CanCore Guidelines Version 2.0: Classification Category

History of Classification Category Document

Date	Version	Comment	Person
June 6, 2002	1.1	Based on IMS Learning Resource Meta-data 1.2.1	Sue Fisher
March 7, 2003	1.7	Preliminary Revisions	Scott Habkirk
June 23, 2003	1.8	Based on IEEE 1484.12.1 LOM	Norm Friesen
August 8, 2003	1.9	Feedback incorporated; examples added	Norm Friesen
November 23, 2003	2.0	Final revisions incorporating feedback	Norm Friesen

Use of Classification Category Elements in Other Application Profiles

Element	CanCore	SCORM	Curriculum Online	TLF	Sing-CORE	UK LOM Core	Dublin Core
9:Classification	Y	M	M	N	Y	O	DC.Subject*
9.1:Purpose	Y	M	M	N/A	Y	O	
9.2:Taxon Path	Y	O	M	N/A	Y	O	
9.2.1:Source	Y	O	M	N/A	Y	O	
9.2.2:Taxon	Y	O	M	N/A	Y	O	
9.2.2.1:Id	Y	O	M	N/A	Y	O	
9.2.2.2:Entry	Y	O	O	N/A	Y	O	
9.3:Description	N	M	O	N/A	Y	O	
9.4:Keyword	Y	M	O	N/A	Y	O	

*when 9.1:Purpose equals Discipline (or Idea)

Legend

Y = Yes, Included in Subset
O = Optional
N = No, Not Included in Subset
N/A = Not Applicable
M = Mandatory
DC = Dublin Core

9:Classification

Explanation	*Size*	*Order*	*Value Space*	*Datatype*
This category describes where this learning object falls within a particular classification system. To define multiple classifications there may be multiple instances of this category.	Smallest permitted maximum: 40 items	Unordered	-	-

Use the Classification category to describe the learning resource from different perspectives or for different purposes using named classification systems (e.g., Dewey Decimal Classification or US Classification of Instructional Programs).

The 9:Classification element category is sophisticated and complex, providing elements for identifying and describing the purpose of the classification, the source, the taxonomic value, and the identifier associated with the classification. It also allows for keyword and free text descriptions that can be attributed and qualified much more effectively than is possible with 1.4:General.Description and 1.5:General.Keyword.

The sub-elements in this category are:

9.1:Purpose
9.2:Taxon Path
9.2.1:Source
9.2.2:Taxon
9.2.2.1:Id
9.2.2.2:Entry
9.3:Description
9.4:Keyword

Elements listed in **bold** are included in the CanCore element application profile.

- The 9:Classification element category can be used to accommodate existing or legacy subject classification.
- The 9:Classification element category should be repeated for each unique classification type or function identified in 9.1:Purpose.
- An instance of the 9:Classification element category can be used in one (or a combination) of the following three ways:
  - 9.2:Taxon Path and its sub-elements can be used to accommodate an identified taxonomy or classification system for a stated classification purpose.
  - 9.3:Description can be used to accommodate a textual description for a stated classification purpose.
  - 9.4:Keyword can be used to accommodate one or more terms for a stated classification purpose.

Examples

- Purpose: Source: LOMv1.0
  Value: discipline
  TaxonPath: Source: DCC NLC-BNC http://www.nlc-bnc.ca/caninfo/
  Taxon:
  Id: 6
  Entry: Technology

- An example of a local implementation (Alberta Learning) using the LOM vocabulary for purpose, and a locally developed taxonomy. The 6 entries in the TaxonPath are indicated here by indentations.

  Purpose: educational objective
  TaxonPath: Source: Alberta Learning Outcomes 2
  Taxon Entry: Science
  Grade 12
  Physics 30
  Electric Forces and Fields
  Major Concept - Coulomb's law relates electric charge to electric force
  Knowledge - Students should be able to demonstrate an understanding that: Coulomb's law explains the relationships among force, charge and separating distance by explaining, quantitatively, using Coulomb's law and vectors, the electrostatic interaction between discrete point charges

