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schools online curriculum content initiative

ANZ-LOM Metadata Application Profile

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Amendment History

Date	Version	Comment	Person
January 2008	1.0	First public release.	Steve Sunter
May 2008	1.01	<p>Adjusted title/subtitle layout.</p> <p>Amended document location (URL redirect).</p> <p>Table format – removed unnecessary values for 'container elements'; added shading.</p> <p>Corrected element type for 1.1.1 Catalog and 1.1.2 Entry.</p> <p>Removed definitions for learning objects and digital resources; removed specific instructions relating to these categories.</p> <p>Modified obligations for several elements: 4.4.1.1 Type (of technical requirement); 4.4.1.2 Name (of technical requirement); 4.5 Installation remarks; 4.6 Other platform requirements. 5.5 Intended end user role 5.6 Context 5.7 Typical age range</p> <p>Added examples of applying classification element for VET resources.</p> <p>Removed version numbers from source fields within classification element examples.</p> <p>Added source for classification examples referencing ISO3166.</p> <p>Added reference for NZ place names. Added references to IMS Best practice guide and Vetadata profile.</p> <p>Minor edits and formatting adjustments.</p>	Steve Sunter

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1 Introduction

Interoperable standards and specifications are fundamental to support distributed management and access to learning content across Australia, New Zealand and internationally. ANZ-LOM focuses on standards that can be widely applied throughout the education sector in Australia and New Zealand. The Le@rning Federation (TLF) has previously published TLF metadata application profiles that focused on supporting production of learning content. ANZ-LOM is a more widely applicable standard that also replaces earlier TLF metadata profiles.

2 Principles

The following principles apply to the development of the metadata specifications for ANZ-LOM:

- adoption of international metadata standards that are compatible with other Australian education sectors without compromising the goals of Australian school education;
- adoption of metadata standards that do not compromise school education systems and sectors in achieving their own educational priorities;
- recognition that optimisation of the learning value of digital learning content is fundamental in establishing interoperable metadata specifications;
- recognition that metadata needs to support the access, search, selection, use, trade and management of learning content;
- recognition of the tension between the processes involved in the international and national standards initiatives and the pragmatic solutions required for the education sector in Australia and New Zealand.

Throughout application and implementation, The Le@rning Federation engages in consultation and reviews its metadata specifications. It actively monitors national and international metadata activities and, where appropriate, modifies specifications accordingly and provides feedback.

The Le@rning Federation works closely with several groups to support interoperable metadata standards across the Australian education sector: MCEETYA ICT in Schools Taskforce; AICTEC Standards Committee, E-standards Expert Group and The Le@rning Federation Consultative Committee.

3 Purposes

This application profile supports the purposes outlined below.

3.1 Content management

ANZ-LOM metadata supports the production and quality assurance of learning content. It encompasses aspects such as version tracking and identification of contributors.

This application profile defines the metadata elements most useful to describe learning content. It is not appropriate for all elements to be applied to all learning content.

Educational publishers establish compliance agreements with a range of partners to produce content. These include:

- commissioned content providers;
- external content providers;
- information systems developers;

- education networks responsible for downstream delivery of the assets.

These agreements inform the quality assurance framework for all online curriculum content. For commissioned online curriculum content this may commence at the content development tendering stage and apply throughout the development, testing, release and maintenance processes.

ANZ-LOM may be applied to any external content that may be republished or supplied to another learning management system.

The Le@rning Federation provides a range of guidelines and support to facilitate the creation of metadata records conforming to this specification.

3.2 Educational purpose and value

The educational purpose and value of learning objects is described with elements for:

- the curriculum topic;
- potential learning outcomes supported by the object;
- teaching methods for presenting the material;
- intended audience for the object.

3.3 Technical interoperability

Specification of common metadata enhances interoperability between the information systems that manage and deliver those learning objects. The ANZ-LOM metadata application profile contains elements for describing the technical requirements needed to use the content.

3.4 Copyright and moral rights

To place a pool of legally reusable educational material within the reach of all Australian students and teachers involves respecting the copyright and moral rights of the owners of intellectual property. To achieve this, curriculum content must be managed to meet relevant statutory and contractual obligations, and optimise the creation, trade and usage of online content. This metadata application profile includes communication of copyright and moral rights. It does not focus on digital rights management.

