brainstorm • Think-Pair-Share • Reflect	Assessment on learning activities feedback		
	Summary	• Brainstorm	Assessment on learning material		

LO5: In-House Knowledge Sharing	Kowledge Sharing	• Peer Collaboration • Reflect	Assessment on knowledge sharing	6	14
	Planning and Design	• Reflect	Assessment on the presentation materials		
	Delivery	• Peer Collaboration	Assessment on the delivery		
	Evaluation	• Reflect	Peer evaluation and exchange of ideas and experiences (F2F / online)		
			SUB TOTAL	**36**	**124**
			TOTAL	**160**	

F2F = Face-to-face teaching SDL = Self-directed learning

Unit 1

Basic Principles of Modular Approach

The Modular Approach or modular teaching has been part of teaching strategies for quite some time. The Modular Approach is actually very useful for most educational needs and it has been used extensively in the development of self-learning materials or modules for learners in Open and Distance Learning (ODL).

The word “Modular” refers to learning packages consisting of separate parts or units or small chunks which can be put together to form sets of instructional materials. You would surely have heard of modular furniture, modular kitchens, modular laboratories and the like.

The same concept is being used here; small units can be put together with different combinations to form much larger units to satisfy various teaching and learning requirements. In this unit, you are going to focus on the Modular Approach in the teaching-learning process. It is applicable to all teaching-learning situations without being merely restricted to self-instruction or distance learning.

For those of you who are not familiar with the Modular Approach, e.g., those who have always been teaching in face-to-face/classroom situations, you may wonder why and when why we use it would be practical to use the Modular Approach.

Consider the case of a student who can study on his/her own for certain topics, thus lessening the demand for you as a teacher/lecturer. Or another case where a missed class that does not have to be replaced because the material is already there.

What about the time constraints that can sometimes limit face-to-face interaction? Or simply, the case of a student who takes a little longer than the other students to comprehend certain concepts/materials.

In all the above scenarios, the Modular Approach can be used as a very realistic alternative. You may want to get more information about Modular Approach using the following links.

- www.nyu.edu/gsas/dept/philo/courses/r...
- www.acrwebsite.org/volumes/display.as...
- www.autoblog.com/2012/09/13/bmw-conce...
- wiki.answers.com/Q/Is_the_divide_and_...
- en.wikipedia.org/wiki/Essentially_con...

To illustrate the concept of teaching using Modular Approach, let's undertake the following activity.

Activity 1.1 Peer Collaboration – Concept of Modular Approach

What comes to your mind when you hear the words "Modular Approach" in teaching? How are you going to apply the modular concept in your teaching?

Jot down your thoughts on a piece of paper.

Then compare your ideas with the participant next to you.
Do both of you have the same ideas on the concept of Modular Approach?

In this unit, you are going to explore the concept of the Modular Approach in teaching. You are going to find out what the modular approach in education is and why and how it is being used. What are the advantages of using this approach? So, by end of this unit, you will be able to:

- explain the concept of the Modular Approach.
- define Modular Approach.
- describe the basic features of Modular Approach
- discuss the merits of the Modular Approach.

1.1 DEFINITION OF MODULAR APPROACH

The Modular Approach in teaching and learning is a process in which you take a large topic/educational task and break it down into smaller parts (also known as chunks) with each smaller part being addressed individually.

As a lecturer, you may view the Modular Approach as the packaging of small units of a lesson into structured and interactive learner-centered materials which can be used for the students' learning at their own pace or via guided face-to-face learning. You may have come across some features of Modular Approaches in courses or training sessions that you have attended.

A typical feature of the Modular Approach can start with a preface for the unit, the unit learning outcomes, followed by contents which comprise texts, learning activities, formative and summative assessments, feedback to assessments and ending with a summary of the unit.

The main idea behind the Modular Approach is to divide into segments or chunks (divide into smaller portions) the instructional events into some logical sequence that will facilitate the learning process. These features presented in sequence will lead the learner towards achieving the stated learning outcomes. You will learn the details of how to design all the features in Unit 4 of this module.

You may want to recall your experiences in Modular Approach, let's do Activity 1.2.

Activity 1.2 Recall – Modular Approach Features

Think back to the last course or training session that you have attended. Or you may consider the course you are teaching right now. Let's find out whether the materials/handouts contain some of the features of the modular approach. In some cases, the features may not be written specifically but are demonstrated by the lecturer verbally. Look at the list given in Table 1.1 and tick the correct responses.

Table 1.1 Modular Approach Features

No	Feature	YES	NO	Text	Verbal
1	Opening statements by the lecturer to motivate encourage and stimulate students' interest in the topic. Recall students' prior learning?				
2	List of learning outcomes to guide students in their learning.				
3	Presentation of contents in small units/ chunks, followed by examples and activities or exercises.				
4	Students are asked/ persuaded/ encouraged to be actively involved in the in-class exercises/activities provided by the lecturer.				
5	Contents presented are in alignment with the learning outcomes expected for that particular unit/topic.				
6	Assessment given is in alignment with the presented contents and stated learning outcomes.				

After doing the Activity 1.2, I hope you will realise that those features found in face-to-face classes are also features present in Modular Approach. Thus, how is modular approach different from any good normal classroom instructional practice?

1.2 ADVANTAGES OF MODULAR APPROACH

How many times did you have to miss delivering a lecture due to unavoidable circumstances, such as having to be away on official business or due to some personal reasons?

Or have you faced a situation where some of your students are giving the impression that you are going too fast or too slow in your lecture? They want a slower or faster pace but you have to cater to everyone.

Or consider this rather familiar scenario: some of your students are having problems with a certain topic in a second year course that you are teaching. They lack the background knowledge or they have conveniently forgotten what they have learnt in the first year. You would like to do some revision or give a refresher course but as usual, time is not on your side.

There are just too many topics to cover. Short of having an extra two or three classes, the problem will linger. You see many empty stares in your class but you are unable to do everything. So you thought.

The Modular Approach can help solve these very typical problems.

What if, based on your years of teaching experience, you can already predict some of the potential problem areas in the course that you are going to teach, e.g., the concept of frequency, wave lengths, amplitude and intensity in light waves. Or the concept of accuracy and precision in measurements. Or the difference between the concept of administration and management in an organisation.

How about you preparing some materials in advance that the students can go through before they proceed to the more advanced topics that would require their comprehension of the basic concepts aforementioned? That preparatory MODULE will probably do wonders for the students and your teaching of the more advanced material.

And we have not talked about catering to students learning at different paces. All these familiar scenarios can actually benefit from the Modular Approach of teaching.

Now, you know the advantages of having some learning materials being designed using Modular Approach Principles. Let share experience on preparing Modular Approach and what are the factors need to be considered when developing them. Do Activity 1.3.

Activity 1.3 Class Discussion – Major Consideration in Modular Approach

If you were to prepare one complete unit of a course (equivalent to a one or two-hours lecture) for the Modular Approach learning materials, what would be your major considerations? Please share your thoughts with the whole class.

You will find that there are many factors need to be considered:

- **Learners**

  Who are the leaners?

  Are they good students or weak students?

  Are they adults students?

- **The type of learning to be achieved**

  Is the learning for knowledge construction, or is it for skills and attitude development?

- **The types of activities to achieve the learning outcome**

  What kind of activities should be conducted to meet the learning objectives?

  Will the activities involve case studies, problem-solving, questions and answer, group discussion, role play etc?

- **The types of resources available**

  What are the types teaching resource available?

Merits of the Modular Approach

Now let's consider some of the issues that I hope will further convince you that the Modular Approach is applicable when solving many teaching-learning needs. Let's undertake the following activity.

Activity 1.4 Buzz Groups – Merits of the Modular Approach

The Modular Approach has been used successfully in several fields of study. Do a literature search on the approach in your field of interest or teaching area. Summarise your findings in Table 1.2. I have filled in the first attribute and merit for you as an example of how I want you to review the paper. You may find different attributes in your review. Share your list with your group or the whole class (yes, we want to see the snowball effect).

Table 1.2 Merits of The Modular Approach

No	Attribute	Advantage
1	Adapts to learner needs (learning outcomes are fixed but individual learning times may vary).	Since learners learn at their own pace, those needing extra time may do so while fast learners may continue to the next module or unit.
2		
3		

At the end of this activity, a table such as the one presented below can be prepared for the benefit of all your group members.

Table 1.3 Attributes and Merits of Modular Approach

No	Attribute	Merit
1	Adapts to learner needs (learning outcomes are fixed but individual learning times may vary)	Since learners learn at their own pace, those needing extra time may do so while fast learners may continue to the next module or unit
2	Learners are actively involved in frequent activities	Many opportunities for in-depth learning experiences
3	Ensures learning	Since each learner must achieve and demonstrate competency (based on the learning outcomes) before being allowed to proceed to the next level, no dropouts occur
4	Generates positive learner attitudes	Everyone contributes to the learning process, the knowledge created belonging to everyone

I hope by now you will accept the idea that the Modular Approach is applicable in many teaching situations. The merits of the approach, as you have discovered in Activity 1.4, should convince you that it is applicable for both face-to-face or self-learning situations.

1.3 SUMMARY

In this unit, you have been introduced to the basic concepts of modular approach. You have been enlightened to the advantages and merits of using modular approach both in self-learning as well as in the face-to-face teaching.

1.4 ADDITIONAL READINGS

Donnelly, R & Fitzmaurice, M. (undated). *Designing Modules for Learning*. http://www.aishe.org/readings/2005-1/donnelly-fitzmaurice-Designing_Modules_for_Learning.html

Rowntree, D. (1990). *Teaching Through Self-Instruction*. London; Kogan Page.

Unit 2

Theory of The Modular Approach

In Unit 1, you have been exposed about the basis features of Modular Approach and its advantages over the conventional approach. To recall your understanding about Modular Approach, let's undertake the following activity.

Activity 2.1 Reflect - Ability of Modular Approach

What has given the Modular Approach the ability to tower over the conventional approach? Ponder on this question and share your views with your friends.

You will see that the Modular Approach involves the use of learning modules which are self-contained with logical links between learner needs, aims, learning outcomes, resources, learning and teaching strategies, assessment and evaluation. Thus it provides highly structured learning experiences with coherent and explicit set of learning outcomes and assessment.

In this unit, you will be exposed to basics of learning theories and subsequently look at those theories that are related to Modular Approach. Specifically, by the end of this unit, you will be able to:

- State and explain the various type of learning theories.
- Identify the learning theories to the Modular Approach of instruction.
- Describe the underlying learning principles of the Modular Approach.

2.1 LEARNING THEORIES

What is a learning theory? A learning theory desribes how your students learn and describe their actions and behaviour when they learnt. Basically, there are five common learning theories:

- Behaviourist – explains learning as change in behavior.
- Cognitivist − explains learning as internal mental process.
  (processing of information, memory and perception)
- Humanist – explains learning as a personal act to fulfill potential.
- Constructivist – views learning as construction of knowledge and meaning through experience.
- Social Constructivist − explains learning as a process of interaction with and observation of others in a social context.

(some description of each learning theory is in order as we cannot presume familiarity.

Activity 2.2 Class Discussion – Strengths and Weaknesses of the Learning Theories

In a group, discuss about the above mentioned 5 learning theories. In each of the thoery, provide the strength and weakness and present this to the class.

From Activity 2.2, you are now aware about the learning thoeries together with their strengths and weakness. Let now recall your experience as a student and the way the teachings were being conducted on you. Let's do the following activity.

Activity 2.3 Reflect – Learning Experience

Reflect upon your experience as a student. How were you trained to learn?

From Activity 2.3, you know that some theories are suitable to be deployed in order to achieve certain learning objectives whereas some thoeries are suitable for other specific purposes.

There are also instances where you need combination of theories to create learning experience suitable to achieve the stipulated learning objectives.

Learning Styles

Humans are born with different characteristics. They have their own preferences when conducting their life. Similarly in learning, humans have difference styles to construct new knowledge and skills. Some prefer reading books whereas others prefer listening or doing it by themselves.

Let us learn more about learning style by undertaking the following activity.

Activity 2.4 Explore – Learning Style

Have you heard about learning styles? How many types of learning style do you know of? List them down and compare your list with friend next to you. For each of the learning styles, suggest the best approach to cater for their styles.

From Acitivity 2.4, you will find that there are many learning styles but the most prominent one are:

- Perceptual styles.
- Processing styles.
- Reinforcement styles.

When you are developing your learning materials, you have to be aware of the different learnings style of your students and incorporate appropriate activities to cater for the various learning styles.

Andragogy

What is andragogy? Andragogy is the art and science of teaching adult learners. Adult learners have multiple roles which include roles as spouse, parents, employees and members of the society.

They possess positive self-concept and are capable of making decision and being responsible for their own choices. They are also rich in experience and able to relate old experiences with new ones.

Andragogy takes into account that adult are self-directing and take responsibility of their own decisions. The fundamental concepts of learning involving andragogy are that adults:

- need to know why they need to learn something.
- need to learn experientially.
- approach learning as problem-solving.
- learn best when the topic is of immediate value.

Now, to understand more about adult learners we need to compare their characteristics with the traditional students. Let's try the activity below.

Activity 2.5 Explore – Adult Learner vs Traditional Learner

What are the differences between adult learners and the traditional learners? List down as many differences as possible. Compare your list with your immediate friends.

