

A System for Assessment in Large Class

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Secure
Online
Assessment
System

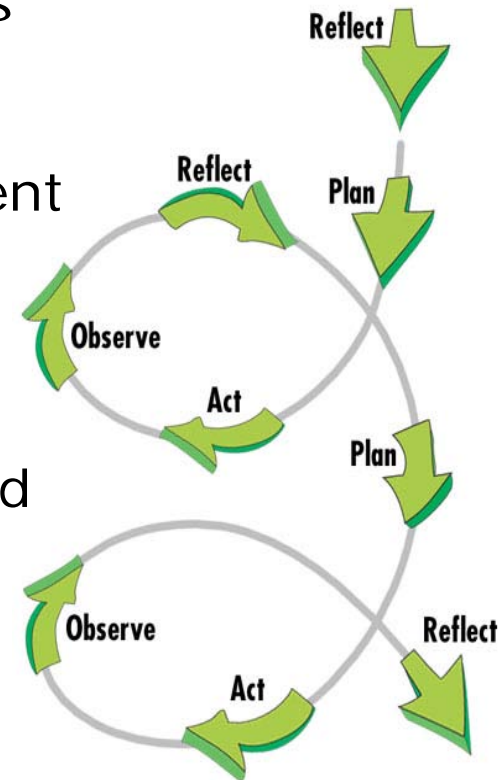


Background

- The need to administer two **examinations** during the Spring semester when the FINA course is delivered to **a large class** of few hundred students
- Each examinations requires **substantial resources in preparation** (i.e. >300 hrs)
- Time is used in **designing** and ensuring clarity of questions, **administering** the examination in several large lecture theaters, hiring and training 25-30 proctors, and **marking** the examination in a consistent, efficient and fair manner.

Action Research Cycle

- **Planning:** identified user requirements for creating a system that will be used to conduct continuous assessment using less resources
- **Action:** built a secured online assessment system with student, instructor and administrator interfaces
- **Evaluation:** conducted 2 rounds of usability tests with TAs/demonstrators and students
- **Reflection:** made refinement onto the system that fit users' preferences



Planning

To design an assessment system which is

- **efficient**: does not require great deal of resources
- **effective**: provides a consistent and fair test to all students by creating randomized tests of “equal” difficulty; incorporates efficient & consistent marking
- **flexible**: allows students to take the test at various assigned times in one or two days
- **secure**: prevents students from communicating with their peers through PCs or internet, and stops them from downloading/ printing the assessment paper.

SOAS System Features (I)

- Create a secure system which consisted of the **student examination interface**, **instructor interface** and **administrator interface**
- Feature that ensure **security**: Student's workstation are configured to run SOAS test only.
- Students are **prohibited to communicate** with each other through PC to PC connection or through the internet. Whenever students login the SOAS system, they could neither open any other programs nor connect to the internet. They would not be able to copy any examination questions.

SOAS System Features (II)

- **Student exam interface**: examination timer; skip/ review questions
- **Instructor interface**: simple or compound questions that support MC , text-based or questions with attachment; randomization of questions and answer options; automatic calculation and marking for MC questions; display results per student or per question.
- **Administrator interface**: users management, import/export questions and all features at instructor interface

Instructor Interface

Question Randomization

For large class

Purely randomized questions
(All different questions)

Partially randomized questions
(Different questions)

+

Partially the same questions
(Common questions)

For small class

Purely the same Questions
(All common questions)

Instructor Interface - Login

http://ctms01.ust.hk/coursedata/soasdemo/admin/login.asp - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Media Refresh Print

Address http://ctms01.ust.hk/coursedata/soasdemo/admin/login.asp Go

Secure Online Assessment System Online Assessment HKUST

Username:

Password:

