"Developing an E-learning Environment for CSE-110 at BRAC University"

SUBMITTED BY:

 Farhana Hasnat   [ID: 03101018]

SUPERVISED BY:

_____
Matin Saad Abdullah
Head of Department of Computer Science and Engineering
BRAC University

Declaration

This is to certify that this project is our original work. No part of this work has been submitted elsewhere partially or fully for the award of any other degree or diploma. Any material reproduced in this project has been properly acknowledged.

Students' names & Signatures.

_____

1. Tanjila Ferdous (ID:-02201109)

_____

2. Farhana Hasnat (ID:-03101018)

ACKNOWLEDGMENTS

Table of Contents

Abstract

Traditional Face-To-Face Learning has some problems which are addressed by Blended Learning. Blended Learning is nothing but the combination of both Face-To-Face and E-Learning. So the focus of our thesis paper is on integration E-Leaning in the classroom. To integrate the process of E-Learning development we have chosen the course CSE-110 at BRAC University. We have also implemented e-learning interaction modules which are compliant with the Sharable Content Object Reference Model standard. During the process of implementing the interaction we have evaluated the two of the most well known methods used in the industry:

1. Macromedia Flash.
2. Hot Potatoes.

Chapter #1

BACKGROUND

1.1 Face-To-Face Learning

We all have had many years of experience in learning in face-to-face settings in both classrooms and seminar rooms. Although the face-to-face learning environments are often complex and unpredictable, we are very familiar with them and have developed high levels of skill in working in these environments.

Most used educational tools in Face-to-Face learning that do not necessarily involve computer technology are-

Content Delivery

- ➢ Textual resources such as textbooks, exercise books
- ➢ Classroom based audio-tape resources (language laboratories)
- ➢ Auditorium multimedia visual resources (movie projectors, slideshows, VCR)
- ➢ Blackboard and whiteboard resources, including high-tech "printing whiteboards" and "online whiteboards"

Assessment

Non-instructional education resources such as

- ➢ Quizzes
- ➢ Test-grading

Interaction

- ➢ Discussion and Session

1.2 Problems of Face-to-Face Learning

- ➢ We have to meet at a specific place and at a specific time.
- ➢ In Face-To-Face learning we usually have to work on one issue at a time
- ➢ Though the time is fixed in Face-To-Face learning there is a little group contact in between meeting.
- ➢ In Face-to Face Learning teacher gets verbal feedback from the student so teachers need to guess how much a student can develop in learning.

Some of these Face-To-Face Learning problems are addressed by Blended Learning. Hence the skills, strategies, and techniques that we so effectively use in Face-To-Face Learning environments will also work more efficiently in Blended Learning.

1.3 Blended Learning

Blended Learning is the combination of multiple approaches to learning. Blended learning can be accomplished through the use of 'blended' virtual and physical resources. A typical example of this would be a combination of technology-based materials and face-to-face sessions used together to deliver instruction.

1.3.1 Dimensions of the Blended Learning

The original use of the phrase "blended learning" was often associated with simply linking traditional classroom training to e-learning activities, such as asynchronous work (typically accessed by learners outside the class at their own time and pace). However, the term has evolved to encompass a much richer set of learning strategies or "dimensions." Today a blended learning program may combine one or more of the following dimensions, although many of these have over-lapping attributes.

Blending Offline and Online Learning

 At the simplest level, a blended learning experience combines offline and online forms of learning where the online learning usually means "over the Internet or Intranet" and offline learning happens in a more traditional classroom setting. We assume that even the offline learning offerings are managed through an online learning system. An example of this type of blending may include a learning program that provides study materials and research resources over the Web, while providing instructor-led, classroom training sessions as the main medium of instruction.

Blending Self-Paced and Live, Collaborative Learning

Self-paced learning implies solitary, on-demand learning at a pace that is managed or controlled by the learner. Collaborative learning, on the other hand, implies a more dynamic communication among many learners that brings about knowledge sharing. The blending of self paced and collaborative learning may include review of important literature on a regulatory change or new product followed by a moderated, live, online, peer-to-peer discussion of the material's application to the learner's job and customers.

Blending Structured and Unstructured Learning

Not all forms of learning imply a premeditated, structured, or formal learning program with organized content in specific sequence like chapters in a textbook. In fact, most learning in the workplace occurs in an unstructured form via meetings, hallway conversations, or e-mail. A blended program design may look to actively capture conversations and documents from unstructured learning events into knowledge repositories available on demand, supporting the way knowledge-workers collaborate and work.

Blending Custom Content with Off-the-Shelf Content

Off-the-shelf content is by definition generic—unaware of an organization's unique context and requirements. However, generic content is much less expensive to buy and frequently has higher production values than custom content. Generic self-paced content can be customized today with a blend of live experiences (classroom or online) or with content customization. Industry standards such as SCORM (Shareable Content Object Reference Model) open the door to increasingly flexible blending of off-the-shelf and custom content, improving the user experience while minimizing cost.

Blending Learning, Practice, and Performance Support

Perhaps the finest form of blended learning is to supplement learning (organized prior to beginning a new job-task) with practice (using job-task or business process simulation models) and just-in-time performance support tools that facilitate the appropriate execution of job-tasks. Cutting-edge productivity tools provide 'workspace' environments that package together the computer based work, collaboration, and performance support tools.

