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LEARNING PROGRESSIONS AND ONLINE FORMATIVE  
ASSESSMENT NATIONAL INITIATIVE











FINAL REPORT – ATTACHMENT 7

DIGITAL RESOURCES QUALITY ASSURANCE, METADATA  
SPECIFICATIONS AND DIGITAL CONTENT  
SPECIFICATIONS

## 1 Quality assurance criteria for digital resources

In order to effectively validate and map existing digital content against the NLNLPs key criteria have been established for judging both the quality and educational value of the digital content. The quality assurance criteria were informed by: ESA's *Educational value and online content guidelines*, ACARA's criteria for curriculum development, Bryman's (2015) four criteria for assessing the quality of teaching and learning resources and Tracy's (2010) criteria for judging the quality of qualitative research. A simple traffic light colouring system (green, amber and red) was employed to highlight strengths and gaps found in the sample digital resources and content.

Table 1: Quality assurance criteria for digital resources

Criteria	Descriptor	Criteria	Descriptor
<b>Breadth</b> 	<ul style="list-style-type: none"> <li>The online content or a learning object can be transferred across curriculum areas with the same reliability and validity as its initial intention.</li> </ul>	<b>Research-based practice (reliability)</b> 	<ul style="list-style-type: none"> <li>Sound research-based references included or referred to.</li> <li>Provides examples or case studies of evidence of impact.</li> </ul>
<b>Depth</b> 	<ul style="list-style-type: none"> <li>The purpose of the online content and/or learning object addresses one of the following:             <ul style="list-style-type: none"> <li>proficiency within the Learning Progressions</li> <li>practise of current skill for mastery</li> <li>transference of skill or understanding</li> <li>corresponds to real world.</li> </ul> </li> </ul>	<b>Evidence-based impact</b> 	<ul style="list-style-type: none"> <li>Evidence of prior impact of content, pedagogical approach or resource on student progress and achievement (as linked to the above research basis criteria).</li> </ul>
<b>Integrity</b> 	<ul style="list-style-type: none"> <li>Is linked to the Australian Curriculum.</li> <li>It actually is what it says it is, and does what it says it will.</li> <li>The information provided about the resource is able to be verified.</li> </ul>	<b>Interactivity/Flexibility</b> 	<ul style="list-style-type: none"> <li>Provides opportunities for users to demonstrate learning.</li> <li>Inquiring, investigating and problem-solving.</li> <li>Provides informative feedback about learning.</li> <li>Flexibility of one source of content that can be found and presented in a variety of formats, environments or uses (e.g. tablet, iPad, iPhone, laptop).</li> </ul>
<b>Alignment</b> 	<ul style="list-style-type: none"> <li>Content intended for students, teachers and parents is directly aligned to the Learning Progressions.</li> </ul>	<b>Accessibility (inclusive)</b> 	<ul style="list-style-type: none"> <li>Inclusive of users' age, socioeconomic status, race, culture, disability, gender or geographic location.</li> <li>Robust, so as to operate with a wide variety of 'user' agents (such as assistive technologies).</li> <li>Withstand technology changes without requiring redesign or recoding.</li> <li>Meets the accessibility standards (WCAG 2.0).</li> </ul>
<b>Purpose</b> 	<ul style="list-style-type: none"> <li>Articulates the purpose of the content for its intended audience.</li> <li>Is intuitive (that is, the intended audience knows what to do and how to do it).</li> </ul>	<b>Relevance</b> 	<ul style="list-style-type: none"> <li>Clear relevance to the Learning Progressions.</li> <li>Supportive of the teacher in developing curriculum that is relevant to the learner.</li> <li>Relevant to current skills and knowledge of how we learn.</li> </ul>

Adapted from the following sources: *Educational value standard for digital resources* [version 1.01], Education Services Australia, 2012; A. Bryman, *Social research methods* (5th ed.), Oxford: Oxford University Press, 2015; S. Tracy, 'Qualitative quality eight 'big-tent' criteria for excellent qualitative research', in *Qualitative inquiry*. Vol., 16, 837, 2010

## 2 Draft metadata considerations to support the design of specifications for online content

The metadata schema for this initiative considered whether existing schemas or the integration of multiple schemas would be required to describe optimal digital learning content. Key considerations for content specifications for this initiative included interoperability, backwards compatibility and whether it is ‘fit for purpose’. These are described in more detail below:

- **Interoperability:** Interoperability refers to the fact that the selected schema must enable the seamless transmission of resource metadata between any systems involved in the initiative ecosystem.
- **Backwards compatibility:** As outlined in the *Online digital content analysis* report (2019) there is a pool of existing online learning content hosted by Education Services Australia, which may be useful for reuse in the initiative and is described in ANZ-LOM. Therefore, a schema must be mappable from ANZ-LOM.
- **Fit for purpose:** Every mandatory metadata element introduces a cost to the creation and maintenance of metadata, thus limiting the number of resources in the system and increasing the likelihood of data-quality issues. The schema must describe resources sufficiently to meet the functional requirements of the initiative, but without any elements that are surplus to these requirements.