Login

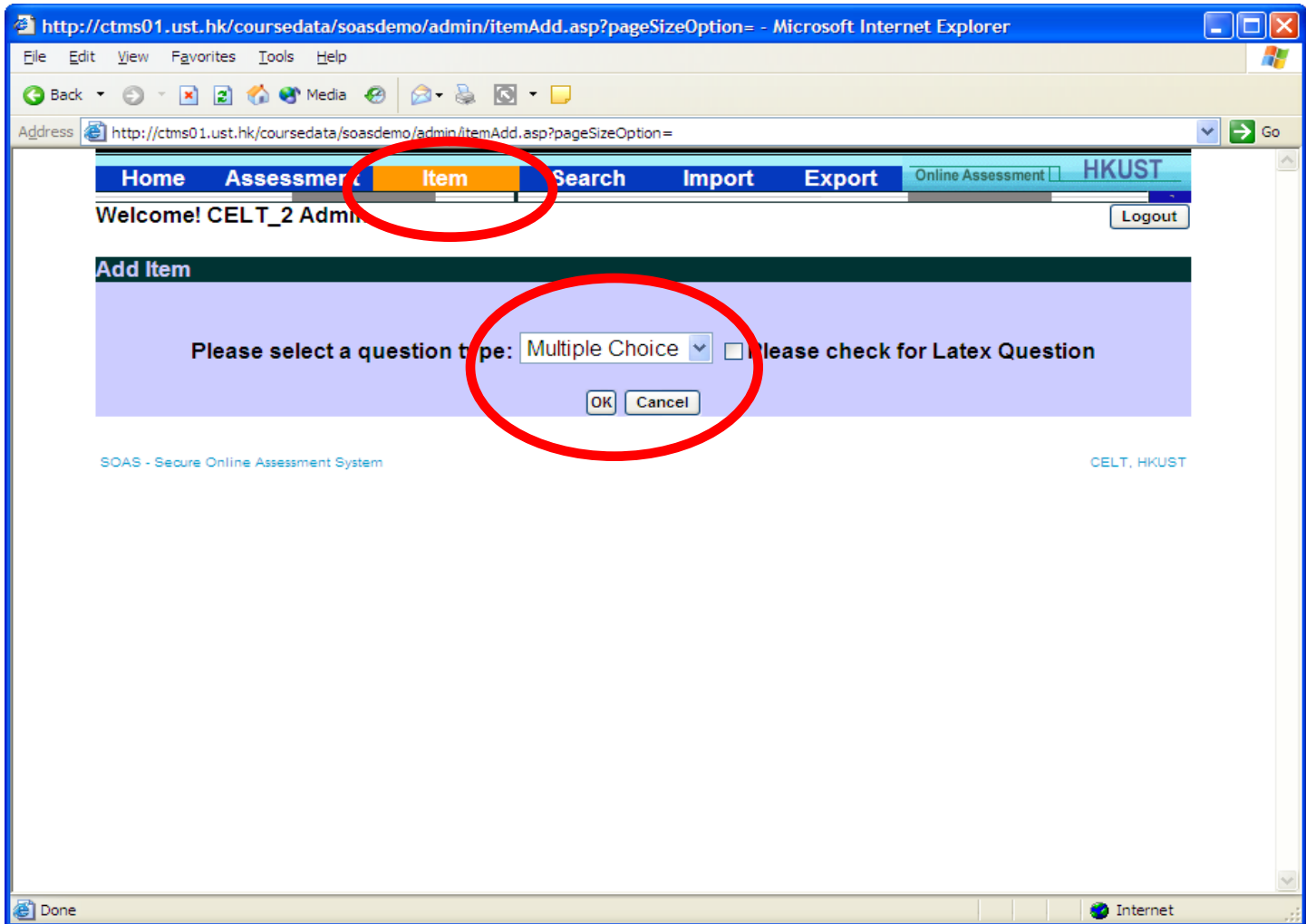
e.g. ITSC account

SOAS - Secure Online Assessment System

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Done Internet

Instructor Interface – Question Type



Instructor Interface – Question Categorization

The screenshot shows a web browser window with the URL `http://ctms01.ust.hk/coursedata/soasdemo/admin/itemAdd.asp?pageSizeOption=`. The page has a navigation menu with **Home**, **Assessment**, **Item** (selected), **Search**, **Import**, and **Export**. There is also a link for **Online Assessment** and the **HKUST** logo. A **Welcome! CELT_2 Admin** message and a **Logout** button are present.