1.3.2 The Benefits of Blending

The concept of blended learning is rooted in the idea that learning is not just a one-time event—learning is a continuous process. Blending provides various benefits over using any single learning delivery medium alone.

Extending the Reach

A single delivery mode inevitably limits the reach of a learning program or critical knowledge transfer in some form or fashion. For example, a physical classroom training program limits the access to only those who can participate at a fixed time and location, whereas a virtual classroom event is inclusive of remote audiences and, when followed up with recorded knowledge objects (ability to playback a recorded live event), can extend the reach to those who could not attend at a specific time.

Optimizing Development Cost and Time

Combining different delivery modes has the potential to balance out and optimize the learning program development and deployment costs and time. A totally online, self-paced, media-rich, Web-based training content may be too expensive to produce (requiring multiple resources and skills), but combining virtual collaborative and

coaching sessions with simpler self-paced materials, such as generic off-the-shelf WBT, documents, case studies, recorded e-learning events, text assignments, and PowerPoint presentations (requiring quicker turn-around time and lower skill to produce) may be just as effective or even more effective.

From the above discussion we realize that the Blended Learning is nothing but the combination of Face-To-Face Learning and E-Learning and to solve the problems of Face-To-Face Learning we decide to create an E-Learning environment for the fundamental course CSE-110 at BRAC University. Now we have to know what is E-Learning. A brief description of E-Learning is given below.

1.4 E-Learning

E-Learning or Electronic learning is the term used to describe all learning that has an electronic dimension to it. So E-Learning is the convergence of learning and the Internet. It uses the power of networks, primarily those that rely on Internet technologies but also satellite networks, and digital content to enable learning.

E-Learning is dynamic and operates in real time. You get what you need, when you need it.

E-Learning is collaborative. Because people learn from one another, E-Learning connects learners with experts, colleagues, and professional peers, both in and outside your organization.

E-Learning is individual. Every e-learner selects activities from a personal menu of learning opportunities most relevant to her background, job and career at that very moment.

E-Learning is comprehensive e-Learning provides learning events from many sources, enabling the e-learner to select a favored format or learning method or training provider.

Finally E-Learning is more likely to:

- Focus on the needs of the learner, not the trainer or institution
- Take advantage of the net: real-time, anywhere, anytime
- Bring people together to collaborate and learn together
- Personalize, often by combining "learning objects" on the fly
- Offer more than one learning method, e.g. virtual classroom and simulation and self-paced instruction
- Incorporate administrative functions such as registration, payment and charge-backs, monitoring learner progress, testing, and maintaining records

Moreover E-Learning provides faster learning at reduced costs, increased access to learning, and clear accountability for all participants in the learning process. In today's fast-paced culture, organizations that implement E-Learning provide their work force with the ability to turn change into an advantage.

E-learning allows you to learn anywhere and usually at any time, as long as you have a properly configured computer. Cell phones allow you to communicate any time and usually anywhere, as long as you have a properly configured phone.

1.4.1 Technology

Many technologies can, and are, used in E-learning:

- Palm pilots
- MP3 Players
- the use of web-based teaching materials
- hypermedia in general
- multimedia CD-ROMs
- web sites
- discussion boards
- collaborative software

- e-mail
- Interactive TV
- wiki
- text chat
- computer aided assessment
- educational animation
- simulations
- games
- learning management software
- electronic voting systems

Most E-Learning situations use combination of the above techniques.

1.4.2 Advantages

Flexibility

The most notable advantages of most types of e-learning are flexibility, convenience and the ability to work at your own pace. E-classes are asynchronous which allows learners to participate and complete coursework in accordance with their daily commitments. This makes an e-learning education a viable option for those that have other commitments such as family or work.

Active Learning

Active learning means doing something with new information. Online environments encourage learners to:

- Make choices
- Interact with others in a social environment
- Choose media

Real-world Context

Online environments can provide authentic experiences because learners have access to so much more information and so many more points of view than before. They can work with:

- Cross-country research projects
- Workplace learning
- Real, current data
- More resources (both formal and non-formal)

Depth of Coverage

Because anyone can publish on the Internet, learners can find more information from more sources and up-to-date research findings, than one professor can possibly provide.

Online research opportunities can be accompanied with instruction about critical information literacy.

Information Literacy Skills

E-Research is a good context for finding and assessing information from non-traditional sources. What is the most appropriate theory of learning for hypermedia environments? The answers to this question are many and varied. Many converge on one point:
Learning is a cognitive learning process involving the acquisition of high-level skills of problem-solving and critical thinking.

Critical and Creative Thinking

Linking through time and space gives learners exposure to the thought processes of others through:

- Discussion
- Problem-solving peer assessment of writing
- Public process

- Writing as cognitive process

Because there is no need for an immediate response in an asynchronous class discussion, learners have more time to reflect on their responses, which encourages higher-order critical thinking.

Collaborative Learning

Individuals can participate in collaborative learning activities even if they are separated across time and space.

Collaborative learning compares very favorably with other approaches, for example, individualized learning. Research on collaborative learning refutes the initial belief that computers would displace or replace the live human teacher and the social setting of the classroom.

