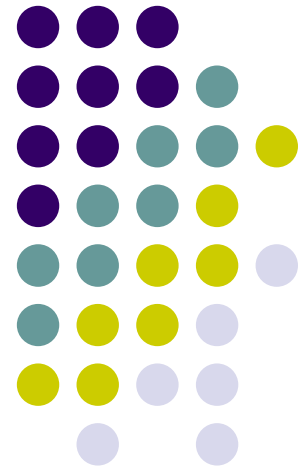




Assessment Literacy



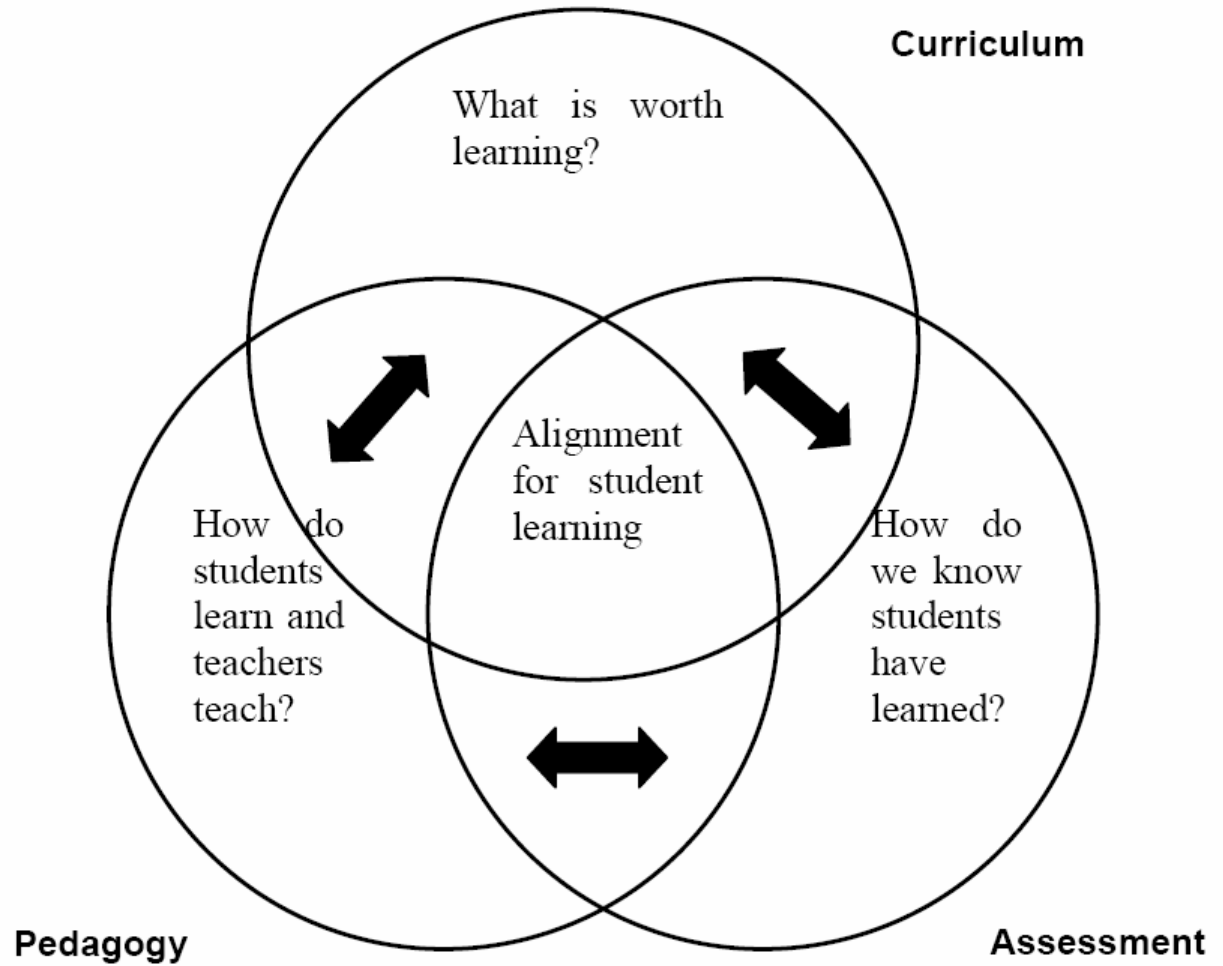
Outline

- Trinity of Student Learning in Schools
- Roles and Types of Assessment
- Formative Assessment
- Internal Assessment for ICT – practices and guiding principles
- Assessment Design Process and Issues
- Assessment Samples

