
Texas Center for Digital Knowledge
University of North Texas
<http://www.txcdk.org>

**A Proof-of-Concept Repository for Learning Objects: Supporting the
Reuse and Repurposing of Redesigned Courses and Their Content**

Course Developers' Guide for the THECB Learning Object Repository

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Course Developers' Guide for the THECB Learning Object Repository

Introduction

The Texas Higher Education Coordinating Board (THECB) is funding the development of a learning object repository (LOR). The LOR will store the contents of courses being redesigned by funding from THECB. The Texas Center for Digital Knowledge (TxCDK) at the University of North Texas is designing, developing, and implementing the THECB LOR. Information about THECB LOR project is available at: <<http://theclor.unt.edu/>>.

For efficient and effective submission of redesigned course content into the LOR, the course redesign developers will need to prepare and organize files comprising course content that follow guidelines described in this document. Because the logical structure of redesigned courses may not be standardized, THECB LOR project staff has developed these guidelines to facilitate submission of course content into the repository. This document provides an introduction to the repository structure, and makes recommendations on various aspects of preparing the content for submission such as file naming, grouping files, etc. The project staff will work with course developers to assist them in understanding and preparing the content for submission into the LOR.

Brief Overview of the THECB LOR & Structure

In Summer 2007, TxCDK implemented a proof-of-concept implementation of the THECB LOR: <<http://zed.lis.unt.edu:8083/dspace/>>. Course content from the U.S. History I redesigned course was used to test various components and demonstrate the feasibility of the THECB LOR. The course content was “decomposed” into discrete learning objects (LO), where a learning object is defined simply as any entity that can be used for learning, education, or training. In the context of the THECB LOR, all LOs are in digital form. A key question that is being explored by the project team is what is the appropriate size, scope, and level of detail of a LO for most effective reuse. Level of granularity is used as a label to refer to the LO size, scope, and level of detail. The THECB LOR will allow users to search and discover course content at the level of granularity best suited to the users' needs (see Figure 1).

The screenshot shows the THECB Learning Object Repository interface. At the top, there is a logo for the Texas Higher Education Coordinating Board and the text "Learning Object Repository". Below this, there is a search bar and a navigation menu. The main content area displays "Disciplines and Courses" with a list of history courses. The list is structured as follows:

- **History Courses**
 - **U.S. History**
 - **U.S. History 1**
 - [A. Course Structure](#)
 - [B. Course-wide Assessments](#)
 - [C. Complete Course](#)
 - [D. Course Units](#)
 - [E. Course Lessons and Related Assessments](#)
 - [F. Course Topics](#)
 - [G. Case Studies and Case Study Teaching Guides](#)
 - [H. Free-Standing Learning Objects](#)
 - [I. IMS Content Packages](#)

Figure 1. Organization of the Learning Objects in Repository

Based on a review of the literature, there doesn't appear to be standard conventions for naming structural component of a course. For the proof-of-concept implementation, the levels of granularity for the LOs chosen reflected the structure of the U.S. History I course:

- **Entire Course:** All component parts of the course constitute the LO.
 - **Unit:** The largest aggregation of course content, which contains two or more lessons
 - **Lessons:** The second level of granularity that contains two or more topics
 - **Topics:** The third level of granularity that may be comprised of several files but constitutes a coherent learning object. A Topic is the smallest piece of instructionally meaningful material
 - **Free Standing LOs:** The fourth level of granularity in which specific components of a Topic (e.g., an interactive flash animation) are viewed as having reuse value outside the context of the Topic of which it is a part.

LOs at each of these levels of granularity (from low at the Unit level to high at the Topic and Free Standing LO level) is comprised of multiple files. As one moves from high granularity to low granularity, the number of files comprising a LO increases. A Topic LO may be comprised of an HTML file that has embedded image files, interactive flash files, video files, etc. These files comprise the logical entity of Topic level LO. Instructional content organized at the Topic level of granularity can be seen as building blocks for instructors wishing to integrate THECB learning objects into new or existing sequences of instruction.

In the proof-of-concept implementation and working with the U.S. History I course, a number of issues arose that presented challenges to efficient submission of LOs at all granularity levels. As the project moves forward to acquire new redesigned course content, it is important that developers of redesigned courses be cognizant of the guidelines in this document in preparing their course content as LOs for submission into the THECB LOR.

In addition, we assume that the logical structure and structural components of redesigned courses may differ from course to course. In this phase of the THECB LOR project, we will work with new course content from the redesigned courses to understand their structures and to develop a standardized way of reflecting levels of granularity of the LOs.