3.5 Inclusive access

The Le@rning Federation has developed an accessibility specification that conforms to Commonwealth laws concerning accessibility. *The Le@rning Federation Accessibility Specification for Content Development* outlines principles to ensure that project online resources and services are inclusive of a range of teaching and learning capacities, contexts and environments. It affirms policy commitments by State and Territory education systems to inclusive educational provision. This metadata application profile contains support for describing the accessibility of online content.

3.6 Distributed delivery

The Le@rning Federation provides access to online educational content via central content repositories such as 'the Exchange' and 'Sharing Exchange'. Education systems can retrieve online educational content from the central repositories and provide distribution through their online systems. The education systems also provide tools and e-learning environments required by schools.

The Exchange is also used to manage the quality assurance of educational content. Metadata is associated with educational content during the quality assurance process. Only a subset of the metadata used to manage the quality assurance process is relevant for export from the Exchange.

4 Metadata framework

4.1 Application profile approach

Metadata application profiles consist of metadata elements drawn from one or more existing namespaces, combined and optimised for a particular application. A namespace identifies the management authority for particular metadata schema. An application profile has the following characteristics:

- draws from one or more existing namespaces;
- does not introduce new data elements;
- specifies permitted encoding schemes, vocabularies and values for the application that are in accordance with the namespace schema;
- refines standard definitions within the namespace schema.

4.2 Metadata schemas referenced

The namespaces being used for ANZ-LOM are:

- IEEE Standard for Learning Object Metadata (IEEE 1484.12.1) [LOM v1.0]
- Dublin Core Metadata Element Set, v1.1 [DCMES v1.1];
- edna Metadata Standard, v1.1 [edna 1.1]; and
- Sharable Content Object Reference Model [SCORM 2004]

4.3 Metadata model

The information model is based on and extends the information model used by the IEEE Learning Object Metadata standard [LOM v1.0].

4.3.1 Basic structure

Metadata elements are grouped into nine categories:

- The *general* category describes the digital asset as a whole and its management.
- The *life cycle* category groups the changes affecting the learning content during its history.
- The *metametadata* category records the management of the metadata of the learning content.
- The *technical* category groups the technical requirements and characteristics of the learning content.
- The *educational* category groups the educational and pedagogical characteristics of the learning content.
- The *rights* category groups the intellectual property rights and conditions of use for the learning content.
- The *relation* category groups the relationships between the learning content and other items.
- The *annotation* category enables recording of comments on the educational use of the learning content.
- The *classification* category enables identification of the characteristics of learning content as defined in structured classification systems. For example, classifications of competencies, subject schemes and accessibility characteristics of the learning content.

4.3.2 Structure of data elements

The information model is a hierarchy of data elements. Some data elements are combinations of sub-elements. Those elements may not have data values themselves; it is the data elements with no further sub-elements that have values. Data elements with sub-elements have values indirectly, through their sub-elements.

The hierarchy is indicated by the numbering scheme for metadata elements. For example, the following metadata element has two components:

- 1.1 Identifier
 - 1.1.1 Catalog
 - 1.1.2 Entry.

4.3.3 Repeatability

Some metadata elements are repeatable. When an instance of a grouped metadata element is repeated, all of its sub-elements can appear in each repetition. For example, the following element is repeatable.

- 2.3 Lifecycle.Contribute

Every time this element is repeated, each of its sub-elements can be included.

4.3.4 Obligation

Some metadata elements are mandatory within the application profile for certain types of content. That is, those metadata elements must appear in metadata instances conforming to this profile.

Elements may have both mandatory sub-elements and optional sub-elements. In this case, only the mandatory sub-elements must appear.

Refer to IETF RFC 2119 for exact definitions of the following words: MUST, MUST NOT, REQUIRED, SHOULD, SHOULD NOT; RECOMMENDED; OPTIONAL.

Metadata attributes

Each data element and sub-element is described using a set of eight attributes from the ISO/IEC 11179 standard for the description of data elements.

Attribute	Definition						
Name	The label assigned to the data element.						
Identifier	The unique identifier assigned in IEEE LOM to the data element.						
Version	The version of the data element						
Registration Authority	The entity authorised to register the data element, and the identifier for the element used by that authority.						
Definition	A statement that clearly represents the concept and essential nature of the data element						
Obligation	Indicates if the data element is required to always or sometimes be present.						
	<table border="1"> <thead> <tr> <th>Value</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>Mandatory</td> <td>Required. A value must be supplied.</td> </tr> <tr> <td>Recommended</td> <td>A value should be supplied unless there is a valid reason not to. If irrelevant, then do not enter any values.</td> </tr> </tbody> </table>	Value	Definition	Mandatory	Required. A value must be supplied.	Recommended	A value should be supplied unless there is a valid reason not to. If irrelevant, then do not enter any values.
	Value	Definition					
Mandatory	Required. A value must be supplied.						
Recommended	A value should be supplied unless there is a valid reason not to. If irrelevant, then do not enter any values.						

