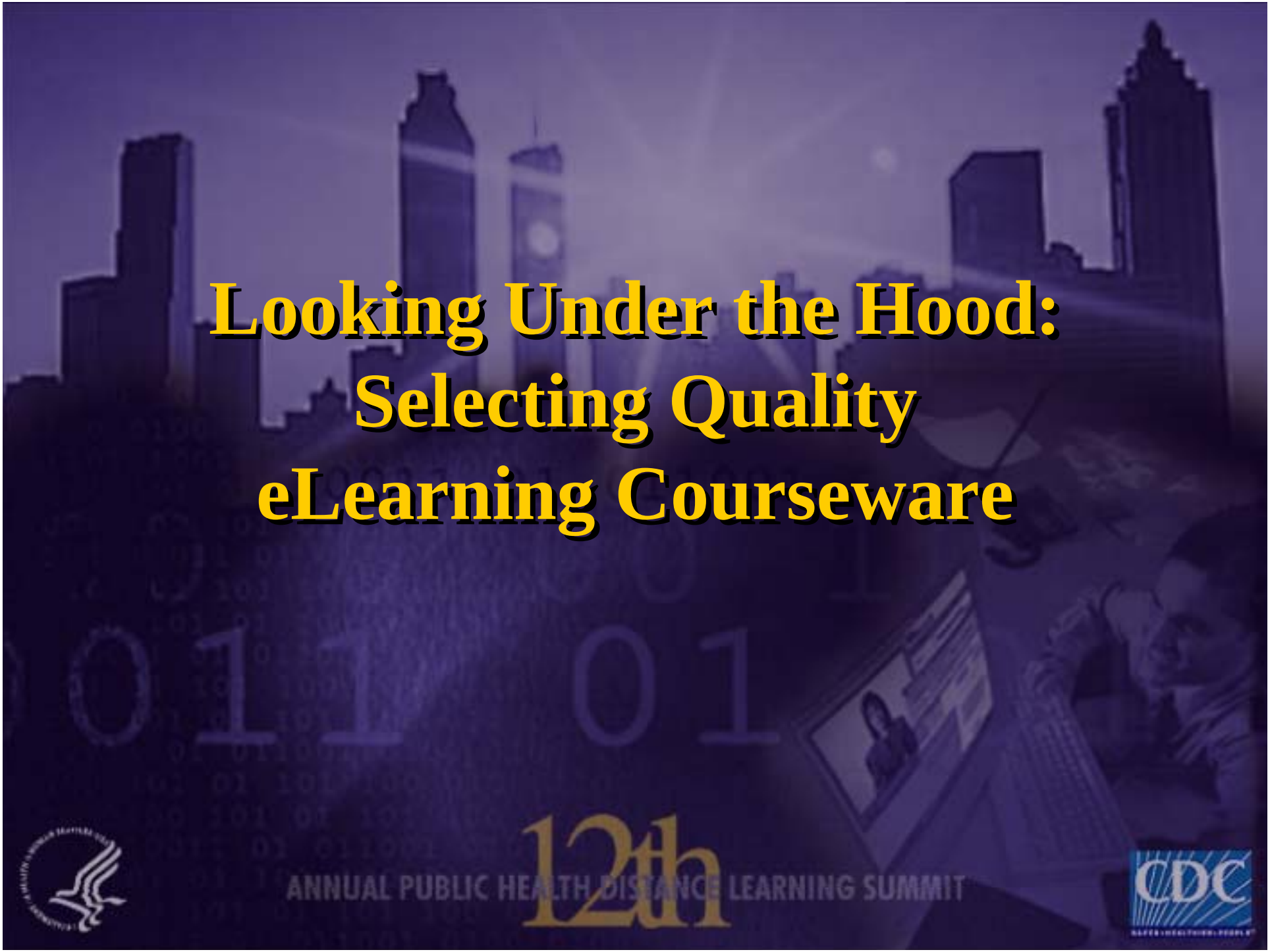
# Looking Under the Hood: Selecting Quality eLearning Courseware



# Faculty

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# Learning Objectives

After this workshop you should be able to:

- Define the 5 major types of criteria to consider when evaluating “off-the-shelf” courseware.
- Evaluate courseware utilizing the evaluation instrument presented in the workshop.

# eLearning Context

| Classroom | Self-Directed eLearning |
| --- | --- |
| • Person-to-person instruction | • Machine-to-person instruction |
| • Group dynamics | • Individual motivation |
| • Familiarity with physical space, printed materials | • Difficult to grasp scale, location and sense of direction |

# Major Criteria Types

- Instructional Design, Content and Assessment
- Interface and Navigation
- Media, Interactivity and Aesthetics
- Technical Operation
- Modularity/Reusability

# Major Criteria Types

- **Instructional Design, Content and Assessment**
- Interface and Navigation
- Media, Interactivity and Aesthetics
- Technical Operation
- Modularity/Reusability

# Instructional Design, Content and Assessment

- Importance:
  Courseware highly rated for “Instructional Design, Content and Assessment” will more likely provide a learning experience in which learners can readily learn.

# Instructional Design, Content and Assessment

Criteria to consider:

- Learning Objectives
- Content
- Structure

# Instructional Design, Content and Assessment

Learning objectives should be:

- Clearly stated
- Measurable
- Supported by the content

# Instructional Design, Content and Assessment

Learning Objectives. Why Bother?

- During development learning objectives guide the instructional design process keeping content and interactivity on target
- In the end-product, learning objectives communicate what the learner will gain from the courseware

# EXAMPLE

More About... Print TTS



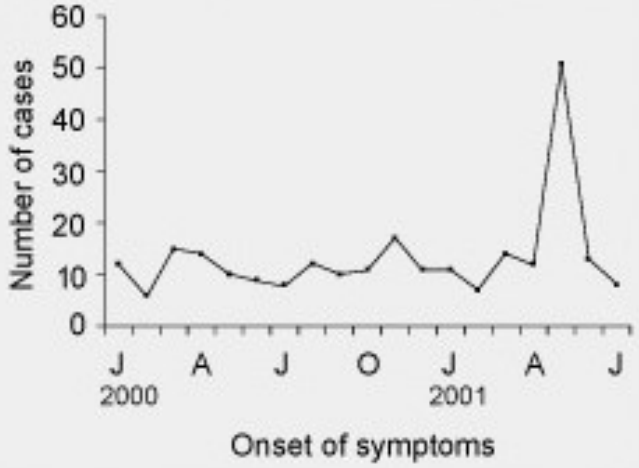
## Defining an Outbreak

An **outbreak** (or **epidemic**) is when you have an increase in the **observed** number of cases of a disease compared with the **expected** number in a given place or among a specific group of people over a particular period of time. The number of cases it takes to indicate the occurrence of an outbreak varies according to the agent, the size and composition of the population, previous exposure to the disease in the community (i.e., level of immunity), and the time of occurrence. For rare diseases (e.g., smallpox, botulism, polio), all it takes is **one case** and you have an outbreak.

**Example**

Approximately 12 cases of hepatitis A virus infection are reported in County X each month. In May of 2001, 51 cases were reported. All but one of the cases were symptomatic and laboratory confirmed.

Fifty-one cases of hepatitis A are clearly in excess of the usual 12 for this community. Unless there were errors in laboratory identification or changes in reporting procedures, it is likely that these cases represent an outbreak.




Hepatitis A cases by month of onset of symptoms, County X, January 2000 - June 2001

**Objectives**

After completing this lesson you will be able to...

- define an outbreak
- list steps to determine if an increase in cases of a disease represents an outbreak
- identify sources for expected numbers of cases of a disease
- list reasons, other than an outbreak, for an increase in case counts

# Instructional Design, Content and Assessment

Content should be:

- Written at an appropriate level of difficulty
- Clearly presented
- Have appropriate tone and language
- Up-to-date
- Relevant to the profession

# NON - EXAMPLE

Investigation Outline

CDC Foodborne Disease Outbreak Investigation -- Botulism in Argentina

Part I Intro

Pssst ... cause you are new to this, I will give you a big hint ... dysarthria, ptosis, diplopia, and paralysis of the upper extremities are all symptoms of botulism. So pick something else. To define these words, use the reference tool to look at the glossary.

**Question 1**

Which of the following IS NOT a usual symptom of botulism?

*Select only one:*

A. difficulty talking
B. drooping eyelids
C. double vision
D. fever
E. inability to lift things

Part II Part III Part IV Part V Part VI Epilog

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REF EPI INFO EPI CURVE EXIT

# Instructional Design, Content and Assessment

Structure should have:

- Appropriate amounts of content presented
- Content organized into easy to comprehend lessons
- Relevant exercises and assessments that measure accomplishment of stated learning objectives

# EXAMPLE

SMALLPOX VACCINE STORAGE & HANDLING

National Immunization Program

Course Menu | Internet Resources | FAQs | Glossary | Exit

DISTRIBUTION | STORAGE | HANDLING | EMERGENCY

*Module 3, Handling the Vaccine: Clinic Issues*

## Vaccine Reconstitution Procedure

### Preparing the Components

**1.** Lift up the tab of the aluminum seal on the vaccine vial.

Do not break off or tear down the tab.

**2.** Wipe off the vial's rubber stopper with an alcohol sponge and allow the stopper to dry.

This is meant to wipe off dust. It is not meant to sterilize the stopper.