The Repository and Metadata

The THECB LOR is implemented using DSpace, an open source digital repository platform. DSpace enables the storage of LOs, and end users can search the repository using a variety of access methods (e.g., search by title, by type of LO, by subject covered, etc.). Each LO in the repository is described by a metadata record. The metadata record contains a variety of elements (or fields) that represent the LO. Appendix A contains the list of the metadata elements currently used in the proof-of-concept implementation. Course redesigners will need to provide data values for some of these elements, since they are most knowledgeable about the specific course content. For example, course redesigners can assess the time needed to complete the LO, the type of LO, the difficulty level, and what subject terms should be used to describe what the LO is about. Figure 2 is a sample metadata record representing a Topic level learning object.

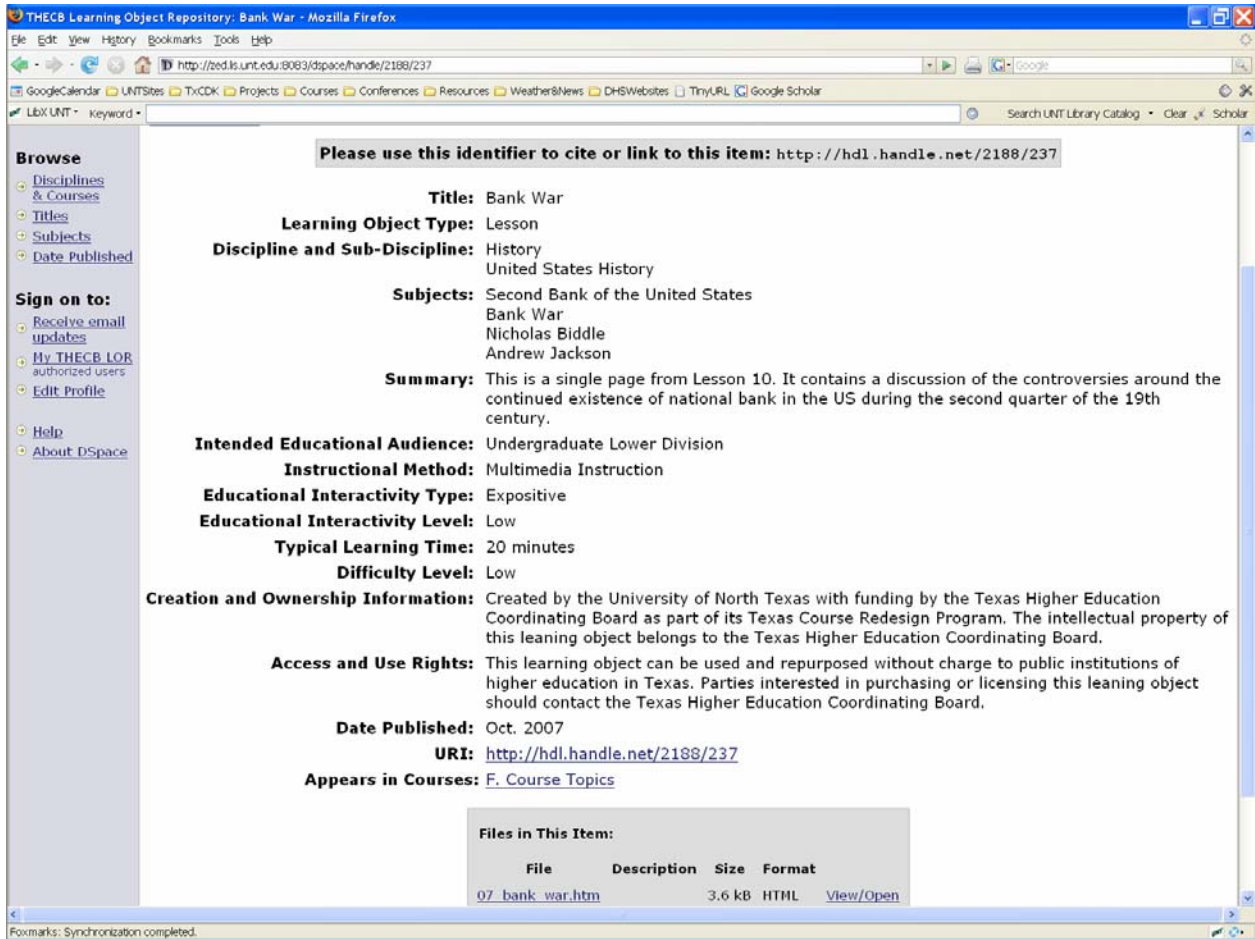


Figure 2. Example of the Simple Metadata Record

Guidelines and Recommendations

Based on the experience during the proof-of-concept work, the following presents guidelines for course developers.

Course Structure

In order for learning objects to be accurately cataloged and organized within the repository, each course developed for the THECB LOR should be accompanied by a course structure document. Course redesigners should supply a document that describes the logical structure and structural components of the course. This can be a Word, PDF, or HTML document. Table 1 shows a part of the the U.S. History I course structure. Appendix B contains the more complete structure. This is just a sample, and individual course developers can organize their structure document as they wish, but the goal is for the THECB LOR staff to have a reference document to understand what the structural components are and how they are related.

