

# JORUM Application Profile



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## 1. Introduction

This document describes the JORUM metadata application profile. This application profile is based on the UK Learning Object Metadata Core ([UK LOM Core](#)) which is itself derived from the IEEE 1484.12.1-2002 Standard for Learning Object Metadata ([IEEE LOM](#)). The UK LOM Core was specifically designed for use by metadata implementers such as the JORUM Project (i.e. those creating applications for service and data providers that implement the LOM).

In the context of metadata implementation, application profiles may be defined as:

“... meta-data element sets that are either abbreviated versions of complete standards or are a heterogeneous mix of elements drawn from different meta-data schemata. Typically, application profiles are developed to meet the needs of a specific application, within a specific community.”  
(IMS, 2004).

Application profiles may determine the syntax of metadata instances e.g. by enforcing the ordering of elements or by requiring the use of a particular binding or encoding format. They may also provide guidelines on the semantics of the data model e.g. by recommending how elements should be used, by requiring the use of community specific vocabularies or by specifying the definition of vocabulary terms for a particular community of practice. For further definitions of the term “application profile”, references and guidelines on creating metadata application profiles see the [IMS Best Practice and Implementation guide](#) for IEEE 1484.12.1-2002 Standard for Learning Objects Metadata (LOM) v 1.3 Draft Specification.

The primary objective of the UK LOM Core is to increase the interoperability of metadata instances and application profiles within the UK educational community by:

- Promoting the appropriate use of LOM syntax and semantics
- Defining the semantics of LOM data elements and advocating the use of common vocabularies
- Identifying a common core of elements that will provide an adequate description to facilitate general-purpose use and interoperability

As a [JISC](#) funded service, JORUM has been developed to be a component of the [JISC Information Environment](#) and interoperable with other services within it. As a consequence, JORUM will be one component of a distributed network of repositories that may include institutional, project and regional repositories. In addition, JORUM will expose metadata to the JISC IE through the use of [Open Archives Initiative Protocol for Metadata Harvesting](#)

(OAI-PMH) . To facilitate interoperability within this distributed environment it is essential to expose metadata in a standard format and manner.

In order for a metadata application profile to conform to the UK LOM Core's Core Element Set, all of the LOM Core required elements must be included in the profile. In addition, profile developers such as JORUM "should" publish their application profiles, including vocabularies, on a project website or in an application profile registry, to ensure that they are accessible to other UK LOM Core implementers.

This version of the JORUM application profile is based on the current working draft of the [UK LOM Core version 0.3 1244](#) dated December 2004. The profile has been developed to meet the requirements of the JORUM user community as they are currently understood.

The profile will enable learning and teaching resources to be located in the JORUM system by browsing and searching against metadata entries. Examples include:

- Browsing for resources using [JACS](#) , [Learndirect](#) , [UK Education Level](#) classification schemes
- Performing basic searches for resources using a limited number of metadata fields, including: title, description, keywords and education level
- Performing advanced searches for resources using any of the metadata fields included in the profile

## 2. JORUM Application Profile Element Set

The table below details the IEEE LOM elements that are used in the JORUM application profile. The notes and guidelines are based on the original UK LOM Core guidelines.

**REQUIRED** means that a value must be supplied. **RECOMMENDED** means that a value should be supplied unless there is a valid reason not to. **OPTIONAL** means that a value may be supplied if desired. The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" used throughout this document are to be interpreted as described in [IETF RFC 2119](#).

Nr	Name	Explanation (UK LOM Core)	Size	Order	Value Space	Data type	Optionality	Notes and Guidelines
1	General	This category groups the general information that describes this learning object as a whole.	1	unspecified		Aggregate element	REQUIRED	
1.1	Identifier	A globally unique label that identifies this learning object.	Smallest permitted maximum : 10 items	unspecified		Aggregate element	REQUIRED	JORUM will choose from a range of persistent, globally unique identifier schemata that includes, but is not restricted to, URI, URN, PURL, Handle, DOI, POI, XRI.  It is REQUIRED by the UK LOM Core that the chosen scheme is encoded in the form of a URI. JORUM is currently considering URI, Handle and POI identifying schemata.  Imported identifiers will be retained in addition to any auto generated system identifier.
1.1.1	Catalog	The name or designator of the identification or cataloguing scheme for this entry. A namespace scheme.	1	unspecified	Repertoire of ISO/IEC 10646-1:2000	CharacterString (minimum-maximum: 1000 char)	REQUIRED	
1.1.2	Entry	The value of the	1	unspecified	Repertoire of ISO/IEC 10646-	CharacterString	REQUIRED	The actual value of the