Technical Support



This course is developed and maintained by the Centers for Disease Control & Prevention National Immunization Program

Disclaimer

# EXAMPLE

SMALLPOX VACCINE STORAGE & HANDLING

National Immunization Program

Course Menu | Internet Resources | FAQs | Glossary | Exit

DISTRIBUTION | STORAGE | HANDLING | EMERGENCY

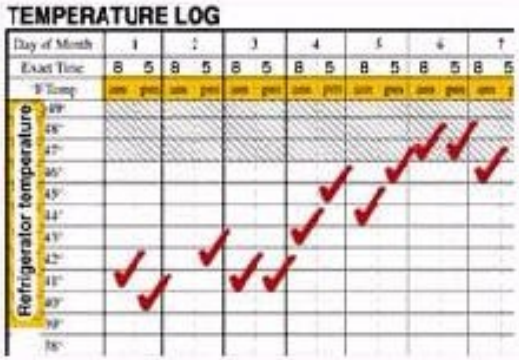
*Module 2, Vaccine Storage*

## Monitoring Temperature

### PRACTICE ACTIVITY

**Study the image of the temperature log. Check all answers that apply.**

- ☐ Days 1, 3, 4 and 5 indicate problems because the temperatures fluctuate during the day.
- ☐ The temperature is out of range on day 1.
- ☐ The temperature is out of range on day 6.
- ☐ Day 2 has been recorded inadequately.




Submit

Technical Support

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Disclaimer

# EXAMPLE

Investigation Outline | Print

Foodborne Disease Outbreak Investigation: Botulism in Argentina, 2002

Intro | Step 1 | Step 2 | Step 3 | Step 4 | Step 5 | Step 6 | Epilog

**Line List**
**Botulism Cases**
**Buenos Aires, January 1998**

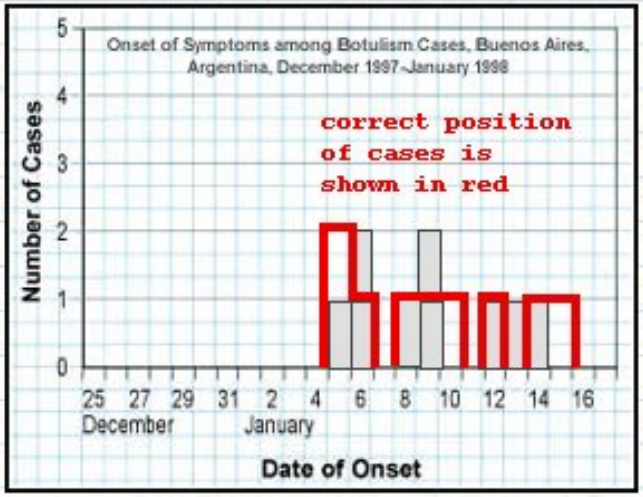
| Case # | Age | Gender | Work Shift | Onset | Symptoms |
|---|---|---|---|---|---|
| 1 | 42 | M | Morn | Jan 6 | BV,DV,DE,UE,LE, RD,F |
| 2 | 31 | M | Morn | Jan 5 | BV,DV,DE,UE,LE |
| 3 | 23 | M | Morn | Jan 9 | BV,DE,UE,F |
| 4 | 46 | M | Morn | Jan 8 | DE,DS |
| 5 | 54 | M | Morn | Jan 5 | BV,DV,DE,DS,RD |
| 6 | 49 | M | Morn | Jan 10 | BV,DE,DS |
| 7 | 31 | M | Morn | Jan 15 | BV,DV,DE,UE,LE, RD,F |
| 8 | 44 | M | Morn | Jan 14 | BV,RD,F,DE |
| 9 | 24 | M | Morn | Jan 12 | DE,F |

## Question 8

To complete the epidemic curve, drag and drop each box to correspond with the onset of symptoms for a case. HINT!

**Answer**

You misplaced a number of cases! Look at the line list again.

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REF | More Abc | EPI INFO | EPI CURVE | EXIT

# Major Criteria Types

- Instructional Design, Content and Assessment
- **Interface and Navigation**
- Media, Interactivity and Aesthetics
- Technical Operation
- Modularity/Reusability

# Interface

- Importance- A well designed interface helps learners to quickly understand the purpose and meaning of elements and makes it clear how to use them.

# Interface

- The interface is simple and intuitive

# Interface

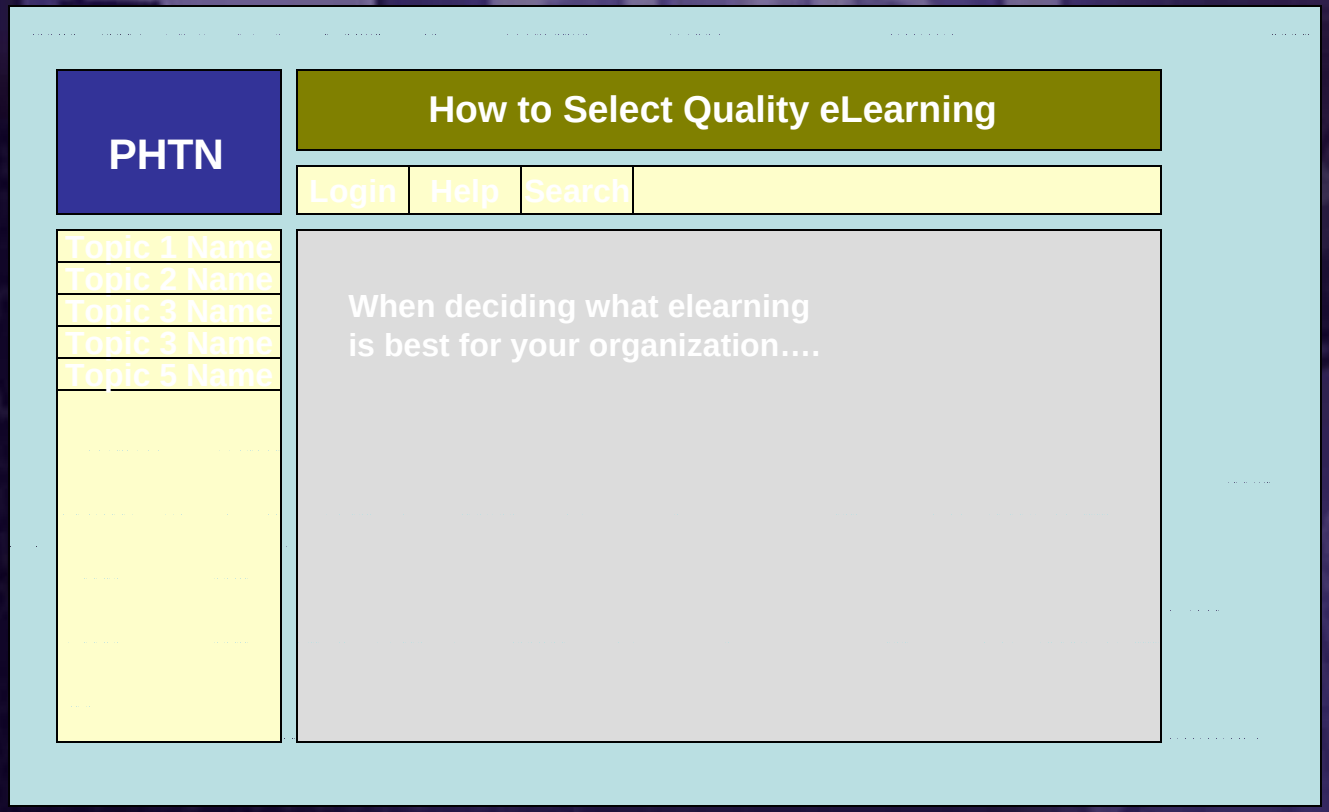
- How to evaluate-
  - Screen clearly divided into functional areas
  - Purpose of different areas of screen is clear
  - Elements in different areas logically grouped
  - Easy to distinguish active & inactive elements
  - Active elements labeled clearly

# Interface

- Example

# Interface

- Example



# Navigation

- Importance- Well designed navigation gives the user a sense of the amount of material available, allows easy movement through the material, indicates what has been completed, and allows for easy return to where the user left off.

