

SREB

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Evaluation Criteria for SREB-SCORE Learning Objects

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592 10th St. N.W.
Atlanta, GA 30318
(404) 875-9211
www.sreb.org

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Introduction

SREB-SCORE (Sharable Content Object Repositories for Education) is an initiative of the Southern Regional Education Board to help SREB states improve teaching and learning and achieve cost savings through the use of shared digital learning content. Through SREB-SCORE, participating SREB state educational agencies, schools, colleges and universities will work together over the long term to create quality digital learning content and share it through state “repositories” (databases). When fully implemented, SREB-SCORE will make it easy for teachers and faculty across the region to use digital learning content to customize, share and enhance the quality of their courses.

SREB has developed this document to help participating state agencies review and confirm the quality of digital learning content. Following this initial review and additional steps in the confirmation process, digital learning content will be deposited in state repositories that all participating states can access through a centralized SREB-SCORE catalog. These modular pieces of course content — known as learning objects — will then be available for teachers and faculty to use to improve the quality of their courses.

What is a learning object? In preliminary stages of SREB-SCORE development, this definition of a learning object was crafted and agreed upon by participating institutions:

Learning objects are digital learning content that can be used and reused for teaching and learning. They are modular, flexible, portable, transferable (interoperable) and accessible. Learning objects may be used to teach a particular skill or concept, or to provide stimulating thinking and learning experiences for the teacher or student. A learning object, as defined by SREB-SCORE, includes digital learning content, practice activities and assessment tools that are linked to one or more educational objectives and classified in a plan that allows information about the content to be stored and retrieved (metadata schema).

For teaching and learning purposes, effective learning objects are documents, graphics, simulations, video, sound and other media tools that go beyond static textbook presentations to engage students in real-world content.

While SREB-SCORE supports this definition, it is recognized that users of digital learning content will place other resources in SREB-SCORE repositories in addition to those described above. Digital learning content comes in many forms, from finished course modules to the ancillary resources used to create them. For more information about the categories of digital learning content, including those that SREB-SCORE has identified, see Appendix A.

Criteria for Evaluating SREB-SCORE Learning Objects

- **Content Quality** — *The content is accurate and grammatically correct, and the scope is sufficient for the intended use.*
 - The content is accurate.
 - The writing is clear and concise.
 - Course materials are free of errors.
 - The writing is fair and unbiased, and it conveys no overt or implied bias.
 - The content is sequenced logically and effectively.
 - The scope of the content is appropriate as a learning object, is targeted, and provides the content and learning experiences needed to achieve the learning outcomes.
 - The activities are sufficient in number and scope to support the targeted outcomes.
 - The content has been reviewed by an external subject-matter expert in addition to the developer.

- **Learning Goal Alignment** — *Learning goals and objectives are provided to outline learning expectations and are applicable and relevant to the subject matter and the audience.*
 - The learning goals are appropriate to the intended learning outcomes.
 - The learning objectives are clearly or explicitly stated, either within content accessed by the learner or in the metadata (the information about a digital object that enables it to be retrieved from a database).
 - The learning goals/objectives, content, and learning and evaluation activities are consistent.

- **Feedback** — *Learners are provided with constructive, relevant and frequent feedback based on their activities within the learning object.*
 - Feedback supports positive learning outcomes.
 - Learners are provided with timely, corrective responses and feedback when asked to complete computations, answer questions or provide information.
 - Feedback uses language that encourages student learning and effort.
 - Feedback compares learner performance with the applicable criteria, illustrates performance results and explains how performance can be improved.

- **Motivation** — *The learning environment is engaging, interactive and relevant to the intended learner.*
 - The learning environment provides appropriate and engaging learning opportunities for the student.
 - Feedback informs learners of their level of competence and success relative to the learning goals/objectives of the learning object.
 - The learning object is designed to offer the opportunity to build new knowledge, understanding or skills.
 - The learning object provides true-to-life learning activities, multimedia, interactivity, humor, or game-like challenges whenever possible.
 - The learning object provides realistic expectations and standards for success.
 - Learners are given adequate directions and support to engage successfully in the learning object activities.

- **Presentation Design** — *Visual and auditory information enhances and facilitates learning.*
 - Universal Design for Learning¹ principles (usable regardless of age, ability or situation) are employed.
 - The learning object content and design are attractive and appropriate for the students.
 - The design is clear, consistent and provides instructions for navigation and interaction that are appropriate.
 - Graphic elements have clear instructional purposes.
 - Content can be viewed with minimal scrolling.
 - The presentation design is applied consistently within each learning object.