1.4.3 The elements of e-learning

Looking at the e-learning experience from the learner's point of view, E-Learning appears as combinations of the following elements:
- ➢ Logon process
- ➢ Registration process
- ➢ Personal profile
- ➢ Competency and skills assessments
- ➢ Course catalogues
- ➢ Course enrolment processes
- ➢ Pre-defined learning paths
- ➢ Personal learning path
- ➢ Customizable home page
- ➢ Online courses—custom built or bought off-the-shelf, usually containing some combination of these elements:

- Pre-assessment
- Text
- Graphics, photographs
- Streaming animations, audio, video
- Simulations
- Interactive exercises
- Online and downloadable tools
- Quizzes
- Bookmarks
- Online notepads
- Post-assessment
- Feedback forms
- Downloadable courses or course elements
- Electronic Performance Support Systems (EPSS)
- Moderated message boards (formal peer-to-peer communication)
- Peer-to-peer message boards (informal peer-to-peer communication)
- Peer-to-peer Instant Messaging (informal peer-to-peer communication)
- Virtual classrooms—live and archived
- Online mentoring
- Other collaborative applications, e.g. Lotus Anytime, Groove
- Web casts—lives and archived
- Links to public or subscription Web sites
- Access to proprietary or third-party Knowledge Management databases
- Online help files
- Online help desks
- Telephone help desks

1.4.4 E-learning content

All e-learning content has three dimensions:

➢ Subject matter—the content of content

➢ focus—an indicator of the breadth of the learner base

➢ Intention—how the learning is intended to affect learners

1.4.5 Five planning aspects in E-Learning design

Five planning aspects:

1. Outcomes
2. Learners
3. Activities
4. Assessment
5. Resources

We focus mainly on Assessment.

Assessment

The assessment of students' learning is a not well understood and, in most disciplines, an under-researched aspect of higher education. We have to know why it is important to include a discussion of student assessment in a handbook for teachers in higher education. It is important for two quite different reasons. Assessment is an integral component of the teaching and learning system. Assessment may be used explicitly to guide students in their study. But also, student perceptions of what is rewarded and what is ignored by more formal examination procedures will have a substantial impact upon their learning behavior and thus upon the outcomes of a course.

Second, for a variety of reasons, assessment needs to be accurate and if it is not itself examined, then we cannot know how accurate it is. We need assessment to be accurate because it is pointless and unfair to students if it is otherwise. We need it to be accurate for internal and external quality assurance purposes; and we need it to be accurate to defend the increasingly likely legal challenges from disaffected students who feel they have been unfairly judged, classified or even excluded.

Assessment Methods

A large number of assessment methods are available for use in higher education. Those most likely to confront new university teachers are long essay questions, short answer questions, so-called multiple choice questions (MCQs) of many varieties, the assessment of practical or laboratory exercises and quite possibly oral examinations.

As the use of information technology is becoming ubiquitous in the classroom, so it is increasingly being used to support assessment. All of these question formats are amenable to the use of software applications which may enhance examination presentation, analysis and quality monitoring, as well as in the provision of course and student feedback.

1.5 E-Learning Tools (Learning Management System)

A Learning Management System (or LMS) is a software package that enables the management and delivery of online content to learners. Most LMSs are web-based to facilitate "anytime, any place any pace" access to learning content and administration.

Typically LMSs allow for learner registration, delivery of learning activities, and learner assessment in an online environment. More comprehensive LMSs often include tools such as competency management, Skills-gap analysis, succession planning, certifications and resource allocation (venues, rooms, textbooks, instructors, etc.).

There are two types of Learning Management System.

1. Open Source Learning Management System.

Example: MOODLE

2. Commercial Learning Management System.

Example:

- Blackboard
- Worldwide Web course Tools (WebCT)

We choose an Open Learning Management System to design our course which is Modular Object-Oriented Dynamic Learning Environment (MOODLE) because this is a free Learning Management System.

1.6 Modular Object-Oriented Dynamic Learning Environment (MOODLE)

MOODLE is a free learning management system that enables you to create powerful, flexible and engaging online learning experiences. Here we use the phrase "online learning experiences" instead of "online courses" deliberately. The phrase "online course" often connotes a sequential series of web pages, some images, maybe a few animations, and a quiz put online. There might be some email or bulletin board communication between the teacher and students. However, online learning can be much more engaging than that.

The phrase "online learning experience" connotes a more active, engaging role for the students and teachers. It connotes web pages that can be explored in any order, courses with live chats among students and teachers, forums where users can rate messages on their relevance or insight, online workshops that enable students to collaborate and evaluate each other's work, impromptu polls that let the teacher evaluate what students think of a course's progress, directories set aside for students to upload and share their files. All of these features create an active learning environment, full of different kinds of student-to-student and student-to-teacher interaction.

MOODLE enables us to add six types of interactive course material. This is course material that a student interacts with, by answering questions, entering text, or uploading files:

1. Assignment (uploading files to be reviewed by the teacher and/or students)
2. Choice (a single question)
3. Journal (an online journal)
4. Lesson (a conditional, branching activity)
5. Quiz (an online test)
6. Survey (with results available to the teacher and/or students)

MOODLE enables you to add five kinds of static course material. This is course material that a student reads, but does not interact with:

1. A text page
2. A web page
3. A link to anything on the Web (including material on your MOODLE site)
4. A view into one of the course's directories
5. A label that displays any text or image

MOODLE also offers five kinds of activities where students interact with each other. These are used to create social course material:

1. Chat (live online chat between students)
2. Forum (you can choose the number of online bulletin boards for each course)
3. Glossary (students and/or teachers can contribute terms to site-wide glossaries)
4. Wiki (Wikis can be inserted into courses, or a Wiki can be the entire course)
5. Workshop (workshops support collaborative, graded efforts among students)

That's five kinds of static course material, and eleven kinds of interactive course material. In addition, some of MOODLE's add-on modules add even more types of interaction. For example, one add-on module enables students and teachers to schedule appointments with each other.