You will find that there are huge differences between adult learners and traditional learners. Appropriate steps must be undertaken to address the characteristics of adult learners when developing learning materials. Learning activities for them must be appropriate to their characteristics so that learning take place in suitable and condusive environments.

2.2 RELEVANT LEARNING THEORIES OF MODULAR APPROACH

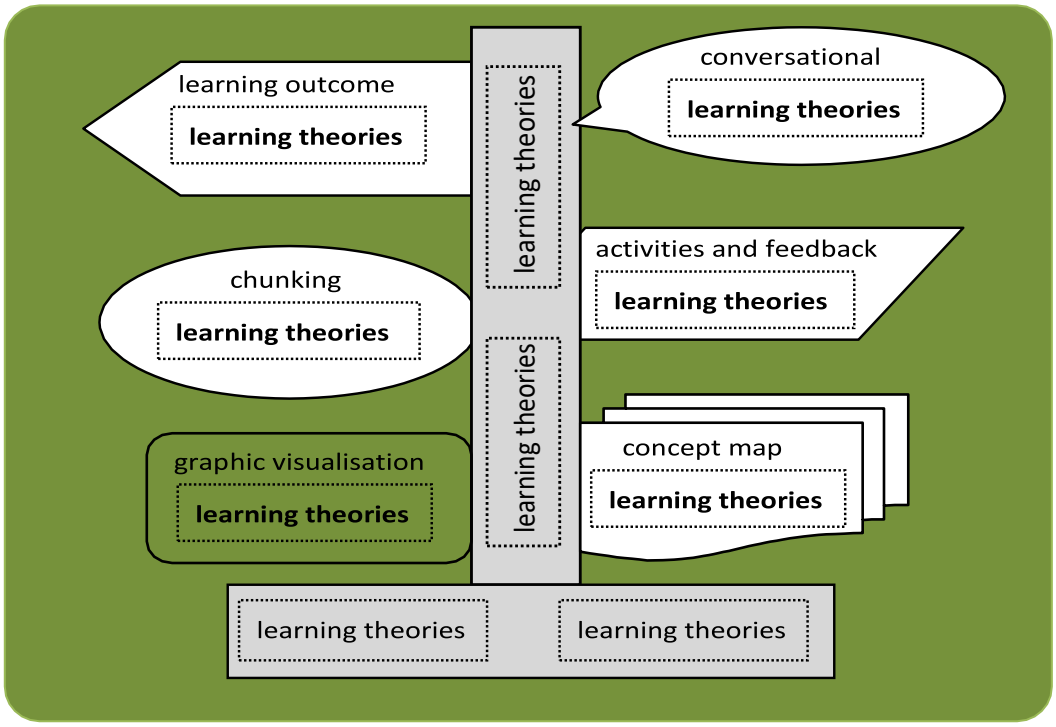

Figure 2.1 Learning theories and The Modular Approach

Figure 2.1 shows the learning theories from which the characteristic features and structure of the Modular Approach are derived. These theories form the skeletal backbone and the foundational learning principles of the approach.

From the previous activities, you are now aware about the various types of learning theories. The issue now is: which ones are related to the Modular Approach?

Your task of relating the learning theories with the Modular Approach of instruction is akin to finding Modular Approach needles in the learning theory haystacks. Pool your resources and experiences by brainstorming and in group discussions in Activity 2.6 and 2.7.

Activity 2.6 Brainstorm – Learning Theories Related to Modular Approach

Brainstorm to list the learning theories that are related to Modular Approach.

After this acivtity, you should now know all the theories that are related to Modular Approach.

Activity 2.7 Jigsaw – Modular Approach Underlying Learning Principles

Each group is given the following tasks:

(a) Search the Internet for the essence of a few learning theories.

(b) Relate the learning theories to the Modular Approach features/ traits.

(c) Present your findings, followed by discussion.

Table 2.1 The Modular Approach underlying learning principles

No	Modular approach features/traits	Essence of a learning theory	Learning theory
1	Learning outcomes	Stimulus-response	Behaviourism
2	_____	_____	_____
3	_____	_____	_____
...	_____	_____	_____

(d) Complete Table 2.1. One example has been shown.

Now that you have completed Table 2.1, does this activity help you internalise the basis of the identified modular approach features presented in Unit 1? This experience will help you to overcome the ensuing challenges during the writing phase as you are able to reason out why you must include them in your learning materials. Their exclusion may increase the learning curves of your learners due to the missing learning scaffoldings.

2.3 SUMMARY

The Modular Approach underlying learning principles is derived from the essence of several main learning theories such as behaviourism, cognitivism, constructivism, motivational, social and humanism. Since most of these learning theories are research-based findings, it is evident that the modular approach features, traits and structure are beneficial to your students.

2.4 ADDITIONAL READINGS

Donnelly, R & Fitzmaurice, M. (2005). *Designing Modules for Learning*. http://www.aishe.org/readings/2005-1/donnelly-fitzmaurice-designing_Modules_for_Learning.

Hergenhahn, B. R., & Olson, M. (2009). *An Introduction to Theories of Learning* (8th ed.). Upper Saddle River, NJ: Prentice Hall.
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Jonassen, D. H., & Land, S. M. (2012). *Theoretical Foundations of Learning Environments*. New York, NY: Routledge.

Learning theories knowledgebase (2012, August). from http://www.learning-theories.com/. (Retrieved August 8th, 2012).

Schunk, D. H. (2012). *Learning Theories: An Educational Perspective.* (6th ed.). Boston, MA: Pearson.

Slavin, R. E. (2012). *Educational Psychology: Theory and Practice.* (10th ed.). Upper Saddle River, NJ: Prentice Hall.

Unit 3

Conducting Task Analysis

Now that you have decided to write your learning materials based on the Modular Approach, which topic have you chosen? Often, the topic would be a problematic one or the one where most of your students are having difficulties. It might also be the topic that you may l not be around to deliver. Regardless of the topics that you have chosen, naturally you would like your students to be able to perform as desired after using your learning materials.

But how are you going to ensure that *what you desire* is really what your students need to bridge the learning gap? Hitting the bulls-eye each time does require you to think deeply – at the end of the day, *what is it really* you want them to be able to do? Will your learning materials be able to facilitate such learning? To answer these questions, try the role play in Activity 3.1. The activity aims at bridging the learning gap of your students.

Activity 3.1 Think-Pair-Share – Bridging the Learning Gap of Your Students

Visualise yourself as a driving instructor. What is the learning gap of your student drivers and how are you going to bridge it? Of course at the end of the day, you as an instructor would have inner peace if you know that your bridging tasks have contributed towards the better-life pie for the students.

Use the think-pair-share approach to discuss this scenario.

Intuitively, you might have said the gap is in the ability to drive. However, is the ability to drive the "*real"* gap or should it be the ability to drive safely? Think about it. Your choice of the learning/performance gap and the ensuing bridging tasks may have an impact on the road mortality rate.

Let us say you did mention driving safely. Did your identify the bridging learning tasks in constructive alignment? In other words, are these the tasks that enabled you to accomplish your desired learning outcomes and bridged the gaps in the learning/performance once and for all? Regardless of the outcomes, this role play does illustrate the importance of doing the two fundamental steps of a task analysis:

(1) Identifying the *real* learning/performance gaps.
(2) Listing the constructively aligned bridging tasks.

Both steps are very crucial in ensuring the deliverables of your Modular Approach learning materials. *Basically, the task analysis describes and sequences the learning outcomes or sub-tasks involved in the performance of an identified task*. You are going to break up the learning gap into its constituent sub-tasks and show how the sub-tasks relate to each other and to the ultimate end-task of the learning gap.

Let undertake the following activity which is about reflecting on your teaching.

Activity 3.2 Reflect – Reflecting on Your Teaching

Before you proceed to the task analysis, ponder whether the following practices are your norm when developing your lecturing/teaching materials:

Do you jump ahead to develop the materials, skipping these task analysis steps? In the case of a learning/performance problem, do you look at the learning /performance surface symptoms, not giving much thought about the learning/performance gaps and the root causes, when prescribing a (band-aid) solution?

In actual practice, you will find that these two lines of attack, time and again, do provide a quick remedy to the learning/performance problems – yes, without even the necessity of doing any task analysis. A word of caution here: this is only true if the learning/performance problem is of the procedural type.

For others, there is a danger that this stop-gap measure may exacerbate the learning problems especially if they relate to the foundational prerequisites of other knowledge, skills and attitude. Indeed unintentionally, you may be passing the problem baton to the next learning stage.

To help you perform a decisive task analysis and to ensure that you hit the performance/ learning gaps' bulls-eye each time, in this unit you will be guided on how to do the followings:

- identify the real learning/performance gap of your learners.
- select constructively aligned tasks in the bridging learning activities with the help of the content structure.

3.1 IDENTIFYING THE LEARNING/ PERFORMANCE GAPS

The scenario in Activity 3.1 exemplifies the importance of choosing the real learning gap gleamed from actual symptoms and root causes. To start off the real learning gap search, try Activity 3.3. which aims at looking at the key questions to establish the learning gap.

Activity 3.3 Think-Pair-Share – Establishing the Learning Gap

What questions would you ask yourself when looking for the learning gap in the topic or problem of your choice? List and discuss them, using the think-pair-share approach. Among others, you may have said:

- What are the learning difficulties/problems in that topic?
- What are your students doing that they should not be doing?
- What specific things should your students do, but do not?
- When students perform well, what do you see them doing?
- What prevents them from performing the prescribed tasks to achieve the benchmarked learning outcomes?

Are the learning aids available and if so, are they helpful? Are they being used?

These are the “looking for symptoms” or the “what questions” – basically the tacit difference between novice and expert performers and “what is there or not”. These are inadequate. If you stop here, you may have found a learning gap in your students but not necessarily the real one needing attention. To understand about the learning gap predicament, let undertake Activity 3.4.

Activity 3.4 Think-Pair-Share – The Learning Gap Predicament

Let us say that you have looked at the symptoms and answered the “what questions”. You have found your students’ learning gap, i.e., they do not know how to write a report. So, congruent to that end-task (writing a report), you list out the steps of how to write a report as your learning outcomes and accordingly, write your learning materials. At the end of the day, all you get are mostly mediocre reports and you are disappointed. Who is/are to be blamed? Your students have literarily done exactly what is being listed in the learning outcomes. What is wrong here? Use the think-pair-share approach to discuss this scenario.

Activity 3.4 is a classic example of a stop-gap measure. Your discussion may have started with a “what question” and ended up answering the “why question”: *why are they not able to write good reports*? The word *good* is the key - adding the *good* means the end-task has been redefined to have a condition or a degree of refinement. The goal to be achieved has indeed been changed. Thus, one can now blame the end-task for not being accurate.

However, with the change in the accuracy of the end-task, the procedural steps as learning outcomes given earlier are now rendered inadequate as they only serve well when writing a basic report. So, additional learning outcomes are warranted for good report writing, i.e., strategic skills and principles to discern a good report from a mediocre one – without which your students may not be able to perform at their very best.

Often, the additional learning outcome is seldom stated explicitly and it is assumed that the students will be able to infer it by themselves; this is unfortunately seldom true in most cases. And so the end-task, normally written as “write a report” and being silent about the condition of being *good*, inadvertently leads to the missing vital, discerning and enabling skills needed for good report writing.

In short, Activity 3.4 has illustrated that asking the ”why questions” will eventually lead you to the *real* learning gap and nail the good report predicament. Yes, indeed you need to go a step further – from the “what questions” to the “probing root cause” or the “why questions”:

- Why are they having such difficulties/problems?
- Why is there a schema missing in their mental model?

If the “why questions” do not deliver what you really desire, you should go to much higher tacit compliance questions:

- Are the learning outcomes in constructive alignment or congruent to the *needed* end-task or goal of the topic? If not, why?
- Is the end-task really the one you tacitly desire or needed by the students in order to perform well?

In cases of non-compliance with the learning outcomes to the *needed* end-task, treating the symptoms in themselves only will not bridge the learning/performance gap as seen in Activity 3.1 and Activity 3.4. So early on before writing your modular approach learning materials, you should be clear of what your *real* learning gap and end-task are. A false step here will be costly to your students and a nightmare for you.

Activity 3.5 Think-Pair-Share – Probing the Root Cause

By now, you may have realised the importance of the root cause and the "why questions" in revealing your *real* learning gap and the decisive end-task. Use the think-pair-share approach to discuss how you can probe the answers to your "why questions".

Typically as subject matter experts, you may have relied on your experiences and your students' work to gauge the learning gap. However, these two resources may only serve as the starting point since they normally provide only the surface symptoms. To get to the root cause, you have to probe deeper and in consultation with your students and fellow subject matter experts. It would be best if you corroborate your findings with the followings:

- Literature search on learning gaps.
- A diagnostic pen-pencil quiz on learning gaps.

Yes, this is a tedious process. However, once you have written your Modular Approach learning materials with the *real* learning gap and associated bridging learning outcomes, the rewards are satisfying – many happy students – and for you, a reduced number of students knocking on your door asking the same questions.

Activity 3.6 Think-Pair-Share – Bridging Learning Gaps

(1) Write your students' *real* learning gaps.
(2) Explain how you determine *real* learning gaps.
(3) List your proposed learning outcomes or tasks in bridging learning gaps.

Discuss, using think-pair-share, the strategies you have used to determine the *real* learning gaps of your students.