XML Examples

```
<classification>
  <purpose>
    <source>LOMv1.0</source>
    <value>discipline</value>
  </purpose>
  <taxonpath>
    <source>
      <string language="eng">DDC NLC-BNC http://www.nlc-
      bnc.ca/caninfo</string>
    </source>
    <taxon>
      <id>6</id>
      <entry>
        <string language="eng">Technology</string>
      </entry>
```

```
      </taxon>
    </taxonpath>
  </classification>

  <classification>
    <purpose>
      <source>LOMv1.0</source>
      <value>educational objective</value>
    </purpose>
    <taxonpath>
      <source>
        <string language="eng">Alberta Learning Outcomes
        2</string>
      </source>
      <taxon>
        <entry>
          <string language="eng">Science</string>
        </entry>
      </taxon>
      <taxon>
        <entry>
          <string language="eng">Grade 12</string>
        </entry>
      </taxon>
      <taxon>
        <entry>
          <string language="eng">Physics 30</string>
        </entry>
      </taxon>
      <taxon>
        <entry>
          <string language="eng">Electric Forces and
          Fields</string>
        </entry>
      </taxon>
      <taxon>
        <entry>
          <string language="eng">Major Concept - Coulomb's law
          relates electric charge to electric force</string>
        </entry>
      </taxon>
      <taxon>
        <entry>
          <string language="eng">Knowledge - Students should be
          able to demonstrate an understanding that: Coulomb's
          law explains the relationships among force, charge and
          separating distance by explaining, quantitatively,
          using Coulomb's law and vectors, the electrostatic
          interaction between discrete point charges</string>
        </entry>
      </taxon>
    </taxonpath>
  </classification>
```

9.1:Purpose

Explanation	*Size*	*Order*	*Value Space*	*Datatype*
The purpose of classifying this learning object.	1	Unspecified	discipline idea prerequisite educational objective accessibility restrictions educational level skill level security level competency	Vocabulary (State)

Indicate the function or kind of classification being provided to describe the resource.

- Each iteration of the 9:Classfication element category should be associated with a different classification purpose.
- CanCore strongly recommends that 1.4:General.Description and 1.5:General.Keyword be used when describing the *general* disciplinary aspects or the subject of the resource.

Vocabulary Recommendations

discipline (*discipline*)
"A branch of instruction or education; a department of learning or knowledge; a science or art in its educational aspect" (*OED*). This purpose can be used to classify a resource according to its use by disciplinary departments, faculties, or units in an organization. If this classification purpose is selected, the taxon or classification system employed should be clearly identified using 9.2.1:Source.
Note that CanCore recommends and provides guidance for the use of a simplified version of the Dewey Decimal Classification (DDC) system as a systematic subject description solution. See below, 9.2.1:Source.

idea (*idée*)
"Any product of mental apprehension or activity, existing in the mind as an object of knowledge or thought; an item of knowledge or belief; a thought, conception, notion; a way of thinking" (*OED*). This purpose can be used to classify resources within a particular discipline, possibly using a taxonomic system particular to that discipline (e.g., ERIC in education, MESH in medicine). If this classification purpose is selected, the taxon or classification system employed should be clearly identified using 9.2.1:Source.
Note that the classification purpose indicated by this term is associated with "subject classification" in the LOM (9:Classification = DC.Subject when 9.1:Purpose = discipline or idea, according to the DC crosswalk provided in the LOM).

prerequisite (*pré requis*)
"That which is required beforehand; a condition previously necessary" (*OED*).

educational objective (*objectif d'apprentissage*)
"The systematic instruction, schooling or training given to the young in preparation for the work of life; by extension, similar instruction or training obtained in adult age" (*OED*; definition for "education"). "Of or pertaining to the object or end as the cause of action" (*OED*; definition for "objective").

accessibility restrictions (*accessibilité contraintes*)
"The quality of being accessible, or of admitting approach" (*OED*; definition for "accessibility"). "A limitation imposed upon a person or thing; a condition or regulation of this nature" (*OED*; definition for restriction).
Note that in LOM communities, this term is frequently associated with the accommodation of users with special needs or disabilities

educational level (*niveau d'éducation*)
"The systematic instruction, schooling or training given to the young in preparation for the work of life; by extension, similar instruction or training obtained in adult age" (*OED*; definition for "education"). "A position (on a real or imaginary scale) in respect of amount, intensity, extent, or the like; the relative amount or intensity of any property, attribute, or activity" (*OED*; definition for "level").

skill level (*niveau d'habileté*)
"An ability to perform a function, acquired or learnt with practice" (*OED*; see also the definition of "level" provided under "educational level," above.)

security level (*niveau de sécurité*)
"Something which secures or makes safe; a protection, guard, defence" (*OED*; see also the definition of "level" provided under "educational level," above.)
Note that this term may be used for describing the user permissions or level of access associated with a particular learning resource.

competency (*compétence*)
"Sufficiency of qualification; capacity to deal adequately with a subject" (*OED*).