The main content area is titled **Add Item** and contains the following form fields:

- Category**: A dropdown menu with the text "Please select one category". A red star is next to the label. Below it is a text input field with "Finance".
- Sub-category**: A dropdown menu with "N/A". A red star is next to the label. Below it is a text input field with "Chapter 1".
- Year**: A dropdown menu with "UG1".
- Difficulty**: A dropdown menu with "Easy". A red star is next to the label.
- Bloom's Taxonomy**: A dropdown menu with "Knowledge".
- Conceptual/Numerical**: A dropdown menu with "Conceptual". A red star is next to the label.
- MC/TF/FIB**: A dropdown menu with "MC".
- Item Stem**: A large text area.
- Keywords**: A text input field.

Below the form, there is a section titled **Item 1** with the following fields:

- Item Type**: Multiple Choice
- Item Title**: A text input field.
- Item Text**: A text input field.

Instructor Interface – Input Question

http://ctms01.ust.hk/coursedata/soasdemo/admin/itemAdd.asp?pageSizeOption= - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Media Print Refresh

Address http://ctms01.ust.hk/coursedata/soasdemo/admin/itemAdd.asp?pageSizeOption= Go

Item 1

Item Type Multiple Choice

Item Title

Item Text The mixture of debt and equity used by the firm to finance its operations is called:

Option 1 A **Label** for this option

Text for this option
working capital management.

Points for this option

Feedback for this option

Option 2 B **Label** for this option

Done Internet

Instructor Interface – Student List

The screenshot shows a web browser window displaying the instructor interface for the SOAS system. The address bar shows the URL: <http://ctms01.ust.hk/coursedata/soasdemo/admin/mgtstd.asp>. The page features a navigation menu with tabs for Home, Assessment, Item, Search, Import, and Export. The current user is identified as CELT_2 Admin, and there is a Logout button. The main content area is titled "FINA-111" and contains a table of registered students. The table has two columns: "Name of Registered Student" and "Number of Attempt". There are three rows of student data, each with a checkbox in the first column. Below the table, there are two buttons: "Add Student" and "Upload Student List", which are circled in red. A "Back to Main" link is also present. The footer of the page includes "SOAS - Secure Online Assessment System" and "CELT, HKUST".

	Name of Registered Student	Number of Attempt
<input type="checkbox"/>	1. Charlotte Chow	0
<input type="checkbox"/>	2. Dennis Tong	0
<input type="checkbox"/>	3. Nadia Chan	0

Student Exam Interface - Login

Welcome to Secure Online Assessment System! - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Media Refresh Print

Address <http://ctms01.ust.hk/coursedata/soasdemo/student/login.asp> Go

Welcome to the Secure Online Assessment System!

Username :

Password :