3.2 CONTENT STRUCTURE OF LEARNING GAPS

In Activity 3.6, you have written your students' learning gap and the proposed learning outcomes. Now, let us see how we can ensure that the learning gaps are being bridged effectively. Let's undertake the following activity.

Activity 3.7 **Think-Pair-Share – Ensuring the Effectiveness in the Bridging of Learning Gaps**

Discuss, by using the think-pair-share approach, how you can be certain that your proposed learning outcomes or tasks will once and for all bridge the learning gaps of your students.

You might have suggested numerous ways. However, the true and simple way is via the content structure of each learning gap. In general, three elements determine the content structure:

(1) The types of contents.
(2) The end-tasks to be achieved that are unique to specific types of contents.
(3) Associated constituents or sub-tasks that will lead to the achievement of the end-task.

The content structure of a learning gap will help you identify the appropriate instructional strategies. The content structure of specific types of knowledge or information may be new to you. However, learning it will make your task of developing your learning materials much easier.

The same holds true for your lectures and tutorials; at a glance, you will be able to check the inclusion of all the essential learning outcomes for the achievement of the end-tasks for a particular concept. At the end of the day, a peaceful mind will be yours as you have done all your part to the bargain.

You may share the content structure with your students so that they will be able to do the checking themselves. Giving your students content coverage self-assessment skills will be in line with student-centred learning.

The content structure of a learning gap can be classified into five structures, i.e., facts, concept, procedure, process and principle. Let us go through each one.

Content Structure 1: Facts

Factual information or in short, facts, are the basic building blocks of a topic and often constitute the vocabulary of the topic. They can be in three formats as shown in Table 3.1.

Table 3.1 Three Formats of Factual Information

No.	Format	Example
1	Specific information or identifying name	LBP3050 Canon printer, ERGO201 typist chair
		E8 IRD tax form, CIMB deposit form
		Archimedes principle
2	Data	0194567890, 046523421
		QUT912, Gemilang_39
		21/2/1999, 31 Aug 1957
3	Associative statements	Universal gas constant = 8.31, F = ma
		The conference room needs 230 chairs

Now, let us extract common characteristics of facts. Let undertake the following activity.

Activity 3.8 Think-Pair-Share – Extracting Common Factual Characteristics

Extract, using think-pair-share, the common characteristics of the facts in Table 3.1.

From Table 3.1, it can be seen that there are two common or defining characteristics of a fact:

i. A fact is specific information

For example, the LBP3050 Canon printer is considered a fact since it gives the specific identifying label about a type of Canon printer. The datum 0194567890 is a set of unique contact numbers assigned to a telephone SIM card. So is the statement: universal gas constant = 8.31. It gives a specific association between the term “universal gas constant” and the datum “8.31”. From all this, the key to identifying a fact is to ask the question: is this piece of information specific?

ii. All instances of a fact are identical

For example, a LBP3050 Canon printer is identical to another LBP3050 Canon printer. So too are the **E8 IRD tax forms.** The first refers to a specific type of Canon printers while the latter refers to a specific type of tax forms, all of which are identical one to the other. It would be not a fact if it is referring to any other tax form or Canon printer as there are many instances of the generic tax form and different models of Canon printers. Thus, if the information is generic, it is not a fact.

In summary, a fact is information that is specific and identical in all instances. Using the two characteristics of a fact as the differentiating criteria, try Activity 3.9. Remember to ask: is this piece of information specific?

Activity 3.9 List and Verify – Differentiating A Fact from A Non-Fact

Tick the information that is a fact.

☐	Chair	☐	Room 25
☐	LBP3060 Canon printer	☐	Gravitational acceleration = 9.81
☐	Iphone 5	☐	Pencil
☐	12-12-12	☐	Room

The Canon printer LBP3060, Iphone 5, gravitational acceleration = 9.81 and 12-12-12 are facts since they are specific in identifying information about a particular device model, associative statement or datum respectively; each of their instances shares identical characteristics. However, it is different in the case of the chair, pencil and room.

There are many instances of chairs (rocking chair, typist chair, etc), pencils (colouring pencil, drawing pencil etc.) and rooms (bedroom, living room, etc.). So, they are not facts.

However in the case of Room 256, the information given is about a specific room with the number 256 and it is a fact. So too, if the pencil is given as a HB1422 pencil, the information HB1422 pencil is a fact – since the information gives the identifying name and of course, you know that all instances of HB1422 pencils are identical.

Activity 3.10 Reflect – Listing of Facts

Now it is your turn to list three examples of facts in your course.

Did you ask the question: is this piece of information specific? If you did, you will find that it is much easier to discern the facts from non-facts. Make sure your given factual examples are specific information where all instances are identical.

Activity 3.11 Think-Pair-Share – Bridging the Factual Learning Gap

If your students are missing most of the facts listed in Activity 3.10, how would you go about bridging the missing facts learning gap? Discuss it using the think-pair-share approach.

If your students' learning gap is missing factual information and you are not going to provide a fact aid sheet, they must remember the facts – there is no other way to learn facts. Yes, indeed the end-task for learning facts is to *remember* them.

Activity 3.12 Reflect – Listing Strategies to Remember Facts

Brainstorm a list of instructional strategies on how to remember facts.
Yes, apart from memorising facts, there are various ways that you may use to help remember them, including mnemonics, drill-and-practice and visualisation.

To demonstrate that the students can remember given facts, they must be able to retrieve the facts from their memory. Ask them to do two sub-tasks:

(1) *Recognising* the facts from a list of possible answers as illustrated in Activity 3.9.
(2) *Recalling* the facts without any aid of possible answers as illustrated in Activity 3.10.

Activity 3.13 Question and Answer – Naming Factual Tasks

In learning a fact, what is/are the following:

(a) The end- task?
(b) The two sub-tasks or learning outcomes?
(c) The difference between the two factual sub tasks?

I hope you are able to recall them as they are the core of teaching-learning facts. They provide the structure to your factual bridging tasks. Depending on the usage of the facts, certain facts have to be recalled automatically while others need only to be recognised.

Activity 3.14 Think-Pair-Share – Checking Congruency

Look at your fact bridging tasks in Activity 3.11. Are they congruent with the end-task and two sub-tasks or learning outcomes of facts? Use the think-pair-share approach to discuss this. Revise your findings. accordingly.

Activity 3.15 Brainstorm – The Guidelines for the Design of Facts

You have completed and discussed several activities on facts. Capitalising on your experiences, brainstorm a list of design guidelines for facts. Tabulate them in Table 3.2.

Table 3.2 Guidelines in Designing Facts

No	Element	Guideline
1		
2		
...		

Again, cross-check your factual bridging tasks in Activity 3.11 with the guidelines suggested in Table 3.2. It pays to be meticulous as any error or inappropriate approach may increase your students' learning time – rendering it to be an inefficient learning experience.

What you have noted about facts is that all instances are identical. Next, you will learn about concepts whose multiple instances may appear different but they share common features. Facts are often confused with concepts. Make sure you are able to discern the difference between them as their instructional strategies are completely different.

Content Structure 2: Concepts

Recall the cases of chairs and pencils. You know that chairs and pencils are not facts since they are many examples of chairs and pencils. But what are they? They are known as concepts. They are classified as concepts because of their two characteristic features:

(1) Each has many examples or instances.
(2) They share common characteristics but differ in irrelevant features.

In short, a concept is a general class of “things” (objects, ideas, events) or groupings with common defining features but varying in irrelevant features. So the key question to ask when you are not sure whether a “thing” is a concept or not is whether this “thing” has many instances but vary in irrelevant features. Try Activity 3.16 to identify the instances of a concept named a chair.

Activity 3.16 List and Verify – Identifying Instances of A Concept

Tick the object that is a chair.

☐	Couch	☐	Stool
☐	Typist chair	☐	Settee
☐	Sofa	☐	Rocker
☐	Recliner	☐	Bench

A couch, typist chair, sofa, recliner, settee and rocker are chairs but a stool and a bench are not chairs. Perhaps you wonder why stools and benches are not considered as chairs. This is because, in this case, a chair is defined as a seat with four legs and a back rest.

So in classifying objects into general classes of things or concepts, you need to be clear about the defining or critical features. Keep in mind that there are also borderline cases where the critical features almost apply and grey cases where they apply only in a certain way. Examples of concrete concepts are mammals, fruits, vegetables, cakes and soft drinks. Apart from concrete concepts, there are also abstract concepts such as emotion, liberty, dark matter and justice.

Activity 3.17 Reflect – Listing Examples of Concepts

Now it is your turn to list three examples of concepts used in your course. Discuss, using the think-pair-share approach the correctness of the given concepts.

When listing the concepts used in your course, did you fall back to the key question: do these terms have many instances but vary in irrelevant features? If you did not, recheck by using the question as a guide and revise your answers accordingly.

Activity 3.18 Think-Pair-Share – Bridging the Conceptual Learning Gap

If your students miss a concept listed in Activity 3.17, how would you go about bridging the missing concept learning gap? Discuss it using the think-pair-share approach.

You may have said to your students: what is the concept and do you know how to apply it? The issue here is: what is it that should be explained and what task do they need to practise and experience in order to ensure the conceptual learning gap is bridged?

Yes, in a concept, similar objects are grouped together and assigned a name. To be clear about what a concept is means being able to discern whether an instance is a member of a group or not. So, the end-task for learning a concept is to *differentiate*. Let us say you need to teach the concept of a chair. Hence, the end- task is that the students must be able to differentiate whether an instance is a chair or not a chair by using its defining features. This end-task will be made easier when five sub-tasks have been accomplished:

(1) *State* the name of the concept.
(2) *List* the defining features of the concept.
(3) *Show* examples and non-examples of the concept.
(4) *Compare and contrast* examples and non-examples of the concept.

Activity 3.19 Question and Answer – Naming Conceptual Tasks

In learning a concept, what is/are the following:

(a) The end-task?
(b) The five sub-tasks?

Knowing the end-task and five sub-tasks will help structure your mind when teaching a concept.

Activity 3.20 Think-Pair-Share – Checking Congruency

Look at your concept bridging tasks in Activity 3.18. Are they congruent with the end-task and five sub-tasks of a concept? Use the think-pair-share approach to discuss it.

Revise accordingly.

You have discussed two types of content structures, i.e., fact and concept. Normally, the confusing part is differentiating between them. Try to ask the two key questions whenever in doubt. Another issue is that students are prone to memorise materials especially in cases where they do not understand them.

In the case of a fact, it is acceptable since the end-task is to remember what it is but where a concept is concerned, the end-task is to differentiate features. So it is best for you to remind students that memorisation is not the appropriate strategy when learning concepts and show them the effective strategy.

Activity 3.21 Brainstorm – Guidelines for the Design of Concepts

You have now gained enough experiences in designing concepts. Brainstorm a list of design guidelines for concepts and tabulate them in Table 3.3.

Table 3.3 Guidelines in Designing Concepts

No	Element	Guideline
1		
2		
...		

Have another try at checking your conceptual bridging tasks in Activity 3.18 with the guidelines given in Table 3.3. It may be much easier now that all the means of assessing, designing and instructional strategies are given holistically under a set of guidelines. Bear them in mind whenever you are developing learning materials on concept contents.

Content Structure 3: Procedures

Activity 3.22 Reflect – Writing the Steps to Operate A Computer

Write the steps for switching on a computer. Use the think-pair-share approach to discuss how it should be done.

In Activity 3.22, did you sequence and number the steps? Have you tried it out and is the computer switched on? If you did and the computer is switched in, you have written the procedure on how to switch on a computer.
A procedure is an ordered sequence of clearly defined action steps that must be executed to accomplish a routine task. In short, a procedure is a directive to do something.

There are two types of procedures:

1. Linear procedures: actions carried out in sequential steps such as switching on a computer.
2. Decisional procedures: the sequence may be changed by a judgment made at a decisional step such as photocopying when paper runs out.

Activity 3.23 Brainstorm – Listing Essential Procedural Steps

From your experience writing and discussing procedures in Activity 3.22, brainstorm a check list of the essential steps to remember when writing a procedure. Tabulate the check list in Table 3.4.

Table 3.4 Check List of the Essential Steps in A Procedure

No	Essential step	✓ when available or x if missing
1		
2		
...		

Ensure that apart from proper sequencing and numbering of steps, you have done the following:

- Pre-listed the components /equipment needed when performing the procedure.
- Used action verbs and added illustrations in writing the steps.
- Ensured that the listed steps will indeed result in the achievement of the routine task. (This is a crucial step)

Activity 3.24 Reflect – Writing A Procedure

Write a procedure of a routine task in your course. Use the think-pair-share approach to assess your procedure with the check list in Table 3.4.

You will realise that Activity 3.24 is much easier than Activity 3.22. with the check list as a guide. It is also crucial that you test your procedure to be certain that it will get the task done – this would be foremost in your mind after writing a procedure.

Activity 3.25 Think-Pair-Share – Bridging the Procedural Learning Gap

In your lecture, you have presented the procedure given in Activity 3.24. However, some students may experience gaps in their learning of the procedure; a few may be unable to repeat the steps off-hand while others may be unable to carry out the procedure properly.

How would you go about bridging the procedural learning gap? Discuss it using the think-pair-share approach.