	Optional	A value may be supplied if desired.
	Not recommended	Do not use this element; it may cause interoperability issues.
	<p>Note: Some mandatory elements should be automatically maintained by a content management system. These are also noted in this table.</p>	
Datatype	<p>Indicates the type of data that can be represented in the value of the data element. Possible datatypes are</p> <ul style="list-style-type: none"> • CharacterString • LangString • Vocabulary <p>CharacterString is the default datatype for all elements.</p> <p>When a vocabulary is indicated, this attribute also identifies the allowable values for the data element, either by listing values or referencing an external vocabulary.</p>	
Maximum Occurrence	<p>Indicates any limit to the repeatability of the data element.</p> <p>The value '*' means there is no limit to repeatability. The value '1' means the element cannot be repeated.</p> <p>Note, a non-repeatable element may be repeated if it is a sub-element of a repeatable grouped data element. See Section Error! Reference source not found.</p>	

4.4 Datatypes

Datatypes indicate the type of data that can be represented in the value of the data. This application profile uses datatypes listed in the IEEE Learning Object Metadata standard [LOM].

4.4.1 CharacterString

CharacterString is the default datatype for all of the elements. CharacterStrings use characters from ISO/IEC 10646-1:2000: the international Standard that specifies a character set that relies on 32 bits, and includes approximately 4 billion characters, of which the first 65536 are Unicode, the first 256 are ISO 8859-1, and the first 128 are ASCII.

4.4.2 LangString

A LangString contains a string and an indication of the language of that string. One possible representation is as a (language, string) pair. The language is indicated by an ISO 639 language code and an optional ISO 3166-1 country code. The language code is in lower case; the country code is upper case. For example,

('en-GB', 'A picture of the Mona Lisa').

4.4.3 Vocabulary

Data values from vocabularies must indicate the vocabulary from which they are sourced. One possible representation is a (source, value) pair. For example, values for the element '5.2 learning resource type' are based on the Dublin Core DCMI type vocabulary. The 'Moving image' value from this vocabulary would be indicated by the pair ('DCMI Type', 'Moving image')

5 Metadata Elements and Sub-elements

Identifier	Name	Definition	Obligation	Maximum Occurrence	Datatype
1	General	This category groups general information that describes the learning content as a whole.	-	1	-
1.1	Identifier	Defines an entry within a listing identification system applied to this learning content.	-	*	-
1.1.1	Catalog	The name of the listing identification system.	Mandatory#	1	CharacterString
1.1.2	Entry	Actual string value of the entry.	Mandatory#	1	CharacterString
1.2	Title	Name given to the learning content.	Mandatory	1	LangString
1.3	Language	The primary human language or languages used within the learning content.	Mandatory	*	CharacterString [unordered] ISO 639 Language code and optional ISO 3166 Country code eg: fr-CA Language code in lower case and country code (if any) in upper case.
1.4	Description	Textual description of the content of the learning content.	Mandatory	1	LangString [unordered]
1.5	Keyword	Keywords or phrases describing this learning content.	Mandatory	*	LangString [unordered]
1.6	Coverage	The span or extent of the coverage of the learning content.	Not recommended. Refer to element 9.	1	LangString [unordered]
1.7	Structure	'Underlying organizational structure of learning content'	Not recommended. Refer to element 9.		Vocabulary

Identifier	Name	Definition	Obligation	Maximum Occurrence	Datatype
1.8	Aggregation level	The functional granularity of this learning content.	Mandatory#	1	Vocabulary Integer derived from LOM v1.0 aggregation vocabulary: 1 if asset is a file 2 if asset is a LO containing only files 3 if asset is a LO containing other LOs
2	Life cycle	This category describes the history and current state of this learning content and those who have affected it during its evolution.	-	-	
2.1	Version	This edition of the learning content.	Mandatory#	1	LangString
2.2	Status	The completion status or condition of this learning content.	Mandatory#	1	Vocabulary [subset of LOM v1.0 Status vocabulary] <ul style="list-style-type: none"> • draft • final • revised
2.3	Contribute	This element describes those people or organisations that have affected the state of this learning content during its evolution. Note: Metadata contributors may be recorded in 3.2.	Mandatory	*	- [ordered]