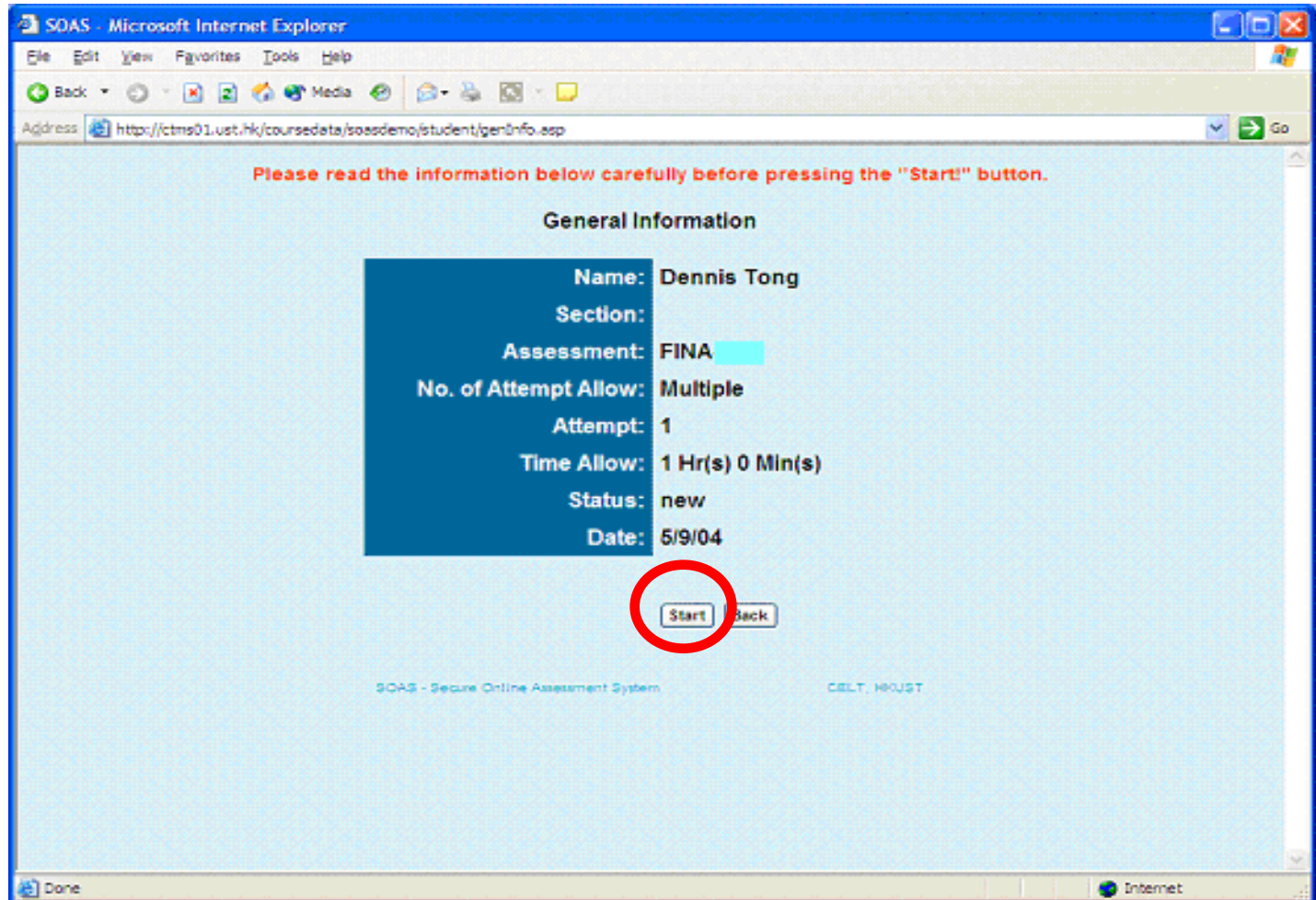
Submit

SOAS - Secure Online Assessment System CELT, HKUST

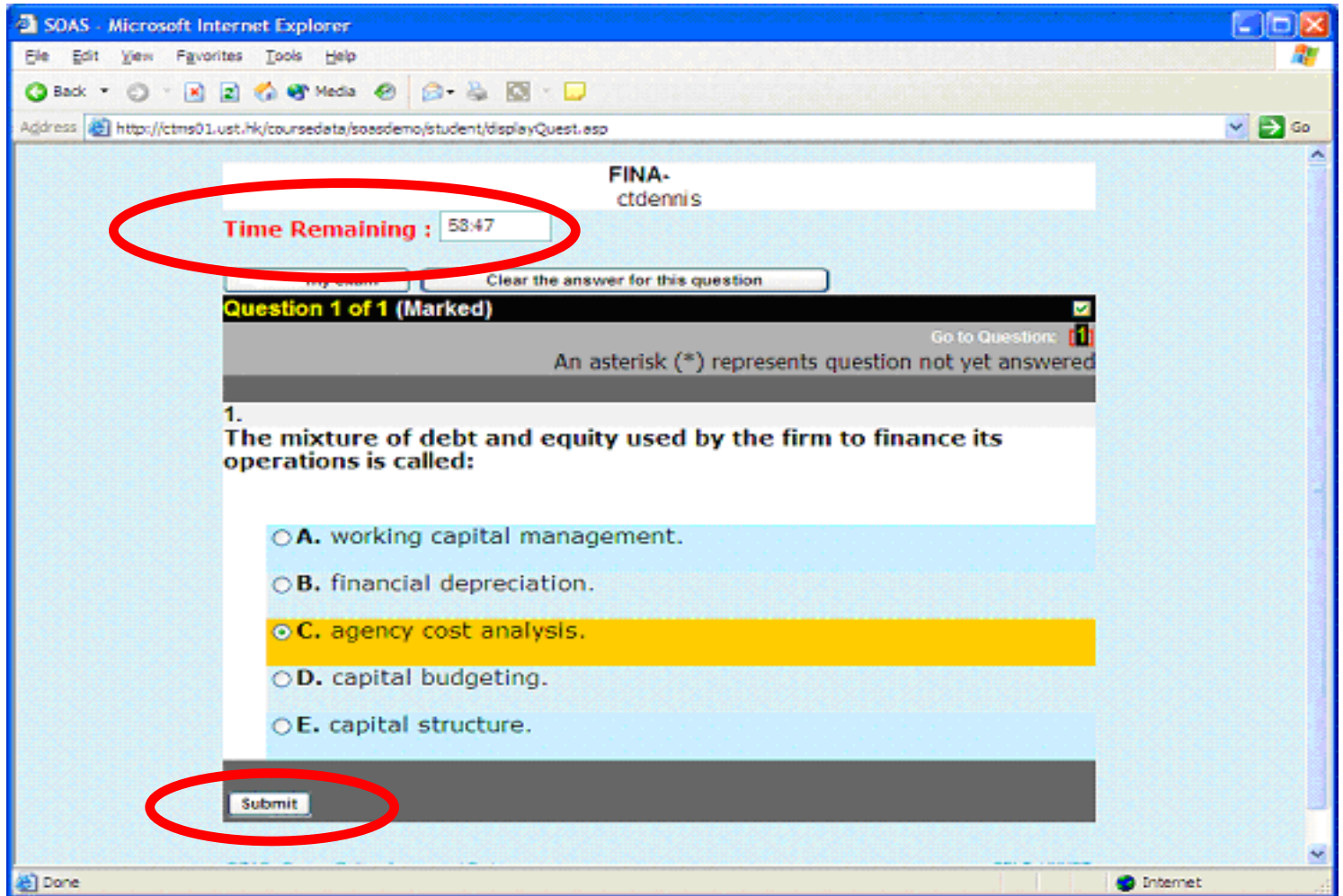
Done Internet

e.g. ITSC account

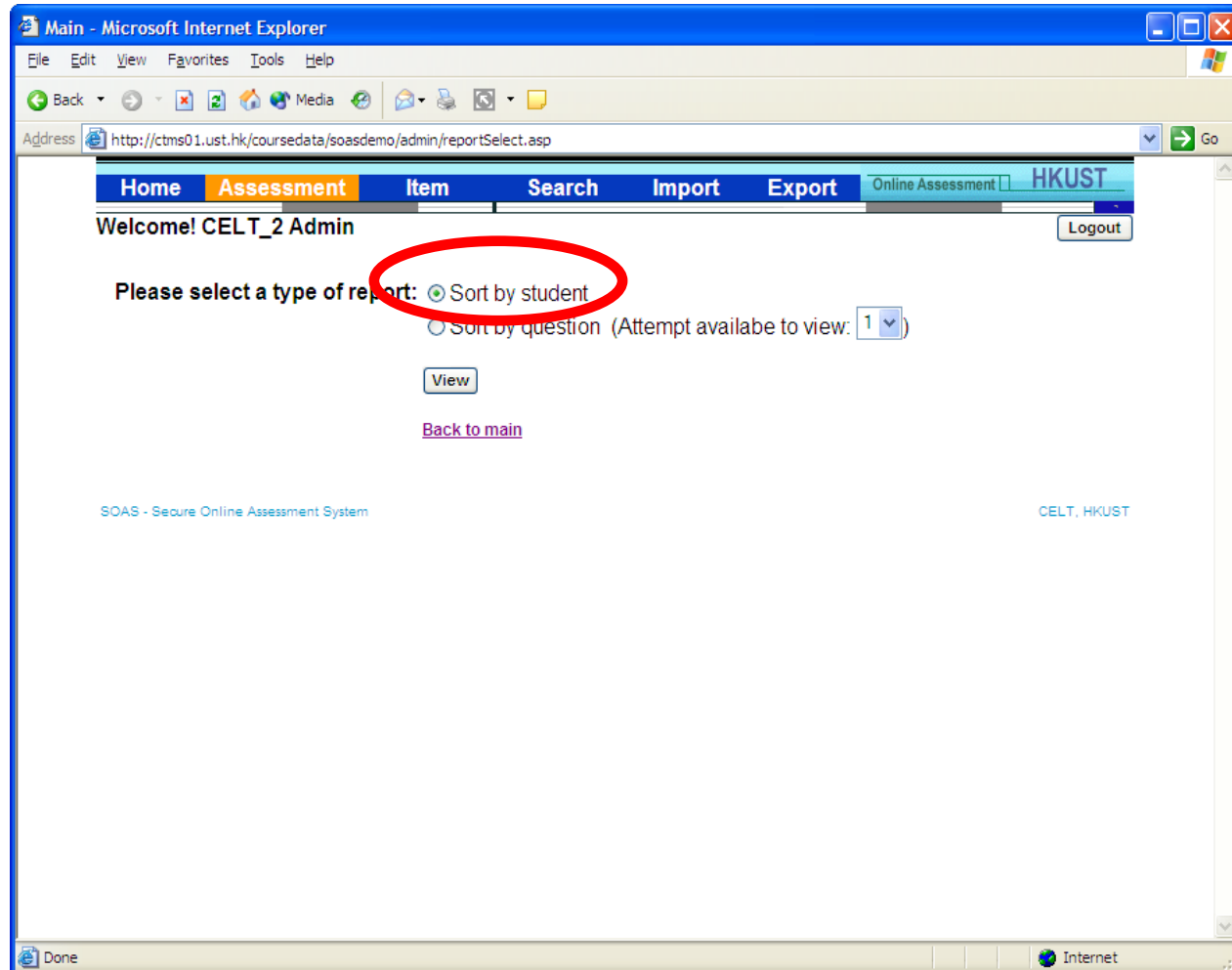
Student Exam Interface – Start Exam



Student Exam Interface – Attempt Question



Instructor Interface – View Report as Sorted by Student



Instructor Interface - Report as Sorted by Student

The image displays two screenshots of a web-based instructor interface. The top screenshot shows a 'Report - FINA-' page with a red circle highlighting the 'Assessment Title : FINA' and 'Student Name : Dennis Tong' fields. The bottom screenshot shows a 'Question 1.' detail page with a red circle highlighting the 'Obtained' score of 0 for option C.

Report - FINA-

General Information

Attempt : 1
Assessment Title : FINA
Student Name : Dennis Tong