UNIT ONE: Colliding Cultures	Lesson Topics	Assessment
Introduction to Unit		Midterm exam for units 1 and 2
Lesson 1: Pre-Columbian America		Lesson Quiz

UNIT ONE: Colliding Cultures	Lesson Topics	Assessment
	Topic: The Americas Before Columbus	
	Topic: How did the First People Come to the Americas?	
	Topic: Central and South American Indians	
	Topic: North American Indians	
	Topic: Summary	

Table 1. Sample Course Structure Document

The Course Structure will help ensure that the LOs are placed on the proper level of granularity and that each LO can be nested into its corresponding LO at the next highest level of granularity. In addition each LO needs to include a title which is usually determined by its content. These titles can be used as a reference to determine files associated with each Unit, each Lesson, each Topic (including quizzes at the Lesson level), and also additional LOs in the form of Teaching Guide, Case Studies, etc.

File Map of Course Content

Aligned with the Course Structure document is a document that identifies individual files associated with the structural components of the course content. In the case of the U.S. History I course, the course designers prepared a document that named each of the files that comprised logical units. Table 2 shows an excerpt from the File Map document for that course.

Unit/Lesson/Topic	Files
UNIT 1: Colliding Cultures	
Unit 1 Preview	00_unit_one_preview.htm
• Introduction	01_preview.htm
• Objectives	02_objectives.htm
<i>Lesson 1: Pre-Columbian America</i>	00_unit_one_lesson_one.htm
Topic: The Americas Before Columbus	01_americas_before_columbus.htm
Topic: How did the First People Come to the Americas?	02_how_did.htm FirstPeopleMap.swf
Topic: Central and South American Indians	03_central_south.htm Aztechumansacri.jpg SouthAmericaMap.swf
Topic: North American Indians	04_north.htm Hopewellpottery.jpg NorthAmericaMap.swf
Topic: Summary	05_summary.htm comparing_cultures.swf

Table 2. File Map Excerpt for U.S. History Course

With this information, the THECB LOR staff can identify the specific files associated with a LO for submission into the repository.

Naming the Files

A LO consists of a file or a set of files. Often these may be HTML files and other types of files with references to them from within HTML files. All files associated with a learning object should have an

original unique name, where the name can indicate sequence if appropriate. Using descriptive words in the filename is also recommended.

Using an example from Table 2 illustrates filenaming conventions. The topic-level LO is titled: North American Indians. Three files comprise this LO. The HTML file is named 04_north.htm indicating that it is the fourth topic in the sequence for the Lesson Pre-Columbian America. The image that is embedded in the HTML page gives a descriptive term, Hopewellpottery, as part of the filename. Similarly, the flash file has descriptive terms in the filename.

All filenames should be limited to those acceptable to any operating system on which the files may be loaded. For example, Windows allows for many special characters to be used in filenames. UNIX has a more limited set of characters allowed. The UNIX set should be the guide since all characters UNIX allows are allowed by Windows. UNIX filenames are case sensitive and Windows are not. Filenames should have no spaces between component terms. The following are examples of preferred filenames:

Lesson1_NamingTheFiles.pdf
04_NorthAmericanIndians.html
InteractiveNorthAmericanIndianSelfTest.swf

Prefixes that may indicate the logical unit the file is associated with can be separated with an underscore from the descriptive terms, where the descriptive terms uses a camelBack type of upper and lowercase convention with the terms pulled together and no spaces between the words.

The following are examples of problematic filenames:

- **index.html** (the course content may have many such files for different components, and this may result in name collisions within the repository)
- **image 1.gif** (in addition to potential name collisions, there is no descriptive indication about the title/subject of the image)
- **Example of Problem.pdf** (spaces between parts of filename, not very descriptive)

Bundling Files Together

Using the Course Structure document and the File Map document, course designers can easily bundle the course files together physically in a way that the THECB LOR staff can find the files and know which files area associated with a LO. The recommendation is to set up a hierarchal folder/directory structure that aligns with the Course Structure and File Map similar to the following using the U.S. History I structure for illustration



Folder Name: Unit1_Preview (contains 00_unit_one_preview.htm, 01_preview.htm, 02_objectives.htm)



Folder Name: Lesson1.1_PreColumbianAmerica (contains 00_unit_one_lesson_one.htm)



Folder Name: Topic1_AmericasBeforeColumbus (contains 01_americas_before_columbus.htm)



Folder Name: Topic2_FirstPeopleComeAmericas (contains 02_how_did.htm, FirstPeopleMap.swf)



Folder Name: Unit2....



Folder Name: Lesson2.....

It is recommended that all files associated with particular learning object are located in appropriate folders (as suggested above) and available during submission. However, files also may be added to a LO and submitted into the repository at a later time.

