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Best Practices for Educational Resources Submitted for the DLESE Reviewed Collection

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INTRODUCTION:

The Digital Library for Earth System Education (DLESE) includes a "Broad Collection" of resources which meet minimum standards of relevance and appropriateness, and a "Reviewed Collection" of resources which have been more stringently reviewed.

The DLESE Collections Subcommittee has defined a set of seven selection criteria by which resources will be judged for inclusion in DLESE's Reviewed Collection:

- o Scientifically accurate
- o Importance or significance
- o Pedagogical effectiveness: has student learning occurred?
- o Well-documented
- o Ease of use for students and faculty
- o Power to inspire or motivate students
- o Robustness/sustainability as a digital resource

The purpose of this document is to provide guidelines or best practices with respect to these seven selection criteria, for the guidance of both resource creators and reviewers/editors.

Please Comment

1. PEDAGOGICAL EFFECTIVENESS

1a. DLESE best practice is that the review for pedagogical effectiveness should include feedback from educators who have observed learners interacting with the resource and/or feedback from learners who have learned by using the resource.

1b. The instructional time required for use of the resource is commensurate with the importance and magnitude of the learning achieved.

1c. The level of difficulty of the resource is appropriate for the target audience.

1d. Student learning achieved by use of this resource is assessable. DLESE best practice is to include assessment opportunities with or within the resource, together with assessment guidance to teachers such as answer key or scoring rubric.

(Note: this criterion especially needs more thought and input. In developing the DLESE Collection Scope statement, the founders of DLESE explicitly chose to avoid endorsing any specific pedagogical approach or philosophy.)

Please Comment

2. IMPORTANCE/SIGNIFICANCE

2a. A resource for the DLESE Reviewed Collection should deal with content or skills or understandings that are likely to be important to a significant fraction of the teachers and learners in the DLESE community.

2b. Best practice is that the resource should indicate why the learning made possible by the resource is important or significant. Possible reasons could include:

- o the resource supports learning that is called for in national or state educational standards
- o the resource supports learning on a topic of societal importance
- o the resource supports mastering of foundational skills needed for advancement in a discipline or career
- o the resource supports understanding of a concept which is central to a discipline of Earth or environmental science
- o the resource supports understanding of linkages and interactions between or within portions of the Earth system
- o other compelling reason, as articulated in the resource

Please Comment

3. WELL - DOCUMENTED

(The "Well-documented" criterion covers both information in the DLESE metadata catalog and information in the resource itself.)

3a. Metadata (in the DLESE catalog):

- o All of the DLESE "Required" metadata fields must be complete in the DLESE metadata catalog: Title, Description, Subject, URL, Technical Information, Resource Type, Audience, Copyright, Name and contact information for the resource creator, publisher and/or contact person.
- o Best practice is that the "Robust" metadata fields should also be complete in the DLESE metadata catalog. As of February 2003, these include: Spatial and temporal coverage, science standards, geography standards, relationship between resources.
- o For further information see the DLESE metadata website: http://www.dlese.org/Metadata/main/levels.htm

3b. Technical documentation (in the resource):

- o Hardware needed to use this resource
- o Software, including plug-ins, needed to use this resource; links or contact information to acquire such software
- o Any known hardware or software incompatibilities
- o (for software or complex resources) A clear and comprehensive user's guide.

3c. Practical documentation (in the resource):

- o Materials list; links or contact information to acquire uncommon materials
- o Safety precautions
- o (for labs, activites, etc.) Estimate of time required

3d. Pedagogical Documentation (in the resource):

- o Skills and understandings needed prior to doing activity
- o Age or educational level for which resource is recommended
- o Learning objectives
- o Commonly observed mistakes or misconceptions
- o Notes on instructional strategies

3e. Scientific Documentation (in the resource):

- o Reference list or Bibliography
- o Links to related websites

3f. Data Documentation (for resources containing data) (in the resource):

- o Basic information about the instrument which collected the data and how it works (or links to such information)
- o (for individual data sets) When and where the data was collected
- o (for derived data products or merged data sets) Link to data archive or other source of description about how data were processed or merged.

Please Comment

4. SCIENTIFIC ACCURACY

4a. DLESE best practice is that the review for scientific accuracy should be made by a scientist who is a specialist in this field.

4b. Any errors of fact identified in the science review process must be revised before the resource can be admitted to the Reviewed Collection.

4c. To help learners and teachers understand the reliability of the various parts of the resource, the resource should distinguish between what is observation/fact and what is interpretation/hypothesis, and should identify assumptions.

Please Comment

5. EASE OF USE FOR TEACHERS AND LEARNERS

5a. Navigation pathways within the resource should be self-evident and intuitive.

5b. Preparation time and effort required by the teacher should not be excessive, relative to the educational potential of the resource.

5c. DLESE best practice is to present resources in ways that ease the process of adapting to students' and teachers' individual differences, interests, abilities, and needs. Examples include:

- o providing teacher-editable versions of student hand-outs, e.g. Word versions as well as .pdf's
- o providing several levels of difficulty or complexity in student activities
- o providing links to maps or local data sets for use in for different localities

Please Comment

6. INSPIRATIONAL/MOTIVATIONAL FOR LEARNERS

6a. DLESE best practice is that the review for inspirational/motivational should include feedback from educators who have observed learners interacting with the resource and/or feedback from learners who have learned by using the resource.

6b. Reviewed Collection resources should inspire or motivate learners to:

- o show curiosity about the topic of the resource: ask questions, seek out further information
- o perform at a high level, do their personal best work.

Please Comment

7. ROBUSTNESS AS A DIGITAL RESOURCE

7a. DLESE best practice is that a resource should work on current versions of major Web browsers, under operating systems widely used in educational settings. Currently, this would mean Netscape and Explorer, Windows and Mac OS. Any exceptions should be noted in the documentation.

7b. Resources should not be admitted to the DLESE Reviewed Collection if they have conspicuous non-working elements: e.g. links that don't work, graphics that don't display, applets that don't run.

7c. Text and graphic elements of the resource should be printable.

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