1.7 Comparison between Blackboard and MOODLE

What is Blackboard?

- Learning Management System (LMS) software partially owned by Microsoft
- Popular software used around the world
- Licensed annually (HSU pays approx. $8,600 each year)
- Used at HSU since 2001
- Over $1 million spent each year in the CSU on Blackboard licenses

What is MOODLE?

- "Open source" (free!) Learning Management System (LMS) software
- Customizable by programming staff
- Flexible for the instructor and developer
- Supported by programmers world-wide

MOODLE advantages over Blackboard

- Providing individualized feedback easily to all assignments
- Easier to track each student's activity in class
    - When and how often parts of class accessed
    - From where students access the course
- Easier to maneuver (fewer "clicks"!)
- Less area monopolized for navigation
- Easier to incorporate multimedia elements
- More tools available (glossary, poll, lesson, journal)
- Track student activity to see which parts of the course are preferred
- Quiz tool scores correctly and provides details on the student's use
- Can be customized to add desired features
- Features are robust

➢ Survey allows as few as two choices

For above reason we try to implement MOODLE but for some installation problem we are not able to do that.

Chapter # 2

Design and Implementation

2.1 Introduction

We investigate the process of e-learning development and we have chosen the fundamental course CSE110 at the BRAC University because if student at fundamental level is known with the e-learning environment then they are easily habituated with that and it will help to increase their programming interaction.

This course is designed for those students who want to improve their programming skills in JAVA and also for those students who want to prepare themselves for the Sun JAVA Certification Exam.

When we design this course we break the whole course into three major parts so that we can develop this course straightforwardly. Three parts are given below:

1. Content development.
2. Interaction.
3. User profile management.

We analyze these three parts and try to define these parts in brief for our course design though we focus on only Interaction part.

2.2 Content Development

Though we are not work with this part, we make a plan to work with it in future. Someone is already started work with this part and we hope she/he will write a report on this part very soon.

2.3 Interaction

In Interaction part we decide to use a well-known E-Learning interaction Module which is Sharable Content Object Reference Model (SCORM).

2.3.1 SCORM

- ✓ SCORM is a collection of standards and specifications adapted from multiple sources to provide a comprehensive suite of e-learning capabilities that enable interoperability, accessibility and reusability of Web-based learning content.

✓ SCORM is a collection and harmonization of specifications and standards that defines the interrelationship of content objects, data models and protocols such that objects are sharable across systems that conform to the same model.

✓ It contains the conformance testing software, procedures and supporting documents for organizations to perform self-testing on LMSs, SCOs and Content Packages.

During the process of implementing the interaction we have evaluated the most well known methods used in the industry

1. Macromedia Flash
2. Java Script: Hot Potatoes

2.4 Macromedia Flash

Life without Flash would be uninteresting and mundane. Flash is increasingly the solution for developing Internet applications as well. From designer to programmer, Flash has become the tool of choice for delivering dynamic content across various browsers and Platforms. Many of today's big-impact sites are either full-blown Rich Internet Applications (RIAs) or a prudent blend of HTML and Flash. This careful melding of technologies, coupled with seamless integration, means the difference between an online experience that's striking, and one that's utterly forgettable.

The new user can approach Flash from many different angles. Designers may well be impressed by Flash's capabilities in the realms of interface design, aesthetics, and functionality. Flash's inherent ability to create super-compact, vector-based animations, coupled with a powerful scripting language (Action Script), allows users to develop complex effects, transitions, and interfaces with relative ease—something that would take

many more hours, or be completely impossible, using traditional HTML and DHTML coding methods.

Flash can be used to create interactive rich media content (including text, photos, music, video, vector graphics, voiceover, and a wide variety of motion graphic effects and animation) to be displayed in a browser. Using Flash we can easily create extremely fascinating and attractive things like websites, presentation movies, games, cartoons, forms, quiz etc.

Flash is not only used for entertaining or making a statement on a website, but for any online application involving user interaction, display of database content, need for resizable graphics (maps, eg), explanatory animation, custom navigation, or seamless/custom integration of video or sound.

A list of new templates designed to aid the rapid development of Flash applications is available with the 2004 release of Flash which makes Flash application.

The templates include:

- Advertising
- Form Applications
- Mobile Devices
- Photo Slideshows
- Presentations
- Quiz
- Slide Presentations
- Video

From this template we use only Quiz template for our implementation part, which allows us to create a quiz and the quiz template is designed to be easy to modify. The tool uses

components, so there is no ActionScript we can just plug and play. We develop a Sun JAVA Certification Mock quiz by using this quiz template.

Macromedia Flash 8 Quiz Template is simple tools for creating quizzes. To create a quiz we can start with quiz template and components. It's very easy to use and even a beginner can create high quality quizzes. We want to set our quizzes online. For this purpose we can import quiz question as required.

After each quiz, there is the results service. So anyone can send you e-mail each time after completion their quiz. That shows you the user and the scores for each quiz attempt. There's nothing special to setup - the quiz taker needs an internet connection. And you just need an e-mail address

You can use random question selection to make each quiz different each time it is taken. It will randomize the questions that are asked and the order of the possible answers presented.