		identifier within the identification or cataloguing scheme that designates or identifies this learning object. A namespace specific string.		d	1:2000	(minimum-maximum: 1000 char)		identifier. This value will be automatically generated by the JORUM repository system.
1.2	Title	Name given to this learning object	1	unspecified		LangString (smallest permitted maximum: 1000 char)	REQUIRED	This element may not be repeated, so only one title may be encoded.  JORUM system will add object filename as default basic title.
1.3	Language	The primary human language or languages used within this learning object to communicate to the intended user	smallest permitted maximum : 10 items	unordered	ISO 639:1988 and ISO 3166-1:1997	CharacterString (smallest permitted maximum: 100 char)	REQUIRED	This element is REQUIRED as the UK is multi-lingual (ethnic, Welsh, Gaelic, etc.) and a member of the European Union. The appropriate two character language code MUST be chosen from ISO 639-2:1988. An additional two character country code from ISO 3166-1:1997 SHOULD also be used where appropriate. The default entry for this element is 'en-GB'.
1.4	Description	A textual description of the content of this learning object.	smallest permitted maximum : 10 items	unordered		LangString (smallest permitted maximum: 2000 char)	REQUIRED	The description MUST be a concise, keyword-intensive description of the object. If the resource has an abstract or table of contents, that information SHOULD be included here. The general description should not be confused with the educational description of the object.
1.5	Keyword	Keywords or phrases describing this learning object.	smallest permitted maximum : 10 items	unordered		LangString (smallest permitted maximum: 1000 char)	RECOMMENDED	These keywords SHOULD ideally be created by the author of the resource. Choose specific significant terms for keywords, avoiding those that are too general to describe the object effectively.

								<p>If the subject of the resource is a person, enter their name using the 'familyname, forename' format. E.g. Shakespeare, William.</p> <p>If the subject of the resource is an organisation, enter its name. E.g. Royal National Institute for the Blind.</p> <p>If the name is hierarchical, list the parts of the hierarchy from largest to smallest, separated by full stops. E.g. University of Edinburgh. School of Literatures Languages and Cultures. Celtic and Scottish Studies.</p> <p>This element can be repeated in the JORUM system for multiple free-text keywords.</p>
1.6	Coverage	The time, culture, geography or region to which this learning object applies.	smallest permitted maximum : 10 items	unordered		LangString (smallest permitted maximum: 1000 char)	OPTIONAL	<p>Refer to Dublin Core Coverage element: Typically, Coverage will include spatial location (a place name or geographic coordinates), temporal period (a period label, date, or date range) or jurisdiction (such as a named administrative entity). Recommended best practice is to select a value from a controlled vocabulary (for example, the Thesaurus of Geographic Names [TGN]) and to use, where appropriate, named places or time periods in preference to numeric identifiers such as sets of coordinates or date ranges.</p> <p>For temporal coverage, the date <b>MUST</b> be recorded in</p>

								ISO 8601:2000 format e.g. YYYY-MM-DD. See <a href="http://www.w3.org/TR/NOTE-datetime">http://www.w3.org/TR/NOTE-datetime</a> for further details.
1.7	Structure	Underlying organisational structure of this learning object	1	unspecified	"atomic" "collection" "networked" "hierarchical" "linear "	Vocabulary (State)	OPTIONAL	Refer to <a href="#">CanCore Guidelines 2.0</a> : CanCore does not recommend the use of this element.
1.8	Aggregation Level	The functional granularity of this learning object.	1	unspecified	"1" "2" "3" "4"	Vocabulary (Enumerated)	OPTIONAL	As there is no consensus as to how to categorise aggregation level, use of this element is not recommended unless there is a specific rationale for exploring how aggregation can be described. <a href="#">CanCore Guidelines 2.0</a> contain a useful starting point for defining aggregation levels using this element.
2	Lifecycle	This category describes the history and current state of this learning object and those who have affected this learning object during its evolution.	1	unspecified		Container element	REQUIRED	
2.1	Version	The edition of this learning object.	1	unspecified		LangString (smallest permitted maximum: 50 char)	RECOMMENDED	Developers of learning objects SHOULD systematically control versions of their resources.  Refer to <a href="#">CanCore Guidelines 2.0</a> :  This element is understood as describing software versioning conventions (e.g., alpha, beta) as well as document publication conventions (e.g., first edition).  This element is not intended to