- **Interface Usability** — *The ease of navigation, predictability and quality of the interface enhance the learner's experience.*
 - Interface elements implicitly show learners how to interact with the object, or clear instructions guiding use are provided.
 - The interface is consistent and predictable.
 - Common elements, navigational buttons and text are placed consistently.
 - Interface actions and elements are consistent with directions that are clear and concise.
 - The progress of file loading and downloading is graphically or textually displayed.
 - Navigation provides users a way to return to the start menu, navigate within and exit from the learning object.

¹ Universal Design for Learning principles can be viewed at <http://www.cast.org/research/udl/index.html>.

- If animation or audio and video components are present, user control is allowed. If the medium is designed to play automatically, the user can replay, stop and control volume.
 - Appropriate file formats are provided to accommodate various download speeds.
 - Hyperlinks or buttons function correctly.
- **Accessibility** — *The learning object provides accommodation for learners with sensory and/or motor disabilities.*
- As appropriate, learning objects should be assessed to determine conformance with the WAI Priority 1 (Web Accessibility Initiative²) specification checkpoints for accessibility.
 - If certain technologies used to develop content in learning objects are not accessible, the areas of inaccessibility should be noted in the metatagging.
- **Reusability** — *The learning object can be used in varying learning contexts with learners from diverse backgrounds.*
- The learning object consists of one or more self-contained learning experiences, each addressing a single topic or learning objective and structured as a stand-alone resource.
 - Software requirements are identified and, preferably, are available at no cost.
 - Learning objects are standards-based. (See Standards Compliance criteria below for minimum requirements.)
 - The learning object contains all of the resources necessary to complete the activity.
 - External contextual dependencies (e.g., textbooks, references and resources) are avoided. The content does not refer to a specific course, module or page.
- **Standards Compliance** — *The learning object supports international standards and specifications.*
- The SREB-SCORE adopted metadata are provided in tagged code within the object and are available to users.
 - The learning object conforms to the IMS Global Learning Consortium's Content Packaging Specification³ or SCORM⁴.

² Web Accessibility Initiative information can be viewed at <http://www.w3.org/WAI/>.

³ The IMS Global Learning Consortium's Content Packaging Specification can be viewed at <http://www.ims-global.org/content/packaging/>.

⁴ Information on SCORM can be viewed at <http://www.adlnet.gov/scorm/index.aspx>.

■ **Intellectual Property and Copyright** — *The learning object metadata address the rights of the owner and the conditions for use.*

- Permission to use copyrighted materials has been obtained.
- All quoted materials are cited correctly by adhering consistently to one of the commonly accepted styles for citations.
- Use is allowed according to element (6.0) in SREB-SCORE Learning Object Metadata, including rights for aggregation, disaggregation or modification.
- Full contact information for the copyright holder or learning object owner is provided.
- If the content is developed and owned by the person submitting the learning object, a Creative Commons⁵ or similar license is attached.
- If the learning object contains third-party intellectual property that is developed and owned by the submitter's institution or system, and written permission was obtained to publish and share that content in perpetuity, a copy of the license or permission letter is attached.
- If the learning object contains third-party intellectual property within the public domain, a justification for attributing the intellectual property to the public domain, the date of development, and the person or entity that developed it is attached.
- If the learning object contains third-party intellectual property for which a Creative Commons license or similar model was obtained from the copyright holder, a copy of the license is attached.
- If the learning object contains third-party intellectual property for which permission was obtained from the copyright holder to publish and share that content in perpetuity, a copy of the license is attached.
- If the learning object references third-party content that does not allow for free sharing, the following is attached in the metadata:
 - ◆ a non-reproducible copy of the work (i.e., streaming media, PDF with full protection or a low-resolution thumbnail image);
 - ◆ complete, current contact information for the copyright holder; and
 - ◆ current costs, terms and conditions of licensing.

This information should be updated annually and tagged in the metadata, stating that permission is required.

⁵ Creative Commons information can be viewed at <http://creativecommons.org/>.

Additional Resources

Academic ADL Co-Lab, University of Wisconsin System. *Pedagogical and Economic Effectiveness of Sharable Content Objects in Online Instruction*. 2006 — <http://www.academiccolab.org/resources/documents/FIPSEFinalReport-013006.pdf>.