Quiz takers get a report at the end of each quiz. This contains percentage scores and passes or fails messages. It can be printed off as a certificate to keep. Detailed question feedback is also presented so the quiz taker can see exactly how well he answered each question.

It supports Unicode, so you can add any foreign language characters and mathematical and scientific symbols. Also - all labels and feedback messages can be changed to customize your quiz for your language or audience.

You can add images and animations to your quiz to make it more exciting and engaging. There's also support for Flash animations that can include video and sound.

2.4.1 Features

Fast Development
  ➢ Create new quizzes in minutes
  ➢ Change the whole appearance of a quiz in seconds using 20 different themes

No coding required

➢ Anyone can make quizzes - No programming skills required

Reporting

➢ Reports for on-line quizzes can be automatically sent to your e-mail address. (Guaranteed best effort service for minimum of 2 years. Requires Flash player 7.)

➢ Quiz takers can print out test summary reports

➢ Quiz takers can send reports to you using their usual e-mail program

Question Feedback

➢ Feedback is made automatically for each question

➢ Show feedback after each question, or at the end of the quiz

6 Question Types

➢ Multiple Choice

➢ Multiple Response

➢ Fill In The Blank

➢ Matching

➢ True / False

➢ Partial Credit

Real reusability

➢ Never create a test from scratch again! Use questions and themes from previous quizzes in new ones.

Multiple language support

➢ Use languages like Greek, Japanese and Chinese, and special mathematical symbols.

The recent upgrades to Macromedia Flash make it an excellent choice for an E-Learning authoring environment. Macromedia Flash MX learning interactions help you create interactive online instructional courses that run in Flash. Each individual Flash learning interaction can send tracking information to a server-side learning management system (LMS) that complies with the Aviation Industry CBT Committee (AICC) protocol. Additionally, the quiz templates track cumulative results from a sequence of interactions and can pass them along to the LMS using an enhanced data tracking functionality that conforms to either AICC or Shareable Content Object Reference Model (SCORM) standards.

.
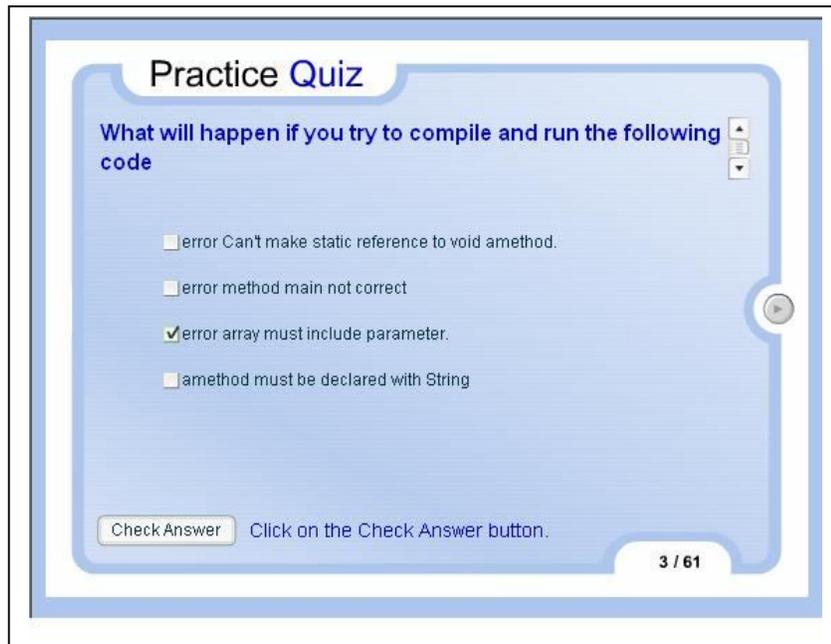
Fig 2.1: A Sun Java Certification exercise created by using flash quiz template.

2.5 Hot Potatoes

The Hot Potatoes suite is a set of six authoring tools, created by the Research and Development team at the University of Victoria. The purpose of the Hot Potatoes is to

enable us to create interactive Web-based teaching exercises which can be delivered to any Internet-connected computer equipped with a browser. The exercises use HTML and JavaScript to implement their interactivity, but we do not need to know anything about these languages in order to use the programs. All we need to do is enter the data for our exercises (questions, answers, responses etc.), and press a button. The program will create the Web pages for us, and we can then upload them to our server.
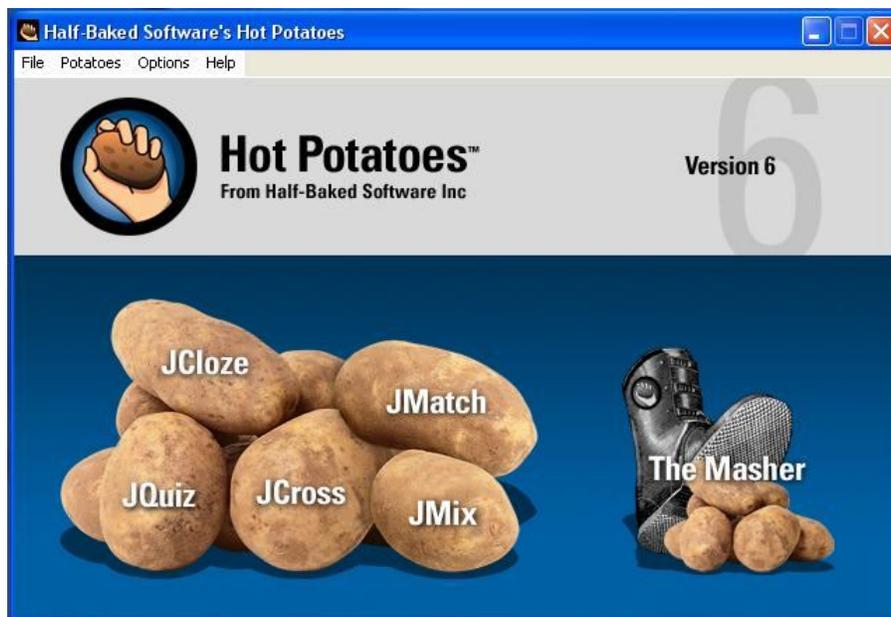
Fig 2.2: This is the first look of the Hot Potatoes.