								convey document status information (e.g., draft, revised, final) nor series number information (e.g., episode 12). For document status information, refer to element 2.2:Status.
2.2	Status	The completion status if condition of this learning object	1	unspecified	"draft" "final" "revised" "unavailable"	Vocabulary (State)	OPTIONAL	As many learning object developers may not use formal development cycles, appropriate use of this element can not be guaranteed and consequently its use is optional.  This element could be used by JORUM to control the public availability of the object.
2.3	Contribute	Those entities (i.e., people, organisations) that have contributed to the state of this learning object during its life cycle (e.g., creation, edits, publication).	smallest permitted maximum : 30 items	ordered		Container element	REQUIRED	
2.3.1	Role	Kind of contribution.	1	unspecified	'Author' 'Content Provider' 'Editor' 'Educational Validator' 'Graphical Designer' 'Initiator' 'Instructional Designer' 'Publisher' 'Script Writer' 'Technical Implementer' 'Technical Validator' 'Terminator' 'Unknown' 'Validator'	Vocabulary (State)	REQUIRED	LOM v1.0 vocabulary  For resources created by individual authors e.g. teachers or lecturers, 'author' MUST be used to denote the person who created the object and 'publisher' SHOULD be used to denote their institution/employer.  If an author is acting independently they MUST record their own name as both 'publisher' and 'author' Multiple authors SHOULD be recorded.
2.3.2	Entity	The identification of	smallest	ordered	vCard	CharacterString	REQUIRED	The REQUIRED minimum set

		and information about people or organisations contributing to this learning object, most relevant first.	permitted maximum : 40 items		<a href="http://www.imc.org/pdi/">http://www.imc.org/pdi/</a>	(smallest permitted maximum: 1000 chars)		of element types are declared by the vCard specification. See <a href="http://www.imc.org/pdi/">http://www.imc.org/pdi/</a>
2.3.3	Date	The date of the contribution.	1	unspecified		DateTime	REQUIRED	<p>Typically this will be the date of creation or publication of the resource.</p> <p>Date MUST be recorded in ISO 8601:2000 format e.g. YYYY[-MM[-DD]]. See <a href="http://www.w3.org/TR/NOTE-datetime">http://www.w3.org/TR/NOTE-datetime</a> for further details. If the exact date is not known year and month alone SHOULD be recorded e.g. YYYY-MM. If the month is not known only the year SHOULD be recorded e.g. YYYY.</p> <p>If the date cannot be recorded in ISO 8601:2000 format, or additional information is required, a textual description of the date SHOULD be added.</p> <p>This element MAY be used to identify a specific version of a resource in the absence of a formal method of version control.</p>
3	Metametadata	This category describes this metadata record itself (rather than the learning object that this record describes).	1	unspecified		Container element	REQUIRED	The meta-metadata elements describe the metadata record associated with a resource, not the resource itself.
3.1	Identifier	A globally unique label that identifies this metadata record. This is not and shall	1	unspecified		Container element	REQUIRED	JORUM will choose from a range of persistent, globally unique identifier schemata which include, but are not

		not be used, as there is no specified method for the creation of a globally unique identifier.						restricted to, URI, URN, PURL, Handle, DOI, POI, XRI.  In order to facilitate interoperability within distributed environments it is REQUIRED that the chosen scheme is encoded in the form of a URI.
3.1.1	Catalog	The name or designator of the identification or cataloging scheme for this entry. A namespace scheme.	1	unspecified	Repertoire of ISO/IEC 10646-1:2000	CharacterString (smallest permitted maximum: 1000 char)	REQUIRED	UK LOM Core REQUIRED value is URI. JORUM may also use Handle, POI and/or others
3.1.2	Entry	The value of the identifier within the identification or cataloging scheme that designates or identifies this metadata record. A namespace specific string.	1	unspecified	Repertoire of ISO/IEC 10646-1:2000  use the oai-identifier assigned to the record in the OAI repository as RDN?	LangString (smallest permitted maximum: 1000 char)	REQUIRED	The actual value of the identifier. This value will be generated by the JORUM repository system.
3.2	Contribute	Those entities (i.e., people or organisations) that have affected the state of this metadata instance during its life cycle (e.g., creation, validation).	smallest permitted maximum : 10 items	ordered		Container element	REQUIRED	
3.2.1	Role	Kind of contribution. Exactly one instance of creator should exist.	1	unspecified	"creator" "validator"	Vocabulary	REQUIRED	It is important to trust the validity of information contained in a metadata record therefore the 'creator' of the record is REQUIRED.
3.2.2	Entity	The identification of and information about the people or organisations contributing to this	smallest permitted maximum : 10 items	ordered	vCard <a href="http://www.imc.org/pdi/">http://www.imc.org/pdi/</a>	Characterstring (smallest permitted maximum: 1000 char)	REQUIRED	See 2.3.2 above.