Identifier	Name	Definition	Obligation	Maximum Occurrence	Datatype
2.3.1	Role	Kind of contribution.	Mandatory	1	<p>Vocabulary</p> <p>Extension of LOM v1.0 role vocabulary. The extended value is shown in <i>italics</i>.</p> <ul style="list-style-type: none"> • <i>Copyright holder#</i> • Author • Publisher • Unknown • Initiator • Terminator • Validator • Editor • Graphical designer • Technical implementer • Content provider • Technical validator • Educational validator • Script writer • Instructional designer • Subject matter expert <p># This extended value is adapted from the MARC Relator vocabulary.</p> <p>'Use for a person or organization to whom copy and legal rights have been granted or transferred for the intellectual content of a work. The copyright holder, although not necessarily the creator of the work, usually has the exclusive right to benefit financially from the sale and use of the work to which the associated copyright protection applies.'</p>

Identifier	Name	Definition	Obligation	Maximum Occurrence	Datatype
2.3.2	Entity	The identification of and information about people or Organisations contributing to this learning content.	Mandatory	1	Vocabulary [ordered] [vCard v3.0] tools.ietf.org/html/rfc2425 tools.ietf.org/html/rfc2426 For vCard role, refer to MARC relators: www.loc.gov/marc/relators/
2.3.3	Date	Date of the contribution.	Optional	File, LO	Vocabulary [W3C-DTF] for date http://www.w3.org/TR/NOTE-datetime
3	Meta-metadata	This category describes the metadata record itself rather than the learning content.	Mandatory	1	-
3.1	Identifier	A globally unique label that identifies this metadata record.	-		-
3.1.1	Catalog	The name of the listing identification system.	Mandatory#		CharacterString
3.1.2	Entry	Actual string value of the entry.	Mandatory#		CharacterString
3.2	Contribute	Those entities that have affected the state of this metadata instance during its life cycle. Includes 3.2.1 Role; 3.2.2 Entity; 3.2.3 Date	Optional		- [ordered]
3.3	Metadata scheme		Mandatory#		CharacterString [unordered]
3.4	Language	Language of this metadata instance. This is the default language for all language strings.	Mandatory#	1	Vocabulary ISO 639 language code. Must be lower case.
4	Technical	This category describes the technical requirements and characteristics of the learning content.	-		-

Identifier	Name	Definition	Obligation	Maximum Occurrence	Datatype
4.1	Format	Technical data types of all the components of the learning content. This data element is used to identify the software needed to access the learning content.	Mandatory#	*	Vocabulary [unordered] [MIME Media types] Refer to IANA http://www.iana.org/assignments/media-types/
4.2	Size	The size of the learning content in bytes. This data element refers to the actual size of this learning content. If the learning content is compressed then this data element refers to the uncompressed size.	Mandatory#	1	CharacterString
4.3	Location	A string that resolves to an item location for accessing the item.	Mandatory#	*	CharacterString [ordered]
4.4	Requirement	This sub category describes the technical capabilities required to use this learning content.		*	- [unordered]
4.4.1	OrComposite	Grouping of multiple requirements.			- [unordered]
4.4.1.1	Type	Type of requirement	Recommended	1	Vocabulary Refer to <i>Curriculum Corporation Technical requirements vocabulary</i> . Operating system; Browser; Plug-in.
4.4.1.2	Name	Name of the required technology to use this learning content. Note: the value of this may be derived automatically from 3.1: technical.format eg, video/mpeg implies Multi-OS	Recommended	1	Vocabulary Refer to <i>Curriculum Corporation Technical requirements vocabulary</i> .
4.4.1.3	Minimum version	Lowest possible version of the required technology to use this learning content.	Recommended	1	CharacterString

Identifier	Name	Definition	Obligation	Maximum Occurrence	Datatype
4.4.1.4	Maximum version	Highest possible version of the required technology to use this learning content.	Optional	1	CharacterString
4.5	Installation remarks	Description of how to install this learning content.	Optional	1	LangString
4.6	Other platform requirements	Information about other software and hardware requirements.	Recommended	1	LangString
4.7	Duration	Time a continuous piece of learning content takes when played at intended speed. NOTE: This data element is especially useful for sounds, movies or animations.	Optional#	1	Vocabulary [ISO8601] Duration
5	Educational	This category describes key educational or pedagogic characteristics of the learning content.	-		-
5.1	Interactivity type	"Predominant mode of learning supported".	Not recommended	1	Vocabulary
5.2	Learning Resource Type	This data element is used to identify the kind of the learning content. It is an ordered element; most dominant kind first.	Mandatory	*	Vocabulary [ordered] DCMI Type Vocabulary http://dublincore.org/documents/dcmi-type-vocabulary/ Use extensions from this vocabulary: Curriculum Corporation Learning resource type: www.thelearningfederation.edu.au/metadata For VET sector, use LOMv1.0 vocabulary 'Learning resource type' plus extensions from this vocabulary: VET Educational Use e-standards.flexiblelearning.net.au/vetadata/ed_use.htm