Trinity of Student Learning in Schools



- Curriculum
- Pedagogy
- Assessment



“Trinity” of student learning in schools – adopted from Figure 4.1 in [1]

Introduction to Assessment



“Assessment is the practice of collecting evidence of student learning”

It is aim to

- improve learning and teaching, and
- recognize student achievements.

Roles of Assessment (1)

- Give feedback to students, teachers, schools and parents on the effectiveness of teaching and on students' strengths and weaknesses in learning

What are my students learning?

How effective am I teaching?

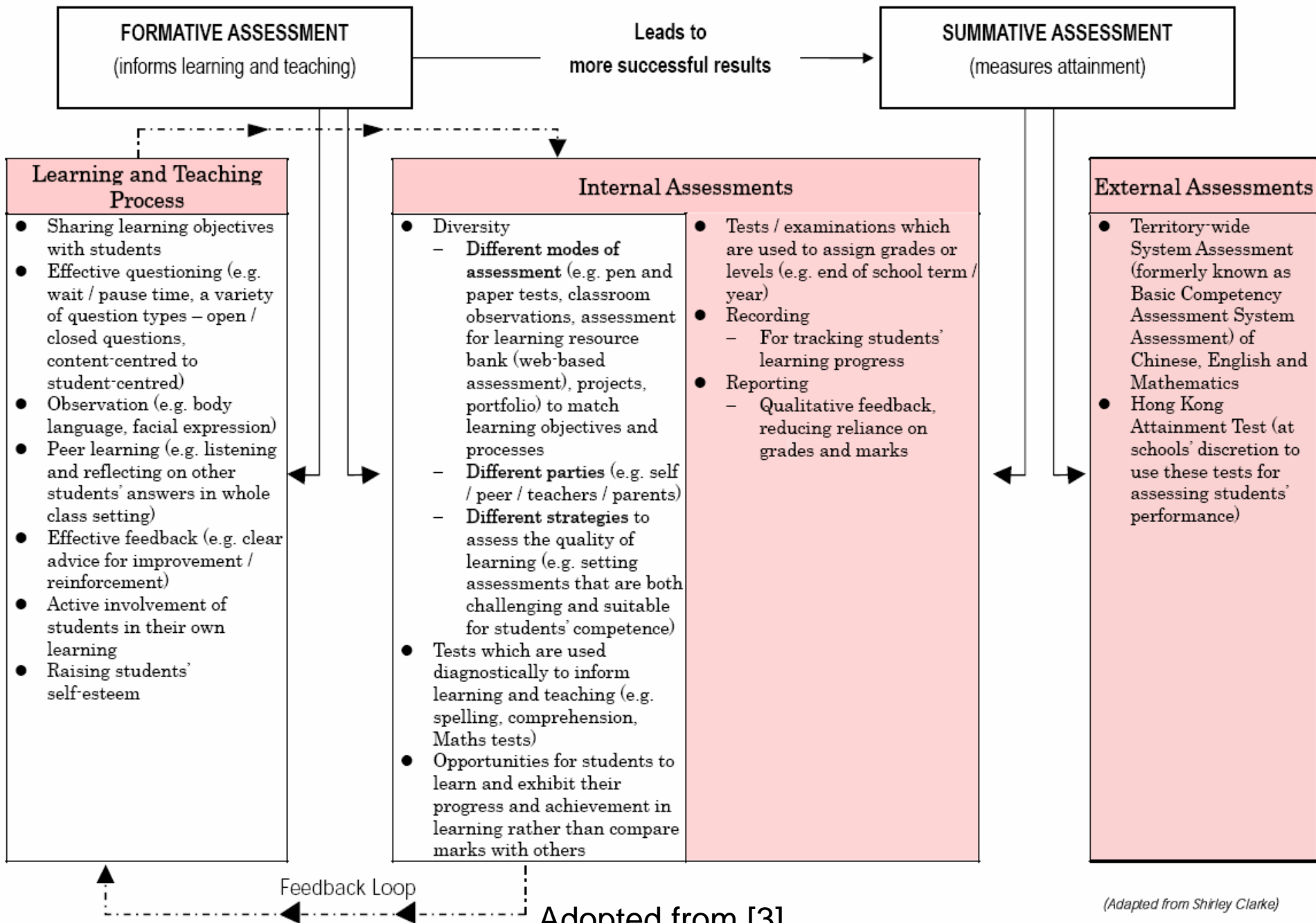
Roles of Assessment (2)