# Navigation

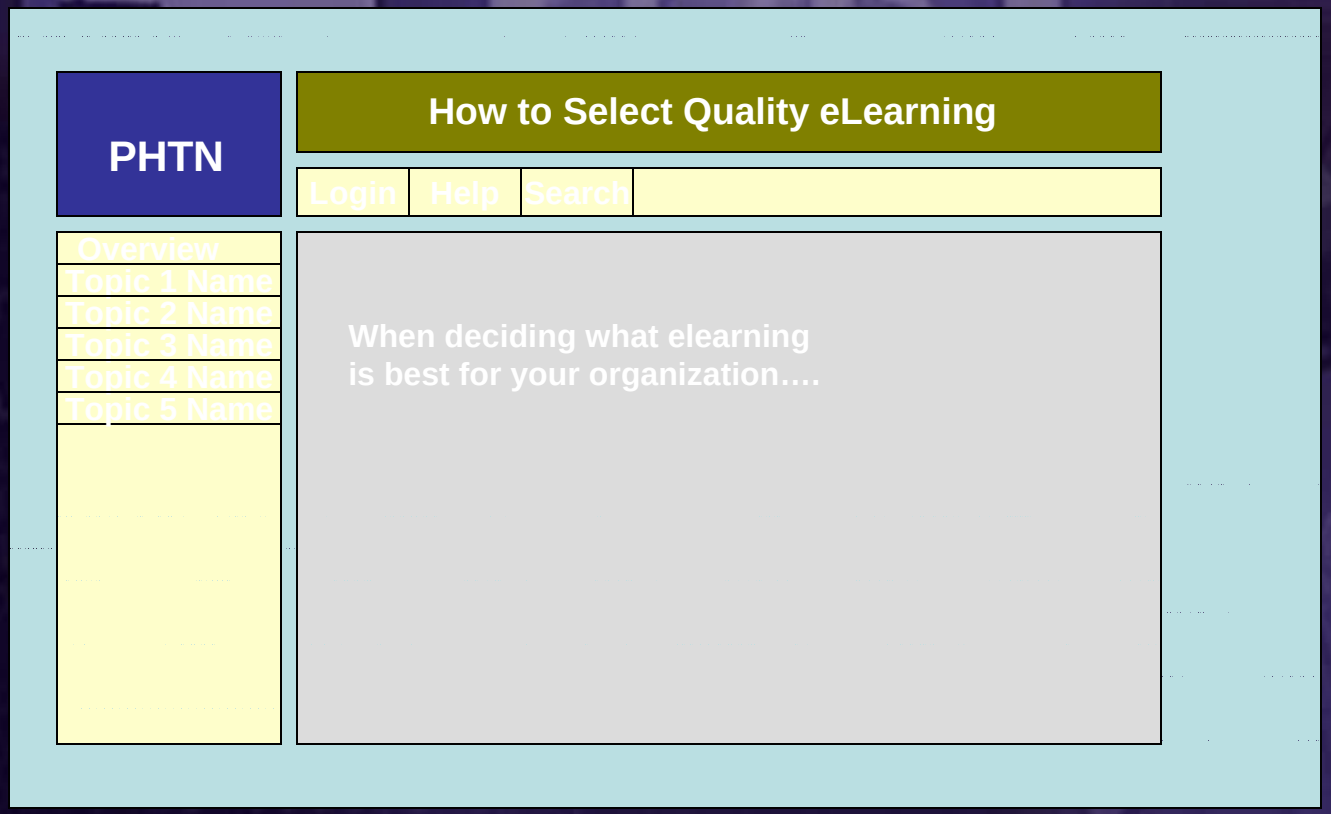
- The course is easy to navigate

# Navigation

- How to evaluate-
  - Home link appears on every page
  - Lessons represented in the navigation
  - Lesson highlighted in the navigation
  - Label contains the lesson number and title
  - Lesson navigation has forward and back arrows
  - Lesson pages are numbered
  - Summary of what has been completed
  - Course remembers where you left off