Example

- Discipline

XML Example

```
<purpose>
  <source>LOMv1.0</source>
  <value>discipline</value>
</purpose>
```

9.2:Taxon Path

Explanation	*Size*	*Order*	*Value Space*	*Datatype*
A taxonomic path in a specific classification system. Each succeeding level is a refinement in the definition of the proceeding level. There may be different paths, in the same or different classifications, which describe the same characteristic.	Smallest permitted maximum: 15 items	Unordered	-	-

Use this element aggregate to trace the path set out in a structured taxonomy for any given term. For example, if Children's Literature is a narrower term of Literature and if Literature is a narrower term of Humanities in a taxonomy, the 9.2:Taxon Path element group allows the indexer to reconstruct this hierarchical relationship for search and retrieval purposes.

The sub-elements of 9.2:Taxon Path are:

9.2.1:Source
9.2.2:Taxon
9.2.2.1:Id
9.2.2.2:Entry

Elements listed in bold are included in the CanCore element subset.

- Start a new 9.2:Taxon Path element for each distinct term or "tree" of terms that applies to the stated purpose.

- Use a single 9.2:Taxon Path element tree for each term listing. Where the hierarchical listing (or taxonomic tree) of the term in the named classification is available, list the terms within a single 9.2:Taxon Path, thus creating a path from the broadest term to the narrowest term.

- Sometimes, more than one taxonomic path (and multiple 9.2:Taxon Path element group iterations) may be used to arrive at the same specific taxon term(s).

- In terms of its own structure, the sub-elements of 9.2:Taxon Path are not repeated in a nested or hierarchical manner to reflect the hierarchical structure of a taxonomic path. Instead, 9.2.2:Taxon and its sub-elements can be iterated in an ordered manner to reflect the hierarchical structure of a taxonomic path.

Examples

- A single term listing.
  TaxonPath:
    Source: DCC NLC-BNC http://www.nlc-bnc.ca/caninfo/
    Taxon:
      Entry: Technology
- A hierarchical term listing (or term tree). In this and subsequent non-XML examples, this listing is represented by commas
  TaxonPath:
    Source: ERIC http://www.ericfacility.net/extra/pub/thessearch.cfm
    Taxon:
      Entry: Liberal Arts, Sciences, Natural Sciences, Biological Sciences,Genetics
- An example where a single term has two distinct paths within the controlled vocabulary.
  TaxonPath:
    Source: ERIC http://www.ericfacility.net/extra/pub/thessearch.cfm
    Taxon:
      Entry: Literacy, Reading, Beginning Reading
  TaxonPath:
    Source: ERIC http://www.ericfacility.net/extra/pub/thessearch.cfm
    Taxon:
      Entry: Language Arts, Reading, Beginning Reading
- An example where multiple hierarchical term listings (or term trees) have been selected from a taxonomy.
  TaxonPath:
    Source: ERIC http://www.ericfacility.net/extra/pub/thessearch.cfm
    Taxon:
      Entry: Literacy, Reading, Beginning Reading
  TaxonPath:
    Source: ERIC http://www.ericfacility.net/extra/pub/thessearch.cfm
    Taxon:
      Entry: Printed Materials, Books, Picture Books