- Provide information to schools, school systems, government, tertiary institutions and employers to enable them to monitor standards and to facilitate selection decisions
- Most importantly, promote learning and monitoring students' progress

Introduction to Types of Assessment

- Formative Assessment
“Assessment for learning”
- Summative Assessment
“Assessment of learning”
- Internal Assessment
The assessment practices that teachers and schools employ as part of the ongoing learning and teaching process during the three years of senior secondary studies
- Public Assessment
The assessment conducted as part of the assessment process in place for all schools

A FRAMEWORK OF SCHOOL ASSESSMENT PRACTICES



Adopted from [3]

(Adapted from Shirley Clarke)

(Updated 22 Dec 2003)

Formative Assessment

“It is all about forming or shaping learning and teaching”

- Obtain feedback on learning and teaching
- Utilize the assessment to make learning more effective, and introduce any necessary changes to teaching strategies
- should take place on a daily basis and typically involves close attention to small “chunks” of learning

Summative Assessment



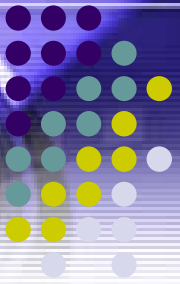
“It is all about summarizing how much learning has taken place.”

- Determine progress in learning
- Normally, undertaken at the conclusion of a significant period of instruction (e.g. at the end of the year, or of a key stage of schooling), and reviews much larger “chunks” of learning

Formative vs. Summative

- Not always have sharp distinction
- The same assessment, in some circumstances, can serve both formative and summative purposes

Formative vs. Continuous



Formative assessment \neq Continuous Assessment

- Formative assessment
Feedback is provided, which is based on formal or informal assessment on student performance, to improve learning and teaching
- Continuous assessment
The assessment of students' ongoing work
 \Rightarrow may not provide feedback to improve learning and teaching!!

Why Formative Assessment?

- Refine instructional decision-making in teaching; and
- Generate feedback (formal or informal) to improve learning, i.e. constructive advice to students on how they can improve their learning

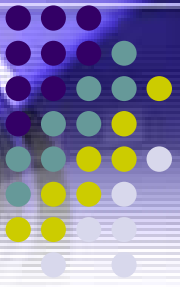
It should be an
integral part of classroom teaching

Internal Assessment

- Practices should be aligned with curriculum planning, teaching progression, student abilities and local school contexts
- Information collected should help
 1. to motivate, promote and monitor student learning, and
 2. teachers to find ways of promoting more effective learning and teaching

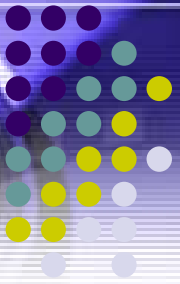
Note: public examinations and the moderated school-based assessments (SBA) are conducted or supervised by the HKEAA in place for all schools, i.e. NOT internal assessments.

