Introduction to E-learning

Presented by: Hicham Hage
Supervisor: Prof. Esma Aïmeur
Introduction to E-learning

• What is E-learning

• E-learning Standards and Specifications

• A look at E-learning today

• Obstacles to E-learning
What is E-learning

- Definition of E-learning
- Types of E-learning
- Advantages of E-learning
- Components of an E-learning System
  - LMS vs. LCMS
Definition of E-learning

- “The convergence of the Internet and learning, or Internet-enabled learning.”

- “The use of network technologies to create, foster, deliver, and facilitate learning, anytime and anywhere.”

- “A phenomenon that delivers accountability, accessibility, and opportunity allowing people and organizations to keep up with the rapid changes that define the Internet world.”

[URL1]
Types of E-learning

• Synchronous
  – Time frame restriction
  – Real-time involvement
  – Chat
  – Web conference

• Asynchronous
  – No time frame
  – No real-time involvement
  – Discussion forum
  – Email
Benefits & Advantages

• Learner Centered
  – student has access to many resources and tools

• Convenient and portable
  – Not bound by place or time
  – Study at own pace

• Flexible
  – Skip material already learned
  – Variety of tools to fit the learner’s own style
Components of an E-learning system

- E-learning Life cycle
  - Skill Analysis
  - Material Development
  - Learning Activity
  - Evaluation

- There are different components that interact and collaborate during the e-learning life cycle.
Simplified E-learning system

- Developer/Teacher
- Content Authoring
- Content Manager
- Content Repository
- Learner
- Delivery Environment
- Course Manager
- Learner Profile Manager
- Collaborative Environment
- Evaluation/Assessment
- Learner Profile Repository

Introduction to E-learning
LMS vs. LCMS

- **Learning Management System**
  - manages the learner
  - monitors performance and progress

- **Learning Content Management System**
  - manages the content and the learning material

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<tr>
<th>LCMS</th>
<th>LMS</th>
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<td>Collaborative</td>
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<td>Content Manager</td>
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E-learning Standards and Specifications

• Why the need for standards

• E-learning standards organizations
  – IEEE / ADL / IMS

• E-learning standards
  – SCORM / LOM / QTI / LIP
Why the need for standards

Standards and Specifications ensure that e-learning material is **RAID**: 

- **Reusable**: modified easily and can be used on different development tools.
- **Accessible**: available as needed by learners or course developers.
- **Interoperable**: functional across different hardware or software platforms.
- **Durable**: easy to modify and to update for new software versions.

[URL17]
E-learning standards organizations

- IEEE Learning Technology Standards Committee
  - itsc.ieee.org
  - LOM

- ADL (Advanced Distributed Learning Initiative)
  - www.adlnet.org/
  - SCORM

- IMS (Instructional Management System Project)
  - www.imsproject.org
  - QTI / LIP

For a complete listing visit: workshops.eduworks.com/standards
SCORM
Sharable Content Object Reference Model

- Set of standards for
  - Developing,
  - Packaging, and
  - Delivering training material

- SCORM has 3 components
  - Content Packaging
  - Runtime Communication
  - Course Metadata
SCORM Components

Content Packaging

• Packaging of all necessary material and components for the course

• imsmanifest.xml
  – general course information
  – order of the course material
  – list of the files and resources
SCORM Components
Runtime Communication

• Occurs when a certain course communicates with the LMS

• Runtime Communication contains two elements:
  – Runtime commands
    • 8 commands to communicate with the LMS
  – Learner metadata
    • 49 data elements to store/retrieve learner information
SCORM Components
Course Metadata

• Information packaged within a course when it is archived

• Allows students, or course developers to search through the archives, and easily identify the content of the course

• SCORM contains a dictionary of metadata terms that can be used for the course description
LOM

Learning Object Metadata

• Standard for defining the attributes of different LO (Learning Objects)

• An index information used to search and reuse LOs

• LOM is a hierarchy of data elements. Nine categories exist at the top level of the hierarchy
LOM
Data Elements Categories

- **General**
  - groups the general information that describe the LO as a whole
- **Life cycle**
  - groups the features related to the history and current state of the LO
- **Meta-metadata**
  - groups information about the metadata instance itself
- **Educational**
  - groups the educational and pedagogic characteristics of the LO
- **Technical**
  - groups the technical requirements and technical characteristics of the LO
- **Rights**
  - groups the intellectual property rights and conditions of use for the LO
- **Relation**
  - groups features that define the relationship between the LO and other related LOs
- **Annotation**
  - provides comments on the educational use of the LO
- **Classification**
  - describes this learning object in relation to a particular classification system
For each data elements the LOM defines:

- **Name**, to refer to the data element
- **Explanation**, to define the data element
- **Size**, that is the number of values allowed
- **Order**, to specify the order of the values
- **Example**, an illustrative example
- **Value Space**, to define the set of allowed values of the data element
- **Datatype** that indicates the type of the value of the data element
QTI

Question and Test Interoperability

• List of specifications used to exchange assessment information, such as questions, tests, and results

• Allows systems to store data in their own format, and provides a mean to import/export that data between various systems
QTI Cont’d

• QTI is composed of two parts
  – ASI (Assessment Section and Item)
    • Support different question types
    • QTI Lite, support only one type: multiple choice single response
  
  – Result reporting
    • Relates to a single learner
    • Contains results of several assessments
    • IMS LIP can be used as an alternative
This is a simple multiple choice example.
The rendering is a standard radio button style.
Response processing is incorporated.