Identifier	Name	Definition	Obligation	Maximum Occurrence	Datatype
5.3	Interactivity level	"The degree of interactivity characterizing this learning object."	Not recommended		Vocabulary (Enumerated) [LOMv1.0]
5.4	Semantic density	"The degree of conciseness of a learning object."	Not recommended		Vocabulary (Enumerated) [LOMv1.0]
5.5	Intended end user role	An audience group targeted for the learning content.	Recommended	*	Vocabulary [LOMv1.0] <ul style="list-style-type: none"> • learner • teacher • manager • author
5.6	Context	The education or training sector at which the learning content is aimed. Note similarities to edna 1.1 sector	Recommended	*	Vocabulary [unordered] [LOMv1.0] <ul style="list-style-type: none"> • school • higher education • training • other
5.7	Typical age range	Age of the typical intended user. Note direct relationship to edna user level.	Recommended		LangString [unordered]
5.8	Difficulty	'How hard it is to work with or through this learning object for the typical intended target audience.'	Not recommended		Vocabulary
5.9	Typical learning time	'Approximate or typical time it takes to work with or through this learning object for the typical intended audience.'	Not recommended		Duration
5.10	Description	'Comments on how this learning object is to be used.'	Optional		LangString
5.11	Language	'The human language used by the typical intended user of this learning object.'	Not recommended		CharacterString [unordered]

Identifier	Name	Definition	Obligation	Maximum Occurrence	Datatype
6	Rights	This category describes key intellectual property rights and conditions of use for the learning content.			-
6.1	Cost	'Whether use of this learning object requires payment.'	Mandatory#	1	Vocabulary [LOMv1.0] <ul style="list-style-type: none"> • yes • no
6.2	Copyright and other restrictions	'Whether copyright or other restrictions apply to the use of this learning object.'	Mandatory#	1	Vocabulary [LOMv1.0] <ul style="list-style-type: none"> • yes • no
6.3	Description	Text description of rights associated with the learning content.	Mandatory	1	LangString
7	Relation	This category describes the relation of the resource to other resources.	Recommended	*	- [unordered]

Identifier	Name	Definition	Obligation	Maximum Occurrence	Datatype
7.1	Kind	Kind of relation.	Recommended	1	<p>Vocabulary</p> <p>Extension of LOM v1.0 'kind' vocabulary. Extended values shown in <i>italics</i>.</p> <p>ispartof haspart isversionof hasversion isformatof hasformat references isreferencedby isbasedon isbasisfor requires isrequiredby <i>issiblingof#</i></p> <p># This extended value is adapted from the Gateway to Educational Materials (GEM) element set qualifier v2.0 vocabulary. 'The resource being described is at the same level in some arbitrary hierarchy as the resource being pointed to by this Relation element.'</p>
7.2	Resource	The target learning resource that this relationship references.	-	*	-
7.2.1	Identifier	A globally unique label that identifies the target learning resource.	-	*	-
7.2.1.1	Catalog	The name or designator of the identification or cataloging scheme for this entry. A namespace scheme.	Recommended	1	LangString
7.2.1.2	Entry	The value of the identifier within the identification or cataloging scheme that designates or identifies the target learning resource. A namespace specific string.	Recommended	1	LangString

Identifier	Name	Definition	Obligation	Maximum Occurrence	Datatype
7.2.2	Description	Textual description of the content of the related resource or nature of the relationship.	Optional	1	LangString
8	Annotation	This category provides comments on the educational use of the learning content and information on when and by whom the comments were created.	-	*	- [unordered]
8.1	Entity	The person or organisation that created the annotation.	Optional	1	Vocabulary [vCard v3.0]
8.2	Date	Date the annotation was created.	Optional	1	Vocabulary [W3C-DTF] for date
8.3	Description	The content of the annotation.	Optional	1	LangString
9	Classification				-
9.1	Purpose	The purpose of classifying this item.	Mandatory		Vocabulary [LOM v.1.0] <ul style="list-style-type: none"> • discipline • idea • prerequisite • educational objective • accessibility restrictions • educational level • skill level • security level • competency
9.2	Taxon path	A taxonomic path in a specific classification system. Each succeeding level is a refinement in definition of the preceding level.	-		-