Internal, Formative Assessment for ICT



- Feedback is the heart of effective formative assessment since this provides constructive advice to students on how they can improve their learning
- Examples practices
 - Ask students to discuss a question or topic
 - Ask students to poll/vote on several alternatives
 - Ask students to answer some questions (in oral or written form) after a session or phase to confirm their understanding or progress

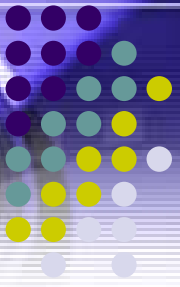
Learning Targets for ICT (1)



Knowledge and Understanding

1. develop knowledge and understanding of the range and organization of computer systems, and the interrelationships between hardware, software and data;
2. realize the social, ethical and legal issues pertaining to the use of information and communication technologies;

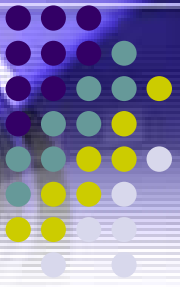
Learning Targets for ICT (2)



Skills

3. use a range of applications software effectively, ethically and with discrimination to support information-processing and problem-solving;
4. demonstrate an understanding of methods for analyzing problems, and planning and implementing solutions using information and communication technologies;

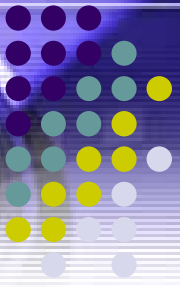
Learning Targets for ICT (3)



Values and Attitudes

5. appreciate how information literacy and the sharing of knowledge using information and communication technologies influence decision-making and shape our society; and
6. develop responsible and positive attitudes towards the use of information and communication technologies.

Overview of Guiding Principles of Internal Assessment in ICT

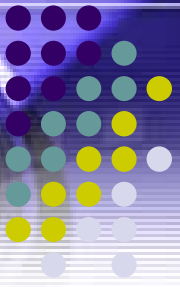


1. Alignment with the learning objectives
2. Catering for the range of student ability
3. Tracking progress over time
4. Timely and quality feedback with encouragement
5. Making reference to the school's context
6. Making reference to current progress in student learning
7. Encouraging peer assessment and self-assessment
8. Appropriate use of assessment information to provide feedback

Guiding Principles of Internal Assessment in ICT (1)

- Alignment with the learning objectives
 - Dimensions of learning aim (Learning Objectives/Targets)
 - Knowledge
 - Practical Skills
 - Values and Attitudes
 - Different assessment practices for different learning objectives

Guiding Principles of Internal Assessment in ICT (2)



- Catering for the range of student ability
 - Existence of diversities, students of different
 - aptitudes and,
 - abilities
 - Use of different
 - levels of difficulty,
 - diverse modes

Guiding Principles of Internal Assessment in ICT (3)

- Tracking progress over time
 - Internal assessment is NOT a one-off exercise
 - e.g. use of portfolios

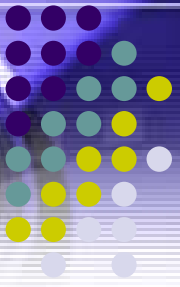
Guiding Principles of Internal Assessment in ICT (4)

- Timely and quality feedback with encouragement, e.g.
 - constructive verbal comments during classroom activities
 - written remarks on assignments with an indication of where improvements should be made

Guiding Principles of Internal Assessment in ICT (5)

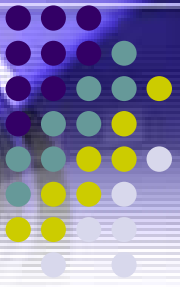
- Making reference to the school's context
 - learning is more meaningful when the content or process is linked to a setting which is familiar to students
 - design a few assessment tasks that make reference to the school's own context
 - e.g. location, relationship with the community, and mission

Guiding Principles of Internal Assessment in ICT (6)



- Making reference to current progress in student learning
 - Internal assessment tasks should be designed with reference to students' current state of knowledge
 - avoids placing impossible demands on students
 - the danger of a cumulative negative impact on learning

Guiding Principles of Internal Assessment in ICT (7)



- Encouraging peer assessment and self-assessment
 - provide opportunities, in student learning, for
 - peer assessment (enable students to learn among themselves) and,
 - self-assessment (promote reflective thinking which is vital for students' lifelong learning)

Guiding Principles of Internal Assessment in ICT (8)

- Appropriate use of assessment information to provide feedback
 - provides a rich source of data for providing evidence-based feedback on learning in a formative manner

Internal Assessment Practices for ICT

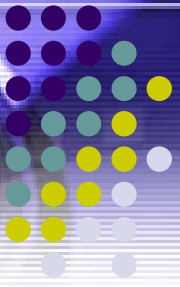
- Practical tasks
- Written tests
- Projects
(further discuss in the coming workshop)
- Oral questioning