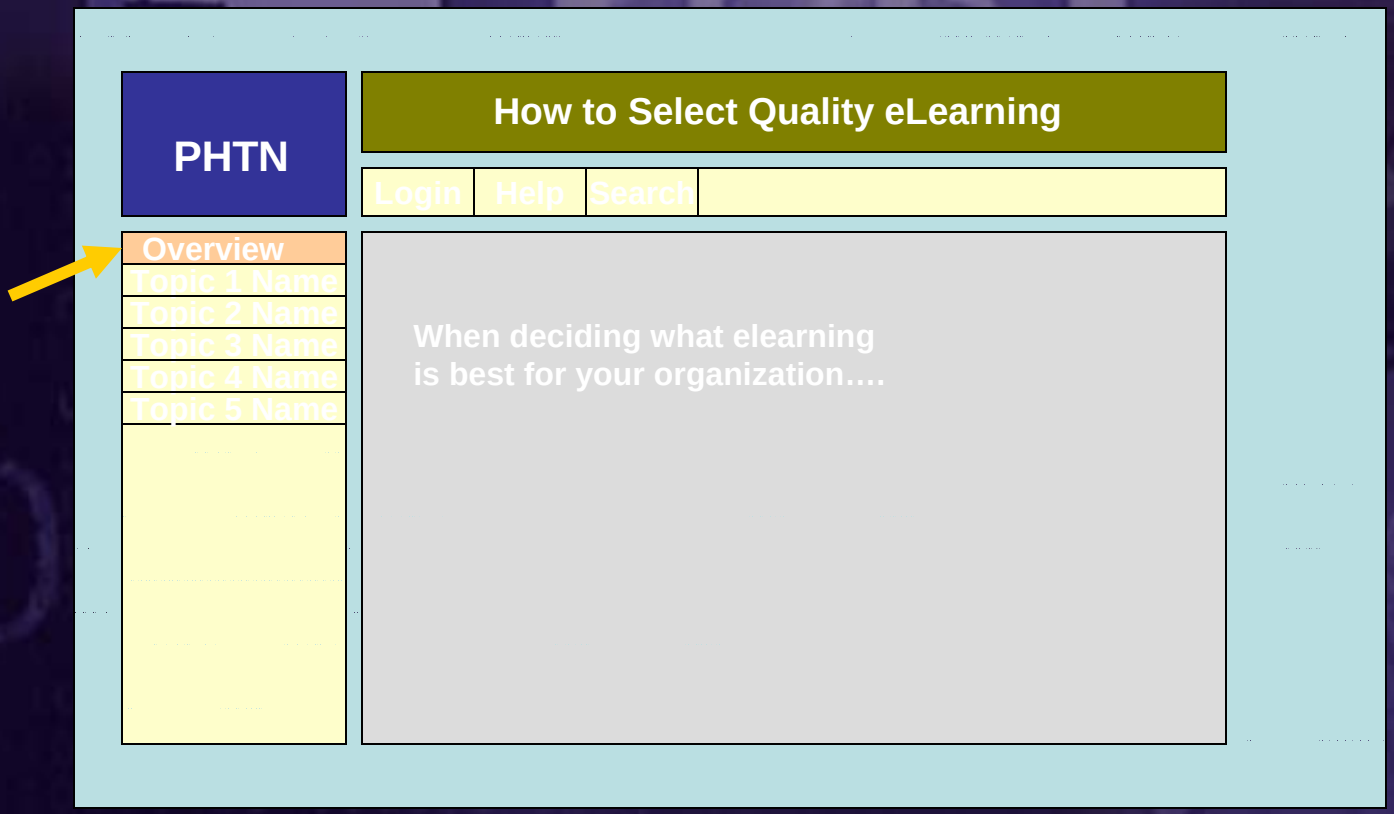
# Navigation

- Example



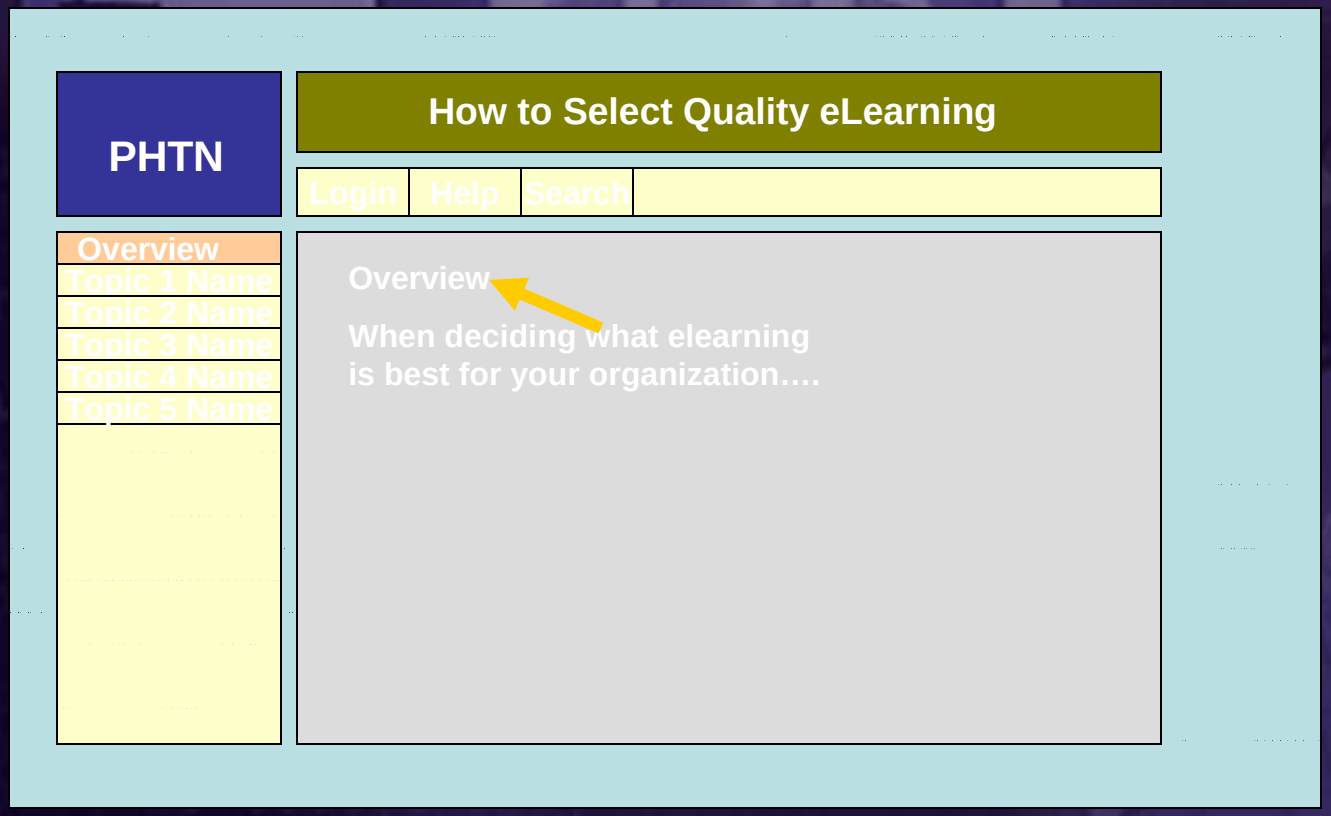
# Navigation

- Example



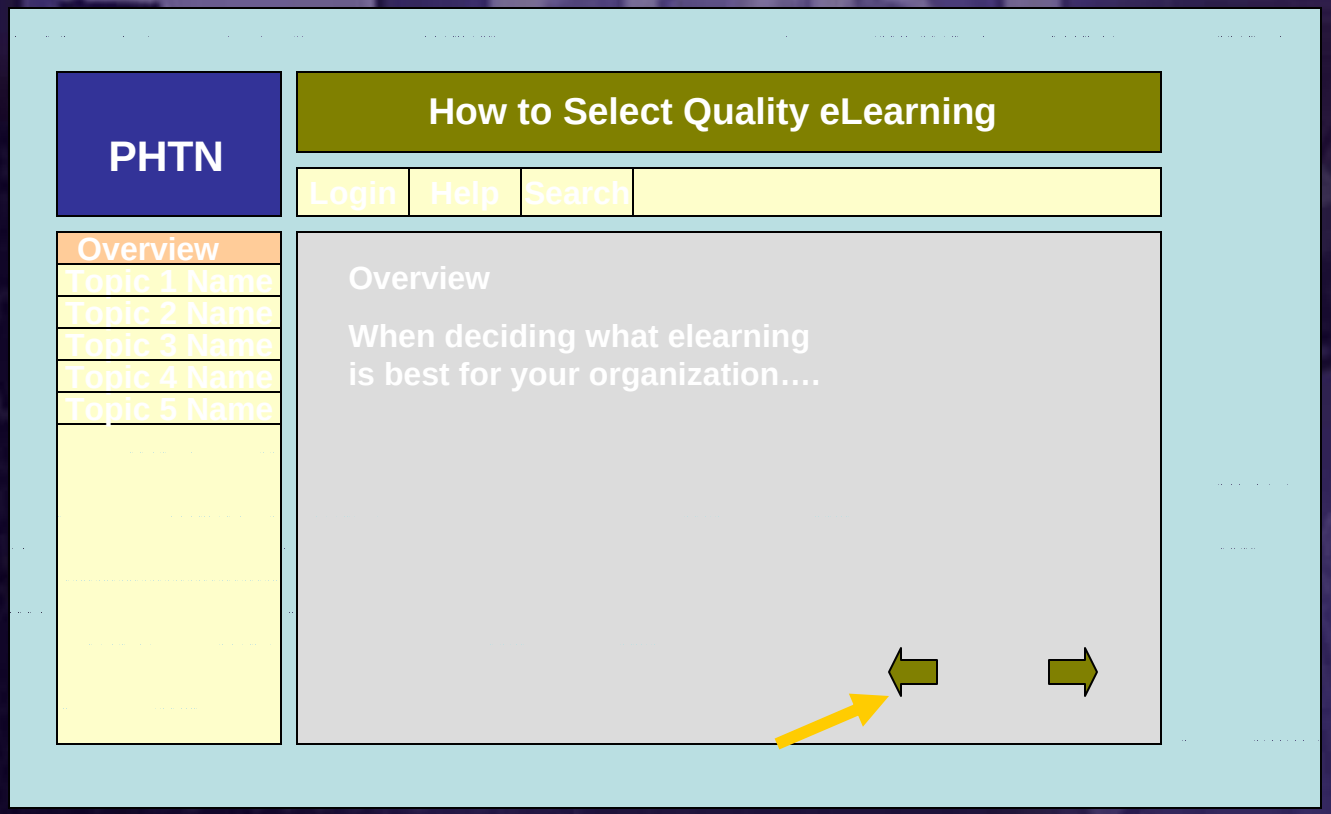
# Navigation

- Example



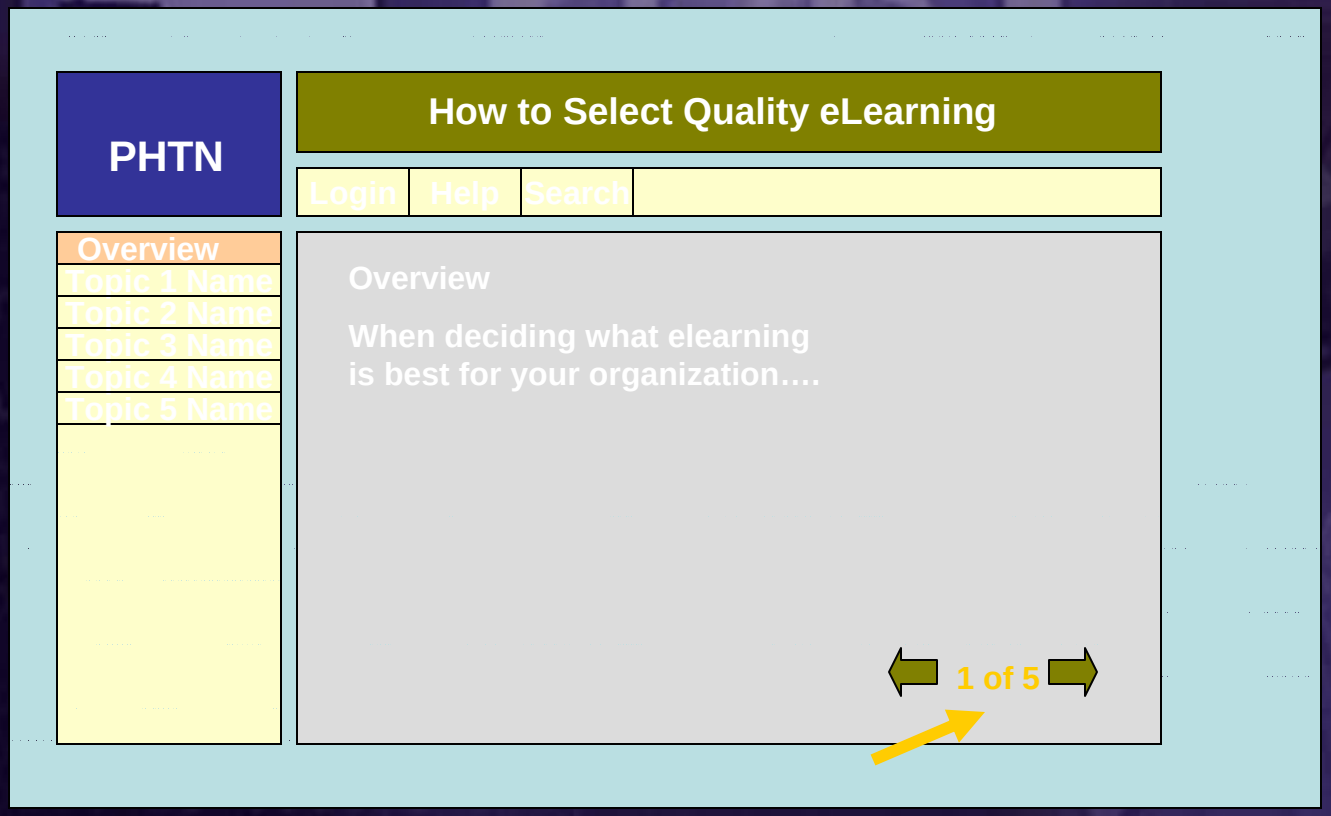
# Navigation

- Example



# Navigation

- Example



# Major Criteria Types

- Instructional Design, Content and Assessment
- Interface and Navigation
- **Media, Interactivity and Aesthetics**
- Technical Operation
- Modularity/Reusability

# Media

- Importance- People don’t like reading a lot of text on screen. What they do read, they read with reduced comprehension. Adding relevant visuals can improve learning.
- Example visuals
  - Photographs
  - Diagrams
  - Charts
  - Animations
  - Videos