You may have told yourself: explain to them about the procedure and show them how to carry out the procedure. Again the issue here is: since it is a routine task, is there a need to explain about the procedure or should it be that the students should be practising using it until they are able to carry it out spontaneously? In bridging the procedure learning gap, it is pertinent that the emphasis is changed from being lecturer centred to student centred since it is the students who must to be able to carry out the procedure and not just observe it.

The end-task in learning a procedure is therefore to be able to *spontaneously execute* the procedure. To do so, six sub-tasks have to be accomplished:

(1) *State* the name the procedure.
(2) *List* the components.
(3) *List* the steps.
(4) The "*Show me how"* step.
(5) The "*Let me try"* step.
(6) *Chunk* the procedural steps.

Activity 3.26 Question and Answer – Naming the Tasks of A Procedure

In learning a procedure, what is/are the following:

(a) The end-task?

(b) The six sub-tasks?

Knowing the end-task and six sub-tasks will help structure your mind when teaching a procedure.

Activity 3.27 Think-Pair-Share – Checking Congruency

Look at your procedural bridging tasks in Activity 3.25. Are they congruent with the end-task and six sub-tasks of a procedure? Use the think-pair-share approach to discuss it. Revise accordingly.

Activity 3.28 Brainstorm – Guidelines for the Design of Procedures

After doing all the suggested activities, it would be practical ***to*** *chunk* the procedural design and assessment into a set of guidelines to remember for future application. Thus brainstorm a list of design guidelines for procedures and tabulate them in Table 3.5.

Table 3.5 Guidelines in Designing Procedures

No	Element	Guideline
1		
2		
...		

Recall these guidelines whenever you are developing or assessing a procedural content. As a start, you may want to cross-check your procedural bridging tasks in Activity 3.23 with the design guidelines.Basically, a procedure is a directive on how to do a task. Next, you are going to learn about a process – a description of how things work.

Content Structure 4: Process

Activity 3.29 Group Discussion – Describing How 'Things" Work

(a) How does a car work?

(b) Explain the water cycle.

(c) Describe how you were hired for your present job.

Divide the class into three groups, with each group discussing and presenting one sub-question. The others write down the sub-tasks mentioned in each presentation. In Activity 3.29, you have described the workings of a car, a water cycle and job hiring. Essentially, what you are trying to do is to present the process that occurs in each domain.

A process is a description of a flow of events of how things work. As you can deduce from Activity 3.29, there are three types of processes:

(1) A technical process - how a mechanical system works (Activity 3.29 (a)).

(2) A scientific process – how nature works (Activity 3.29 (b)).

(3) A business process − stages of the work flow carried out by different personnel or departments in achieving a task (Activity 3.29 (c)).

Activity 3.30 Reflect – Reflecting on Your Notes

Now look at your sub-task notes on the respective processes. Do you think that the sub-tasks mentioned will enable you to mentally trace how each process works? If not, what sub-tasks should be included? Brainstorm a check list of the essential steps of a process. Tabulate them in Table 3.6.

Table 3.6 Check List of the Essential Steps in A Process

No	Essential step	✓ when available or x if missing
1		
2		
...		

Capitalising on your experiences in Activity 3.29 and 3.30, have try Activity 3.31.

Activity 3.31 Reflect – Describing A Process

Describe a process that you have taught in your lecture.

You have twice written a content process (Activity 3.29 and 3.31). The latter activity should be more refined if you had been guided by the check list shown in Table 3.6.

Activity 3.32 Think-Pair-Share – Bridging the Process Learning Gap

In your lecture, you have presented the process given in Activity 3.29. However, your students may still experience gaps in their learning of the process: a few being unable to list the stages off-hand and others being unable to solve problems or make predictions. How would you go about bridging the process learning gap? Discuss it using the think-pair-share approach.

You may have said: explain the process to them again.

The issue here is the depth of your explanation. Will the students be able to construct the cause-and-effect model? This model helps them to solve problems and make predictions. An explanation that only leads to a static model is insufficient as it will not allow them to mentally animate the process.

Essentially, there are three end tasks involved in learning a process:

(1) *Execution of* the process.
(2) Application of the process in *solving problems.*
(3) *Prediction making.*

Eight sub-tasks need to be accomplished when learning a process:
(1) *Statement of* the name of the process.
(2) *Listing of the relevant* components.
(3) *Description of* the function of each component.
(4) *Listing of* the stages involved.
(5) *Illustration of* how each component interacts with the other.
(6) The "*Show me how" stage.*
(7) The "*Let me try" stage.*
(8) *Chunking of* the process.

Activity 3.33 Question and Answer – Naming the Tasks when Learning A Process

In learning a process, what are the following:

(1) The end-tasks?

(2) The eight sub-tasks?

The ability to recall the end-tasks and eight sub-tasks of a process will help you structure the process content.

Activity 3.34 Think-Pair-Share – Checking Congruency

Look at your procedural bridging tasks in Activity 3.32. Are they congruent with the end-tasks and the eight sub-tasks of a process? Use the think- pair-share approach to discuss it. Revise accordingly.

Sharing an example of procedural bridging tasks that are *not* congruent with the end tasks/eight subtasks may be useful here.

Activity 3.35 Brainstorm – Guidelines in the Design of A Process

To avoid fragmentation of your knowledge and skills in the process design and assessment, brainstorm a list of design guidelines for a process. Tabulate them in Table 3.7.

Table 3.7 Guidelines in Designing a Process

No	Element	Guideline
1		
2		
...		

You may want to cross-check your process bridging tasks in Activity 3.32 with the design guidelines in Table 3.7 and revise accordingly.

You have learned that procedures and processes are about how tasks are done and how things work, respectively. In the next content structure, you will learn about principles, i.e., the combination of the what, how and why of a task or problem.

Content Structure 5: Principles

Activity 3.36 Think-Pair-Share – Designing A Task with Adaptable Steps

When teaching a procedure, every step is clearly sequenced. However, have you ever been in a situation where the steps in performing a task are not clearly defined but must be adapted to a changing situation? How do you deal with such circumstances? Discuss it, using the think-pair-share approach.

In cases such as advance troubleshooting, sales marketing, new product designs and client services where the context dictates the steps that have to be performed, you either provide guidelines or train your students on how to generate the guidelines. In short, what you are doing is relating the guiding principle for the task.

A principle is the strategic knowledge (what, why and how) or a set of guidelines in dealing with a task or situation (usually problematic) in accomplishing a desired goal. It can also be in a form of a law or a cause-effect statement with predictive capability like a validated equation or a law in the science and technology domains.

Activity 3.37 Reflect – Writing A Principle

Write a principle that you have taught in your lecture.

Make sure your principle is a guideline and not a procedure or process. There are two contrasting end-tasks involved when learning a principle:

(1) *Executing* an existing principle.
(2) *Generating* a validated principle.

With these in mind, should your students fail to achieve the learning outcomes, what would you do? Try Activity 3.38.

Activity 3.38 Think-Pair-Share – Bridging the Principle Learning Gap

Consider these two scenarios in your course;

(a) You have presented the principle given in Activity 3.37. However, you find that your students still experience gaps in their learning of the principle as they are unable to use it in a role play.
(b) You have created a client-service role play and you want your students to generate a set of guidelines on how to deal with fussy clients.

How would you go about bridging the principle learning gaps in these two scenarios? Discuss them, using think-pair-share.

If you have said: explain the principle to them again, you are missing the point here. A principle is about experiencing the nuances of a context and making informed decisions. The key to mastering a principle is for the students to experience making informed decisions in variable situations, not only in those conforming to the guidelines but also in non-compliance cases.

Unless and until they get the feel of the principle, it is just a statement to be memorised and regurgitated during examinations.

As for the second scenario in Activity 3.38 (b), it is pertinent that the principle is validated since an invalid principle may not lead to the accomplishment of the desired goal. A principle should not be designed based on a hunch but be well founded by an in-depth inference from several sources such as the work of exemplary performers, documents and field studies.

Fundamentally, there are eight sub-tasks involved when learning a principle:

(1) *Naming* the principle.
(2) *Listing the* guidelines.
(3) *Practice* using examples/non-examples and case studies.
(4) The "*Show me how" stage.*
(5) The "*Let me try" stage.*
(6) *Formulation of suggestions* on how to make the guidelines.
(7) *Validation of* the guidelines.
(8) *Chunking of* the principle.

Activity 3.39 Question and Answer – Naming the Tasks when Learning A Principle

Hence, in the case of learning a principle, what are the following:

(3) The end- tasks?
(4) The eight sub-tasks?

The ability to recall the end- task and eight sub-tasks of a principle will help you structure the principle content.

Activity 3.40 Think-Pair-Share – Checking Congruency

Look at your principal bridging tasks in Activity 3.38. Are they congruent with the end-tasks and eight sub-tasks of a principle? Use think-pair-share to discuss it. Revise accordingly.

Activity 3.41 Brainstorm – Guidelines in the Design of A Principle

Since there are ten tasks involved in the learning of a principle, it will be useful to chunk them into a set of guidelines. Brainstorm a list of design guidelines for a principle. Tabulate them in Table 3.8.

Table 3.8 Guidelines in Designing Principles

No	Element	Guideline
1		
2		
...		

You may not have realised that all along, you have been using the guidelines in Table 3.8 to generate the design guidelines for the respective content structures. In summing up, you may want to cross-check your principle bridging tasks in Activity 3.32 with the design guidelines shown in Table 3.8 and revise accordingly.

3.3 SUMMARY

This unit has demonstrated how to do task analysis which comprises identifying the students' learning gaps and bridging these gaps. In order to ensure that the gaps will be bridged, the end-tasks and sub-tasks of the learning gap content structures are used to facilitate the instructional events. The content structure of a learning gap is identified from its features. Five content structures have been discussed and the steps on how to capitalise them in teaching-learning settings demonstrated.

3.4 ADDITIONAL READINGS

Clark, R. C. (2008). Developing *Technical Training*. San Francisco, CA: Pfeiffer.

Dick, C., Carey, L., & Carey, J. O. (2011). The *Systematic Design of Instruction*. Boston, MA: Allyn & Bacon.

Kemp, J. E., Morrison, G. R., Ross, S. M., & Kalman, H. (2010). *Designing Effective Instruction*. Hoboken, NJ: John Wiley.

Pass. F., Renkl. A., & Sweller. J. (2003). *Cognitive Load Theory and Instructional Design: Recent Developments*. *Educational Psychologist*, *38*(1), 1– 4.

Piskurich, G. A. (2000). *Rapid Instructional Design*. San Francisco, CA: Jossey-Bass/Pfeiffer.

Unit 4

Designing and Developing Specific Components of The Modular Approach

In Unit 1, you learnt that the modular approach is a teaching strategy where you put together learning experiences into a modular package. Unit 2 allowed you to delve into relevant learning theories that uphold the modular approach as one of the effective learning approaches. Unit 3 has given you detailed explanations on how to conduct task analysis in order to identify performance gaps and to design content structures for the gaps.

In Unit 4, you are going to learn how to design and develop specific components of the Modular Approach. The end product of Unit 4 will be a complete set of Modular Approach learning materials which can be used for your course. Unit 4 is divided into 10 sub-topics.

The first four sub-topics deal with how to design the structure of Modular Approach materials, orientate students on how to use the materials, develop students' learning outcomes and develop a concept map to make sense of the materials. The following six sub-topics introduce you to design, write the contents of your material and to reinforce student learning.

By the end of Unit 4, you will be able to:

- Design and develop specific components of Modular Approach learning materials.
- Integrate all the components into an effective and complete set of Modular Approach learning materials.

4.1 STRUCTURE OF THE MODULAR APPROACH

From Unit 1, you can see that the main idea in Modular Approach is the breaking up of a large lesson into smaller parts/chunks with each part/chunk being used individually to help students achieve the learning outcomes.

The next task is how to structure your teaching to include all the specific components needed in the Modular Approach. Just like you need a blueprint before you start building a house, you also need to develop a structure for your components to guide you in writing the contents.

Activity 4.1 Think-Pair-Share – What Constitutes A Structure in Modular Approach Materials?

Spend a couple of minutes thinking about a lecture you have presented in class. Did you plan in advance how you were going to present the content to the class? Write down in order the sequence or structure of your presentation. Compare your structure with that of a colleague. Can you identify any common features?

Just as in your lecture, Modular Approach materials have to be structured to guide you in the presentation of the contents. The outline of a general structure for a set of Modular Approach materials is shown in Figure 4.1.