These practices are integral part of learning and teaching,
i.e. NOT “add-on” activities

Internal Assessment Practices for ICT – Practical tasks (1)

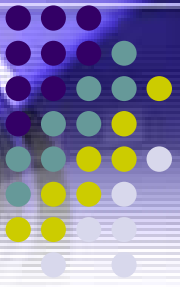
- Acquisition of fundamental practical skills is essential for student understanding of some of the curriculum content
- These tasks are standards-referenced, i.e. students' performance is matched against preset standards
- Teachers can assess students' performance on standards, and give feedback, as often as necessary

Internal Assessment Practices for ICT – Practical tasks (2)



- Be sure to let students know before the task is given
What are being assessed?
How their performance are being assessed?
- Provide feedback to students about the task;
whenever possible, provide the feedback right after
the task
- For formative assessment, emphasize on the process,
not the product
- Based on learning objectives and learning outcomes,
choose among integrated task and core skills

Internal Assessment Practices for ICT – Written tests

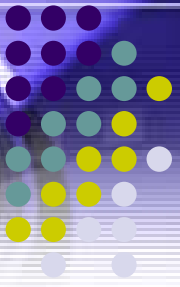


- To reflect the curriculum aims and learning targets
- Rather than just factual recall
- Should be geared towards assessing students' understanding of concepts, creativity and higher-order thinking skills
open-ended questions can help in evaluating such higher-order skills

Internal Assessment Practices for ICT – Projects (1)

- Any piece of extended work from which the constraints of lesson time have been largely removed
- Asking students to carry out project work provides an opportunity for them to study a topic of interest in depth
- Teachers should help students to acquire the essential practical ICT skills for completing the project
- Teachers may consider offering a range of project options to accommodate the full spectrum of students' aptitudes and abilities (to enhance the validity and reliability of internal assessment)

Internal Assessment Practices for ICT – Projects (2)



Project processes/phases:

- Clarifying the areas of interest
- Interpretation of the question
- Analysis of the case
- Designing a solution
- Implementation of the solution
- Testing and evaluation
- Documentation
- Presenting the product

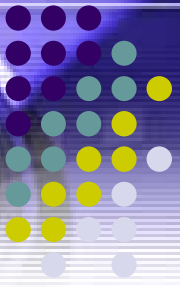
Internal Assessment Practices for ICT – Oral questioning (1)

It allows teachers to

- discuss matters in depth with able students
- tease out the meaning of obscure statements
- find out the reasons for students' conclusions

Teachers are encouraged to try using oral assessment, as it is simple and easy to design/use. Also, it can be a valuable supplement to conventional assessment methods

Internal Assessment Practices for ICT – Oral questioning (2)

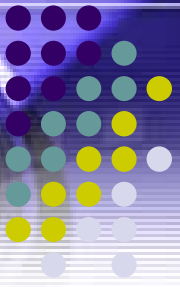


- Know who you are asking
 - Asking an individual
 - Let whom you are asking know that he/she is being asked, e.g. call his/her name, point to him/her
 - Asking a selection
 - Use filtering questions to make targets visible
Which of you choose option 1? Which of you choose option 2?
 - Asking everyone
 - Make sure they know they are being asked
 - Get them involved
Does anyone know how to normalize the given relation/table?
- Beware of repeatedly asking only a few students

Assessment Design Process and Issues

- Identify the area of interests to be assessed
- Identify the corresponding learning objectives and outcomes
- Choose appropriate practice(s) for the assessment (preferably at the same time planning the curriculum)
- Determine the scope, questions and duration for the chosen assessment practice(s)
- Provide feedback and perform item analysis
 - constructive advice to improve learning
 - Common responses, mistakes and their causes

Internal, Formative Assessment Design Issues



Assessment practices for internal, formative assessment should be

- Simple and Easy to design/use in classroom and computer room
- Help you gauge individual performance
- A good estimation of class performance

Oral questioning, practical tasks can serve these requirements

Designing Questions (1)

- Forms of questions
 - Closed(-ended): can be answered with a simple answer; usually used to test students' knowledge and understanding; e.g.
Do you know how to draw an ER diagram?
 - Open(-ended) : cannot be answered with a simple answer; usually used to test students' in higher level cognitive ability (e.g. application, analysis, synthesis, evaluation) and as follow-up questions; e.g.
What can be told from the given ER diagram?