# Media

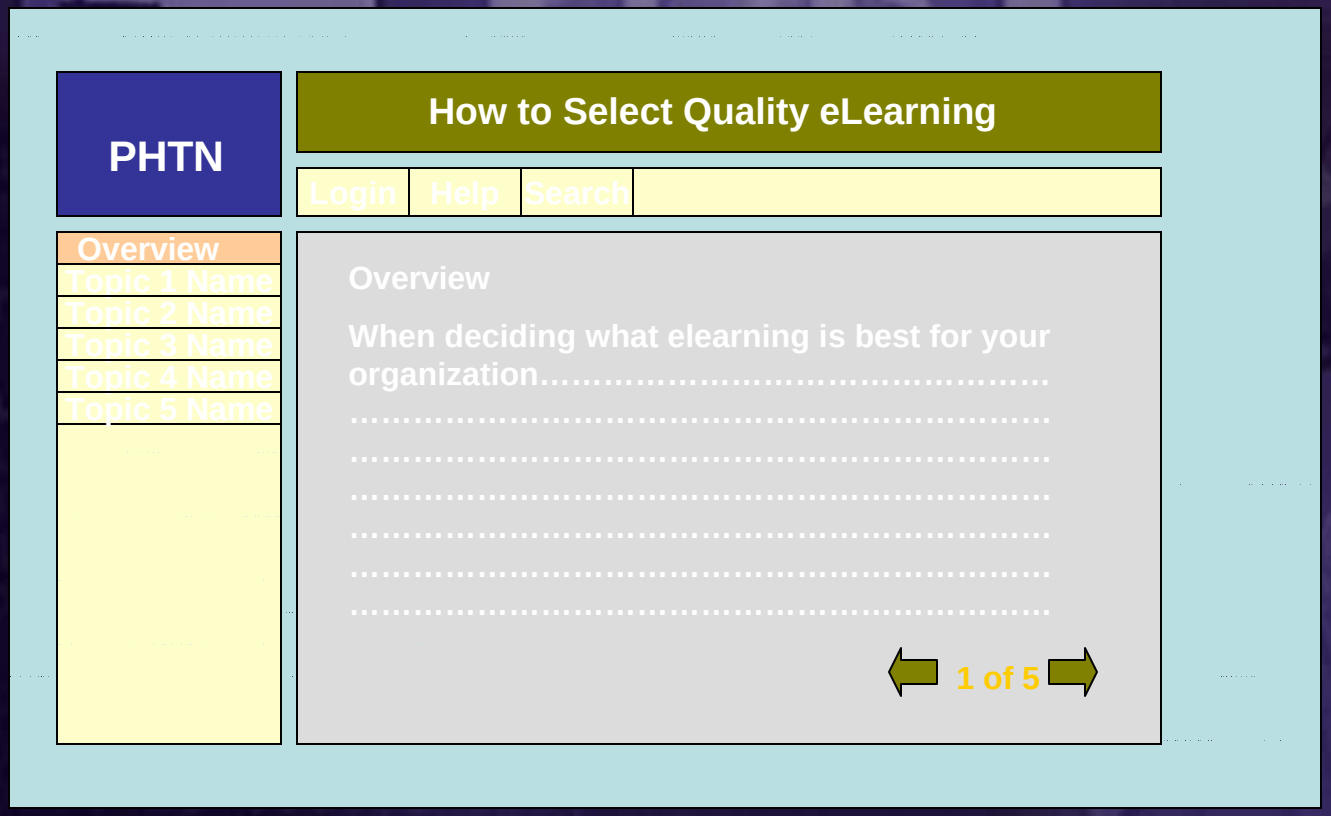
- The use of text and media facilitate comprehension of the materials

# Media

- How to evaluate-
  - Text's font size and style make it easy to read
  - Text columns roughly 40 characters wide
  - Blank line roughly every 5 lines
  - Media visuals assist in comprehending text
  - Media visuals have professional look

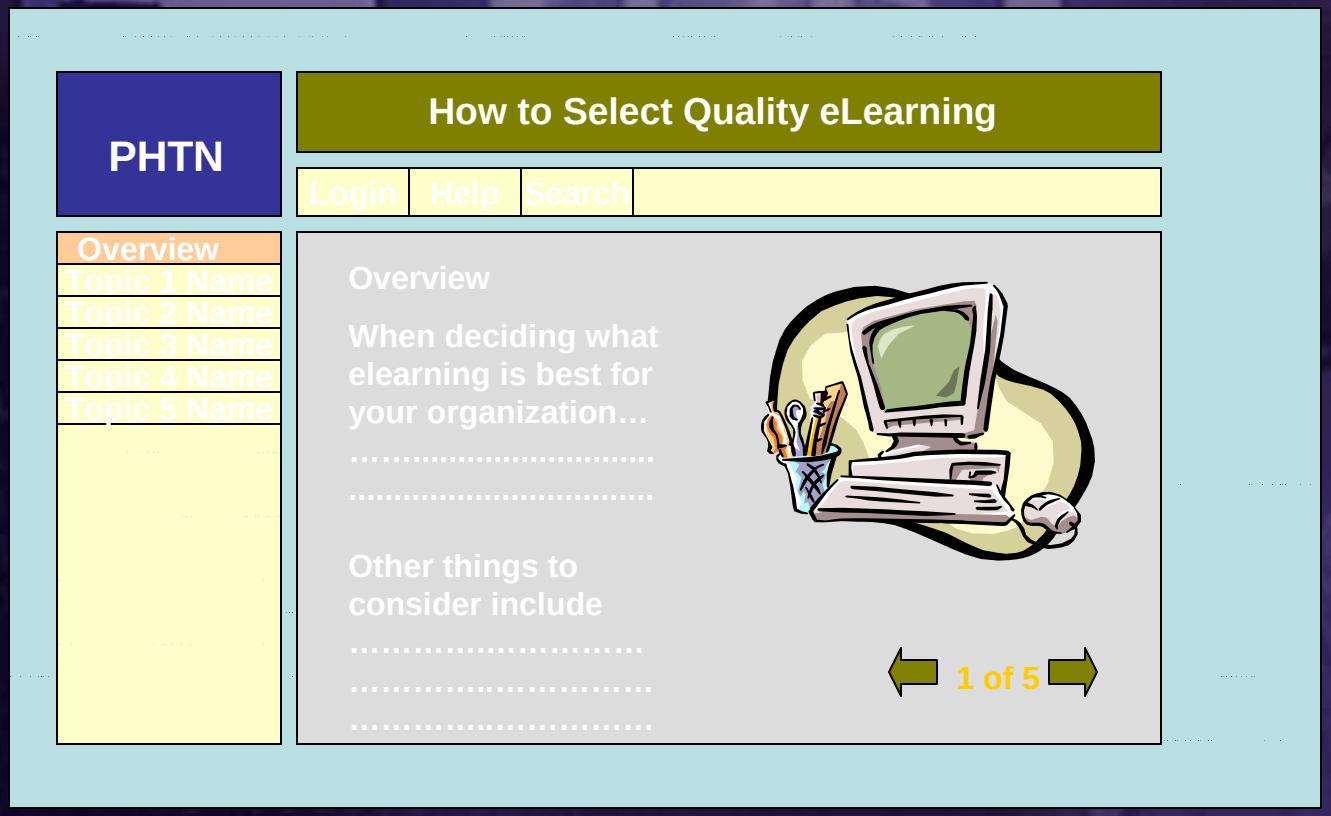
# Media

- Example



# Media

- Example



# Interactivity

- Importance- Well designed interactions let users reinforce their understanding of the material by actively applying it in meaningful situations.

# Interactivity

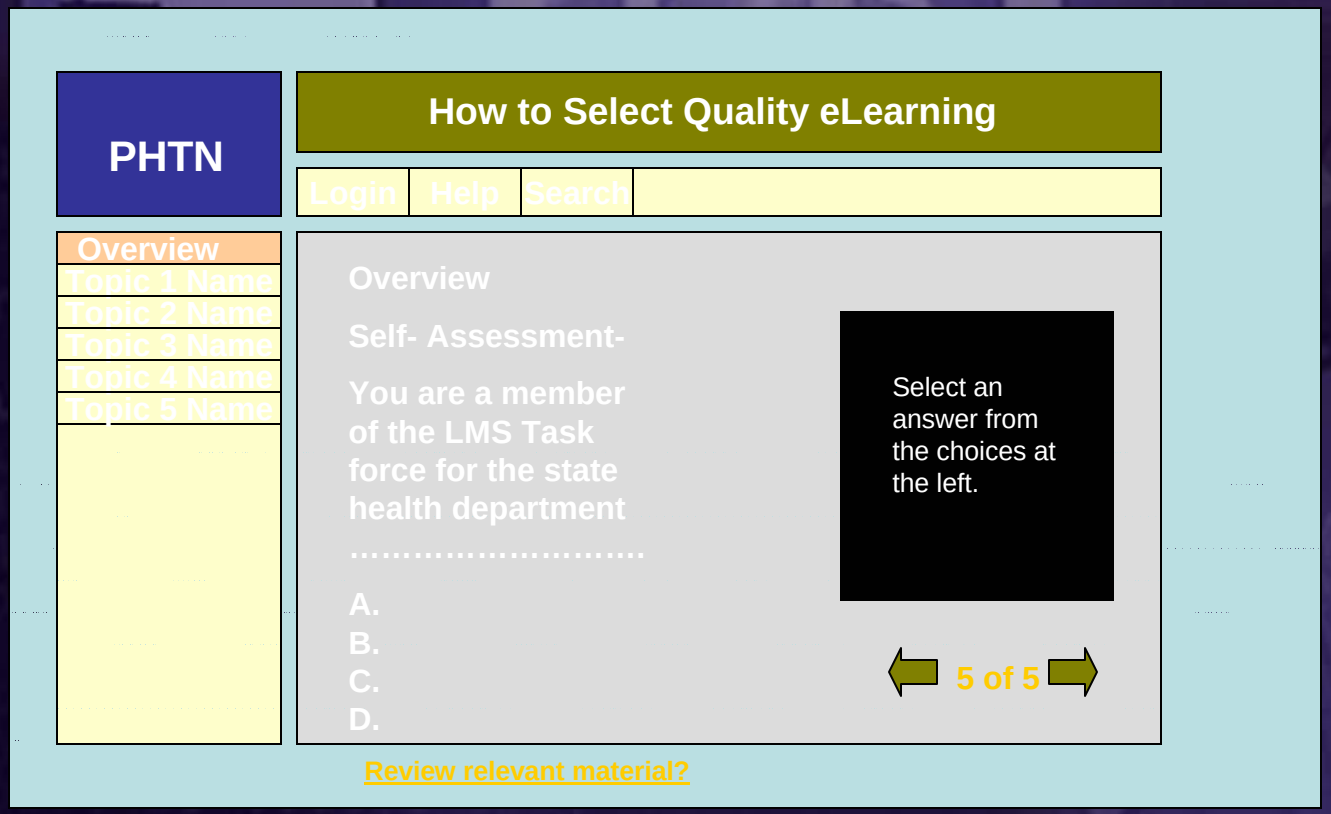
- Interactions assist learner motivation and comprehension

# Interactivity

- How to evaluate-
  - Interactions provided frequently enough
  - Interactions are “real-world”
  - Interactions allow for revisiting previous material or reviewing additional material

# Interactivity

- Example



# Aesthetics

- Importance- eLearning applications won't be completely successful if they do not attract initial interest and make it visually comfortable to continue to completion.