From the fig 2.2 we see there are five basic program tools: JQuiz, JColze, JCross, JMix and JMatch and there is an advance tool the Masher.

There are five basic programs in the Hot Potatoes suite:

2.5.1 JQuiz

The JQuiz program creates question-based quizzes. Questions can be of four different types: multiple-choice, short-answer, hybrid and multi-select. Specific feedback can be provided both for right answers and predicted wrong answers. This is a detailed explanation of each question type:

Multiple-choice

In multiple-choice questions, the student chooses an answer by clicking on a button. If the answer is correct, the button caption will change to a smiley face :-), and if it's wrong, it will change to an X but we can configure these bits of text in the configuration screen. In either case, the student will see feedback specific to that answer, explaining why it's right or wrong if we write the feedback when we make the exercise. If the answer is wrong, the student can continue choosing answers until a correct answer is selected. The score for each question is based on the number of tries taken to get a correct answer. Once a correct answer is chosen, the scoring is frozen, but the student can still click on buttons to see the feedback for other answers without penalty.
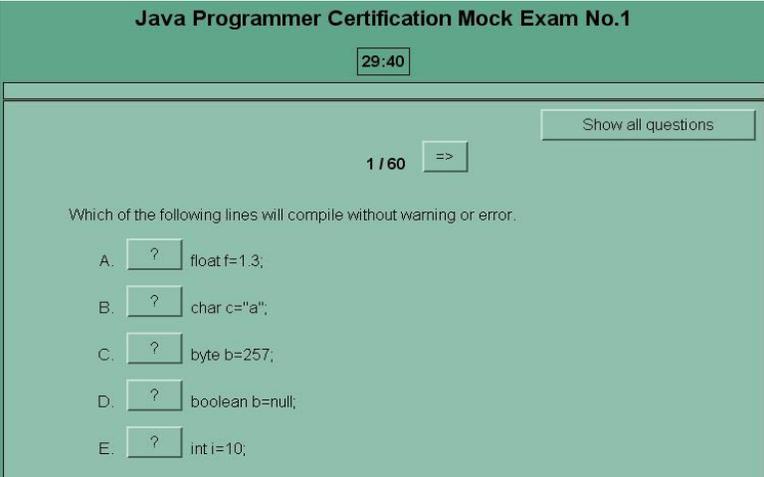
Fig 2.3: This is a multiple choice question which is the part of JQuiz exercise.

Short- answer

In short-answer questions, the students has to type the answer into a text box on the page, and press a Check button to see if it is correct. The page will try to match the student's answer to a list of correct or incorrect answers we have defined. If a match is found, the feedback for that answer will be shown. If not, then the page will try to find the nearest match among the specified correct answers, and signal to the student which parts of their answer are right and which parts are wrong. The score for each question is based on the number of attempts the student makes before getting a correct answer. We can also include a Hint button, which will give the student one letter of the answer; using the Hint button incurs a penalty on the score.
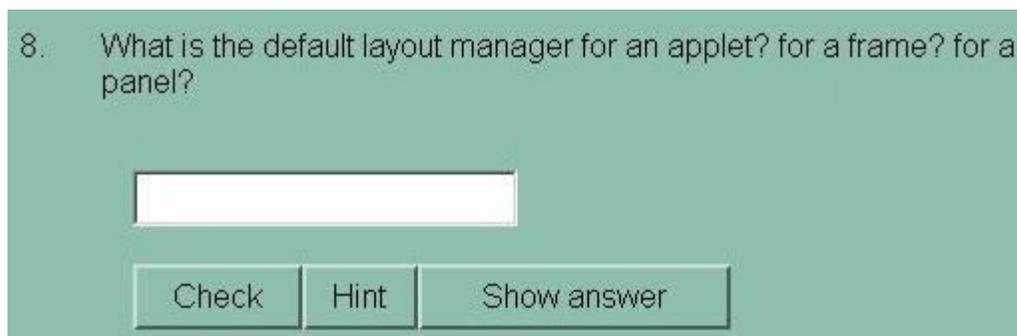

Fig 2.4: This is a Short answer question which is the part of JQuiz exercise.

Hybrid question

A hybrid question is a combination of a multiple-choice question and a short-answer question. In this type of question, the student is first presented with a text box and asked to type the answer. However, if the student fails to get the answer right after a specified number of tries then the question changes to a multiple-choice question to make it easier but to make this option we need to configure in the configuration screen.