		metadata instance, most relevant first.						
3.2.3	Date	The date of the contribution.	1	unspecified		DateTime	REQUIRED	Date MUST be recorded in ISO 8601:2000 format e.g. YYYY[-MM[-DD]], and will be generated automatically by the JORUM repository. See section 2.3.3 and <a href="http://www.w3.org/TR/NOTE-datetime">http://www.w3.org/TR/NOTE-datetime</a> for further guidelines.
3.3	Metadatascheme	The name and version of the authoritative specification used to create this metadata instance.	smallest permitted maximum : 10 items	unordered	Repertoire of ISO/IEC 10646-1:2000	CharacterString (smallest permitted maximum: 30 char)	REQUIRED	LOM v1.0 & JORUMv1.0
3.4	Language	Language of this metadata instance. This is the default language for all LangString values in this metadata instance. If a value for this data element is not present in a metadata instance, then there is no default language for LangString values.	1	unspecified	ISO 639:1988 and ISO 3166-1:1997	CharacterString (smallest permitted maximum: 100 char)	REQUIRED	The appropriate two character language code MUST be chosen from ISO 639-2:1988. An additional two character country code from ISO 3166-1:1997 SHOULD also be used where appropriate.  The default entry for this element is 'en-GB'. This value is generated automatically by the JORUM repository system.
4	Technical	This category describes the technical requirements and characteristics of this learning object.	1	unspecified		Container element	REQUIRED	
4.1	Format	Technical data type(s) of (all the components of) this learning object.	smallest permitted maximum : 40 items	unordered	MIME types based on IANA registration (see RFC2048:1996) or 'non-digital'	CharacterString (smallest permitted maximum: 500 char)	RECOMMENDED	MIME types SHOULD only be used. LOM stipulates that the technical data types of all components are recorded. For example for a Flash animation in an HTML Web page, repeat this element to encode both 'text/html' and 'application/x-shockwave-flash'.
4.2	Size	The size of the digital	1	unspecified	ISO 646:1991	CharacterString	RECOMMENDED	The size of the learning object

		learning object in bytes (octets). If the learning object is compressed, then this data element shall refer to the uncompressed size.		d		(smallest permitted maximum: 30 char)	D	is generated automatically by the JORUM repository system.  UK LOM Core requires the size MUST refer to the uncompressed size of the resource.  The size is displayed to the user in the most appropriate format e.g. KB, MB etc.
4.3	Location	A string that is used to access this learning object. It may be a location (e.g., Universal Resource Locator), or a method that resolves to a location (e.g., Universal Resource Identifier). The first element of this list shall be the preferable location.	smallest permitted maximum : 10 items	Yes	Repertoire of ISO/IEC 10646-1:2000	CharacterString (smallest permitted maximum: 1000 char)	REQUIRED	This refers to the location of the object rather than the location of the metadata record. This value resolves to a location where the learning object can be found i.e. a URL. For objects held in the JORUM repository system this element refers to the location of the object in the repository and is generated automatically by the system.
4.4	Requirement	The technical capabilities necessary for using this learning object. If there are multiple requirements, then all are required, i.e., the logical connector is AND.	smallest permitted maximum : 40 items	unordered		Container element	OPTIONAL	Refer to <a href="#">CanCore Guidelines 2.0</a>
4.4.1	OrComposite	Grouping of multiple requirements. The composite requirement is satisfied when one of the component requirements is satisfied, i.e., the logical connector is OR.	Smallest permitted maximum : 40 items	unordered		Container element	OPTIONAL	Refer to <a href="#">CanCore Guidelines 2.0</a>
4.4.1.1	Type	The technology required to use this	1	unspecified	"Browser" "Operating System"	Vocabulary (State)	OPTIONAL	Refer to <a href="#">CanCore Guidelines 2.0</a>

		learning object. E.g. hardware, software, network, etc						
4.4.1.2	Name	Name of the required technology to use this learning object.	1	unspecified	<p>if Type='operating system' then:</p> <p>"pc-dos"  "ms-windows"  "macos"  "unix"  "multi-os"  "none"</p> <p>if Type='browser' then:</p> <p>"any"  "netscape"  "communicator"  "ms internet"  "explorer"  "opera"  "amaya"</p>	Vocabulary (State)	OPTIONAL	
4.4.1.3	Minimum Version	Lowest possible version of the required technology to use this learning object.	1	unspecified	Repertoire of ISO/IEC 10646-1:2000	CharacterString (smallest permitted maximum: 30 char)	OPTIONAL	Refer to <a href="#">CanCore Guidelines 2.0</a>
4.4.1.4	Maximum Version	Highest version of the technology known to support the use of this learning object.	1	unspecified	Repertoire of ISO/IEC 10646-1:2000	CharacterString (smallest permitted maximum: 30 char)	OPTIONAL	Refer to <a href="#">CanCore Guidelines 2.0</a>
4.5	Installation Remarks	Description of how to install this learning object.	1	unspecified		LangString (smallest permitted maximum: 1000 char)	OPTIONAL	Refer to <a href="#">CanCore Guidelines 2.0</a>
4.6	Other Platform Requirements	Information about other software and hardware requirements.	1	unspecified		LangString (smallest permitted maximum: 1000 char)	OPTIONAL	Use as a general comment element to describe any technical information the user may require in order to use the object that has not already been described in 4.1 technical format.

