Educational Application and Content Development for Engineering students

M.Tech Stage-I Project

Subhasmita Mahalik (113050073)

under the Guidance of

Prof. D. B. Phatak

Department of Computer Science and Engineering,
Indian Institute Of Technology , Bombay

November 1, 2012
1. Traditional learning

2. Why Standard...??

3. Motivation

4. Problem Definition

5. SCORM Demystified...

6. Advantages and Disadvantages of SCORM

7. Future Work

8. Conclusion

9. References
Active Learning: Getting students to participate actively in their learning, to develop ideas, to practice solving problems, to talk to and listen to their peers.

Passive learning: Learners simply sit and listen to lectures and don’t challenge themselves.

Active learning works because the learners play an active role in the learning process and their brains are stimulated in different ways. Studies show that people retain

- 20% of what they hear
- 40% of what they hear and see
- 60% of what they hear, see, and do
- 80% of what they hear, see, do, and discuss
1. To make course content and learning tools **compatible** among various e-learning delivery systems.

2. We can create **portable content** that can be used in any e-learning delivery system without modifying the content.

3. The **LMS** can easily **interpret** and deliver the **standard-compliant content**

The various e-learning standards are: AICC, IMS, ARIADNE, SCORM etc.
Motivation

There were lot more courses and lot more course providers. But the Problem was that the course providers could not share the courses. All the courses were different. They did not communicate. Then came the brilliant idea that there should be standard !!!

Then they invented “SCORM“
Problem Definition

- To understand the SCORM standard
- To develop interoperable and reusable objects called SCO using Reload Editor
- To test how the SCORM standard is used in developing courses for engineering students
- To add the features of navigation and sequencing in the SCORM object
- To test the SCORM object using Reload Player
The SCORM standard is focused on enabling the plug-and-play interoperability, accessibility, and reusability of Web-based learning content, with the ultimate goal of ensuring ubiquitous access to the highest quality education and training, tailored to individual needs, and delivered cost-effectively anywhere and anytime.
Techniques for effective learning

- Offer learners more than clicking the next button
- **Use branching:** learner makes a choice and different decisions take them down different paths
- **Dont just test at the end:** Test throughout the course forcing learners to think, rather than just read
- **Use audio:** The more senses you can get firing the better
- Make it fun

Things to consider while developing e-learning courses:

1. Sequencing
2. Modular Course Structure
3. Learner Control
What does SCORM Standardize ?!

1. Packaging
2. Metadata
3. Communication
4. Sequencing
Packaging

1. Provide content to move among different systems
2. Based on IMS Global Learning Consortium
3. Content packaging creates a container for shipping learning content from one place to another

Meta-Data

1. To share standard information that describe the nature and purpose of the content
2. Based on IEEE Itsc Learning Object Metadata (LOM) Specification
3. This information can serve many ends, including cataloging, search and discovery, checking technical requirements etc
Communication

1. Guidance for launching, communication with and tracking content in a web-base environment
2. Based on run-time environment functionality defined in AICC guideline for interoperability

Sequencing

1. Defined a method for representing the intended behavior of an authored learning experience such that any LMS can sequence discrete learning activities in consistent way
2. Based on the IMS Simple Sequencing Specification
3 aspects are: Launch, Application Program Interface (API) and Data Model
Launch: SCO and Assets

API: API Execution State Functions
- LMSGetValue(): Allows the SCO to obtain information from the LMS
- LMSSetValue(): Allows the SCO to send information to the LMS
- LMSCommit(): Requires that any values not yet persisted by the LMS be persisted
- Other functions are: LMSGetLastError(), LMSGetErrorString(), LMSGetDiagnostic()

Data Model: Information required to be furnished by all LMS systems
- cmi.core.student_id
- cmi.core.student_name
- cmi.core.lesson_location
- cmi.core.credit
- cmi.core.lesson_status
- cmi.core.entry
- cmi.core.score.raw
- cmi.core.lesson_mode
1. Content Model
   - Nomenclature defining the content components of a learning experience

2. Meta-data
   - A mechanism for describing the components of the content model

3. Content Packaging
   - Defines how to represent the intended behavior of a learning experience
   - Defines how to package learning resources for movement between different environments
Content Packaging

Package Interchange File

- Package
  - Manifest
    - Meta-data
    - Organizations
    - Resources
    - (sub)Manifest(s)

Content Structure

SCO's & Assets

Physical Files:
(The actual Content, Media, Assessment, Collaboration and other files)
Sequencing

Activity A
If status == "satisfied"
    Then goto C
Else goto B

Activity B
Goto C

Activity C
If status != "satisfied"
    Then goto A
Else goto...

(IIT Bombay)
Tracking

- Tracking information
  1. Activity attempt count
  2. Activity duration
  3. Activity completion
  4. Activity score
  5. Activity mastery
  6. Referenced learning objective/competency completion

- Activity launch limits
  1. Time limits for completion
  2. Time based availability
  3. Maximum attempt limit for completion
  4. Prerequisite completion prior to entry
Advantages of Using SCORM

- **Interoperability**: Instructional components developed in one location with one set of tools or platform and use them in another location.
- **Reusability**: Incorporate instructional components in multiple applications and contexts.
- **Durability**: Ability to withstand technology evolution and changes without costly redesign, reconfiguration or recoding.
- Reduce cost of Content Maintenance
- Increase overall learning effectiveness
Disadvantages of Using SCORM

- The standard puts a great emphasis in the client-side of the learning process
- Security Issue: since it must be accessed from JavaScript and consequently can also be manipulated externally
- Difficult to edit and correct 'typos'
• SCORM is the leading effort towards the reusability and interoperability of learning resources

• SCORM is compatible with most of popular learning resource

• Tools and techniques available for SCORM packaging are relatively easy to use and friendly enough to be tried by most teachers with just a little training

• Learning materials preparation is hard work but the reusability feature of SCORM makes the task worth
My future work will focus on exploring more advanced mechanism to control browser-based sequencing and navigating between learning resources

Adopting more advanced Data Model in the SCORM RTE to enhance interactive and adaptive capability

To develop an educational application to be deployed in android device.
Mahbubur Rahman Syed, "Methods and Applications for Advancing Distance Education Technologies: International Issues and Solutions," Minnesota State University, Mankato, USA, 2009.


Claude Ostyn, "Cooking up a SCORM: A SCORM 1.2 Content Cookbook for Developers, Version 1.2 Draft 0.8," 110-110 Ave NE, Suite 700, Bellevue WA 98004, USA, 2002.


Reload Project. http://www.reload.ac.uk/


Thank you !!!