XML Examples

```
<taxonpath>
  <source>
   <string language="eng">DCC NLC-BNC http://www.nlc-
   bnc.ca/caninfo/</string>
  </source>
  <taxon>
    <id>6</id>
    <entry>
      <string language="eng">Technology</string>
    </entry>
  </taxon>
</taxonpath>
```

```
<taxonpath>
  <source>
    <string language="eng">ERIC
    http://www.ericfacility.net/extra/pub/thessearch.cfm
    </string>
  </source>
  <taxon>
    <entry>
      <string language="eng">Liberal Arts</string>
    </entry>
  </taxon>
  <taxon>
    <entry>
      <string language="eng">Sciences</string>
    </entry>
  </taxon>
  <taxon>
    <entry>
      <string language="eng">Natural Sciences</string>
    </entry>
  </taxon>
  <taxon>
    <entry>
      <string language="eng">Biological Sciences</string>
    </entry>
  </taxon>
  <taxon>
    <entry>
      <string language="eng">Genetics</string>
    </entry>
  </taxon>
</taxonpath>

<taxonpath>
  <source>
    <string language="eng">ERIC
    http://www.ericfacility.net/extra/pub/thessearch.cfm
    </string>
  </source>
  <taxon>
    <entry>
      <string language="eng">Literacy</string>
    </entry>
  </taxon>
  <taxon>
    <entry>
      <string language="eng">Reading</string>
    </entry>
  </taxon>
  <taxon>
    <entry>
      <string language="eng">Beginning Reading</string>
    </entry>
```

```
    </taxon>
  </taxonpath>

  <taxonpath>
    <source>
      <string language="eng">ERIC</string>
    </source>
    <taxon>
      <entry>
        <string language="eng">Language Arts</string>
      </entry>
    </taxon>
    <taxon>
      <entry>
        <string language="eng">Reading</string>
      </entry>
    </taxon>
    <taxon>
      <entry>
        <string language="eng">Beginning Reading</string>
      </entry>
    </taxon>
  </taxonpath>

  <taxonpath>
    <source>
      <string language="eng">ERIC
      http://www.ericfacility.net/extra/pub/thessearch.cfm
      </string>
    </source>
    <taxon>
      <entry>
        <string language="eng">Literacy</string>
      </entry>
    </taxon>
    <taxon>
      <entry>
        <string language="eng">Reading</string>
      </entry>
    </taxon>
    <taxon>
      <entry>
        <string language="eng">Beginning Reading</string>
      </entry>
    </taxon>
  </taxonpath>

  <taxonpath>
    <source>
      <string language="eng">ERIC
      http://www.ericfacility.net/extra/pub/thessearch.cfm
      </string>
    </source>
```

```
    <taxon>
      <entry>
        <string language="eng">Printed Materials</string>
      </entry>
    </taxon>
    <taxon>
      <entry>
        <string language="eng">Books</string>
      </entry>
    </taxon>
    <taxon>
      <entry>
        <string language="eng">Picture Books</string>
      </entry>
    </taxon>
  </taxonpath>
```

9.2.1:Source

Explanation	*Size*	*Order*	*Value Space*	*Datatype*
The name of the classification system. This data element may use any recognized "official" taxonomy or any user-defined taxonomy. NOTE: An indexation, cataloging, or query tool may provide the top-level entries of a well-established classification, such as The Library of Congress Classification (LOC), the Universal Decimal Classification (UDC), the Dewey Decimal Classification (DDC), etc.	1	Unspecified	Repertoire of ISO/IEC 10646-1:2000	LangString (smallest permitted maximum: 1000 char)

Indicate the standard name or title of the taxonomy, term listing, or controlled vocabulary from which the terms used in 9.2.2:Taxon are derived.

- To provide a minimal level of systematic subject description, CanCore recommends and provides guidance for the use of the DDC system. For more, see Appendix B: Dewey Decimal Classification.
- CanCore also recognizes that no one taxonomy for Discipline, Educational Objective or any other classification purpose will satisfy the needs of e-learning implementations and constituencies generally.