Multi-select

Finally, a multi-select question asks the student to select several of a specific set of items. The idea here is that the student must select all the correct items, and not select all the wrong items. If the answer is not completely correct, the student will see a readout of the number of correct choices, and one piece of feedback; this would be the feedback from the first item in the list which was either selected when it shouldn't be selected, or not selected when it should be selected.
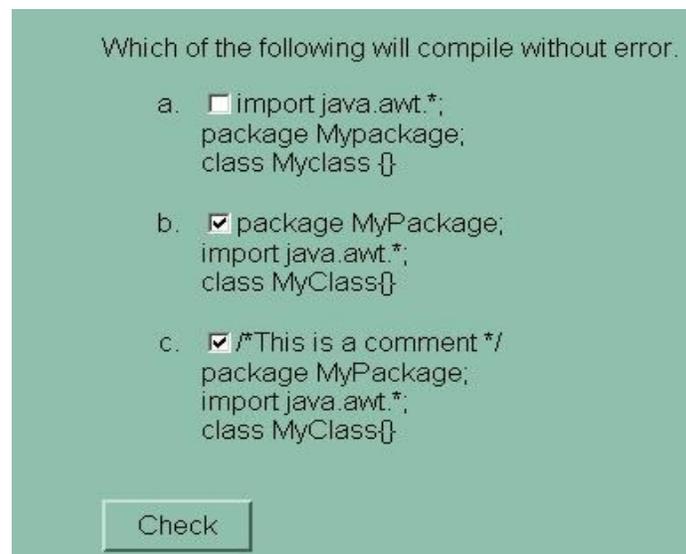
Fig 2.5: This is a Multi-select question which is the part of JQuiz exercise.

2.5.2 JCloze

JCloze is used to make gap-fill or cloze exercises. The idea of a gap-fill exercise is that the student completes all the answers before checking. When all the answers have been entered, the student presses the Check button to mark the answers. Correct answers will be inserted into the text; any incorrect answers will be left in textboxes, so that they can be corrected. When the student checks an answer that is not completely correct, a penalty is incurred, so the score depends on the number of checks required before the answer is

completely correct.

In a JCloze exercise, we include a Hint button which will give the student one free letter of the answer he or she is currently working on (based on where the cursor is). We also include a specific clue for each gap.

Fig 2.6: Some fill in the blanks for JAVA Student which is created by JCloze

2.5.3 JMix

The JMix program creates jumbled-sentence exercises. We can specify as many different correct answers as we want, based on the words and punctuation in the base sentence and a hint button prompts the student with the next correct word or segment of the sentence if needed. JMix has two output formats: Standard and Drag-Drop. We use Standard format for out exercise
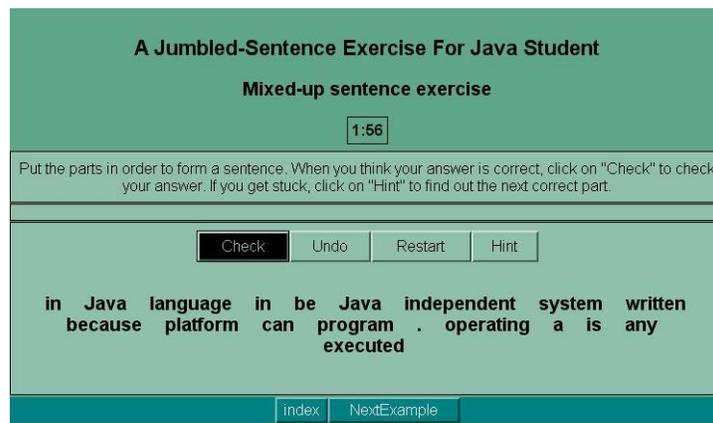

A Jumbled-Sentence Exercise For Java Student

Mixed-up sentence exercise

1:56

Put the parts in order to form a sentence. When you think your answer is correct, click on "Check" to check your answer. If you get stuck, click on "Hint" to find out the next correct part.

Check   Undo   Restart   Hint

in   Java   language   in   be   Java   independent   system   written
because   platform   can   program   .   operating   a   is   any
executed

index   NextExample

Fig 2.7: This Jumbled-Sentence exercise is developed by JMix Tool
and output format of this exercise is Standard.

2.5.4 JCross

The JCross program creates crossword puzzles which can be completed online. There are two steps to making this exercise: first we need to enter letters in the grid, and then need to add the clues. To enter letters in the grid, we have to click on a square and then we can type a letter.
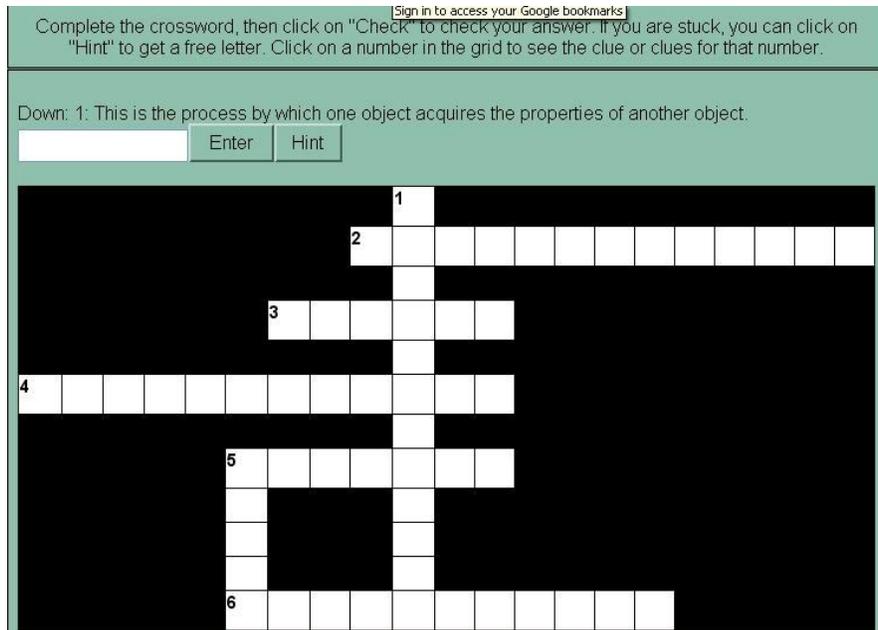
Fig 2.8: This puzzle is developed by JCross Tool