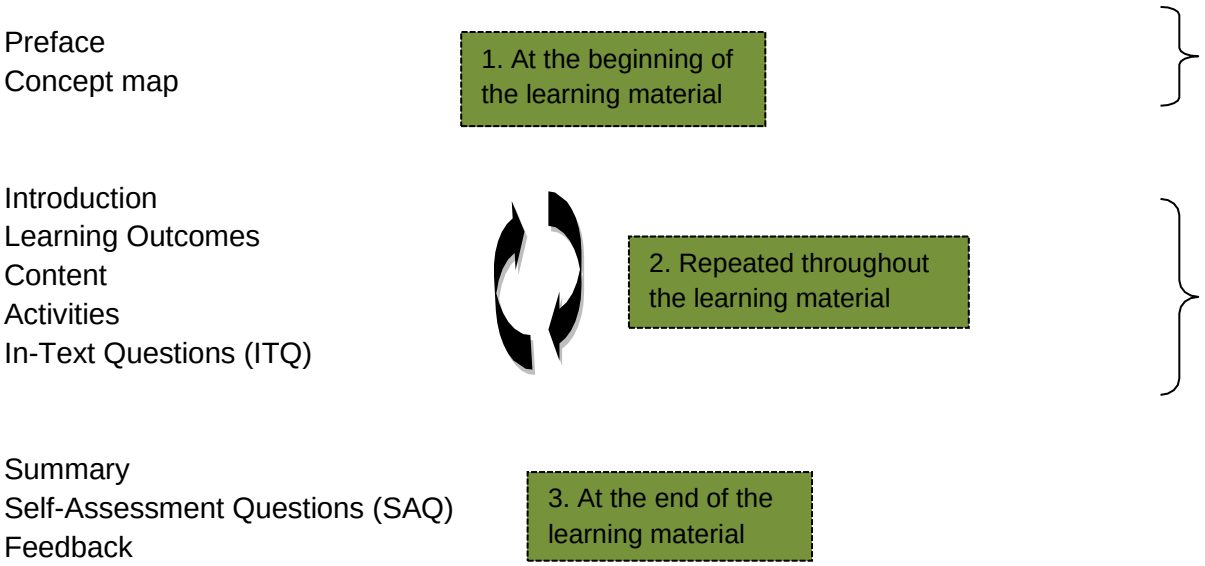

Figure 4.1 The Structure of a Modular Approach

The general structure can be divided into three parts:

1. The function of the first part is to orientate students towards what is going to be studied. The preface is for the lecturer to introduce the contents to the students while the concept map helps students to see the big picture of the learning materials.

2. The second part of the structure involves presentation of the content. The content is organised into a meaningful and skilful sequence with texts and graphics. The built-in activities serve as a powerful tool in the learning process and help to engage students with the learning materials and promote active learning.

3. The last part is the ending which in a manner, rounds off the lesson and gives the students a sense of achievement.

In order to see the similarity and differences between the structure in face to face teaching and the structer of Modular Approach let us do the following activity.

Activity 4.2 **Practice – Preparing the Structure of Modular Approach Material**

Compare the structure that you have drawn for your lecture in Activity 4.1 to the structure of a modular approach material shown in Figure 4.1. Are there any similarities or differences? Modify your structure so that you can use it as a blueprint for developing your own Modular Approach learning materials for the next few topics.

4.2 PREFACE

If you were asked to write a foreword, a preface or an introduction to a book, can you do it? Do you know what they are? Let us try out the following activity to find out.

Activity 4.3 **Think-Pair-Share – Differences between Forewords, Prefaces and Introductions**

What do you think should be included in a foreword, preface and introduction? Take five minutes to think about this and jot down your ideas in the table below. Compare your list with that of the person next to you. You can just use keywords to fill in the blanks. The following questions may help you to organise your thoughts. **Who** is supposed to write it? **Why** do you need to write it? And **what** should be included in it?

	Foreword	Preface	Introduction
Who?			
Why?			
What?			

Now read on to see whether your answers match the following descriptions.

A foreword is an opening statement about a book and is often written by someone other than the author, usually an expert in the field, a well-known public figure, a well-published author, etc. Forewords can be taken as endorsements for books.

An introduction is written by the author to introduce the content of the material. You will learn more on writing introductions to materials in section 4.5. of this unit

However, in this section you are just going to concentrate on writing a preface for your material. The preface is written by the author to introduce the material to the students. A preface is the first thing a student can see on the material. What you say in the preface can influence student's attitudes and expectations towards the material.

A preface may include all or any of the following:

- A general description of the learning material.
- The reason you are writing the material in a modular form and for whom it is intended.
- A brief explanation of what the students would gain if they go through the material. It explains how it would help them.
- Advice on how to study the material and an explanation of how the material is structured. You may want to mention the distinctive features of the material (for example, the learning outcomes, activities, ITQs and SAQs) and what makes them unique.

Activity 4.4 Think-Pair-Share – Writing A Preface

Now that you have understood the differences between a foreword, preface and introduction, let us start by writing a preface for your course on the topic that you have chosen. Use your own writing style and voice to address your audience. Share your preface with a colleague and comment on each other's work.

4.3 LEARNING OUTCOMES

A learning outcome is considered to be the end product of any learning experience, be it a course or a training programme. It describes what occurs as a **result** of instruction, not the activity that occurs **during** the instruction. A learning outcome begins with an action verb and describes performance that is observable and measurable. For example, for this topic on learning outcomes, I can write the following.

By the end of this lesson, you should be able to:

- Define students' learning outcomes.
- Discuss the benefits of learning outcomes to students and lecturers.
- Identify three elements necessary for writing effective students' learning outcomes.
- Write three effective students' learning outcomes for a topic of your choice.

Since all of you are in the education field, I am going to assume that you already have the experience of writing learning outcomes for your course. However in this unit, you are going to learn how to write **effective** learning outcomes. Before you get started, let's see whether you can suggest a definition of learning outcomes.

Activity 4.5 Think-Pair-Share – What is A Learning Outcome?

Think for a moment about a course you are currently teaching. Identify the knowledge or skills that you think would be essential for your students to have by the end of that course. If you are able to do that, you are already in the first stage of writing the learning outcome.

In groups of twos, discuss and present definitions of learning outcomes.

From the above activity you should now know that learning outcomes are the specific intentions of a course written in specific terms. Learning outcomes describe what students are able to demonstrate in terms of knowledge, skills and values or attitudes upon completion of a course or a programme.

In summary:

- **A learning outcome answers the question: what should students be able to do at the end of a lesson or a programme?**
- **A learning outcome is not about what the instructors can provide but what the students can demonstrate.**

Why are learning outcomes useful?

Did you include learning outcomes in your handouts for students during the first day of class? Why did you do it? Can you teach a course without having any learning outcome? Do students benefit from having clearly defined learning outcomes before a class begins?

Activity 4.6 Buzz Group – Benefits of Learning Outcomes

Take five minutes to jot down ideas on why you think learning outcomes are useful. Share the list with a colleague. Then form a group with two other colleagues and finalise the group list. Share it with the whole class.

Why are learning outcomes useful? We can answer this question by looking at learning outcomes from two different perspectives. To the students, learning outcomes are like road maps. Just imagine a new student on a first day in an unfamiliar university campus.

Would a campus map be very helpful in helping him to get to the right lecture hall? Likewise, think back to a time when you had to get to a new place without having a clear idea of where you were going.

It does not matter whether you use a GPS or a hardcopy road map; you still need some sort of directions on how to get to your final destination. So when students know from the beginning what skills and knowledge they will be expected to know and demonstrate, they are better prepared to face the challenges of any course.

In short, learning outcomes will empower students with the following:

- Direction
- Focus
- Energy / drive
- Motivation
- Reason to learn

However, to lecturers like yourselves, a learning outcome is more like a blue print that can ensure structural soundness in your course.

It helps you to achieve the following:

- Organise topics and chapters.
- Plan learning activities and assessments accordingly.
- Evaluate the effect and effectiveness of teaching materials.
- Focus on exactly what you want students to achieve in terms of both knowledge and skills.

Now, let's us look at the relationship between learning outcomes, learning activities and assesments. Let's do the activity below.

Activity 4.7 **Self-Reflection – Relationship between Learning Outcomes, Learning Activities and Assesments**

"…Learning outcomes help lecturers to plan learning activities and assessments accordingly…"

Reflect on the above statement regarding the relationship between learning outcomes, learning activities and assessments. Why do you think it is crucial to make sure that all three are in alignment? (If you are not sure of the answer, come back to this question when you are writing learning activities and assessments for your materials).

Writing Effective Learning Outcomes

Well-written learning outcomes are carefully worded. They include qualifiers to restrict the conditions and terms under which the objectives are met.

Learning outcome statements may be broken down into three main components **(ABC)**

- **A**ntecedent or **Conditions:** These refer to the facilities, environment, information, materials, equipment or other items, required for the students to demonstrate the learning outcomes. For example, in a chemistry class where students are learning about elements in the periodic table, the condition would be, ***"without referring to the periodic table,*** *list all the elements in group 1****".***

- **Behaviour or Performance**: This is the action exhibited by students when demonstrating the learning outcome. Using the same chemistry class example, the behaviour would be **to list all the elements**….Bloom's Taxonomy provides a list of words to assist with selecting the word that matches the desired behaviour (refer to Table 4.1 - section 4.3.3).

- **Criteria**: There are standards or a degree that must be met when students demonstrate the learning outcome. Again, using the chemistry example, **the criteria would be to correctly list all (7) elements in group 1**.

  Success criteria may consist any of these three dimensions: quantity or frequency, quality and timing. For example,

  "...to solve the problem in 10 minutes"
  ".....using at least three of the five factors to explain… "

Activity 4.8 Peer Collaboration – Three Components of Learning Outcomes

Identify the three components of learning outcomes (condition, performance and criteria) in the following examples. Discuss your answers with your peers.

i. Given a list of 10 chemical atoms, arranging them in descending order of atomic size, with 100% accuracy.
ii. Evaluate the learning outcomes using the check list provided in the appendix.
iii. Explain what is meant by the term "validity" as applied to the use of instruments in educational research.

I am sure you have noticed that normally, the conditions in learning outcome statements are not explicitly stated but rather, are implied or assumed. For example, "calculate the average speed" is a valid learning outcome.

In this case, we would assume that a set of relevant data or numbers would be provided to the students. At times, lengthy conditions can be redundant and confusing. So use your own

judgement to decide when conditions are absolutely necessary for you to clarify your learning outcome.

Another component that is always left out of the learning outcome statements would be the criteria. Let us go back to the chemistry example. What will happen when a student can only list five out of the seven elements correctly? You may argue that the standard in all learning outcomes is understood to be 100% accuracy.

So any achievement below par is considered not meeting the desired learning outcome. However, if the answer “five out of seven” is an acceptable success criterion, you must rewrite the learning outcome to be “without referring to the periodic table, list at least five ”

Activity 4.9 Self-Reflection – Examples of Learning Outcomes

Spend a few minutes thinking of a situation in which conditions or success criteria are absolutely critical in order to determine whether the students have attained the learning outcomes.

Give one example of a learning outcome that falls into that category.

Using Bloom’s Taxonomy to Write Learning Outcomes

I assume that most participants involved in this training have at least a passing knowledge of Bloom’s Taxonomy. I encourage those who are not familiar with Bloom’s work to search (Google) for more information. Bloom identified three major learning domains: cognitive, affective and psychomotor.

- cognitive domain – intellectual or thinking skills
- affective domain – attitudes and values
- psychomotor domain – manual or physical skills

The cognitive domain is the area of learning that involves the development of intellectual skills. It may include the recall of specific facts, routines, patterns and concepts. The affective domain involves feelings, emotions, attitudes and values. The psychomotor domain includes physical movements and manual tasks.

Bloom's Taxonomy provides the most comprehensive analysis of learning outcomes that specify six levels of cognitive learning. Table 4.1 illustrates the six levels of Bloom's cognitive domain with related verbs and examples to be used in writing learning outcomes.

Most of the learning outcomes in higher education are in the cognitive domain. However, if you need to write learning outcomes in the affective or psychomotor domains, the following references may be a good starting point.

- *Taxonomy of Educational Objectives: Volume II, The Affective Domain, by Bloom, Krathwohl and Masia,* and
- *Simpson's Taxonomy of the psychomotor domain.*

Finally, you are ready to write learning outcomes for your own courses.

Activity 4.10 Peer Collaboration – Creating Your Learning Outcomes

Write at least three learning outcomes for your topic. Exchange the list with your peers and review each other's work. Rectify any weak verbs and adjust statements based on the feedback, if necessary. Save your list of learning outcomes for future use.

Table 4.1 Revised Edition of Bloom's Cognitive Domain with Related Verbs and Examples

COGNITIVE DOMAIN		
Level and definition	**Related verbs**	**Example**
Remember Retrieve relevant knowledge from long-term memory	Arrange, define, describe, identify, label, list, match, memorise, recognise, outline, relate, recall, select, state.	Memory of specific facts, terminology, rules, sequences, methodology, principles... Recite a policy, poems.... Make a chart, graph, timeline...
Understand Construct meanings from instructional messages, including oral, written and graphic communication	Classify, compare, convert, discuss, distinguish, explain, express, generalise, predict, relate, review, rewrite, summarise, transform, translate	Illustrate with a flow chart... Summarise the findings of... Predict the impact... Translate words and phrases from a foreign language...
Apply Carry out or use a procedure in a given situation	Apply, change, choose, compute, demonstrate, discover, manipulate, modify, predict, prepare, sketch, solve	Illustrate with case studies.. Construct a model... Design a strategy to.... Apply Kolb's Model of learning to....
Analyse Break material into its constituent parts and determine how the parts relate to one another and to an overall structure or purpose	Analyse, arrange, combine, design, develop, examine, differentiate, discriminate, illustrate, outline, relate, separate	Apprise the key issues of.... Compare....
Evaluate Make judgements based on criteria and standards	Appraise, argue, assess, choose, compare, conclude, consider, criticise, decide, defend, evaluate, judge, predict, recommend, select, summarise	Evaluate alternative solutions to.. Judge the effectiveness of... Explain and justify.... Making judgements based on....
Create Put elements together to form a coherent or functional whole; reorganise elements into a new pattern or structure	Arrange, assemble, collect, combine, compose, construct, create, design, develop, formulate, invent, organise, plan, predict, prepare, produce, set up.	Invent... Write a comprehensive report... Plan a programme... Create a product for.. Predict the the impact of.... Design an engine component that...