The LOR uses the DSpace term *bitstream* which is another name for ordinary computer file. Each LO comprises a bundle of files or bitstreams. Also, each LO normally has a file that is starting point when accessing this LO. For example, for a LO comprising of a single PDF file or a Video file it would be this file itself. For a group of linked HTML files or an HTML file with embedded image files, it would be the main file, similar to an index file of a web site. This file is called a *primary bitstream* and should be identified prior to the submission of LO. One of the steps of the submission process is to specify this file for each LO.

URLs and Relative and Absolute Links

The files of LOs comprised of two or more files should be connected to each other. In most cases, these connections are implemented with hyperlinks. Hyperlinks may be used within different kinds of text documents and include names of the related files and the paths to the files. It is assumed that the files comprising a LO may have been originally (as part of the redesigned course) stored either in the same directory or in different directories and even on different systems. Consequently, hyperlinks describing relation between those files may include names of the systems, paths, and filenames.

Files located on external systems (relative to the system hosting the redesigned course) should not be uploaded to the repository. All files listed for upload to the repository should use relative hyperlinks for the references between each other. This is recommended practice for web development in general and allows the files to be uploaded successfully to the repository and retain operation of the links. These files may have been originally stored (as part of the redesigned course) in different directories of the system. When preparing files for the upload and bundling them by folders as suggested in the section Bundling Files Together, it is not necessary to create folders that exactly mimic the original directory structure used in redesigned course. It is also not necessary to change hyperlinks and try to make them work in new folders that are only used to facilitate uploading. In most cases, interrelationships between files and the corresponding original (source) directory structure are determined by DSpace. At the time of uploading DSpace will create an organizing structure based upon the content of the files.

The only exception is that all filenames within one LO bundled for uploading should be unique. If non-unique file names are found they should be renamed and corresponding links inside of all referencing files changed.

Describing Learning Objectives

In discussions with THECB staff, it would be very useful for course designers to list the learning objectives for structural components of the course content. Learning objectives are essential information needed by instructors to determine the content's usefulness. In the case of the U.S. History I course, one could have learning objectives at the Unit Level, the Lesson Level, and at the Topic Level. The number of learning objectives listed for a Unit will be more extensive than those for an individual Lesson, which will be more extensive than for an individual Topic. Course designers are encouraged to provide learning objectives. These could be included (if not specifically included as a file for a Unit, Lesson, or Topic) in the Course Structure document.

Metadata Needed From Course Redesigners

[Please work on this section indicating the information needed for which specific elements, etc.]

The 35 THECB LOR metadata elements are listed in Appendix A. A subset of 13 of these elements contains most of the metadata that describes the educational properties of each LO. These elements are particularly important to the potential users of the LOR because they provide the detailed information necessary for a user to determine if the LO is appropriate for their instructional purpose. Course developers have the detailed knowledge of the course content needed to supply the metadata for the metadata elements listed below:

- Title
- Authors
- Author Affiliation
- Subjects
- Summary
- Educational Interactivity Type
- Educational Interactivity Level
- Difficulty Level
- Typical Learning Time
- Learning Object Type
- Instructional Method
- Audience Educational Level
- Technical Requirements

Information provided for the elements listed above will need to be included for all LOs on the Topic level of granularity. If the metadata elements Title; Authors; Author Affiliation are present in the LOs themselves no additional information for these elements needs to be supplied by course developers. However, if the information for any of these elements is not present in LO, course developers need to supply it. The following provides additional detail on some of these elements.

Summary

For the summary element the course developers provide an abstract of the LO. It can be extracted from the resource or created by the course developer specifically for the repository. The summary can be around 50-150 words.

Educational Interactivity Type

Course developers designate the type of interactivity for each topic level LO by choosing from the following three values for this element:

- **Active:** In "active" mode, learners learn by doing, and it is supported by content that directly induces productive action by the learner. Most of the learners' time is spent interacting through input and feedback. An active learning object prompts the learner for semantically meaningful input or for some other kind of productive action or decision, not necessarily performed within the LO's framework. Active documents include simulations, questionnaires, and exercises.
- **Expositive:** An expositive LO displays information but does not prompt the learner for any semantically meaningful input. In "expositive" mode, learning (e.g., passive learning) occurs when the learner's job mainly consists of absorbing the content exposed to him (generally through text, images or sound). There is no response to the user that is dependent on the user's input, beyond the normal responses of hypertext. (i.e. clicking on links.) Expositive documents include essays, video clips, all kinds of graphical material, and hypertext documents.
- **Mixed:** When a LO blends the active and expositive interactivity types, then its interactivity type is "mixed". Requiring input from the user and responding to this, thus resources which require the following of links cannot be classified as Interactive.

Educational Interactivity Level

Course developers designate the level of interactivity for each topic level LO. The five values for this element are: Very low, Low, Medium, High, and Very High. Examples of typical level of interactivity for each of the three types of interactivity are provided in Table 3.