# Aesthetics

- Criteria to consider-
  - Course is visually appealing

# Aesthetics

- How to evaluate-
  - Screen design is consistent, clean and clear
  - Colors appealing and appropriate for the topic
  - Media aesthetics complement interface
  - White space makes screen uncluttered
  - Labels & icons prominent without distracting

# Aesthetics

- Example

PHTN

How to Select Quality eLearning

Login | Help | Search

Overview
Topic 1 Name
Topic 2 Name
Topic 3 Name
Topic 4 Name
Topic 5 Name

Overview

Self- Assessment-

When shopping for you see this label. You should:

A.
B.
C.
D.

5 of 5

# Aesthetics

- Example

PHTN

How to Select Quality eLearning

Login | Help | Search

Overview
Topic 1 Name
Topic 2 Name
Topic 3 Name
Topic 4 Name
Topic 5 Name

Overview

Self- Assessment-

When shopping for you see this label. You should:

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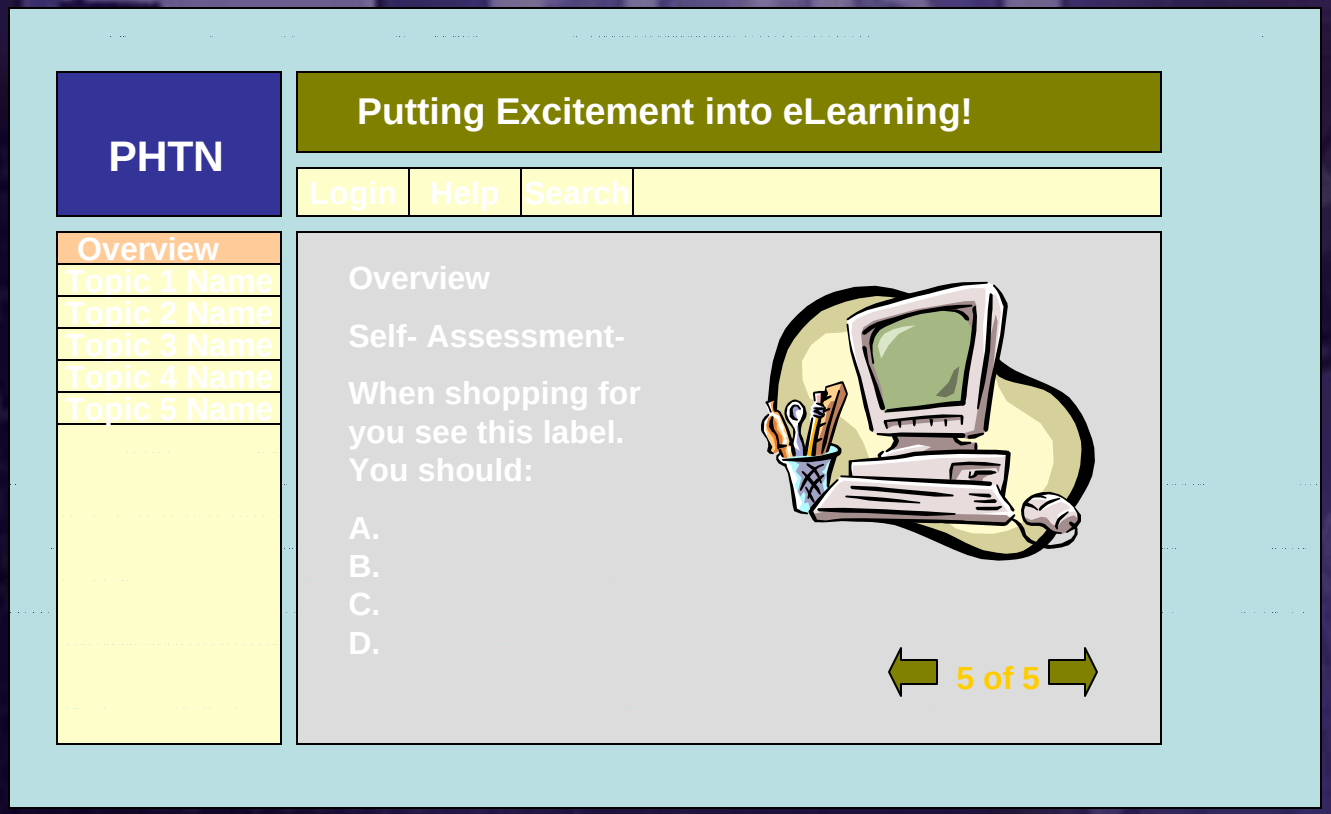
5 of 5

# Aesthetics

- Example



# Aesthetics

- Example

PHTN

Putting Excitement into eLearning!

Login | Help | Search

Overview
Topic 1 Name
Topic 2 Name
Topic 3 Name
Topic 4 Name
Topic 5 Name

Overview

Self- Assessment-

When shopping for you see this label. You should:

A.
B.
C.
D.

5 of 5

# Major Criteria Types

- Instructional Design, Content and Assessment
- Interface and Navigation
- Media, Interactivity and Aesthetics
- **Technical Operation**
- Modularity/Reusability

# Technical Operation

Importance:

A course technically compatible with the IT environment of your organization and your students will be easy for students to access and use.

# Technical Operation

- Criteria to consider
  - Technical Requirements
  - Installation
  - Performance

# Technical Operation

Technical requirements should be:

- Clearly stated
- Compatible with your organization's IT infrastructure
  - LMS
  - Bandwidth
- Compatible with your learner's systems and learning environment (add movie)
  - Bandwidth
  - Accessible to those with disabilities

# Example: Technical Requirements

Windows System Specifications:

| | Required | Recommended |
|---|---|---|
| **Operating System** | Windows 98/ME/NT 4.x/2000/XP | Windows 98/ME/2000/XP |
| **Computer type** | Intel Pentium II or 100% Intel-compatible microprocessor, 300Mhz, with 32MB hard disk space. | Pentium II, 300Mhz or better, 32MB hard disk space. |
| **Video** | 2MB video RAM (16-bit color or better at 640x480) | 4MB+ video RAM (24-bit color at 640x480 or higher) |
| **CD-ROM Drive** | 2x CD-ROM drive with 300kBps data transfer rate | 4x CD-ROM drive or faster |
| **Sound Card** | SoundBlaster or 100% SoundBlaster-compatible sound card and speakers | 16 bit SoundBlaster or 100% SoundBlaster-compatible and speakers |

# Technical Operations

Installation should be:

- Simple and easy to follow
- Easy to download supporting materials
- Provides adequate technical support
- Easy to sign in