Information on writing effective learning outcome is summarised into the following guidelines. Keep the guidelines in mind when you are writing and evaluating learning outcome statements.

Table 4.2 Guidelines for Writing Effective Learning Outcomes

Characteristic		Explanation
1	Learner focused	Describe what the learner will be able to do, rather than what the instructor will do.
2	Measureable outcomes	Avoid verbs that represent action or concepts that are difficult to measure such as understand, know, appreciate, be familiar with, enjoy, believe, comprehend, know, learn and master. Refer to Bloom's list of verbs to select appropriate action words.
3	Varied levels of complexity	It is acceptable for introductory courses to focus on verbs that focus on lower order thinking skills such as to remember and understand. On the other hand, advanced level courses would likely focus on higher order thinking skills such as to evaluate and create.
4	Choose one action verb for each learning outcome	If you have more than one outcome per statement, divide them into separate statements.
5	Include all three components: condition, performance and criteria	Make sure that condition and criteria are included if both components are crucial in determining student achievement of the learning outcome.
6	Sequence the action words in logical order	For example, from simple to complex, from known to unknown, chronologically, etc.
7	Avoid learning outcomes that are too broad in scope	For example, "Discuss all bonding theories in coordination compounds"
8	Avoid learning outcomes that are too narrow.	For example, "State the six categories in Bloom's Taxonomy"

As a summary for this section, learning outcomes are manifestations of terminal behaviour. They are statements on what the students will be able to do after they have completed a course or a training programme.

Bloom's Taxonomy is very useful in developing learning outcomes. It is divided into three domains: the cognitive domain (knowledge or "think" component), the affective domain (attitude or "feel" componenty) and the psychomotor domain (manual and physical skills or "do" component).

An effective learning outcome statement is divided into three components (**ABC**)

Antecedents + **B**ehaviour + **C**riteria.

4.4 CONCEPT MAPS (ALSO KNOWN AS MIND MAPS)

Have you ever drawn a concept map before? Most of you probably have. Or, maybe what you think is a concept map is not really one. However, even if you have never drawn one before, I am sure you would have seen examples of concept maps in books or in online materials. So what are concept maps?

Basically, concept maps are tools to visualise concepts. They are represented by diagrams that show how different elements of concepts are related to each other and/or to main ideas. These diagrams can be simple or complex, depending on your own style of learning and what helps you understand specific concepts.

The following video clip may give you a better picture on what concept maps really are. While viewing the video, I want you to keep this question in mind: are the mind maps that you have seen or constructed before really mind maps or are they just contents listed in disguise? Do remember that content lists can make clear the topics to be covered in learning materials but may reveal very little about the relationships between them.

Activity 4.11 Reflect – Understanding Concept Maps

View the following video on how to develop concept maps by Tony Buzan to help you get started into thinking about such maps. Take notes on the presentation and answer the following questions:

http://www.iMindMap.com/videos/TonyBuzanIntroducesiMindMap.aspx

1. What is a concept map?
2. What are the benefits of concept maps?
3. Identify special features of concept maps?
4. In what ways or situation can lecturers use concept maps as teaching and learning tools?

Search for other resources on concept maps to improve your answers. Discuss your answer in groups of four and summarise your findings.

Activity 4.12 Group Discussion – Guidelines for Constructing Concept Maps

By using your summary in Activity 4.9 and other additional resources, produce guidelines for the construction of concept maps. Share your guidelines with other groups to formulate final effective guidelines that can be used by the whole class.

Now, you are ready to construct a concept map on your own topic. The main idea here is to present the main concept and show how the other sub-concepts are related to each other and also to the main concept.

Activity 4.13 Think-Pair-Share – Constructing Concept Maps

Construct a concept map for your topic. Exchange and review each other's work. Use the guidelines to review and make comments for improvement. In reviewing the construction of concept maps, you should pay attention to these four attributes:

- Accuracy and thoroughness
  - Are the concepts correctly related?
  - Is any important concept missing?
- Organisation
  - Is the hierarchy of the concepts apparent?
  - Is the order of the concepts easy to follow?
- Appearance/ creativity
  - Is the design well drawn?
  - Are spellings correct?
  - Have elements that aid communication or stimulate interest been added?

As a summary for this section, concept maps are graphical tools for organising and representing knowledge. They have specific characteristics that distinguish them from other diagrams that depict relationships between concepts and can be used in education, business, research, etc.

4.5 INTRODUCTION

In previous Topics 4.3 and 4.4, you have learnt how to write learning outcomes and design concept maps. Two out of the three elements mentioned are the advance organisers; the last element is the introduction.

Recall when you first read an interesting novel – the intrigue and a few glimpses of what to come are the elements that get you hooked. Your modular learning materials must also have such elements to create the "want"'. This implies that your students need to be made interested, stimulated to start learning and continually motivated to persist with it. You are in fact setting the theme or mood of the lesson. It sounds like a tall order.

Activity 4.14 Think-Pair-Share – Exploring Introductions

Search the Internet for several (what you deem to be) good introductions and several mediocre ones. Compare and infer the features of a good introduction. Use the think-pair-share approach to list the critical features of a good introduction.

Yes, it is essentially about gaining **A**ttention, being **R**elevant and generating **E**xpectancy or in short, ARE. You can use the letters ARE to structure and check your introduction for completeness.

You may want to use your usual introduction in your lecture or your usual induction set for the learning materials but of course, with one caveat – check the **ARE** of your introduction as you may want to motivate the students not only extrinsically but also intrinsically. Attention grabbers often motivate them extrinsically but have short spans. To be able to influence them on a long-term basis will depend on intrinsic elements such as relevancy and expectancy.

Activity 4.15 Brainstorm – Listing the Guidelines

Divide the students into three groups. Ask each group to brainstorm and produce list guidelines on how to attain each of the ARE. Each group presents its list. All groups are asked to complete Table 4.3 followed by presentations.

Table 4.3 Designing guidelines of ARE

No	Element	Guideline
1	Attention grabber	
2	Relevancy	
3	Expectancy	

Activity 4.16 Think-Pair-Share – Writing Your Introduction

By using the guidelines in Activity 4.3, write the introduction to your modular approach learning materials. Use the think-pair-share approach to analyse your introduction for the elements and completeness of ARE. Revise accordingly.

So, using ARE has helped you structure your introduction, has it not? Always fall back to ARE when writing your introductions as you will be ensured of winning and sustaining the interest of your students.

4.6 CHUNKING

Can you imagine having to follow instructions in a user manual that is about three pages long? Maybe it involves 30 steps of action, for example, the instructions on how to assemble a toy. Generally it will not be an easy task, with parts to put together, screws to be tightened and various larger parts to be assembled in the right sequence.

To make the instruction process more comprehensible and the actual toy assembly easier to an average user, it is recommended that you break the process into smaller steps. Maybe the first

steps could involve opening the packages and putting out the parts or components of the toy separately. The next few steps involve assembling the various parts individually. The last steps will be assembling the parts together to form the complete toy.

The process of separating the large parts into smaller ones is known as chunking. Similarly if chunking is done for your learning materials, your students should be able to digest a particular topic bits by bits in a logical and easy-to-understand manner. You might already want to comment: is that not only logical?

The answer is, of course, YES.

However, often in the rush of delivering the subject matter, the logical process of chunking and sequencing is the last thing that comes to the mind of a lecturer when giving a lecture. It is perhaps the empty clueless stares of your students that will become a reminder that something is amiss. But by then, it is already too late.

So what can you do?

How about doing the CHUNKING and SEQUENCING in advance? And it is very much easier if we embark on teaching via the modular approach. We chunck BEFORE our students learn. We can afford to make mistakes (and correct them) before they actually “attend the class”. That is the advantage of the Modular Approach.

In this section, I will attempt to share with you some key aspects in chunking and sequencing your instruction. So by the end of this section, you should be able to practise chunking your lessons into parts and logically sequencing them in your teaching package.

The whole idea about chunking is dividing a learning endeavour into manageable steps. And with the steps, comes the next phase that is, sequencing those steps into some logical and meaningful order for learning.

Alternatively, it is perhaps best if you can imagine how you would like to learn a particular topic. Would you like to learn something by starting with some example, concept map, set of rules or

some graphics or diagram/graph? The way you would like to learn about a particular material/ topic could serve as the first guide on how to chunk and sequence a learning package.

In the process of deciding how to chunk and sequence, knowledge about that particular material will be of paramount importance. You must be well versed in what you want to teach.

That is only logical. **But knowing the material is only half the answer. Knowing how to share it with your students or audience will be the other half**. Teaching experience will of course help in chunking and sequencing of the material to be presented. Above all, you must also have a vision of the content of the whole course or programme, to achieve all the learning outcomes. Then, when the chunking and sequencing process is done, it will hopefully include all the topics that are in your vision sequenced in some logical manner.

Let us do something that is familiar to most if not all of you.

Activity 4.17 Peer Collaboration – Advanced Planning of A Lecture

Pick a topic that is familiar to you. I recommend the topic to cover part of a one-hour lecture. Then proceed to divide that topic into chunks representing how you would deliver them in a face-to-face lecture. Yes, you would have to imagine planning and delivering the lecture in advance, minute by minute until you finish delivering that particular topic. Remember to keep the topic simple so that you can get a start in this chunking process. Share and discuss your chunked lecture with your peers.

The moment you finish dividing the topic into smaller sub-topics (or sometimes even before you are finished), you would be asking or doing the next logical step, that is, putting which sub- topics to be presented first, second, third and so on. Again this is only logical. That is the sequencing process. Experience will perhaps be your best guide. Here are some suggestions that you can consider in deciding how to sequence your sub-topics.

- Arrange sub-topic by sub-topic from simple to complex or basic to advance.
- Use cause-and-effect sequences.

- Sequence according to the chronology of occurrences.
- Problem-centred sequence should be considered.
- Rule-example or example-rule sequences are often effective.

You can always mix and match the various ways of sequencing your sub-topics. But like I mentioned earlier, knowledge of the topics and experience on how to share and convey those topics with your students will be the critical factors in deciding the sequence.

Now, you are ready to apply your skills in chunking and sequencing your topic in the WRITTEN format, that is, the modular format. Let's do another practice.

Activity 4.18 Peer Collaboration – Sequencing Sub-topics in the Modular Format

Imagine you have to tell a foreign lecturer or student the process of buying a car in Malaysia. You cannot simply tell him/her everything as he/she will forget the things he needs to do very soon.

So you have to carefully plan and write down on what needs to be done, step by step, elaborating on each step as needed. And before you knew it that would be your first draft of a modular approach material. Exchange with your peers.

As we have reached the end of this section, I hope you have learnt how to chunck and sequence your subject matter. Now, let's move on to the core of modular approach which is writing the subject matter.

4.7 WRITING STYLES

Before we go into detail about writing style, let's take a look at Activity 4.17.

Activity 4.19 Reflect – Messaging style

Warning: You are being monitored via close circuit cameras. Shop-lifters will be prosecuted.

Figure 1

Warning: Any theft of items in this supermarket will be dealt with severely.

Figure 2

Let's look at these two warning signs (Figure 1 or Figure 2) posted near the exit of a supermarket. Which sentence conveys a stronger message? Which sentence is likely to command your attention?

From Activity 4.17, different messaging style will invoke different reaction in you. To illustrate further, read the following two short passages (Passage 1 and Passage 2):

Hydrochloric acid is slowly added to sodium hydroxide until the resulting reaction is complete, i.e., no more bubbling is seen. The resulting solution is tested with litmus paper, a green colour confirming that the reaction is complete.This is a classic example of an acid-base reaction, where a strong acid is added to a strong base, resulting in salt and water.

Passage 1

Now you will see how a classic acid-base reaction is performed.

1.Add hydrochloric acid to sodium hydroxide until no more bubbling is seen. When that happens, the reaction is considered complete.

2. Test the resulting solution with litmus paper; a green colour confirms that the reaction is complete.

This is a classic example of an acid-base reaction which you can easily perform by adding a strong acid to a strong base resulting in common salt and water.

Passage 2

Passage 1 is written in the passive third party style while Passage 2 in active first party (I, You, We) or sometimes referred to as the **conversational style**. This style addresses the reader directly, engaging him/her as he/she reads along and this has been found to be more effective for individual learning. Passage 1 tends to alienate the reader since it does not really address the reader personally.

Would you not agree that the conversational style is better for learning since it engages the learner directly?

In the two aforementioned examples, the messages are essentially the same but written in different styles. In modular instruction, you are adviced to write in an active, first party and conversational style.

In this section, I will share with some aspects of the conversational writing style that is commonly used in the modular approach. Based on this sharing process, you should be able to adapt to that writing style in your Modular Approach material. Let's start by doing Activity 4.18.

Activity 4.20 Practice – Writing in the Conversational Style

Convert the following passage into a conversational, active language format.

> *The e-learning portal is different from various course websites available online in one critical aspect; the portal is usually integrated to a centralised student database and course offering database. Such integration allows the course delivery to be managed in a more systematic manner by lecturers and/or administrators. It also affords the inclusion of various teaching and management tools in the system which will be useful to all users be it the instructors, students or administrators.*

Share your work with your peers.