This project's primary importance is documenting the SCO (sharable content object) development processes; in particular, production procedures, application of standards and quality assurance practices.

Association for Advancement of Computing in Education. *Learning Objects 2003 Symposium: Lessons Learned, Questions Asked*. Honolulu, Hawaii, June 24, 2003 — <http://www.aace.org/conf/edmedia/LO2003Symposium.pdf>.

This is a compilation of papers submitted for the AACE Learning Objects 2003 Symposium.

Beck, Robert J. "Learning Objects," Center for International Education, University of Wisconsin-Milwaukee. Milwaukee, 2007 — <http://www.uwm.edu/Dept/CIE/AOP/learningobjects.html>.

This Web site is designed to introduce the subject of learning objects. It offers several characterizations of "learning objects"; links to "Global Studies" learning objects, other learning objects, collections of learning objects, and key organizations associated with learning objects and metadata; and a select bibliography.

CAREO - Campus Alberta Repository of Educational Objects — <http://careo.ucalgary.ca/cgi-bin/WebObjects/CAREO.woa?theme=careo>.

"The CAREO educational object repository is an ongoing research prototype supported by Alberta Learning and CANARIE that has as its primary goal the creation of a searchable, Web-based collection of multidisciplinary teaching materials for educators across the province and beyond."

DLESE (Digital Library for Earth Science Education). "Reviewed Collection (DLESE Reviewed Collection) best practices" — <http://www.dlese.org/Metadata/collections/drc-best-practices.htm>.

"The purpose of this document is to provide guidelines or best practices with respect to criteria set forth in the 'DLESE Accessioning and Deaccessioning Policy,' for the guidance of resource creators, reviewers and collection builders."

eLera (E-Learning Research and Assessment Network) — <http://www.lera.net/eLera/Home>.

"eLera provides tools and information for learning object evaluation and research, maintains a database of learning object reviews, and supports communication and collaboration among researchers, evaluators and users of online learning resourceseLera complies with the IEEE learning object metadata standards as interpreted by the CanCore guidelines."

Haughey, Margaret and Bill Muirhead. *Evaluating Learning Objects for Schools*. University of Alberta and University of Ontario Institute of Technology, 2005 — http://www.usq.edu.au/electpub/ejist/docs/vol8_no1/fullpapers/eval_learnobjects_school.htm.

“This paper describes the developments in the K-12 sector, the arguments around learning object characteristics and the development of an assessment profile.”

Knowledge Media Laboratory of the Carnegie Foundation for the Advancement of Teaching. “A KEEP Toolkit Case Study: Promoting Use of MERLOT Learning Objects by Sharing Authors’ and Users’ Pedagogical Knowledge and Experience.” *Journal of Online Learning and Teaching*, July 2005 — http://jolt.merlot.org/vol1_no1_iiyoshi.htm.

“In a pilot effort between Carnegie Foundation and MERLOT, selected authors and users of online learning resources created succinct and engaging online representations, called ‘snapshots,’ that reflect on their pedagogy as well as provide potential users with guidance on how they might adopt the materials for their own use.”

“Learning Object Tutorial.” EduWorks Corporation — <http://www.eduworks.com/LOTT/Tutorial/>.

This tutorial was created for Learning Object Trick-or-Treat, a Techlearn 2001 event in which participants find learning objects (SCOs) in a virtual pumpkin patch, create a content package by adding their own SCO, and load and launch the package in an LMS.

Masie Center eLearning Consortium. *Making Sense of Learning Specifications & Standards: A Decision Maker’s Guide to their Adoption, 2nd edition*. November 2003 — http://www.masie.com/standards/s3_2nd_edition.pdf.

This updated guide to specifications and standards for learning objects was originally created by the S3 working group, convened in 2001 by The Masie Center.

MERLOT. “Evaluation Criteria for Peer Reviews” — <http://taste.merlot.org/evaluation/criteria.html>.

This Web page presents MERLOT’s evaluation standards for its peer reviews of the learning resources that are in its catalog.

Mortimer, Lori. *(Learning) Objects of Desire: Promise and Practicality*. Learning Circuits, April 2002 — <http://www.learningcircuits.org/2002/apr2002/mortimer.html>.