4.7	Duration	Time a continuous learning object takes when played at intended speed.	1	unspecified			OPTIONAL	This element SHOULD only be used to describe time based media files, e.g. sound, video or animation. Use 5.9 Educational. Typical Learning Time to describe the time needed for a learner to use the resource.
5	Educational	This category describes the key educational or pedagogic characteristics of this learning object. This is the pedagogical information essential to those involved in achieving a quality learning experience. The audience for this metadata includes teachers, managers, authors and learners.	Smallest permitted maximum : 100 items	unspecified		Container element	RECOMMENDED	
5.1	Interactivity Type	Predominant mode of learning supported by this learning object	1	unspecified	"active" "expositive" "mixed" "undefined"	Vocabulary (State)	RECOMMENDED	Refer to <a href="#">CanCore Guidelines 2.0</a> :  It describes characteristics of the resource that are indicated by other elements (e.g., a value of exam or simulation for 5.2:Learning Resource Type will be Active; a value of JPEG or text or 4.1:Technical.Format will likely be Expositive).  The criterion for interactivity presented by this element is different from that presented by element 5.3:Interactivity Level. The categories in these two elements can be understood as relating to one another orthogonally. However, this orthogonal

							<p>relationship between types of interactivity and levels of interactivity is not a simple one, and not reflected in the literature. It may not be readily understood by metadata record creators.</p> <p>Note that Active, Expositive, and Mixed are attributes of the resource, rather than "modes learning" (as stated in the LOM explanation).</p>
5.2	Learning Resource Type	Specific kind of learning object. The most dominant kind shall be first.	items	ordered	<p>LOMv1.0:</p> <p>'Diagram' 'Exam' 'Exercise' 'Experiment' 'Figure' 'Graph' 'Index' 'Narrative Text' 'Problem Statement' 'Questionnaire' 'Self Assessment' 'Simulation' 'Slide' 'Table'</p> <p>or RDNLTSNType:</p> <p>"CourseModuleUnitProgramme" "ResourcePack" "CaseStudy" "ActivityExerciseFieldwork" "ActivityExerciseFieldworkNotes" " "ProjectOutline" "SimulationModel" "StudyGuide" "ExaminationTest" "QuestionBank" "AssessmentItem" "LecturePresentation" "Glossary"</p>	RECOMMENDED	<p>Taken from LOMv1.0 and RDNLTSNType.</p> <p>Use of the LOMv1.0 vocabulary is problematic as it includes terms that describe both the form (e.g. diagram) and the function (e.g. exam) of the object. In recognition of this, many application profiles recommend the use of customised vocabularies to describe this element.</p> <p>LOM and UK LOM Core recommend the use of customised vocabularies in conjunction with LOMv1.0 vocabulary.</p>

					"CourseLecturePresentationNotes" " "WorkedExample" "Textbook" "Demonstration" "Computer-basedTutorial" "ReadingList" "TeachingTip" "CurriculumSyllabus" "EducatorGuide" "EvaluationForm" "EducationalPolicy" "EducationalReport" "LessonPlan"			
5.3	Interactivity Level	The degree of interactivity characterising this learning object. Interactivity in this context refers to the degree to which the learner can influence the aspect or behaviour of the learning object.	1	unspecified	"very low" "low" "medium" "high" "very high"	Vocabulary (Enumerated)	RECOMMENDED	Although this element is not well understood its implementation is RECOMMENDED to help develop a common understanding of its usage.
5.4	Semantic Density	The degree of conciseness of a learning object. The semantic density of a learning object may be estimated in terms of its size, span or – in the case of self-timed resources such as audio or video – duration.	1	unspecified	"very low" "low" "medium" "high" "very high"	Vocabulary (Enumerated)	OPTIONAL	It is recognised that educators routinely make judgments on the appropriateness of learning resources based on a subjective notion of 'semantic density', although they may not use this term.
5.5	Intended End User Role	Principal user(s) for which this learning object was designed, most dominant first.	smallest permitted maximum : 10 items	unordered	"teacher" "author" "learner" "manager"	Vocabulary	RECOMMENDED	From <a href="#">CanCore Guidelines 2.0</a> : <ul style="list-style-type: none"> <li>• A teacher is "one who or that which teaches or instructs; an instructor" (OED).</li> <li>• An author is "the person who originates or gives existence to</li> </ul>