Vocabulary Recommendations

- Values for 9.2.1:Source should be as specific as possible, providing a location or namespace and a common name for the classification system as well as any organization that may have modified or simplified it. The smallest permitted maximum of 1000 characters allows for this level of specificity.
- For a listing of commonly used classification systems and taxonomies and their abbreviated names, see http://www.loc.gov/marc/relators/relaclas.html.
- If a modified version of a commonly used classification system is used, append to the abbreviated name an indication of the nature and/or origin of the modification.
- If the use of classification systems or vocabularies not accommodated elsewhere in the LOM are needed, CanCore strongly recommends that projects not create local taxonomies for any classification purpose. CanCore recommends the use of classification systems and vocabularies that meet the following criteria:
  - should exist in multilingual forms, specifically French and English, and preferably other versions

  - should be stable
  - should be maintained over a long term
  - should be available at no charge
  - should provide culturally-appropriate taxon values
  - should be modifiable to meet the needs of specific constiuencies

- CanCore recommends and provides guidance for the use of DDC as provided by the National Library of Canada (and in other simplified forms) as a simple classification solution for the following reasons:
  - CanCore has been requested to provide guidance in this particular area by a number of projects and implementations.
  - The task of selecting and implementing a particular subject classification system can be resource-intensive, and require considerable expertise.
  - A minimal amount of systematic subject description can be useful in resource discovery, without requiring excessive investment in the description process.

- See Appendix B: Dewey Decimal Classification for more about CanCore's approach to DDC.

- Other taxonomies for discipline and other classification purposes are provided in the "IMS Learning Resource Meta-data Best Practice and Implementation Guide" (http://www.imsproject.org/metadata/imsmdv1p2/imsmd_bestv1p2.html). This illustrates the range of taxonomies that are available; this document does not support the current LOM standard.

Examples

- ERIC http://www.ericfacility.net/extra/pub/thessearch.cfm
- DCC NLC-BNC http://www.nlc-bnc.ca/caninfo

XML Examples

```
<source>ERIC
http://www.ericfacility.net/extra/pub/thessearch.cfm
</source>

<source>DCC NLC-BNC http://www.nlc-bnc.ca/caninfo</source>
```

9.2.2:Taxon

Explanation	*Size*	*Order*	*Value Space*	*Datatype*
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. An ordered list of taxons creates a taxonomic path, i.e., "taxonomic stairway": this is a path from a more general to a more specific entry in a classification.	Smallest permitted maximum: 15 items	Ordered	-	-

Use 9.2.2:Taxon and its sub-elements to indicate a taxon term or the hierarchial series of taxon terms that can be used to describe the learning resource. Each level in the series can be indicated using multiple, ordered instances of 9.2.2:Taxon and its sub-elements.

- The taxonomic path should move from broadest term to narrowest term, not the other way around. A 9.2:Taxon Path is a hierarchical listing of terms; related terms, cross-references, or other conventions used by thesauri and controlled vocabularies that cannot be conveyed using LOM.
- The narrowest term used should be the specific subject descriptor that is assigned to the learning resource. The taxonomic path for this term should be traced from the term itself back to the top term (broadest term possible term) provided by the taxonomy.
- For vocabulary lists that are flat or have no hierarchical differentiation, simply enter a single 9.2.2.2:Entry. If multiple terms from such a flat vocabulary list are needed use multiple, unordered 9.2:Taxon Path elements within the Classification category.

Vocabulary Recommendation

Recommendations for key educational taxonomies can be found in 9.2.1:Source above.

Technical Implementation Note

Projects should investigate software that might be available to implement the use of standard vocabularies so that taxonomic trees can be generated automatically and not manually by the indexer.

Examples (individual values are separated by commas)

- Liberal Arts, Sciences, Natural Sciences, Biological Sciences, Genetics

XML Examples

```
<taxonpath>
  <taxon>
    <entry>
      <string language="eng">Liberal Arts</string>
    </entry>
  </taxon>
  <taxon>
    <entry>
      <string language="eng">Sciences</string>
    </entry>
  </taxon>
  <taxon>
    <entry>
      <string language="eng">Natural Sciences</string>
    </entry>
  </taxon>
  <taxon>
    <entry>
      <string language="eng">Biological Sciences</string>
    </entry>
  </taxon>
  <taxon>
    <entry>
      <string language="eng">Genetics</string>
    </entry>
  </taxon>
</taxonpath>
```

For other relevant examples, see Taxon Path above.

9.2.2.1:Id

Explanation	*Size*	*Order*	*Value Space*	*Datatype*
The identifier of the taxon, such as a number or letter combination provided by the source of the taxonomy.	1	Unspecified	Repertoire of ISO/IEC 10646-1:2000	Character-String (smallest permitted maximum: 100 char)
Indicate the numerical or other identifier corresponding to the descriptor or value provided for 9.2.2.2:Entry.				