Identifier	Name	Definition	Obligation	Maximum Occurrence	Datatype
9.2.1	Source	The name of the classification system. If possible, select source name from the MARC code list IV: Cataloging source: www.loc.gov/marc/relations/relations.html	Mandatory		LangString
9.2.2	Taxon	A particular term within a taxonomy.	-		- [ordered]
9.2.2.1	ID	The identifier of the taxon, such as a number or letter combination provided by the source of the taxonomy.	Recommended		CharacterString
9.2.2.2	Entry	The textual label of the taxon	Mandatory		LangString
9.3	Description	Description of the item relative to the stated classification purpose.	Optional		LangString
9.4	Keyword	Keywords and phrases descriptive of the item relative to the stated classification purpose.	Not recommended. Prefer to use 1.5 Keyword.		LangString [ordered]

It is recommended that values for these elements are system maintained. For example, values are automatically assigned within the TLF Exchange and Sharing Exchange. In some cases, further values may be added or imported to supplement the system-maintained values.

6 Examples of applying 'Classification' systems

9.1 Purpose	9.2.1 Source	9.2.2.1 Taxon ID	9.2.2.2 Taxon entry	Obligation	Authority and comment
accessibility restrictions	TLF_accessprofile		Device independence	Recommended	Describes the accessibility of learning content. An access profile is assigned within the metadata when content has been specifically designed for learning experiences that support the profile. Refer to TLF standards and specifications www.thelearningfederation.edu.au/metadata
competency	Statement of	CcS03	Students	Optional	Describes essential skills,

	learning	GAL01	explore how and why people make decisions.		knowledge, understandings and capacities that students have the opportunity to learn. Refer to: www.curriculum.edu.au/ccsite/default.asp?id=17706
competency	NTIS	RTF2017A	Prune shrubs and small trees	Recommended (VET)	For VET items , use the most specific NTIS competency names and codes. Refer to: www.ntis.gov.au
competency	CGEA	VBM688	Reading and Writing 1	Optional	Certificates in General Education for Adults (CGEA) are accredited certificates which allow adults who have not completed secondary education to improve their literacy, numeracy and general education skills. Refer to: www.saalt.com.au/cgea/
discipline	edna-kla		Science	Recommended (Schools)	Describes the key learning areas supported by use of the learning content. Refer to: www.groups.edna.edu.au/mod/resource/view.php?inpopup=true&id=33318
discipline	TLF_strand		Earth and beyond	Recommended (Schools)	Describes a core set of strands in each key learning area that are supported by the use of the learning content. Refer to TLF standards and specifications. www.thelearningfederation.edu.au/metadata
discipline	AGIFT		Education and training > School education	Optional	Describes the business functions carried out across Commonwealth, state and local governments in Australia. TLF default value is 'School education'. Refer to AGIFT thesaurus: www.naa.gov.au/records-management/create-capture-describe/describe/classification/agift/index.htm
discipline	FONZ		Educating	Optional	Describes the core government functions carried out across New Zealand. Refer to FONZ thesaurus: www.e.govt.nz/standards/nzxls/thesauri/downloads.html
discipline	scisshl		Biodiversity	Optional	Describes the subject of the learning content. Schools Cataloguing Information Service (SCIS) Subject Headings www.curriculum.edu.au/scis
discipline	ATED		Grade equivalent scores	Optional	Describes research and practice terminology in Australian education.