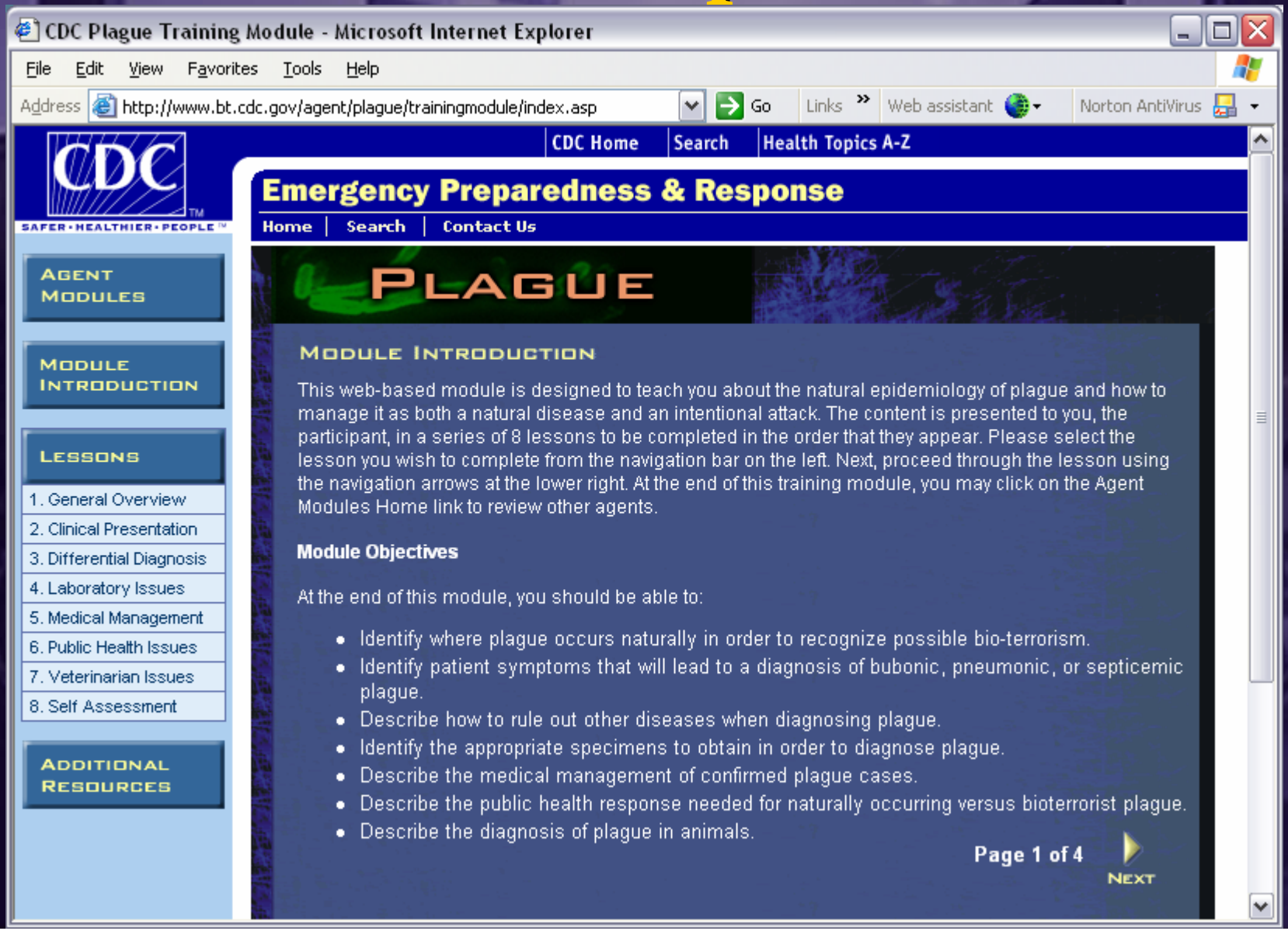
# Installation Example

# Technical Operations

Performance should be:

- Smooth!
  - Pages download in a reasonable time
  - Any plugins are widely used and easily accessible

# Example


CDC Plague Training Module - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Address http://www.bt.cdc.gov/agent/plague/trainingmodule/index.asp
Go Links Web assistant Norton AntiVirus
CDC Home Search Health Topics A-Z
CDC
SAFER·HEALTHIER·PEOPLE
Emergency Preparedness & Response
Home Search Contact Us
AGENT MODULES
MODULE INTRODUCTION
LESSONS
1. General Overview
2. Clinical Presentation
3. Differential Diagnosis
4. Laboratory Issues
5. Medical Management
6. Public Health Issues
7. Veterinarian Issues
8. Self Assessment
ADDITIONAL RESOURCES
PLAGUE
MODULE INTRODUCTION
This web-based module is designed to teach you about the natural epidemiology of plague and how to manage it as both a natural disease and an intentional attack. The content is presented to you, the participant, in a series of 8 lessons to be completed in the order that they appear. Please select the lesson you wish to complete from the navigation bar on the left. Next, proceed through the lesson using the navigation arrows at the lower right. At the end of this training module, you may click on the Agent Modules Home link to review other agents.
Module Objectives
At the end of this module, you should be able to:
Identify where plague occurs naturally in order to recognize possible bio-terrorism.
Identify patient symptoms that will lead to a diagnosis of bubonic, pneumonic, or septicemic plague.
Describe how to rule out other diseases when diagnosing plague.
Identify the appropriate specimens to obtain in order to diagnose plague.
Describe the medical management of confirmed plague cases.
Describe the public health response needed for naturally occurring versus bioterrorist plague.
Describe the diagnosis of plague in animals.
Page 1 of 4
NEXT

# Major Criteria Types

- Instructional Design, Content and Assessment
- Interface and Navigation
- Media, Interactivity and Aesthetics
- Technical Operation
- **Modularity/Reusability**

# Modularity/Reusability

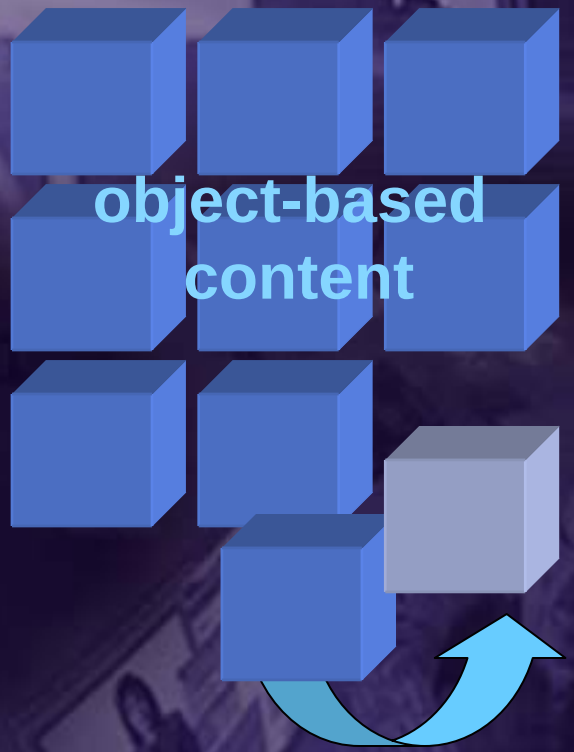
Importance:

Courses with a modular, reusable design based on technology standards will work with many systems and facilitate future content development.

More bang for the buck!

# Modularity/Reusability

- **Key Concept: Learning Objects**
- Definition: Discrete units of digital instruction typically focused on a single learning objective
- Benefits
  - Access just the information/education you need
  - Reuse in multiple contexts and environments



# Modularity/Reusability

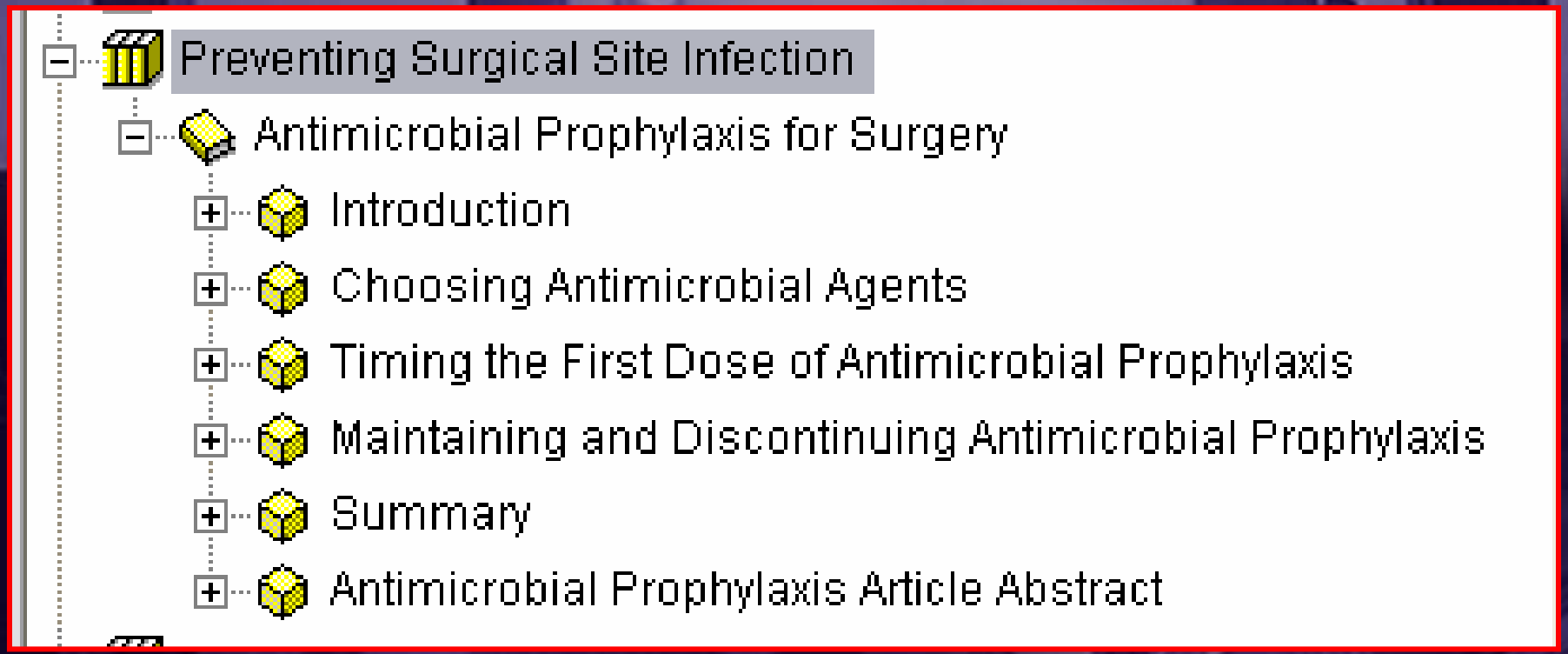
Criteria to consider:

- Structure and Licensing
- Use of Standards

# Modularity/Reusability

- Structure and Licensing
  - Does the course use a learning objects approach?
  - Are “chunks” appropriate?
  - Does the licensing model allow for reuse?