								<p>anything" (OED).</p> <ul style="list-style-type: none"> <li>• A learner is "one who learns or receives instruction" (OED).</li> <li>• A manager is "a person who organises, directs, or plots something; a person who regulates or deploys resources" (OED). Note that manager can be considered as a broad equivalent for more specific values not included in this listing, such as parent, guardian, or supervisor.</li> </ul>
5.6	Context	The principal environment within which the learning and use of this learning object is intended to take place.	smallest permitted maximum : 10 items		<p>UKEC:</p> <p>"nursery education"  "primary education"  "secondary education"  "sixth form college"  "further education"  "higher education"  "continuous professional development"  "vocational training"  "community education"</p> <p>and LOMv1.0:</p> <p>"school"  "higher education"  "training"  "other"</p>	Vocabulary (State)	RECOMMENDED	<p>UK LOM Core recommends the <a href="#">UK Educational Contexts</a> vocabulary for this element. This vocabulary contains terms relevant to the UK educational context.</p> <p>It is RECOMMENDED that this vocabulary SHOULD be used in conjunction with the LOMv1.0 vocabulary to facilitate interoperability with other applications.</p>
5.7	Typical Age Range	Age of the typical intended user. This element shall refer to the developmental	smallest permitted maximum : 5 items	Unordered		LangString (smallest permitted maximum: 1000)	RECOMMENDED	It is RECOMMENDED that this element SHOULD only refer to the chronological age of a user and not their

		age, if that would be different from the chronological age.				chars)		developmental age as suggested by the LOM explanation. Therefore the element is used to indicate the appropriateness of the object for a particular age group. Developmental 'age' or level should be described using 9.1 Classification. Purpose. Educational Level.
5.8	Difficulty	This data element defines how hard it is to work through this learning object for the typical target audience.	1	unspecified	"very easy" "easy" "medium" "difficult" "very difficult"	Vocabulary (Enumerated)	RECOMMENDED	It is recognised that educators routinely make judgements on the appropriateness of learning resources based on a subjective notion of 'difficulty'. Although this element is not well understood its implementation is RECOMMENDED to help develop a common understanding of its usage.
5.9	Typical Learning Time	Approximate or typical time it takes to work with or through this learning object for the typical intended target audience.	1	unspecified		Duration	OPTIONAL	As there is no commonly accepted method of determining how long a learner should work with any given resource, this element should be used with caution.
5.10	Description	Comments on how this learning object is to be used.	Smallest permitted maximum : 10 items	unspecified		LangString (smallest permitted maximum: 1000 char)	RECOMMENDED	This element describes potential educational uses of a resource. For example "use as an introduction to the topic". This element should not be confused with 1.4 General.Description.
5.11	Language	The human language used by the typical intended user of this learning object.	smallest permitted maximum : 10 items	unordered	ISO 639:1988 and ISO 3166-1:1997	CharacterString (smallest permitted maximum: 100 char)	RECOMMENDED	This element describes the language of the intended end user of the resource. This is distinct from 1.3 General.Language.
6	Rights	This category describes the intellectual property rights and conditions of use for this learning object.	1	unspecified		Container element	REQUIRED	JORUM licensing scheme currently being investigated.

6.2	Copyright and Other Restrictions	Whether copyright or other restrictions apply to the use of this learning object.	1	unspecified	"yes"	Vocabulary (State)	REQUIRED	JORUM requires all objects to have license conditions assigned.
6.3	Description	Comments on the conditions of use of this learning object.	1	unspecified		LangString (smallest permitted maximum: 1000 char)	REQUIRED	<p>This element <b>MUST</b> be used to record a description of costs, copyright restrictions, conditions of use or where to access further information regarding usage rights.</p> <p>JORUM may place the licence description in this field or use a URL to link to the JORUM licence on the JORUM website or another location.</p>
7	Relation	This category defines the relationship between this learning object and other learning objects, if any.	smallest permitted maximum : 100 items	unordered		Container element	OPTIONAL	<p>Use of these elements is usually labour intensive. These elements should only be used if they are known to aid discovery.</p> <p>UK LOM Core refers to <a href="#">CanCore Guidelines 2.0</a> for further advice:</p> <p>The utility of the Relation category is highly dependent on the provision and interoperation of infrastructure elements other than metadata (e.g. identification and resolution services, content packaging technology, aggregation and disaggregation mechanisms). Properly supported and integrated, the Relation category can support important functionality and add considerable value to an implementation. Such support and integration, however, is not likely to be available</p>