Designing Questions (2)

- Types of questions [7]
 - Selected-response: one of the offered answers should be selected
 - Multiple Choice Question (MCQ)
 - Only one of the offered answers is correct
 - Multiple responses
 - More than one answer can be correct
 - True/False (a.k.a. Yes/No)
 - The question is a statement the accuracy of which should be evaluated (only two options)
 - Matching questions
 - Notions written in two columns should be matched

Designing Questions (3)

- Types of questions [7] (cont'd)
 - Constructed-response: an answer should be written
 - Essay
 - Short, limited essay and long, extended essay
 - Textual entry
 - There are no answers offered, a student has to write the answer into an empty field
 - Numerical entry
 - A student writes a numerical answer into an empty field
 - Gap filling
 - A student fills in the words missing from the text

Designing Questions (4)

- Based on the learning objectives and outcomes described in the curriculum, the scope and questions can be determined for assessment on topics of modules in compulsory and elective part.
- You will find, in the next slide, some action verbs useful in forming questions for different level of cognitive ability; you can find more in [8].

Designing Questions (5)



Examples of action verbs	Students need to demonstrate
Be aware of, know, define, write, list, relate, recognise, state	The recall and understanding of specific terms or facts and simple concepts.
Discuss, describe, explain, identify, demonstrate, apply, convert	The application of declarative knowledge and practical skills in particular contexts.
Distinguish, analyse, compare, evaluate, organise, prepare, test	The analysis of materials or systems into their constituent parts and the recognition of relationships between parts.
Develop, plan, design, construct, process, integrate, implement	The synthesis of concepts and skills from different areas into a plan for solving a problem or reaching a conclusion, and the transfer of learnt concepts and skills to new scenarios/situations

Questioning Techniques (1)

- Probing questions (follow-up questions)

Based on the response and what are going to be discovered, the following techniques serving different purposes may be used:

- Clarification
- Purpose
- Relevance
- Completeness and Accuracy
- Repetition

Questioning Techniques (2)

- Probing questions – Clarification

To seek further information or clarification

- If the student answer Yes to indicate he/she know how to draw an ER diagram, you may ask to see whether he/she truly understand how to draw
Could you describe what can be represented in an ER diagram?

Questioning Techniques (3)

- Probing questions – Purpose

To look for purposes or underlying causes,
i.e. asking for justification and reasons

- Why you represent the relationship in such form in your ER diagram?
- What is the reason to provide feature A in your (web) user interface design?

Questioning Techniques (4)

- Probing questions – Relevance

To signify irrelevance and bring discussion on track

- How is your schema design reflect our requirements?
- How is it related to our topic/case/problem?
- How can your idea/suggestion be applied to our topic/case/problem?

Questioning Techniques (5)

- Probing questions – Completeness and Accuracy

To confirm the completeness and accuracy

- Is this all you have for your schema design?
- How can your presented interface design satisfy the user requirements?

Questioning Techniques (6)

- Probing questions – Repetition

To check if there is any information missing

- How can your presented (web) user interface design satisfy the user requirements?
- (Rephrased) Which aspects of the user requirements can be satisfied by your (web) user interface design?

To emphasize the area-of-interests for more details

- The students have mentioned their interface design having features A and B but have not talked much into the features. You may ask
Did you mention your interface design have feature A and feature B?