Interactivity Type	Very Low Interactivity Level	Low Interactivity Level	Medium Interactivity Level	High Interactivity Level	Very High Interactivity Level
Active	Test questions formatted for printing	Links provided with instructions for their exploration	Online multiple-choice exercise providing feedback	Dissection simulation with pre- and post-tests	3-D immersive simulation for completing prescribed series of steps
Expositive	Essay formatted for printing	Video clip with play, pause, and replay controls	Hypertext in which readers choose ending	Dissection simulation without evaluation components	3-D immersive environment for exploring remote location

Table 3: Examples of the Educational. Interactivity Type and Interactivity Level

Audience Educational Level

Course developers designate the audience educational level for each topic level LO. There are three values for this element: lower level undergraduate, upper level undergraduate, and graduate.

Difficulty Level

Course developers designate the difficulty level for each topic level LO. There are five values for this element: very easy, easy, medium, difficult, very difficult. The developer determines how difficult the LO is for an average learner specified in the Audience Educational Level element.

Typical Learning Time

Course developers designate the approximate or typical time it takes to work with or through this LO for the typical intended target audience. Time is specified in total minutes and/or hours and minutes.

Learning Object Type

Course developers designate the learning object type for each topic level LO. This element describes the nature or genre of the content of the resource. For this element THECB LOR uses The National Science Digital Library (NSDL) controlled vocabulary (see Appendix A).

Instructional Method

Course developers designate the instructional method for each topic level LO Appendix A has a list of terms for this element. Course developers can choose up to several terms applicable to the LO. They also can suggest new terms if they think they will describe the LO better than those included in current instructional method controlled vocabulary.

Technical Requirements

Course developers designate the technical requirements for each topic level LO. Course developers determine what software is needed to use the LO. Appendix A has a list of terms for this element. Course developers need to choose one or few terms applicable to the LO. They also can suggest new terms if required technical component is not on the current controlled vocabulary.

Subjects Terms

Course developers designate subject terms for each topic level LO. Course developers supply THECB LOR team with subject terms describing LOs. Table 4 has an example of subject terms supplied by U.S. History I course developer Dr. Kelly McMichael at the University of North Texas.

UNIT ONE: Colliding Cultures	Lesson Topics	Subject Terms
Introduction to Unit		
Lesson 1: Pre-Columbian America		
	Topic: The Americas Before Columbus	American Indians, Native Americans
	Topic: How did the First People Come to the Americas?	Beringia, Bering Strait, American Indians, Native Americans, Pre-Columbian America
	Topic: Central and South American Indians	Mayas, Aztecs, Incas, human sacrifice, Isthmus of Panama, American Indians, Native Americans, Pre-Columbian America
	Topic: North American Indians	Hopewell, Mississippian, Mogollons, Hohokams, Anasazi, Eastern Woodlands People, mound builders, kivas, American Indians, Native Americans, Pre-Columbian America
	Topic: Summary	American Indians, Native Americans, Pre-Columbian America
Lesson 2: European Exploration and Colonization of the New World		
	Topic: Europe on the Eve of Exploration	Renaissance, Art
	Topic: The Vikings	Vikings, Explorers
	Topic: Changes in Europe	The Crusades, Renaissance, Population Growth, Spices, Art
	Topic: Early Explorers: The Portuguese	Henry the Navigator, caravel, Portuguese exploration, astrolabe, explorers

Table 4: Subject Terms for History Course

The THECB LOR team has arranged a special workflow for metadata creation, where the course developers have an option of inputting content specific metadata directly into the repository. Appendix C demonstrates an example of workflow used with History I course.

Summary

The THECB LOR project is continuing its research and development work, and the guidelines and recommendations in this document reflect our experience with the first phase of our project. The success of the THECB LOR will require a partnership between the THECB LOR staff and the course redesign developers and their staff. We will work individually with each course redesign developer to answer questions, find solutions, and figure out the optimal procedures and processes to get the high-quality course content you are developing into the LOR.

Appendix A: THEBC LOR Metadata

The following lists the currently implemented metadata elements. The THECB LOR staff is currently doing several user studies to determine more exact requirements for needed metadata. Future iterations may expand or reduce the metadata elements needed to represent the LOs appropriately for users.