					www.acer.edu.au/library/edthesaurus.html
discipline	DDC	577.34 06 WHO a14		Optional	Identifies a subject-based 'call number' to classify the learning content. Dewey Decimal Classification www.oclc.org/dewey
discipline	ANZSIC	01	Agriculture	Recommended (VET)	For VET items , use industry subdivisions to describe relevant industry or occupations. Refer to: Australian and New Zealand Standard Industrial Classification www.abs.gov.au/AUSSTATS/abs@.nsf/mf/1292.0/
discipline	VOCED	t1785	Interpersonal skills	Optional	For VET items (especially ACE) , use the e-standards subset of VOCED for research policy related resources and for resources not tied to specific nationally accredited training packages. Refer to: e-standards.flexiblelearning.net.au/vocabs/voced4ace.htm
discipline	VOCED	t2783	Public speaking	Optional	For VET items (including ACE) , use VOCED for research policy related resources and for resources not tied to specific nationally accredited training packages. Refer to: www.voced.edu.au/thes.htm
educational level	edna-userlevel		4; 5; 6	Recommended	'School year' of intended audience: User levels 0-13. Refer to: www.groups.edna.edu.au/mod/resource/view.php?inpopup=true&id=33440 Generate user level from values in 5.7 Typical age range. min. age – 4 = min. user level max. age – 6 = max. user level
educational level	AQF		Diploma	Optional	For VET items and higher education items , apply AQF Qualification level wherever relevant. Refer to: www.aqf.edu.au/aqfqual.htm
educational objective	Key learning objective		Students apply knowledge of gold formation to evaluate the resource potential of geographic areas.	Recommended	Describes educational outcomes that the user can achieve after interacting with the content. Use this element to describe key learning objectives of the content's learning design. Uncontrolled vocabulary. Refer to <i>TLF guidelines for digital content</i> .
educational objective	Educational value		Explains the methods geologists use	Recommended	Describes the general educational usefulness (value) of the content. Use this element to describe

			to find gold deposits.		potential classroom value of resources. Otherwise, describe learning activities from a pedagogical perspective. Uncontrolled vocabulary. For learning objects, refer to <i>TLF Guidelines for digital content</i> . For other digital resources, refer to <i>TLF Digital resources style guide</i> .
educational objective	TLF_studentactivity		Analysis	Recommended	Describes the nature of the learning activity in which students will engage to help them develop particular skills, knowledge or values. Refer to TLF standards and specifications. www.thelearningfederation.edu.au/metadata
educational objective	TLF_learningdesign		Experiential learning	Optional	Describes the teaching methods and ways of presenting learning materials and experiences that facilitate a particular kind of learning interaction, process or outcomes. Legacy data only. 'Learning design' vocabulary no longer supported. Refer to <i>TLF superseded vocabularies</i> . www.thelearningfederation.edu.au/metadata
idea	scot	5367	Dust storms	Recommended	Describes the topic of the learning content. Schools Online Subject Thesaurus (ScOT). Refer to: scot.curriculum.edu.au
idea	ISO 3166-1	AU	Australia	Recommended	Identifies spatial characteristics of the intellectual content of the learning content. www.iso.org/iso/country_codes/iso_3166_code_lists.htm
idea	ISO 3166-2	AU-WA	Western Australia	Recommended	As above. Note TLF only applies values for Australian states (not regional values for other countries).
idea	DCMI Point		east=117.582; north=32.372; name=Overheu Nature Reserve;	Recommended	As above. www.dublincore.org/documents/dcmi-point/ Derive points and official names of Australian locations from the Gazetteer of Australia: www.ga.gov.au/map/names/ Derive points and official names of New Zealand locations from the New Zealand Geographic

					Placenames Database: www.linz.govt.nz/apps/placenames
idea	DCMI Period		start=1949; end=1949; scheme= W3C-DTF	Recomm- ended	Identifies temporal characteristics (date range) of the intellectual content of the learning content. Method for indicating a time interval is documented at: www.dublincore.org/documents/dcmi-period/
idea	TLF_concept		Geology	Optional	Describes the content learning outcomes supported by the application of the learning content. TLF legacy data only. 'Concept' vocabulary no longer supported. Refer to <i>TLF superseded vocabularies</i> .
skill level	Bloom's taxonomy of the cognitive domain		Knowledge	Optional	Describes the learning skills and process learning outcomes supported by the application of the learning content. TLF legacy data only. Vocabulary no longer supported. Refer to <i>TLF superseded vocabularies</i> .