Assessment samples 1

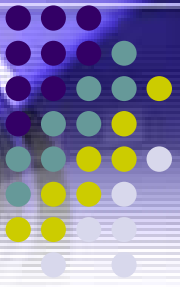
Under the Data Representation topic (Compulsory/Information Processing), students are required to

- distinguish between analog and digital data and, state applications or situations where conversion of analog to digital data is required, or vice versa
- Explain why IT uses digital data
- **Practical tasks**
 - Provide some samples of the two types of data, e.g. cassette tapes vs. CDs, video tapes vs. VCDs/DVDs
 - Ask students to distinguish the given samples into the two types of data
 - Ask students the application of the given samples in their daily life, e.g. at home, in school
 - Ask students to search for other samples of the two types of data and their application in a boarder domain (for more capable students)
- **Oral questioning**

During the practical tasks, we may

 - Ask students the nature of and differences (e.g. representation) between analog and digital data
 - Ask students how they distinguish between the given samples

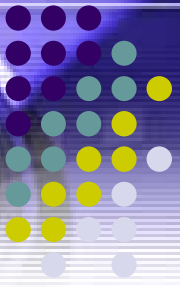
Assessment samples 2 (1)



Under the Basic Machine Organisation topic (Compulsory/Computer System Fundamentals), students are required to

- Describe the functional characteristics of storage devices in terms of random or sequential access, volatile or non-volatile, data transfer rate and storage capacity
- Describe the functions and characteristics of Random Access Memory (RAM), Read Only Memory (ROM) and memory cache. Realise the relationship among the size of the memory, the memory address, word length and the performance of the computer
- Quiz (written test)
 - Ask students to describe the functions and characteristics of memory cache, RAM and ROM
 - Ask students to match the value and unit for storage capacity according to the Système International (SI) notation, e.g. provide options, 1000 Bytes and 1024 Bytes, for 1KB
 - Ask students to calculate/convert between units for storage capacity, e.g. $834\text{KB} = ??\text{MB}$

Assessment samples 2 (2)



- Practical Task
 - Ask students group the given storage devices according to their functional characteristics
 - Ask students to order the given storages devices according to their functional characteristics
 - Ask students to research on some latest development of storage devices
- Oral questioning
 - Ask students how they group the storage devices
 - Ask students how they order the storage devices
 - Ask students the trend of the storage devices

Assessment samples 3



Under The Networking and Internet Basics topic (Compulsory/Internet and its Applications), students are required to

- Explain the functions of the hardware required for a network
- Compare common methods for Internet access in terms of speed, cost, security and availability
- Practical Task
 - Ask students to observe (e.g. showing a video clip or do a research before coming to the class) and describe how to access the internet in various environments, e.g. at home, in school, public library and some public areas
- Oral Questioning
 - Ask students what are the hardware used to connect to the Internet under their observations
 - Ask students how the hardware are used, e.g. in combination
 - Ask students to comment on alternative network configurations
 - Ask students to suggest a brief Internet connection solution for some environments with constraints: speed, cost, security and availability (for more capable students)

Assessment samples 4



Under Algorithm Design topic (Compulsory/Basic Programming Concepts), students are required to

- Define algorithm. Use pseudocode and program flowchart as methods for representing algorithms
- Outline and discuss the input and output requirements of a problem, and design an appropriate user interface

Assume students have completed the Problem-Solving Procedures topic (Compulsory/Basic Programming Concepts)

- Practical Task/Written Test
 - Ask students to outline the algorithm in pseudocode and program flowchart according to the requirements of some problems and suggest an appropriate user interface
 - Ask students to present their algorithm and user interface for peer review
- Oral Questioning
 - Ask students to justify their algorithm design
 - Ask students to justify their user interface design
 - Ask students about the steps they have taken to solve the problems

Assessment samples 5



Under Work and Health Issues topic (Compulsory/ Social Implications), students are required to

- Discuss change in the nature of work in areas such as work monitoring, telecommuting, working hours, virtual organisations and the removal of national and international barriers to business
- Identify health hazards associated with the use of ICT, and propose good ergonomic practices when using them
- Be aware of the consequences of indulgence in Internet activities for individuals
- **Practical Task**
 - Ask students to identify some potential health hazards associated with the use of ICT in their daily environment after showing video clips and providing information about occupational health and safety
 - Ask students to survey on the frequency and duration of internet activities among classmates and discuss their consequences
- **Oral Questioning**
 - Ask students how the use of ICT affect their daily lives
 - Ask students to comment on the changes associated with the use of ICT in their daily lives
 - Ask students to comment on some reported cases of indulgence in Internet activities in the media

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