								across domains, or in highly distributed environments. All of these factors should be taken into account in decisions to use these elements.
7.1	Kind	Nature of the relationship between this learning object and the target learning object, identified by 7.2:Relation.Resource .	1	unspecified	"ispartof" "haspart" "isversionof" "hasversion" "isformatof" "hasformat" "references" "isreferencedby" "isbasedon" "isbasisfor" "requires" "isrequiredby"	Vocabulary (State)	OPTIONAL	Refer to <a href="#">CanCore Guidelines 2.0</a> .
7.2	Resource	The target learning object that this relationship references.	1	unspecified			OPTIONAL	This aggregate element refers to the learning resource to which the resource described by the metadata instance is being related.
7.2.1	Identifier	A globally unique label that identifies the target learning object.	Smallest permitted maximum : 10 items	unspecified		Container element	OPTIONAL	The identifier allocated to the related resource.  Refer to <a href="#">CanCore Guidelines 2.0</a> :  The values supplied for 7.2.1:Identifier should correspond to those provided for 1.1:General.Identifier in the metadata record of the referenced resource.
7.2.1.1	Catalog	The name or designator of the identification or cataloguing scheme for his entry. A namespace scheme	1	unspecified	Repertoire of ISO/IEC 10646-1:2000	CharacterString (smallest permitted maximum:1000 char)	OPTIONAL	Values for this element MAY include, but are not restricted to, URI, URL, URN, PURL, DOI, Handle, XRI, ISBN, and ISSN
7.2.1.3	Entry	The value of the identification or cataloguing scheme that designates or	1	unspecified		LangString (smallest permitted maximum: 1000	OPTIONAL	The actual value of the identifier.

		identifies the target learning object. A namespace specific string.				char)		
7.2.2	Description	Description of the target learning object.	1	unspecified		LangString (smallest permitted maximum: 1000 char)	OPTIONAL	From <a href="#">CanCore Guidelines 2.0</a> : CanCore does not recommend the use of this element for the purposes of interoperation in distributed environments.
8	Annotation	This category provides comments on the educational use of this learning object, and information on when and by whom the comments were created. This category enables educators to share their assessments of learning objects, suggestions for use, etc.	smallest permitted maximum : 30 items	unordered		Container	RECOMMENDED	Implementers and educators SHOULD aspire to using the annotation category elements as they have the potential to significantly enhance the richness of the metadata instance by recording additional qualitative and quantitative information about the resource and its usage.  JORUM envisages this element to be used for peer review in combination with a star rating system.
8.1	Entity	Entity (i.e. people, organisation) that created this annotation	1	unspecified	vCard <a href="http://www.imc.org/pdi/">http://www.imc.org/pdi/</a>	CharacterString (smallest permitted maximum: 1000 char)	RECOMMENDED	See guidelines for 2.3.2 Life Cycle.Contribute.
8.2	Date	Date this annotation was created.	1	unspecified		DateTime	RECOMMENDED	Data type 'DateTime' described in LOM Standard. Date must be recorded in ISO 8601:2000 format e.g. YYYY[-MM[-DD]].
8.3	Description	The content of this annotation.	1	unspecified		LangString (smallest permitted maximum: 1000 char)	RECOMMENDED	This element SHOULD be used to describe the experience of using the resource in a teaching and learning context.  <a href="#">CanCore Guidelines 2.0</a> also suggest using this element to describe educational characteristic that cannot be

								accommodated by the elements in 5. Educational category.
9	Classification	This category describes where this learning object falls within a particular classification system.	smallest permitted maximum : 40 items	unordered		Container element	REQUIRED	
9.1	Purpose	The purpose of classifying this learning object.	1	unspecified	"Discipline"		REQUIRED	Discipline - this refers to a formal subject classification or identification used by an institution or sector. JORUM has implemented <a href="#">LearnDirect (Levels 1-2)</a> and the <a href="#">Joint Academic Coding System</a>
9.2	Taxon Path	A taxonomic path in a specific classification system. Each succeeding level is a refinement in the definition of the preceding level. There may be different paths, in the same or different classifications, which describe the same characteristic.	smallest permitted maximum : 15 items	unordered		Container element	REQUIRED	
9.2.1	Source	The name of the classification system. This data element may use any recognized "official" taxonomy or any user-defined taxonomy.	1	unspecified	"jacs" "ldcs"	LangString (smallest permitted maximum: 1000 char)	REQUIRED	
9.2.2	Taxon	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	smallest permitted maximum : 15 items	ordered		Container element	REQUIRED	i.e. "jacs" or "ldcs"