If you have problem getting started, let's do it together. Remember, we want to engage the readers as we tell them “our story” so that they will be more involved in the learning process. Here we go:

I am sure you have visited many websites and perhaps quite a few e-learning portals. What then is the basic difference between these two? You will find that websites are generally open to as wide an audience as possible. That is the rationale for having websites. But an e-learning portal tends to be more restrictive. There is some amount of control to the access. And this control is usually achieved by integrating a database to the website, and the information available in the database is used to control access at various levels

You can continue your writing from now onwards.

By now, you should be able to discern the level of engagement that is elicited from your readers when we write in an active, conversational writing style.

Activity 4.21 Peer Collaboration – Conversational Style Writing

Write in conversational style on how to create a *pdf* file from a Word document.

Compare with your peers and refine your write-up.

For those of you that face difficulty in conversational style writting, the tricks are to:

- imagine having your student in front of you and write as though you are talking to him/her. You may also try writting as though you are delivering a lecture.
- transcribe your lectures.

When written, a talk or a lecture will essentially become a good first draft of a text written in the conversational style. Of course, details would have to be added later but a good first draft is indeed a good start already. Have fun “writing” your talks or lectures.

4.8 GRAPHIC VISUALISATION

Activity 4.22 Think-Pair-Share – Identifying the Best Strategy

Let us say your friend would like to go to your house from your office. Discuss, using the think-pair-share approach, the best way of describing the route to your house from your office.

Yes, you may have described the route verbally (words) or used graphics such as a map or the virtual reality Google travel or other travel aid software. If you have used graphics, there is a high probability your friend will reach your house easily - a picture is worth a thousand words. The caveat is: if used appropriately. Why? There are three graphic-related design essentials that have to be considered before the “picture” is truly clear i.e., its surface feature, function and learning scaffold. Keep these in mind whenever you design any graphics.

A graphic illustration is the representation of a content that is pictorial with either static or dynamic surface features:

- Static or still graphics such as illustrations, photographs and models.
- Dynamic graphics such as animations, video and virtual reality materials.

Both static and dynamic graphics have their own positive and negative features. When choosing what to use, the three questions you may want to ask are:

- What is the degree of correspondence to the real ”thing”?
- What kind of facilities do your students have?
- Which representation will effectively convey the “story” at a lower budget and less time?

You may have used many graphics to illustrate the content of your course. What reason prompted you to choose a specific type? In short: have you been guided by its function?

Activity 4.23 Brainstorm – Graphic Functions

Brainstorm a list of functions of graphics and their descriptions. Complete Table 4.4.

Table 4.4 Functions of Graphics and their Critical Features

No	Function	Critical feature
1		
2		
...		

The tabulation in Table 4.4 indicates that being able to differentiate between the functions of different graphics is important. It will help you identify the appropriate graphics to use in each instance and ensure its congruency to its function. So, when designing your graphics, ask the question: what is the function of the graphics? Then design accordingly.

Activity 4.24 Think-Pair-Share – Graphics Examples

Illustrate an example of each of the functions of the graphics deployed in your course. Discuss, using the think-pair-share approach, the congruency of the graphic features to their functions.

The graphics that you choose must support learning especially in terms of the five fundamental learning scaffolds shown in Table 4.5.

Activity 4.25 Brainstorm – List Guidelines

Table 4.5 shows the six fundamental Learning Scaffold. Your task is to complete the design guideline appropriate to the scaffolds.

Table 4.5 Six Fundamental Design Guidelines Of Graphic Learning Scaffolds

No	Scaffold	Guideline
1	Support attention	
2	Activate prior knowledge	
3	Minimise cognitive load	
4	Build mental model	
5	Support transfer of learning	
6	Sustain motivation	

Activity 4.26 Think-Pair-Share – Learning Scaffold Conformity

Discuss, using think-pair-share the conformity of your graphics to the learning scaffold guidelines shown in Table 4.5.

Now that you have learned the three critical features of graphic and their guidelines, you are ready to put your knowledge into practice in Activity 4.25.

Activity 4.27 Think-Pair-Share – Develop Graphics

Develop the graphics that you are going to use in your modular learning materials. Discuss, using think-pair-share, the functional congruency (Table 4.4) and conformity of the graphics to the learning scaffold design guidelines (Table 4.5). Revise accordingly.

Now you have all the three essentials for your graphics to be really excellent. The last issue on graphics is about copyright. Make sure you are well informed of the guidelines about copyrighted graphics.

No matter how good the copyrighted graphics (and to prevent grave consequences), draw the graphics yourself; using either Microsoft Word, other graphic software (Corel Draw, Adobe Photoshop etc.) or seek the help of a professional graphic artist.

If possible, consult professionals you have previously worked with you as they may be familiar with your requirements or those highly recommended by your colleagues. Steer clear of the enticement of unknown graphic artists who offer cheap graphics through the internet.

Initially, it might be tedious explaining the graphics to the artist from your sketches but in the long run, it will save you much stress and worry. If your learning materials require many graphics, check the first few graphics to make sure they conform to what you desire; do not procrastinate with your supervision as the discovery of non-compliance graphics at the very last minute will put you into trouble financially and create havoc with your development timelines.

4.9 ACTIVITIES

From experience, did you learn much by listening to your trainers or passively reading this trainer module? On the other hand, you did gain much more by having a go at the learning activities – having discussions, giving examples, reflecting on ideas, etc. Remember, it is the actual action that helps you learn.

It does not matter if you get it correct or make mistakes – all these did help you realign and structure any detoured schema in the mental model of your writing modular approach learning materials. Yes, you learn by doing. So, in your learning materials you too should encourage your students to contribute something and get them to learn by doing – this is active learning.

Activity 4.28 Think-Pair-Share – Necessity of Having Activities

Since you are teaching face-to-face, you have the liberty of seeing their response to the activities first-hand. You might be thinking about these questions:

Is it necessary to have such activities in the learning materials?
Would they not be redundant?

Discuss this possibility using think-pair-share.

From Activity 4.28, you may realise that there are several fundamental reasons for having such activities. Although they may appear redundant, the activities perform the following functions:

- They are the **main drivers** to enable you to meet the instructional goals of your learning materials, without which there will never be any deep learning.
- The performed tasks **enrich** teaching contents, making them less abstract.
- They provide **structure** to your materials as contents become woven around activities which in turn will guide and sequence learning.
- They enable your students to make **mistakes in private** (*save face*) – without others knowing their initial difficulties.
- They enable your learners to carry out applications and practice the concepts just learned , thereby reinforcing their learning

An added bonus is when you have many variability problems for them to solve so as to gain enough experiences to self-generate the principles for applying them but you do not have the time in class to go over them. In short, the activities are an integral part of the teaching – actively performing, reflecting and reasoning.

Basically, activities are interactive learning actions that keep your students actively learning and purposefully engaged with the learning materials. Numerous research findings corroborate that activities do facilitate learning. Students are given the opportunity to do things with the new learning and be made more aware of the involved tasks without which they may assume memorisation is the way to learn. Sometimes, students may end up taking a short cut, memorising examples and activities especially in cases where they are having difficulties in understanding.

These activities can be multi-modal such as print, computer based or both. Often computer- based activities provide short briefings on their goals and learning outcomes, followed by descriptions on how to use the tutorials; they prompt students on what to reflect and provide short explanatory feedback.

Contrary to common student practices, regurgitating given knowledge is never a learning activity except in cases involving facts. In your course, you are likely to have a repertoire of activities and collection of tasks. Share them in Activity 4.9.

Activity 4.29 Think-Pair-Share – Learning Activities Examples

List the activities you provide in your course. Discuss, using think-pair-share, their incorporation into your modular approach learning materials. What features do you need to consider in developing your learning activities?

A pause now and again is advisable to draw active responses from your students and to enable them to do the following:

- *Check* their understanding.
- *Share* examples and non-examples from their prior knowledge or experiences.
- *Summarise* or infer main ideas from a discussion.
- *Solve* related problems.
- *Perform* a practical task.

- *Discuss* a topic.
- *Identify* missing ideas or brainstorm possible problematic issues.
- *Evaluate* the effectiveness of a task.
- *Suggest* key questions.

In short, there are numerous activities that you may include in your modular learning materials. You may also use Bloom's list of learning outcomes given in Table 4.1 for the following tasks:

- Create new learning activities appropriate to your learning materials.
- Guide you when choosing the appropriate action verbs that are congruent to the level of your learning activities.

If you always have the list with you, this will assist in any search for the right action verbs for your activities and as an added bonus, you are bound to choose the ones that you really desire and match the learning level.

Activity 4.30 Reflect – Prioritise Activities

Now that you have the necessary tools to create new activities, which ones should you prioritise?

It is logical that in your learning materials, there must be activities that reflect the end-tasks and sub-tasks of the content structure of your students' learning gaps. In fact, the end-tasks and sub-tasks given in Table 4.1are action verbs or learning outcomes that you must use as activities since accomplishing all those tasks means the gaps are bridged and your instructional goals are achieved.

Activity 4.31 Think-Pair-Share – Design Activity

Choose a specific content structure in your course. Try designing the relevant activities. Discuss, using think-pair-share, the content structure and learning level compliance. Do any new issues crop-up?

While designing the activities, did you have the content structure tasks or learning outcomes in mind and design accordingly? Focusing immediately on the essentials is important.

Yes, apart from the issue of having activities with action verbs which are in compliance to the learning gap content structures and learning levels, five other factors should be considered when designing your activities:

1. Use of question type compliance.
2. The format of activities.
3. Feedback to your activities.
4. The influence of students' responses to your activities.
5. Designing effective activities and constructive feedback.

Eight question types

You might have set questions in your course using some of the eight main types of questions such as multiple-choice, matching, true-false, fill in the blanks, completion, fault finding and open-ended questions. Do Activity 4.30 to find out more about question type compliance.

Activity 4.32 Reflect – Question Types

Which of the question types is congruent to the sub-task recognised for factual content?

Multiple-choice, matching and true-false questions are the questioning options that are available for a recognising task. Why? This is because the defining feature of recognition is having a list

of possible answers to match the question types. Thus, matching features are the compliance key.

Three Activity Formats

Table 4.6 Three Formats of Activities in Your Modular Approach Learning Materials

No	Format	Example
1	Tutorial	In-text and end-of- lesson exercises
2	Dialogue	Transcript of a discussion, interviews and demonstrations
3	Reflective action guide	Practicals, case studies, field work, role plays and industrial training

In your course, you are likely to have activities such as tutorials, role plays, practical, case studies, field work, demonstrations and industrial training. These activities can be classified into three categories as shown in Table 4.6. Contrary to popular belief that only tutorial exercises should be incorporated into your learning materials, it may be advisable to include materials in the other formats in your learning materials as they are crucial for the achievement of the procedural, process and principle contents.

4.10 FEEDBACK

Activity 4.33 Online Search – Responses Characteristics

Search online for responses to learning activities. What common characteristics have you found?

Yes, there is a tendency to use confirmatory (yes, no) and corrective feedback (provide correct answers). However, when your students undertake activities, they need more than mere answers – especially if you intend to reduce the knocking on your door near examination time. The responses to these questions and much more all contribute to feedback.

Activity 4.34 Brainstorm – List of Feedback Elements

Brainstorm to list elements in feedback.

Yes, there is more to feedback than yes and no. Essentially, three elements should be included in constructive feedback:

- Elaborated responses on both correct and incorrect answers.
- Motivational words.
- Conclusive statements about progress.

Activity 4.35 Think-Pair-Share – Design Constructive Feedback

Now, design the feedback to Activity 4.32. Discuss, using think-pair-share, the assessment of the feedback elements. Revise accordingly.

What influences student responses to your activities?

Activity 4.36 Brainstorm – Student Responses Influencer

Before going to the guidelines in designing the activities, you need to have some idea of what influences student responses towards these activities. Brainstorm and list them.

The factors may include motivation, task formats, intellectual level, time, benefit, writing space, clarity, positioning of activities and much more.

Activity 4.37 Reflect – Design Feedback Guidelines

With the student response list in mind and experiences in designing activities and feedback, divide into several groups. Each group should propose one influencing factor and brainstorm possibilities for the design feedback guidelines. Add more elements if necessary. Tabulate the activities and feedback design guidelines in Table 4.7.

Table 4.7 Guidelines in Designing Effective Activities and Constructive Feedback

No	Element	Guideline
1		
2		
3		
,,,		

Have the guidelines at hand when designing the activities and you will not be lost in the activity-feedback maze. Check Activity 4.13 and Activity 4.17 for conformity to the activity/feedback design guidelines. Try out the activities and feedback with several students to gauge their effectiveness.

Again, revise accordingly. It may appear a bit tedious cross-checking the activities-feedback for congruency, effectiveness and errors; however, this will prove satisfying when you witness your students' increasing sense of confidence and satisfaction after attempting the varied activities.

4.11 SUMMARY

It is important for you to summarize the content of every learning material. In short, you need to "tell them what you have told them". What do you think should be included in a summary for it to be effective. Do the Activity 4.38

Activity 4.36 Brainstorm – Write Effective Summary

What do you think should be included in a summary for it to be effective?

Brainstorm and list them.

Your list should include the subject matter content, any process or procedure in applying it and what strategy to use in deciding "*when to use what***".**

4.12 SUMMARY OF UNIT 4

Thus far, you have learned about designing specific components of Modular Approach learning material which includes structure, preface, learning outcome, concept map, chunking, graphic visualisation, activity-feedback and summary. To ease writing your modular learning material you are advised to follow the guidelines as closely as possible.