Which one of the listed standards committees is responsible for developing the token ring specification?

- IEEE 802.3
- IEEE 802.5
- IEEE 802.6
- IEEE 802.11
- None of the above.
LIP
Learner Information Packaging

- List of specifications used to exchange learner information
- Allows profile servers to store information in their own format, and provides means to import/export the data between different profile servers
- LIP provides an extensive set of elements to cover most of the data used by profile servers
LIP Cont’d

- **Identification**: contains basic information about the learner such as name and address
- **Goal**: contains information about the learner’s personal goal and aspirations
- **QCL**: specifies the Qualifications, Certifications, and Licenses
- **Accessibility**: contains the learner preferences such as language, disability
- **Activity**: contains educational and training actions
- **Competency**: contains skills the learner has acquired
- **Interest**: contains information on the learner’s hobbies and recreational activities
- **Transcript**: contains a summary of academic achievement
- **Affiliation**: contains information and description of organizations affiliated with the learner
- **Security Key**: contains the learners security information
- **Relationship**: contains descriptions of the relationships between data contained in the other segments
E-learning today

- E-learning platform tools
- E-learning System
  - Virtual Tour of WebCT
E-learning Platforms Tools

- **Communication Tools**
  - Discussion Forums, File Exchange, Internal Email, Online Journal/Notes, Real-time Chat, Video Services, Whiteboard

- **Productivity Tools**
  - Bookmarks, Calendar/Progress, Review, Orientation/Help, Searching, Within Course, Work Offline/Synchronize

- **Student Involvement Tools**
  - Group work, Self-assessment, Student Community Building, Student Portfolios

- **Course Delivery Tools**
  - Automated Testing and Scoring, Course Management, Instructor Helpdesk, Online Grading Tools, Student Tracking

- **Curriculum Design Tools**
  - Accessibility Compliance, Course Templates, Curriculum Management, Customized Look and Feel, Instructional Design Tools
E-learning System: WebCT

- Implementation started in 1995 at the University of British Columbia
- Currently available in 14 languages
- Institutions that use WebCT:
  - Université de Montréal
  - Johns Hopkins University
  - University of British Columbia
  - France Telecom
  - United Arab Emirates University
- Official web site: www.webct.com
- Virtual Tour:
    - Login name: visit
    - Password: webct
WebCT Virtual Tour
WebCT Virtual Tour Cont’d
Course page
WebCT Virtual Tour Cont’d
Whiteboard

Java Applet Window
WebCT Virtual Tour Cont’d
Discussion Forum
WebCT Virtual Tour Cont’d
My Progress
Obstacles to E-learning

- Cultural Obstacles
  - Reluctance to invest in developing the E-learning content
  - Cost is higher due to the lack of standardization
  - Hard to motivate oneself
  - People prefer to learn through social interaction
  - Must learn new methods and tools

- Technical Obstacles
  - Bandwidth
  - Internet/intranet setup and maintenance
  - Access to computers and a connection
  - Digital Divide
Digital Divide

- The gap in access and knowledge of ICT (Information and Communication Technologies) that exists between people and societies.

- There are no standardized ways for measuring the rate of growth or decline of the digital divide.
Digital Divide Cont’d

- 429 million people online
- Represents 6% of the world population
  - “41% of the global online population is in the United States & Canada”
  - “27% of the online population lives in Europe, the Middle East and Africa (25% of European Homes are online)”
  - “20% of the online population logs on from Asia Pacific (33% of all Asian Homes are online)”
  - “Only 4% of the world’s online population are in South America”

[URL 2]
Introduction to E-learning

Digital Divide Dimensions

- **Social**: conservative society refusing to access the outside world
- **Economical**: Computers or internet connection are expensive
- **Technological**: No infrastructure for an internet connection
- **Linguistic**: most content on the internet is in English
- **Gender**: Dissuasion of women from acquiring technical/computer skills
- **Life stage**: too old to learn how to use a PC
- **Geographical situation**: physically too far to reach proper technology (up on a mountain / or in a desert)
- **Political**: government who wants to control the people access to outside information
In Conclusion

- Overcoming obstacles to E-learning
- Efforts to bridge the digital divide

Email: hagehich@iro.umontreal.ca
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