This discussion examines the learning object concept and the technologies and standards that define, create and use it.

National Science Digital Library Collection Development Policy — <http://collections.comms.ndl.org/cgi-bin/wiki.pl?SelectionCriteriaandQualityIssues>.

“This is a discussion document outlining the selection criteria for resources added to the NSDL Collection and quality issues that may arise concerning these resources.”

Nesbit, John, Karen Belfer and John Vargo. *A Convergent Participation Model for Evaluation of Learning Objects*. Canadian Journal of Learning and Technology. Volume 28(3) Fall/automne, 2002 — http://www.cjlt.ca/content/vol28.3/nesbit_etal.html.

“This article proposes a convergent participation model for learning object evaluation in which representatives from stakeholder groups converge toward more similar descriptions and ratings through a two-stage process supported by online collaboration tools.”

Nesbit, John C. and Jerry Li. *Web-Based Tools for Learning Object Evaluation*. School of Interactive Arts & Technology, Simon Fraser University, 2004 — http://www.sfu.ca/~jzli/publications/Nesbit_Li_2004.pdf.

“This paper reviews current approaches to learning object evaluation and introduces eLera, a set of Web-based tools developed for communities of teachers, learners, instructional designers and developers.”

Queensland, Australia Department of Education, Training and the Arts. “Curriculum Exchange” — <http://education.qld.gov.au/learningplace/cx/>.

This article describes the selection process for resources that are included in the Curriculum Exchange.

Reusable Learning — <http://www.reusablelearning.org/index.asp?id=2>.

The Reusable Learning Project’s goal is to increase the value and impact of digital learning resources by making them easier to reuse — or to modify for reuse — in multiple contexts and in multiple learning environments.

SMETE Digital Library — <http://www.smete.org/smete/>.

“The SMETE Digital Library is an online library and portal of services by the SMETE Open Federation for teachers and students. In the library users can access teaching and learning materials as well as join their expanding community of science, math, engineering and technology explorers of all ages.”

Wisconsin Online Resource Center. “Quality Standards.” — <http://www.wisconline.com/members/resources/QualityStandards.asp>.

This article presents standards for learning objects to be included in Wisc-Online’s resources.

Wright, Clayton R. *Criteria for Evaluating the Quality of Online Courses*. Instructional Media and Design, Grant MacEwan College — <http://www.imd.macewan.ca/imd/content.php?contentid=36>.

The criteria presented in this guide were developed to assist educators in evaluating the effectiveness of online courses; they may be used as guidelines for course developers.

Zhu, Erping, Roberta McKnight and Nancy Edwards. *Principles of Online Design*. Florida Gulf Coast University, 2007 — <http://www.fgcu.edu/onlinedesign/index.html>.

The purpose of this document is to provide a resource to faculty who are designing online instructional materials.

Appendix A

Digital learning resources are categorized by their size, complexity and ability to be aggregated or disaggregated. The four categories identified by SREB-SCORE are listed below from largest to smallest:

- **Assets** are electronic representations of media, text, images, sounds, Web pages and other pieces of data that can be delivered via the Internet. Assets, like the learning objects in which they appear, are highly reusable. In order to be reused, assets are described using metadata so that they are both searchable and discoverable in online content repositories.

- An **Information Object** may be composed of assets that focus on a single piece of information. Examples of information objects are pieces of digital learning content that:
 - illustrate a principle;
 - explain a concept; and
 - describe a process.

Single exercises often are considered to be information objects.

- **Learning Objects** may be assembled using assets and information objects to teach a single concept or lesson. Learning objects are digital learning content that can be used and reused for teaching and learning, and they possess other adaptable characteristics that extend many learning activities. They are modular, flexible, portable, transferable (interoperable) and accessible. Learning objects may be used to teach a particular skill or concept, or to provide stimulating thinking and learning experiences for the teacher or student. Examples of learning objects are:
 - objectives;
 - assessments;
 - practices; and
 - concepts.

This document establishes criteria for evaluating learning objects.

- A **Learning Component** is a generic term for lessons, modules and courses that typically have multiple learning objectives. These components can be disaggregated into reusable learning objects. It has become increasingly apparent in the K-12 virtual school community that the sharing of full courses is a priority. This type of resource will facilitate these initiatives. For evaluation criteria, SREB has developed guidelines for course quality. See *Standards for Quality Online Courses* at www.sreb.org.