# Example: Learning Objects Structure



# What is SCORM?

**S**hareable

**C**ontent

**O**bject

**R**eference

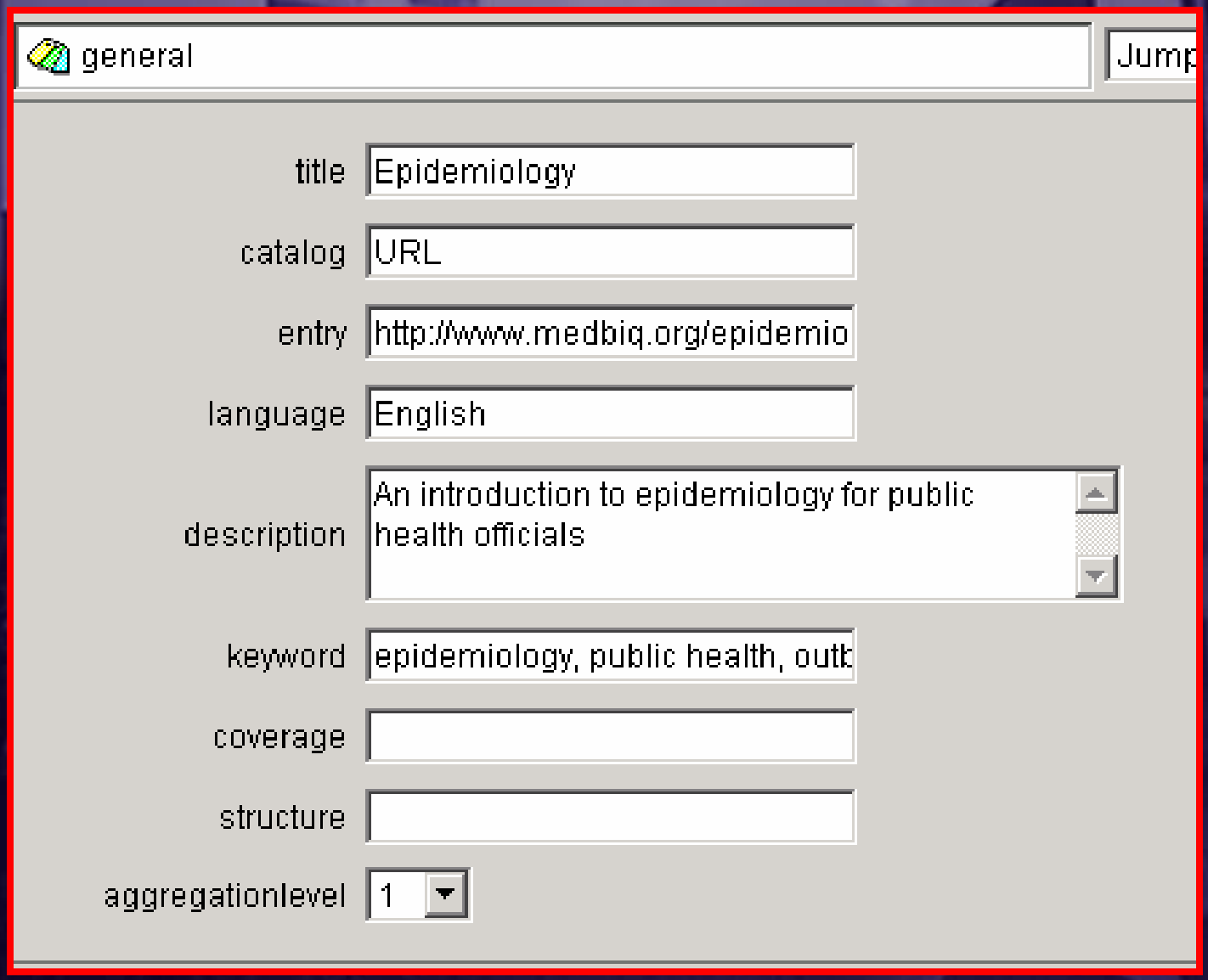
**M**odel

- A suite of e-learning standards that enables **accessibility**, **reuse**, and **interoperability** of learning objects and **tracking** of learner progress.
- Standards for running, packaging, describing learning content
- MEDBIQ-SCORM customizes SCORM for healthcare

# Modularity/Reusability

- Courses should use standards that enable interoperability, accessibility, and adaptability
  - SCORM and MEDBIQ-SCORM
  - Metadata describing learning objects or assets
  - Standardized vocabularies (MeSH, SNOMED)
  - XML or stylesheets

# Example: Standards and Metadata



# Your Turn to Look Under the Hood

Break:

- Take a 10 minute break

When you return:

- Head to your “Team” table

# Your Turn to Look Under the Hood

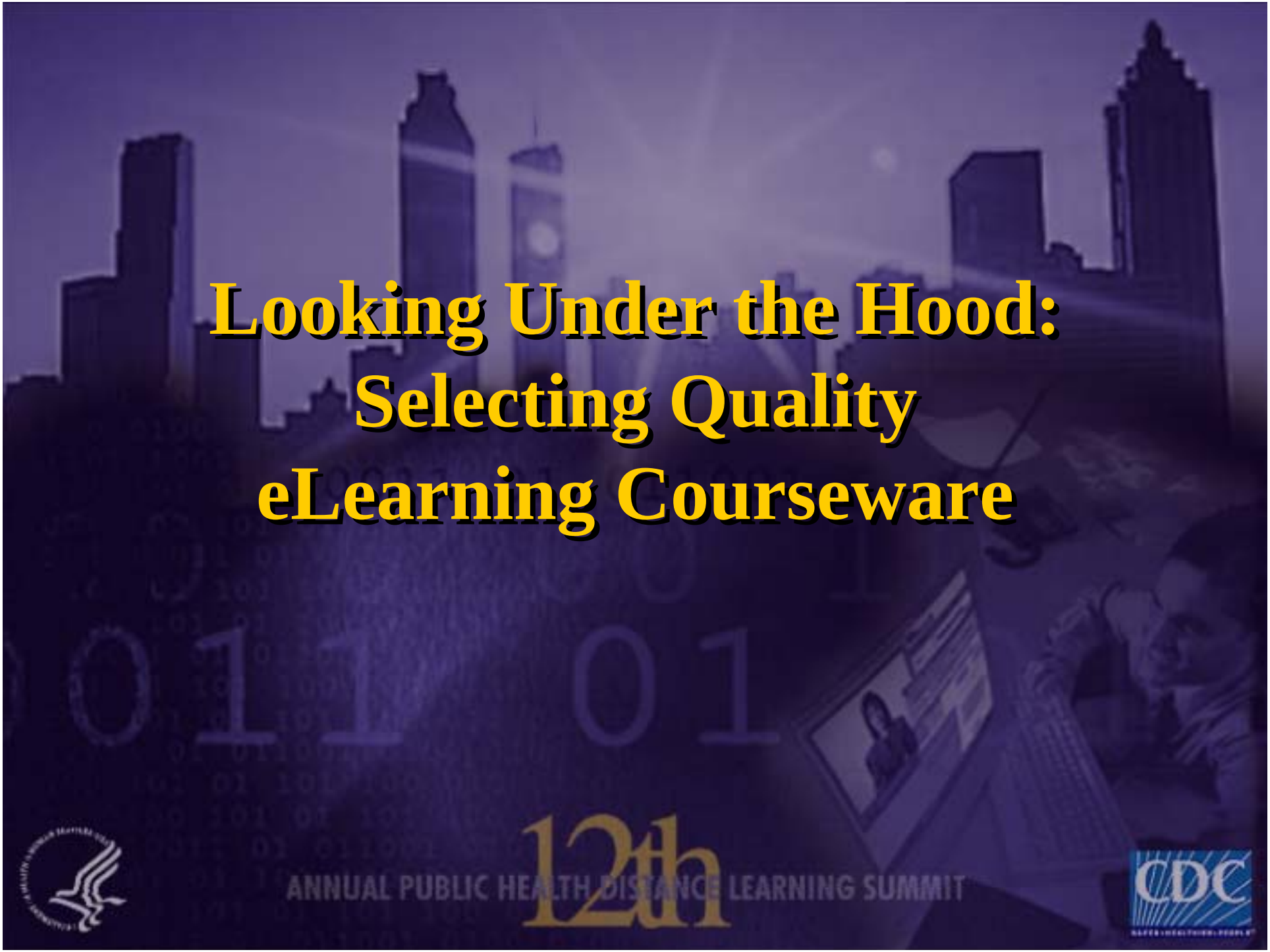
Exercise Instructions:

- Evaluate courseware demo #1 and courseware demo #2 (links on desktop) using the evaluation instrument
- Record ratings on summary evaluation form for each courseware
- Presenter get ready to report and explain your team's ratings

# Final Advice for Looking Under the Hood

- Don’t let bells and whistles woo you
- Prioritize criteria for your needs
- Consider subscriptions to online learning instead of purchasing courses

# More Final Advice for Looking Under the Hood

- Apply systematic review process to ensure consistency
- Strive to minimize biases and maximize objectivity

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