Total Score : 0
Time Limit : 60m 0s
Total Time Spent : 2m 31s
Start : 5/9/04 3:57:52 PM
End : 5/9/04 4:00:23 PM
Scored by : Scored automatically

Question 1.

Points : 1
Last Submit Time : The last action(s) for this question was not saved.
Time Used : 37s
Item Stem :

Question Type : Multiple Choice
Item Text : The mixture of debt and equity used by the firm to finance its operations is called:

Label	Answer Text	Score	Obtained
<input type="radio"/>	A working capital management.	0	
<input type="radio"/>	B financial depreciation.	0	
<input checked="" type="radio"/>	C agency cost analysis.	0	0
<input type="radio"/>	D capital budgeting.	0	
<input type="radio"/>	E capital structure.	0	

This question is scored automatically.

Instructor Interface – Report as Sorted by Question

The top screenshot shows the 'Please select a type of report' dialog with the following options:

- Sort by student
- Sort by question (Attempt available to view: 1)

The bottom screenshot shows the 'Report by Question' page for Question 1.2. The question type is 'Multiple Choice'. The table below shows the student answers and scores:

Student	Answer & Score	Scored By
ctchow	Did not make this attempt.	
ctdennis	A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E <input type="radio"/>	Auto

Evaluation

- Usability Test I:
Students
- Usability Test II:
TAs/ demonstrators

Usability Tests - Objectives

Student exam interface

- to test question randomization
- to test using questions with different answer types: e.g. MC, text-based
- to test simple questions & compound questions
- to test whether assessment can be continued after re-booting the PC
- to test whether submission of answer would be rejected after the pre-assigned time had passed