7 References

- [Application profiles] Application profiles: mixing and matching metadata schema, Rachel Heery and Manjula Patel. Ariadne Issue 25, September 2000. <http://www.ariadne.ac.uk/issue25/app-profiles/>
- [ATAG] Authoring Tool Accessibility Guidelines 1.0, W3C Recommendation 3 February 2000. <http://www.w3.org/TR/ATAG10/>
- [DCMI Box] Dublin Core Metadata Initiative Box Encoding Scheme. Describes a method for identifying a region of space using its geographic limits. <http://dublincore.org/documents/dcmi-box/>
- [DCMES] Dublin Core Metadata Element Set v1.1: This document summarises the definitions for the Dublin Core metadata elements in Version 1.1. <http://www.au.dublincore.org/documents/dces/>
- [DCMI Period] Dublin Core Metadata Initiative Period Encoding Scheme. Describes a method of identifying a single time interval using its limits. <http://www.au.dublincore.org/documents/dcmi-period/>
- [DCMI Point] Dublin Core Metadata Initiative Point Encoding Scheme. Describes a method of identifying a point in space using its geographic coordinates. <http://dublincore.org/documents/dcmi-point/>
- [DCMI Type] Dublin Core Metadata Initiative Type Vocabulary. <http://dublincore.org/documents/dcmi-type-vocabulary/>
- [DCQ] Dublin Core Qualifiers 2000-07-11: The Dublin Core is a metadata element set to facilitate discovery of online resources. This document describes the principles governing Dublin Core qualifiers, the two categories of qualifiers, and lists instances of qualifiers approved by the Dublin Core Usage Committee. <http://www.au.dublincore.org/documents/dcmes-qualifiers/>
- [edna] edna Metadata Standard, v1.1: This is an Australian Education Sector metadata standard based on the Dublin Core Metadata Element Set. <http://www.edna.edu.au/edna/go/resources/metadata>
- [IEEE 1484.12.1-2002] IEEE LOM: Draft Standard for Learning Object Metadata. This standard defines a structure for interoperable descriptions of learning content. http://ltsc.ieee.org/wg12/files/LOM_1484_12_1_v1_Final_Draft.pdf
- [IETF] RFC 2119 Key words for use in RFCs to Indicate Requirement Levels <http://www.ietf.org/rfc/rfc2119.txt>
- [IMS Content Packaging] IMS Content Packaging Specification Information Model, v1.1.4 <http://www.imsproject.org/content/packaging>
- [IMS Best practice guide] IMS Global Learning Consortium (2006) IMS Meta-data Best Practice Guide for IEEE 1484.12.1-2002 Standard for Learning Object Metadata. Version 1.3 Final Specification <http://www.imsproject.org/metadata/>
- [IMT] Internet Media Types <http://www.iana.org/assignments/media-types/>
- [ISO11179] Specification and Standardization of Data Elements, Parts 1-6. <http://www.iso.org/iso/search.htm?qt=11179&published=on>
- [ISO 3166] ISO (International Organisation for Standardization) Country Names and Code Elements. http://www.iso.org/iso/country_codes/iso_3166_code_lists.htm
- [ISO 4217] ISO (International Organisation for Standardization) Currency Names. <http://www.xe.net/gen/oso4217.htm>
- [ISO 639] ISO (International Organisation for Standardization) Language Code <http://www.iso.org/iso/search.htm?qt=639&published=on>
- [ISO 8601] ISO (International Organisation for Standardization) Representations of dates and times. http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=40874
- Library Application Profile, DCMI Working Draft: This document proposes a possible application profile that clarifies the use of the Dublin Core Metadata Element Set in libraries and library-related

applications and projects. <http://www.au.dublincore.org/documents/2001/08/08/library-application-profile/>

[MARC Relators] This is a controlled vocabulary (including codes) for describing contributor roles. <http://lcweb.loc.gov/marc/relators/>

[MIME] Multipurpose Internet Mail Extensions extends the format of Internet mail to allow non-USASCII textual messages, non-textual messages, multipart message bodies, and non-US-ASCII information in message headers. <http://www.oac.uci.edu/indiv/ehood/MIME/MIME.html>

[ODRL] Open Digital Rights Language, v1.1: This is a proposal for expression of digital rights management statements and semantic interoperability. <http://odrl.net/>

[SA HB 256:2007] Standards Australia: November 2007. Metadata usage in Australian and New Zealand education and training. This handbook introduces the topic of metadata and documents current practices with particular focus on the Australia and New Zealand environment. <http://www.saiglobal.com/shop/script/Details.asp?DocN=AS0733782701AT>

[SCORM 2004] Shareable Content Object Reference Model, 2004 version. This is a collection of standards and specifications adapted from multiple sources to provide a comprehensive suite of e-learning capabilities that enable interoperability, accessibility and reusability of Web-based learning content. <http://www.adlnet.gov/scorm/>

[vCard] This standard defines how contact details for people and organizations can be represented. <http://www.imc.org/pdi/>

[Vetadata] Australian Flexible Learning Framework (2007) e-standards for training <http://e-standards.flexiblelearning.net.au/vetadata>

[W3C-DTF] W3C Encoding rules for dates and times, a profile based on ISO 8601. <http://www.w3.org/TR/NOTE-datetime>