Metadata Element	Definition	Controlled Vocabulary
Title	A name given to the resource.	
Other Titles	Any form of the title used as a substitute or alternative to the formal title of the resource.	
Authors	An entity primarily responsible for making the content of the resource.	
Author Affiliation	An organization that author has affiliations with.	
Other Contributors	An entity responsible for making significant contribution to the content of the resource.	
Publisher	An entity responsible for the original publication of the resource.	
Metadata Cataloger	The name of the individual responsible for creation of the description (metadata record) of a resource.	
Domain Cataloger	The name of the individual responsible for creation of the description (metadata record) of a resource.	
Subjects	The topic of the resource. Controlled subject term(s) chosen from the THECB LOR Subject Terms.	
Discipline and Sub-Discipline	A particular term within a taxonomy. A taxon is a node that has a defined label or term. A taxon may also have an alphanumeric designation or identifier for standardized reference. Either or both the label and the entry may be used to designate a particular taxon.	
Summary	A summary of the content of the resource in the form of a formal abstract.	
Learning Object's Contents	A list of subunits of the content of the resource.	
Educational Interactivity Type	Predominant mode of learning supported by this learning object.	Active; Expositive; Mixed
Educational Interactivity Level	The degree of interactivity characterizing this learning object. Interactivity in this context refers to the degree to which the learner can influence the aspect or behavior of the learning object.	Very low; Low; Medium; High; Very high
Difficulty Level	How hard it is to work with or through this learning object for the typical intended target audience.	Very easy; Easy; Medium; Difficult; Very difficult
Typical Learning Time	Approximate or typical time it takes to work with or through this learning object for the typical intended target audience.	

Metadata Element	Definition	Controlled Vocabulary
Learning Object Type	The nature or genre of the content of the resource.	Abstract; Annotation; Article; Artifact; Ask-an-Expert; Assessment; Bibliography; Broadcast; Case Study; Clearinghouse; Course Curriculum; Data Set; Demonstration; Experiment; Fiction; Form; Forum; Game; Glossary; Illustration; Instructor Guide; Lesson; Map; Music; Oral History; Periodical; Photograph; Portal; Presentation; Problem Set; Project; Reference; Remotely Sensed Imagery; Report; Simulation; Study Guide; Syllabus; Textbook; Thesis; Tutorial; Field Trip; Weblog
Instructional Method	A process, used to engender knowledge, attitudes and skills, that the resource is designed to support.	Assessment Item; Activity Exercise; Case Study; Computer-Based Tutorial Instruction; Computer simulations; Course Lecture Presentation Notes; Cooperative learning; Demonstrations; Curriculum Syllabus; Discussions; Examination Test; Experiential learning; Glossary; Interdisciplinary; Learning Module; Lecture Presentation; Multiple activities; Multimedia instruction; Project-based learning; Role playing; Games; Simulations; Student Success guide; Teaching guide; Podcast; Vodcast; Visual instruction
Audience Educational Level	A general statement describing the education or training context. Alternatively, a more specific statement of the location of the audience in terms of its progression through an education or training context.	Undergraduate (Lower Division); Undergraduate (Upper Division); Graduate
Date Published	Date of acceptance of the resource (e.g. of thesis by university department, of article by journal, etc.).	
Extent	The size or duration of the resource.	
Medium	The material or physical carrier of the resource.	
Technical Requirements	The technical capabilities necessary for using this learning object.	Flash; Real Player; Quick Time; Shockwave; Acrobat Reader; Windows; Media Play

Metadata Element	Definition	Controlled Vocabulary
Identifier	An unambiguous reference to the resource within a given context.	
Language	A language of the intellectual content of the resource.	English; Spanish; German; French; Italian; Japanese; Chinese; Other
Creation and Ownership Information	A statement of any changes in ownership and custody of the resource since its creation that are significant for its authenticity, integrity and interpretation.	
Intellectual Property Rights	A statement of any changes in ownership and custody of the resource since its creation that are significant for its authenticity, integrity and interpretation.	
Access Rights	A statement of any changes in ownership and custody of the resource since its creation that are significant for its authenticity, integrity and interpretation.	
Right License	A legal document giving official permission to do something with the resource.	
Rights Holder	A person or organization owning or managing rights over the resource.	
Course Structure	The described resource is physical or logical part of the referenced resource.	
Media Format	The physical or digital manifestation of the resource. Typically, Format may include the media-type.	Audio; Video; Text; Multimedia
IMS Content Package	A reference to a related resource.	
Title	The title of the IMS content packages name.	
Learning Object Description	A reference to a related LOs.	

Appendix B: Logical Structure of U.S. History I Course

U.S. History I Course Structure

This document provides an outline of the structure and content this U.S. History I course designed and developed by Dr. Kelly McMichael, Center for Teaching, Learning, and Assessment at the University of North Texas. A document similar to this will be needed by the THECB LOR staff when working with the redesigned courses.