Instructor interface

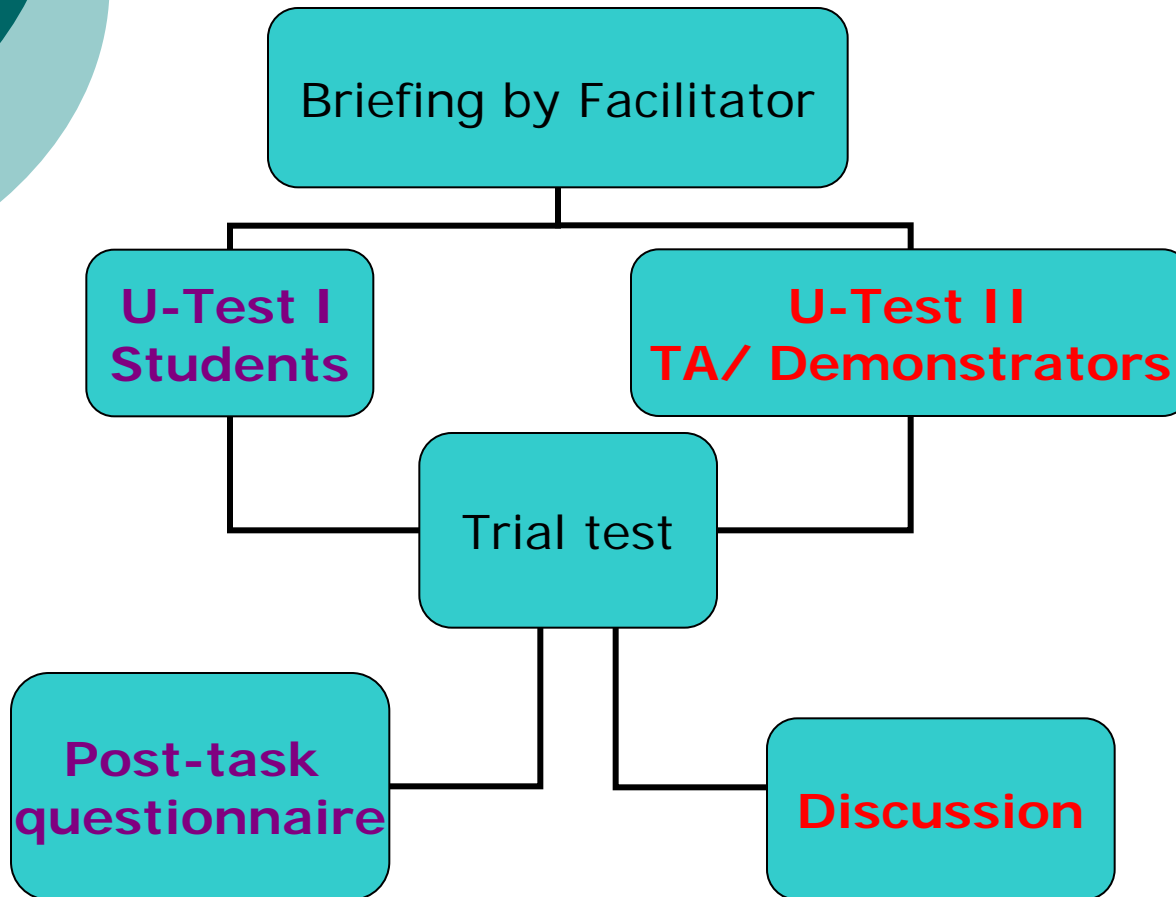
- to mark questions, re-adjust previously marked questions & calculate total scores
- to generate report

Two Usability Tests - Design

	FINA Students	FINA TA/ Demonstrator s
No. of Participants	70	5
Data Collection Date	11 Jul 2003	17 Jun 2003
Student Exam Interface	Tested	Tested
Instructor Interface	N/A	Tested
No. of trial test questions	20 simple Q & 1 compound Q	60 simple Q & 1 compound Q
Time allowed	30 mins	40 mins