		reference. Either or both the label and the entry may be used to designate a particular taxon.						
9.2.2.1	Id	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 10646-1:200	CharacterString (smallest permitted maximum: 100 char)	REQUIRED	JORUM uses the notation or classmark from the chosen classification scheme.  e.g. "K110"
9.2.2.2	Entry	The textual label of the taxon.	1	unspecified		LangString (smallest permitted maximum: 500 char)	REQUIRED	JORUM uses terms from the chosen classification scheme.  e.g. "Architectural Design Theory"
9	Classification						RECOMMENDED	
9.1	Purpose				"Educational Level"		RECOMMENDED	Educational Level – this relates to the cognitive or grade level for which the resource is intended. UK LOM Core RECOMMENDs that the <a href="#">UK Educational Levels</a> (UKEL) vocabulary SHOULD be used. UKEL terms correspond directly to the <a href="#">Scottish Credit and Qualifications Framework</a> .  JORUM has implemented the UKEL classification scheme.
9.2	Taxon Path						RECOMMENDED	
9.2.1	Source				"UKEL"		RECOMMENDED	UKEL
9.2.2	Taxon						RECOMMENDED	
9.2.2.1	Id						RECOMMENDED	e.g. "ukel11"
9.2.2.2	Entry				" UK Educational Level 1" " UK Educational Level 2"		RECOMMENDED	

					" UK Educational Level 3" " UK Educational Level 4" " UK Educational Level 5" " UK Educational Level 6" " UK Educational Level 7" " UK Educational Level 8" "UK Educational Level 9" " UK Educational Level 10" " UK Educational Level 11" " UK Educational Level 12"			
9	Classification						OPTIONAL	
9.1	Purpose				"idea"		OPTIONAL	Idea – this relates to the concept contained in the resource. JORUM will implement the <a href="#">LTSN Policy Themes vocabulary</a> .
9.2	Taxon Path						OPTIONAL	
9.2.1	Source				"LTSN Policy Themes Vocabulary Version 1.0"		OPTIONAL	
9.2.2	Taxon						OPTIONAL	
9.2.2.1	Id						OPTIONAL	
9.2.2.2	Entry						OPTIONAL	e.g. "Distance students"
9	Classification						OPTIONAL	
9.1	Purpose				"educational objective"		OPTIONAL	JORUM will implement the <a href="#">LTSN Pedagogic vocabulary</a> .
9.2	Taxon Path						OPTIONAL	
9.2.1	Source				"LTSN Pedagogic Vocabulary Version 1.0"		OPTIONAL	
9.2.2	Taxon						OPTIONAL	
9.2.2.1	Id						OPTIONAL	
9.2.2.2	Entry						OPTIONAL	e.g. "Problem solving"
9	Classification						RECOMMENDED	
9.1	Purpose				"Accessibility Restrictions"		RECOMMENDED	Accessibility Restrictions – Accessibility metadata is information about the accessibility of a resource or

								learning object, which can be used for filtering or manipulating those resources, so that a learner can find learning objects that will match their requirements or preferences.  <a href="#">TechDis</a> have drafted an “ <a href="#">Accessibility Metadata Specification</a> ” that JORUM has implemented for describing the accessibility of learning objects and resources.
9.2	Taxon Path						RECOMMENDED	
9.2.1	Source				"Techdis"		RECOMMENDED	
9.2.2	Taxon						RECOMMENDED	
9.2.2.1	Id						RECOMMENDED	e.g. "_96_3._good_contrast"
9.2.2.2	Entry						RECOMMENDED	e.g. "3. Good Contrast"

## References

- The 'RDNLTSNType' list is documented at <http://www.rdn.ac.uk/publications/rdn-ltsn/types/>.
- The 'UKEL' (UK Educational Levels) list is documented at <http://www.ukoln.ac.uk/metadata/education/ukel/>.
- The 'UKEC' (UK Educational Contexts) list is documented at <http://www.ukoln.ac.uk/metadata/education/ukey/>.
- The LTSN policy themes vocabulary version 1.0 is documented at <http://www.rdn.ac.uk/publications/rdn-ltsn/policy-themes/>.
- The LTSN pedagogic vocabulary version 1.0 is documented at <http://www.rdn.ac.uk/publications/rdn-ltsn/pedagogic-terms/>.
- The Techdis accessibility metadata specification version 1.2 is documented at <http://www.techdis.ac.uk/metadata/spec.html>.