UNIT ONE: Colliding Cultures	Lesson Topics	Assessment
Introduction to Unit		Midterm exam for units 1 and 2
Lesson 1: Pre-Columbian America		Lesson Quiz
	Topic: The Americas Before Columbus	
	Topic: How did the First People Come to the Americas?	
	Topic: Central and South American Indians	
	Topic: North American Indians	
	Topic: Summary	
Lesson 2: European Exploration and Colonization of the New World		Lesson Quiz
	Topic: Europe on the Eve of Exploration	
	Topic: The Vikings	
	Topic: Changes in Europe	
	Topic: Early Explorers: The Portuguese	
	Topic: The Voyages of Christopher Columbus	
	Topic: Spanish Exploration	
	Topic: Biological Exchange	
	Topic: Challenges to Spain's Empire	
	Topic: English Colonization and Exploration	
	Topic: English Dominance in North America	
	Topic: Jamestown	
	Topic: Summary	
Lesson 3: The New World and the Old		Lesson Quiz
	Topic: Spain's Empire	
	Topic: The Protestant Reformation	
	Topic: The Reformation Spreads to England	
	Topic: Puritans in the New World	
	Topic: Dissent in the Colony	
	Topic: Summary	

UNIT ONE: Colliding Cultures	Lesson Topics	Assessment
Lesson 4: The Colonial Experiment		Lesson Quiz
	Topic: The Colonial Experiment	
	Topic: The Middle Colonies	
	Topic: The Northern Colonies	
	Topic: The Southern Colonies	
	Topic: Slavery in the Colonies	
	Topic: The Middle Passage and Slave Agency	
	Topic: Colonial Cities	
	Topic: The Enlightenment	
	Topic: The Great Awakening	
	Topic: Summary	

UNIT TWO: Colonization and Revolution	Lesson Topics	Assessment
Introduction to Unit Two		Midterm Exam for Units 1 and 2
Lesson 5: The English Empire		Lesson Quiz
	Topic: English Administration of the Colonies	
	Topic: Mercantilist System	
	Topic: Consolidating Royal Power	
	Topic: Colonial Governments	
	Topic: Imperial Warfare	
	Topic: French and Indian War	
	Topic: Summary	
Lesson 6: The Revolution		Lesson Quiz
	Topic: Colonies on Eve of Revolution	
	Topic: Roots of Revolution	
	Topic: Colonials Grew Suspicious	
	Topic: Building Colonial Unity	
	Topic: American Rights	
	Topic: The American Revolution	
	Topic: Was it a Real Revolution?	
	Topic: Summary	
Lesson 7: Creating the United States		Lesson Quiz
	Topic: Shaping a Union	
	Topic: The Federal Union	
	Topic: The Philadelphia Convention	
	Topic: The U.S. Constitution	
	Topic: Ratifying the Constitution	
	Topic: The Federalists	
	Topic: Problems Facing the New Country	

UNIT TWO: Colonization and Revolution	Lesson Topics	Assessment
	Topic: Republicans	
	Topic: Foreign Crises	
	Topic: Partisan Politics	
	Topic: Summary	
Lesson 8: Change of Power		Lesson Quiz
	Topic: From Federalism to Republicanism	
	Topic: Revolution of 1800	
	Topic: The Louisiana Purchase	
	Topic: Foreign Crisis and the Embargo of 1807	
	The Election of James Madison	
	Topic: War of 1812	
	Topic: Era of Good Feeling	
	Topic: Significant Supreme Court Decisions	
	Topic: Monroe Doctrine	
	Topic: Summary	

UNIT THREE: A New Nation Emerging	Lesson Topics	Assessment
Introduction to Unit		Final Exam for Units 1,2,3, and 4
Lesson 9: The Growing Nation		Lesson Quiz
	Topic: The Government and the Market	
	Topic: The American System	
	Topic: Cotton and the Economy	
	Topic: Westward Movement	
	Topic: Changes in Transportation	
	Topic: Industrial Revolution	
	Topic: Urbanization	
	Topic: Immigration	
	Topic: Labor Organizations	
	Topic: Summary	
Lesson 10: Rise in Democracy		Lesson Quiz
	Topic: Democracy in the Age of Jackson	
	Topic: Election of 1824	
	Topic: The Presidency of John Quincy Adams	
	Topic: Rise of Mass Democracy	
	Topic: The Presidency of Andrew Jackson	

UNIT THREE: A New Nation Emerging	Lesson Topics	Assessment
	Topic: Nullification Crisis	
	Topic: Bank War	
	Topic: Election of 1832	
	Topic: Jackson's Indian Policy	
	Topic: Jacksonian Democracy	
	Topic: The Presidency of Martin Van Buren	
	Topic: Summary	
Lesson 11: American Society and Culture		Lesson Quiz
	Topic: Reform Movements	
	Topic: Second Great Awakening	
	Topic: Women and Reform	
	Topic: Moral Reform	
	Topic: Social Reform	
	Topic: True Womanhood	
	Topic: Woman's Property Rights	
	Topic: Radical Reform	
	Topic: Women and Anti-Slavery Societies	
	Topic: Woman's Rights Movement	
	Topic: Seneca Falls Convention, 1848	
	Topic: Leaders Emerge	
	Topic: African American Women and Woman's Rights	
	Topic: Utopian Movement	
	Topic: American Renaissance	
	Topic: Summary	
Lesson 12: Manifest Destiny		Lesson Quiz
	Topic: America Expanding	
	Topic: The Federal Government and the West	
	Topic: The Journey West: Oregon and California	
	Topic: The Journey West: Texas	
	Topic: Election of 1844	
	Topic: Mexican-American War	
	Topic: Summary	