Two Usability Tests – Procedure

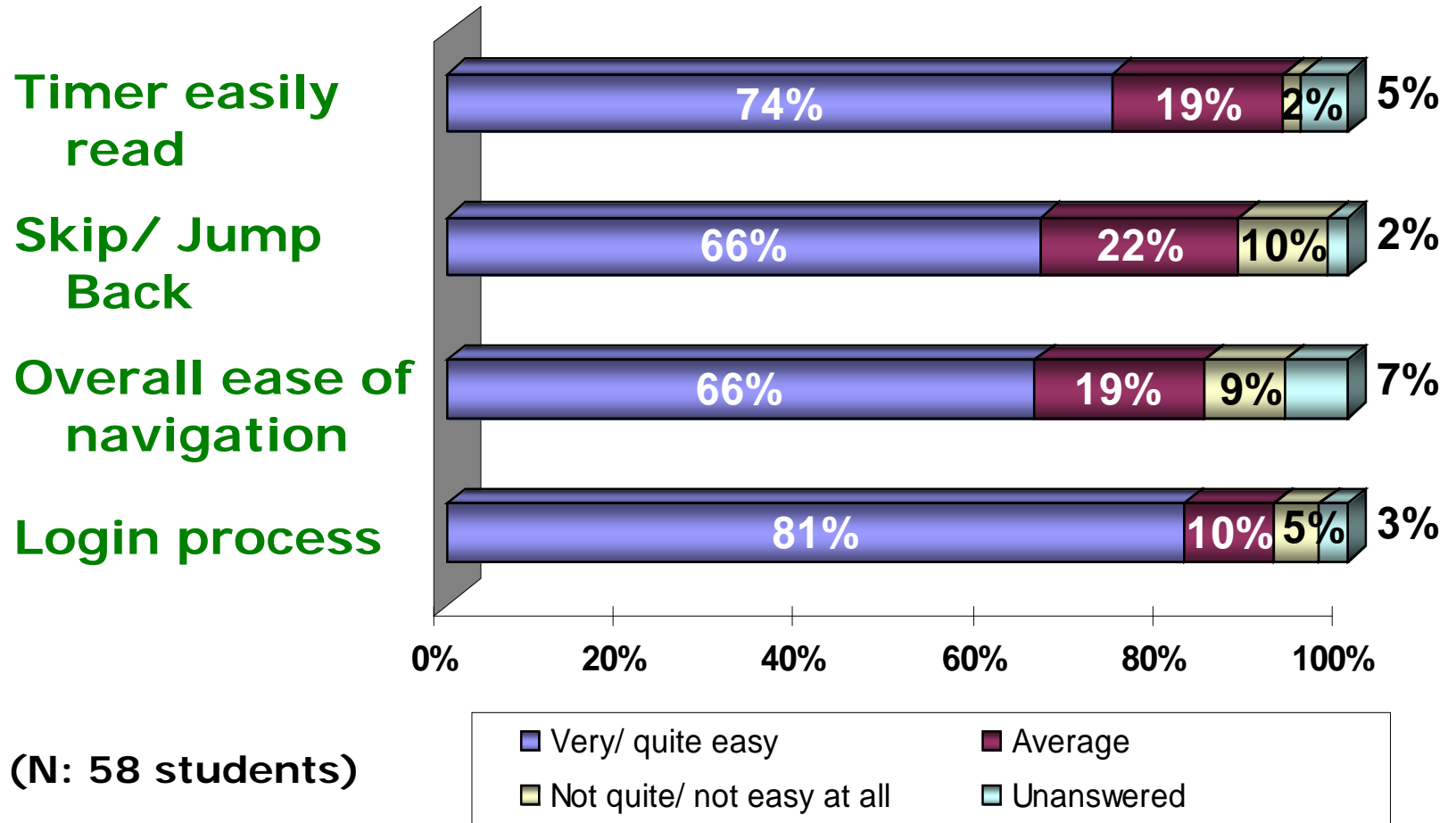
- Aim: to test the SOAS's **student exam interface** by simulating the actual exam procedure & environment



- **Facilitator** briefed TAs/ demonstrators/ students about the test procedure and circulated instruction sheets to them.
- **Observers and invigilators** jotted down field notes on participants' behavior in using SOAS system.
- There were gifts rewarded to students scored the top 2 highest marks. Students were **motivated to achieve good score**, as if in normal exam.

Finding (I)

Quantitative opinions from students:



Finding (II)

Several **refinements** were made with reference to the qualitative opinions from TA/ demonstrators:

- **Student exam interface**

(e.g. change timer bar to a 'stop watch' time counter, etc.)

- **Instructor interface**

(e.g. enhanced the preview function: give a preview of all questions to be randomized for a single class assessment, etc.)

Future Implementation

- A **designated classroom** reserved for conducting real examination/ test using SOAS is currently under renovation.
- The key to implementing SOAS is **to select and codify questions**, which test a student's understanding and critical thinking ability for a given subject.
- As an **extension of this project**, a colleague at the ISMT department will use SOAS in upcoming semester(s).



End of Presentation

Thank You !

SOAS website: <<http://celt.ust.hk/cli/projects/soas/>>