4.13 ADDITIONAL READINGS

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Unit 5

In-House Knowledge Sharing

The preceding units in this module have given you fundamental knowledge on what constitutes the Modular Approach. Your task now is to **plan**, **deliver** and **evaluate** the knowledge and skills you have gained with your colleagues at your respective institutions. The three aspects are connected and important to your knowledge sharing intention.

There are various ways and opportunities for you to plan, deliver and evaluate in-house knowledge sharing at your institutions. This unit is intended as a useful tool for you to determine the appropriate knowledge sharing and delivery strategy and develop methods and strategies for in-house knowledge sharing. Specifically, this unit is intended to help you to do the following:

- Inform and influence thinking, policies and practices among your colleagues on the Modular Approach;
- Plan, prepare and deliver knowledge and skills on the Modular Approach in a clear and coherent manner, appropriate for different types of audiences at your institutions.
- Inculcate an in-house knowledge sharing culture.

5.1 KNOWLEDGE SHARING

Let's begin this topic by doing Activity 5.1.

Activity 5.1 Peer Collaboration - Knowledge Sharing

Discuss with your colleagues the following questions:

- Why do you need to plan, deliver and evaluate your efforts on knowledge sharing?
- Why should knowledge sharing be encouraged?
- Why are in-house sessions conducted? Can they be out-sourced?

From Activity 5.1, you will find that if your knowledge and skills on the Modular Approach are to have any great impact on your colleagues and staff members at your respective institutions, your sharing of knowledge on the subject has to be available to the right person(s), at the right place and at the right time. It is therefore important to find ways of establishing networks to share this new knowledge.

Let undetake Activity 5.2.

Activity 5.2 Reflect - Knowledge Sharing and In-House Knowledge Sharing

Reflect on activites on knowledge sharing you have experience before and discuss it with your peers.

You now know that knowledge sharing can add value, create opportunities and give the competitive edge to your institution. However, there is no single “best way” of doing it. It all depends on your skills and knowledge as the trainer, your institutional culture and the nature of the tasks to be done.

These affect how in-house knowledge sharing can best be extracted and used. This unit explores the factors that affect the delivery of knowledge sharing from YOU to YOUR colleagues as the receivers of the knowledge and some of the different methods of transfer.

There are many resources on knowledge sharing and you can get them from the following links:

- www.scribd.com/doc/82744738/Organizat...
- www.scribd.com/doc/80559922/Earl-Babb...
- v-sgsync-lnx1.nwu.ac.za/P_14/ENGL%201...
- canute1.wordpress.com/category/runnin...
- www.gpo.gov/fdsys/pkg/CHRG-110shrg478...

Knowledge Sharing Objectives

Well-defined knowledge sharing objectives will keep all involved on the right track throughout the session. They provide an important link between the needs assessment and the design and preparation of the intended to-be shared materials.

As the trainer, you can assess if the objectives are met, indicating whether the training has been successful in meeting the needs of the trainees. The in-house knowledge sharing objectives therefore provide the basis of evaluation.

Objectives for such knowledge sharing may involve:

- Improving skills
- Increasing knowledge
- Changing attitudes

Advantages of In-House Knowledge Sharing

There are various advantages in conducting in-house knowledge sharing. One of the primary strengths is the incorporation of your institutional vision, mission and values delivered consistently to ensure greater ownership by the management and staff as a whole at your institution. Other advantages include:

- ***Cost-effectiveness*** In-house knowledge sharing or training is cost effective. Your colleagues can be trained at an extremely low per person cost.

- ***Flexibility*** The sharing session can be planed around your institution's timetables and resources with options like two-hour segments, half-day lessons or two- day workshops.

- ***Special focus on the Modular Approach*** In-house knowledge sharing sessions can focus on the issues or approaches critical to your respective institutions. Your time will not be wasted on topics or issues that have no relevance to your institutional staff development. The focus is on you and your university or college.

- ***Engagement*** Having only your own colleagues on the course will create focus and discussion on the issues that are important to your institution.

- ***High impact*** If the training is prepared and delivered with proper planning and high standards, its knowledge sharing impact to your institution will be immediate.

- ***Benefits to stakeholders*** In-house knowledge sharing is a great initiative in the development of your fellow colleagues, staff and institution. You will have the ability to address specific staff issues, needs or challenges on issues pertaining to the Modular Approach in a conducive setting.

Let's now move to important steps which are involved in planning a in-house knowledge sharing. The steps and phases are shown in Figure 5.1.

Figure 5.1 The Sequence of In-House Training Program

For each of the phase of in-house knowledge sharing, there are several activites involved. Table 5.1 shows the phases and the corresponding activities.

Table 5.1 The Training Phases and the Activity Involved for In-House Knowledge Sharing

Step	Phase	Activity
1	Planning	Analysis of the need and goals
2	Design and Development	Design a means to meet the training needs and goal
3	Delivery	Carry out the training program and activity
4	Evaluation	Assess the value of the traning and activities

However, the same step are also involved in planning, designing and evaluating a training program which will be covered in detail in Unit 4 and 5 of Module 2.

5.2 PLANNING AND DESIGN

Before we go into the planning aspect of in-house knowledge sharing, let's begin by introducing the purpose of the in-house knowledge sharing (IKS) activity. Let try out Activity 5.3.

Activity 5.3 Reflect - Steps for In-house Knowledge Sharing

What do you think are the question to be addressed when planning an in-house knowledge sharing at your institution? List them down and discuss them with your group.

IKS is a strategy or plan that you may use to deliver in your in-house knowledge sharing initiatives so that your colleagues achieve the objectives of the session. Various methods or strategies can be chosen and it is always practical and effective to use a variety of knowledge sharing methods throughout to maintain the interest of your heterogeneous colleagues.

Some of the questions that should be addressed when organising your in-house knowledge sharing sessions on a Modular Approach course may include:

- What are the objectives of the session?
- How will the Modular Approach be introduced?
- Which training methods will strengthen your presentation and content deliverables?
- What are relevant materials and resources needed?
- What questions will your colleagues be likely to ask?
- What questions should you ask your colleagues?
- How long is the sharing session?
- What is the size of the participants?
- What are the tools needed to maintain attention?

5.3 DELIVERY

Now that you have already know how to plan in-house knowledge sharing session, how are you goung to delivery it? Let's do Activity 5.4.

Activity 5.4 Peer Collaboration - Good and Effective Delivery of Knowledge

Read the following statement:

> "A *good plan of IKS session does not guarantee success or maximum impact if the delivery of the knowledge being shared does not meet with the standard or expectations of the participants."*

What do you think? Discuss.

As a presenter, you must strive to have the followings:

- Understand the roles and functions of training as a management strategy to help your institution achieve its mission and know how competency-based knowledge sharing on the modular approach can promote "best practice".

- Have skills sufficient to communicate effectively with your colleagues.

- Be able to differentiate between training needs and other types of performance problems that university lecturers or teachers may have and know the proper role of a training system in addressing performance problems.

- Pursue self-development activities including professional reading, training events and active involvement in professional training institutions like AKEPT and other national training agencies.

- Seek to develop and utilise skills in serving as performance consultants rather than simply just sharing knowledge and skills you have on the Modular Approach.

Delivery Skills in Knowledge Sharing

The effectiveness of knowledge sharing activities is dependent on various factors. One that is very important is the delivery skills.

Activity 5.5 Peer Collaboration - Effective Delivery

Over the years, you must have attended various talks and presentations. From your personal observation, what makes good and effective delivery skills? Would those skills be essential for knowledge sharing activities? Discuss with your peers.

The following are various delivery skills that you may have to consider or acquire. As you go down the list, **read them carefully and clarify if you have any disagreements or comments** on them.

- Recognise the impact of the physical training environment in facilitating or impeding learning; can arrange the training room to promote comfort, interaction and group development and can assure that training facilities are easily accessible to persons with disabilities.

- Have the ability to use a variety of self-management strategies to reduce personal stress and stage fright associated with public speaking.

- Understand the impact of personal appearance and dress, physical positioning in relation to trainees, hand and body movements, positioning of a podium or tables and tone of voice on both the quality of the presentation and receptivity by trainees.
- Demonstrate the use of name tags, ice-breaker exercises, introductions and other activities at the beginning of a session to create a positive group climate and begin the engagement process.

- Have the ability to speak clearly at an appropriate volume, can vary volume, pace, tone, and inflection to maintain trainees' attention and can avoid using unnecessary and distracting vocalisations.

- Can adjust your presentation methods, use of language and group management styles to achieve the optimal level of formality for the group and/or to match your colleagues' level of expertise.

- Understand the potential impact of your colleagues having been mandated to attend the knowledge sharing event and can use supportive engagement strategies to help them identify personal learning objectives and develop an investment in the knowledge sharing initiative.

- Demonstrate the use of reflective listening and feedback to encourage group involvement, to clarify and expand upon contributions, to guide the direction of the discussion and to enhance the participants' understanding of the contents and concepts of the modular approach.

- Have the ability to use verbal enhancers that fully communicate and explain essential concepts and information, including examples and illustrations, creative phrasing, analogies, quotations, rhetorical questions and comparing and contrasting concepts.

- Know strategies to keep the group focused on tasks and within established time frames, while remaining responsive to group needs and concerns.

- Have the skills to engage and involve trainees who display resistance or a lack of involvement or who exhibit disruptive behaviours that interfere with the development of the constructive group process.

- Have the ability to use information from written participant evaluations, evaluation summaries and feedback from trainees and appropriate managers-in-charge to identify opportunities for improving future in-house knowledge sharing events.

5.4 EVALUATION

Let begin this section by undertaking activity about measument of knowledge sharing.

Activity 5.6 Reflect - Outcome Measurement for Knowledge Sharing

Let us first watch the following YouTube Video entitled: Outcome Measurements from Knowledge Sharing. Matt Reeves from pACT participated in the session on outcome measurement for knowledge sharing. See more at http://kdid.org/kmic

What is the information he gains from the session?

What is evaluation?

- Evaluation is a measure of the effectiveness, efficiency and acceptability of a planned intervention in achieving its stated objectives.

- There are many stakeholders involved in conducting training courses. Besides the trainer and your colleagues as the trainees, other stakeholders may include your respective institution and the organisation for which the training is being conducted. In this case, it could be for AKEPT or the Malaysian Ministry of Higher Education.

- Different stakeholders may have different expectations of the training and expect different outcomes.

- It is important to speak with different stakeholders in order to understand what information they require about the knowledge sharing events or training.

- As the person undertaking the evaluation, you can develop the appropriate tools and methods to collect information about the extent to which your knowledge sharing or training outcomes and stakeholder expectations have been met. This information can then be transmitted to the stakeholders through the training report (which you will cover in a later module and unit).

Benefits from Evaluating an In-House Knowledge Sharing

Evaluating aspects of a knowledge sharing event or training can be beneficial for all stakeholders. Possible benefits may include:

- The participants - assessment of whether they have achieved their learning goals and ability to apply the knowledge and skills learned to their work, decisions about whether training has been a worthwhile investment of time, effort and/or money.

- The respective institutions - information on the extent to which their investment in terms of time and money spent on the in-house knowledge sharing event or training has been worthwhile.

What can be measured in an evaluation?

Evaluation can tell us about the appropriateness of the goals or learning objectives of the in-house knowledge sharing event or training. It can also provide information on how well the training has met the identified goals or learning objectives.

How do you collect the evaluation data for your in-house knowledge sharing session?

There are three main techniques that you may want to consider:

1. **Qualitative techniques:** these are concerned with the collection of descriptive data. They allow participants to look for more in-depth information about particular aspects of your delivery.

   Tools for collecting qualitative data include reflective diaries (e.g., used in self-assessment), using evaluation forms with open-ended questions and notes from open discussions with participants. Qualitative techniques can help answer questions such as why, how, etc.

2. **Quantitative techniques:** these are concerned with collecting measurable data. Quantitative techniques can help answer questions such as to how much, to what degree, etc.

   Tools for collecting quantitative data include check lists and evaluation forms using yes/no answers or a choice of pre-set answers that are assigned values. These can then be scored to allow comparisons over time or between participants.

3. A **mix of qualitative and quantitative techniques** is thought to be the best way of achieving a thorough evaluation. Collecting information from more than one source, e.g., from participants can help support the evaluation findings.

What tools and methods can be used to evaluate IKS?

There are a number of tools and methods that you can utilise to evaluate your IKS event. These include the following types of evaluation:

- Pre- IKS evaluation using a check list to assess readiness for modular approach.
- Having the IKS videotaped or audio taped for self-assessment using a check list or informal feedback (quantitative and qualitative) to ensure that IKS objectives are achieve.

- IKS evaluation forms, mostly used for assessing processes used in the training (quantitative and qualitative).
- Discussion questions at the end of a session to assess the level of knowledge and understanding.

5.5 SUMMARY

In-house knowledge sharing is growing in popularity as a means to continuously disseminate knowledge and share best practices. It also helps organisations and institutions to grow and train their employees. In reality, the in-house sharing of knowledge or in-house training is the most cost-effective way of doing it. However, it requires **planning**, effective **delivery skills and methods** and must be continuously **evaluated.**

5. 6 ADDITIONAL READINGS

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