Appendix C: Metadata Creation Workflow for of U.S. History I Course

As part of the research and development in the current phase of the THECB LOR, the project team will be examining various workflows for optimal and efficient submission of items into the repository. In the work with the U.S. History I course, we established a workflow (using functions available in DSpace) to divide the metadata creation process between the Metadata Experts (Library and Information Science students) and the Domain Experts (U.S. History students).

In this workflow, the Metadata Experts initiated the submission of an item into the repository, creating some of the metadata and submitting the item into the repository. The Domain Experts were then notified by the system, and proceeded to complete the metadata creation by providing appropriate data for the more educationally related elements. Domain Experts could also initiate the submission process.

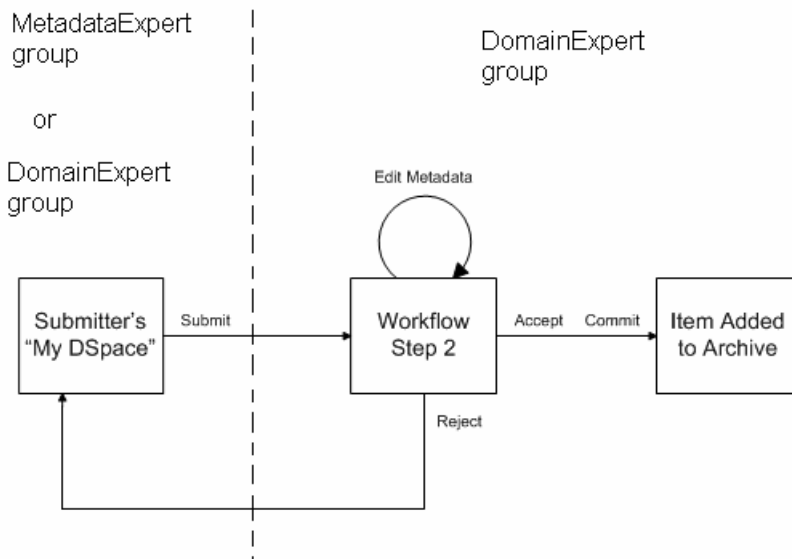


Figure 1. Workflow

When the repository receives a submission, workflow step 2 is invoked, and the Domain Expert group is notified via email. Also, members of the Domain Expert group will see new submissions in their My Dspace page as shown on Figure 2. At this point a task is waiting in the pool until processed by any member of the Domain Expert group.

[DSpace 1: THECB Learning Object Repository](#) >

My DSpace: Name Here

[Help...](#)

Tasks in the Pool

Below are tasks in the task pool that have been assigned to you.

Task	Item	Submitted To	Submitted By	
Check Submission	North America Map	H. Free-Standing Learning Objects	Name Here	<input type="button" value="Take Task"/>
Check Submission	North American Indians	F. Course Topics	Name Here	<input type="button" value="Take Task"/>
Check Submission	Colliding Cultures	D. Course Units	Name Here	<input type="button" value="Take Task"/>

[See Your Subscriptions](#)

Figure 2. Task Pool

One member of Domain Expert group takes the task from the pool, and the task is then removed from the task pool, to avoid the situation where several people in the group may be performing the same task without realizing it. The member of the group who has taken the task from the pool may:

- edit metadata provided by the user with the submission, but cannot change the submitted files.
- accept submission for inclusion, or reject submission (Figure 4).

If you have reviewed the item and it is suitable for inclusion in the collection, select "Approve".	<input type="button" value="Approve"/>
If you have reviewed the item and found it is not suitable for inclusion in the collection, select "Reject". You will then be asked to enter a message indicating why the item is unsuitable, and whether the submitter should change something and re-submit.	<input type="button" value="Reject"/>
Select this option to correct, amend or otherwise edit the item's metadata.	<input type="button" value="Edit Metadata"/>
If you wish to leave this task for now, and return to your "My DSpace", use this option.	<input type="button" value="Do Later"/>
To return the task to the pool so that another user can perform the task, use this option.	<input type="button" value="Return Task to Pool"/>

Figure 4. Workflow Step 2 Options

If a submission is rejected, the reason (entered by the workflow participant) is e-mailed to the submitter, and it is returned to the submitter's 'My DSpace' page. The submitter can then make any necessary modifications and re-submit, whereupon the process starts again.

If a submission is 'accepted', it is passed to the next step in the workflow -- the submission is installed in the main archive.