Example

- 971 Canada

XML Example

```
<id>971</id>
<entry>
  <string language="eng">Canada</string>
</entry>
```

9.2.2.2:Entry

Explanation	*Size*	*Order*	*Value Space*	*Datatype*
The textual label of the taxon.	1	Unspecified	-	LangString (smallest permitted maximum: 500 char)

Provide the human language value for the taxonomic term.

- Multilingual implementations of this element group should make use of multiple or multilingual taxonomies rather than simply translating individual taxonomic terms.
- It may be sometimes necessary to use this element to provide phrases or longer formulations that may accompany or explain a taxonomic term. Such formulations cannot be accommodated for each taxonomic entry by 9.3:Description (which can only be repeated 40 times, with the whole Classification group), and should generally not exceed the smallest permitted maximum of 500 characters associated with 9.2.2.2:Entry.

Example

- 971 Canada

XML Example

```
<id>971</id>
<entry>
  <string language="eng">Canada</string>
</entry>
```

9.3:Description

Explanation	*Size*	*Order*	*Value Space*	*Datatype*
Description of the learning object relative to the stated 9.1:Classification.Purpose of this specific classification, such as discipline, idea, skill level, educational objective, etc.	1	Unspecified	-	LangString (smallest permitted maximum: 2000 char)

Provide a concise yet thorough description of the resource in accordance with the function or type of classification identified in 9.1:Purpose. If the value of 9.1:Purpose is Discipline, provide a description relative to this purpose using 1.4:General.Description.

CanCore does not recommend the use of this element for the purposes of interoperation in distributed environments.

- For general descriptions of the contents or purpose of the resource, CanCore strongly recommends the use of 1.4:General.Description.

- Only one description can be provided for each iteration of the Classification group of elements as a whole. This means that only one description would typically be provided for each descriptive function or purpose.

Examples

- Descriptions associated with the classification purpose "accessibility requirements":
  - This resource is compliant with Section 508 (29 U.S.C. ‘ 794d). It provides disabled employees and members of the public access to information that is comparable to the access available to others.
  - This resource is not yet compliant with Section 508 (29 U.S.C. ‘ 794d). Use and distribute at your own risk.

XML Examples

```
<description>
   <string language="eng">This resource is compliant with
   Section 508 (29 U.S.C. ' 794d). It provides disabled
   employees and members of the public access to information
   that is comparable to the access available to
   others.</string>
</description>

<description>
   <string language="eng">This resource is not yet
   compliantwith Section 508 (29 U.S.C. ' 794d). Use and
   distribute at your own risk.</string>
</description>
```

9.4:Keyword

Explanation	*Size*	*Order*	*Value Space*	*Datatype*
Keywords and phrases descriptive of the learning object relative to the stated 9.1:Classification.Purpose of this specific classification, such as accessibility, security, level, etc.; most relevant first.	Smallest permitted maximum: 40 items	Ordered	-	LangString (smallest permitted maximum: 1000 char)

Provide the most specific terms appropriate to the purpose stated in 9.1:Purpose.

- Use a separate 9.4:Keyword element for each term or phrase used.
- If the value of 9.1 is Discipline, and the keywords are not from a specific taxonomy, use 1.5:General.Keyword.
- Keywords are assigned by the record creator based on his or her interpretation of the learning resource's properties. As such, keywords are derived either from the resource itself or from an indexer's interpretation of the resource. They are not derived from an external vocabulary. Terms derived from an external vocabulary are best dealt with in 9.2:Taxon Path.

Examples (individual values are separated by commas)

- educational technology, computer-based instruction, assessment
- environmental studies, environmentalism/ecology

XML Examples

```
<keyword>
  <string language="eng">educational technology</string>
</keyword>
<keyword>
  <string language="eng">computer-based instruction</string>
</keyword>
<keyword>
  <string language="eng">assessment</string>
</keyword>

<keyword>
  <string language="eng">environmental studies</string>
</keyword>
<keyword>
  <string language="eng">environmentalism</string>
</keyword>
<keyword>
  <string language="eng">ecology</string>
</keyword>
```