2.5.5 JMatch

JMatch is used to create matching exercises. Basically, this means that a list of items appears on one side, and each one must be matched up to an item on the other side.

JMatch output comes in two types: standard and drag-drop. The standard output uses a drop-down list of items on the right. This is the format to use when we have more than seven or eight items, and the items on the right are only text; if we have only a few items, and especially if the items are graphics, we may want to use the drag-drop format. We should not use the drag-drop format if we have more than eight items, because scrolling on the page will make dragging and dropping difficult.
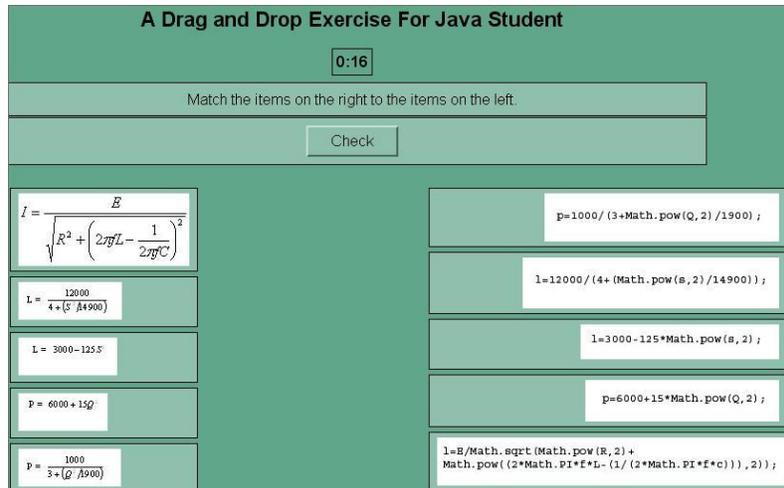
Fig 2.9: This is a Drag and Drop exercise developed by JMatch Tool.

2.6 Comparison between Macromedia Flash and Hot potatoes

During our design and implementation part when we thought about the interaction method two method's names come to our mind. One is the famous and very familiar design tool which is Macromedia Flash and another is a new but very much user friendly interaction method which is Hot potatoes. Hot Potatoes need less memory space than the memory space of Macromedia flash for installation purpose. Though Flash can be used to create interactive rich media content including text, photos, music, video, vector graphics, voiceover, and a wide variety of motion graphic effects and animation but for web interaction Hot potatoes are mostly used because Hot Potatoes is more user friendly than Macromedia Flash.

In our implementation part we developed a Sun Java Certification Mock exam by using Macromedia Flash Quiz template and we also developed five different types of exercise for JAVA programming student and we find that Hot potatoes is more useful for the faster development rather than the Macromedia Flash and we can provide as much as

feedback both for wrong and right answer which is quite difficult in quiz template of Macromedia Flash.

And finally we decided to use Hot Potatoes to develop interactive quiz and we developed three (3) Sun Java Certification Mock Exams which have two hundred (200) questions with feedback (both right and wrong answer) approximately and we also developed thirty seven (37) quizzes for JAVA Programming students having 650 questions approximately.

2.7 User Profile Management

We try to implement MOODLE to enhance user profile management system that conforms to Shareable Content Object Reference Model (SCORM) standards. By this system each individual learning interaction can send tracking information to a server-side learning management system (MOODLE). When we insert SCORM into MOODLE (LSM), the exercise will be able to report back to the LSM about the actions taken by the student, including the time spent on the exercise, the student's score, and the way it finished (completed, uncompleted, time-out, etc) that means a teacher can easily observe the performance of each student individually.

Chapter # 3

Future Plan

3.1 Introduction

When we start our project we want to create an E-Learning Environment for the fundamental course of CSE 110 at BRAC University and we choose Modular Object-Oriented Dynamic Learning Environment (LMS), an E-Learning interaction Module-Sharable Content Object Reference Model (SCORM), two interaction methods: Macromedia Flash and Hot Potatoes but unfortunately we are not able to implement MOODLE because of the installation problem. So we make some future plan to make our project successful.

3.2 Future Plan

Solve MOODLE problem

We are failed to install MOODLE so we want to solve this installation problem in future to do our project successful.

Develop M-learning

Mobile is an important part of our life now so we want to develop an M-Learning environment by using Web-server or Low Bandwidth Group SMS.

Content Development

Someone is already stated to develop this part at BRAC University so we hope that content part is developed soon.

References:

Books:

"Java™: The Complete Reference, J2SE™ 5 Edition" by Herbert Schildt

Web Sites:

http://www.google.com

http://hotpot.uvic.ca