The table below presents a range of metadata domains of relevance to the NLNLPs, including schema elements from the DCMI, LRMI/schema.org, and MLR schemas, and their proposed contribution to and their proposed contribution to user tasks outlined in the *Draft content specifications for existing, third-party and new digital content report* (2019), section 7.3.2 Application of metadata considerations for this initiative, available on request from the PMB Secretariat.

Table 2: Draft metadata considerations

Domain	Description/Scope	Example schema elements	Find	Identify	Select	Obtain	Browse
<b>Description of content</b>	Includes description of content; sensory-modality/type of content; language; duration (eg of video)	<b>DCMI:</b> description, type, language <b>LRMI/schema.org:</b> about, accessMode, inLanguage, duration <b>MLR:</b> description, type, language	Y	Y	Y		
<b>Topic and coverage</b>	Includes topic (controlled vocabulary); keywords; spatial and temporal coverage	<b>DCMI:</b> subject, coverage, spatial, temporal <b>LRMI/schema.org:</b> about, keywords, contentLocation, temporalCoverage <b>MLR:</b> subject, coverage	Y		Y		Y
<b>Framework alignment</b>	Element/s of curriculum or Learning Progression frameworks to which the resource is aligned.  May also include: <ul style="list-style-type: none"> <li>Where the resource sits on an aligned curriculum element, relative to other resources in terms of difficulty/complexity.</li> <li>Source and nature of the alignment framework elements that are a prerequisite for the use of the resource</li> </ul>	<b>LRMI/schema.org:</b> educationalAlignment <b>MLR:</b> has curriculum	Y				
<b>Technical description</b>	Includes encoding formats, technical requirements, file size (for downloadables), device dependence, method of access	<b>DCMI:</b> format (and sub-elements) <b>LRMI/schema.org:</b> material, encodingFormat, contentSize <b>MLR:</b> format		Y	Y		
<b>Identification/ Accessing</b>	Includes unique identifiers; URL or other location specifier	<b>DCMI:</b> identifier <b>LRMI/schema.org:</b> identifier, url <b>MLR:</b> identifier		Y		Y	

<b>Contribution</b>	Includes authors/creators, sponsoring organisations and other contributors, as well as the nature of the contribution	<b>DCMI:</b> contributor and creator <b>LRMI/schema.org:</b> contributor, author, sourceOrganisation, sponsor <b>MLR:</b> contributor, creator		Y			Y
<b>Lifecycle events</b>	Includes agency, date and/or place of events including first publication, copyright, accession, modification	<b>DCMI:</b> publisher, date (and sub-elements) <b>LRMI/schema.org:</b> publisher, publisherImprint, locationCreated, copyrightYear, dateCreated, dateModified, datePublished <b>MLR:</b> publisher, date		Y			Y
<b>Edition/version</b>		<b>LRMI/Schema.org:</b> version		Y			
<b>Title</b>	Includes main and alternative titles	<b>DCMI:</b> title and alternative <b>LRMI/schema.org:</b> name and alternativeName <b>MLR:</b> title		Y			
<b>Accessibility</b>	Accessibility requirements met (or not met) by the resource	<b>LRMI/schema.org:</b> accessibilityAPI, accessibilityControl, accessibilityFeature, accessibilityHazard			Y		
<b>Audience</b>	Intended audience role (eg teacher versus student), school level or range, and/or age-level or range	<b>DCMI:</b> audience, educationLevel, mediator <b>LRMI/schema.org:</b> audience, typicalAgeRange, educationalAudience:educationalRole <b>MLR:</b> Audience.audience level, Audience.maximum age, Audience.minimum age, Audience.audience role			Y		
<b>Classroom and educational use</b>	How resource can be used in the classroom; whether or degree to which the resource requires user interaction; kinds of activities the resource requires from or induces in students; form or 'genre' of the learning resource, eg instructional game	<b>DCMI:</b> instructionalMethod <b>LRMI/schema.org:</b> educationalUse; interactivityType; learningResourceType <b>MLR:</b> learning method; Learning Activity: induced activity; Learning Activity.pedagogical type			Y		
<b>Resource quality and other educational notes</b>	Includes education value statements, educational objectives, resource quality	<b>MLR:</b> Annotation (which includes types global; content quality; suggestion for use; reliability; usability; handiness; reusability; efficiency)			Y		
<b>Paradata</b>	Includes use of the resource, popularity, user feedback				Y		

<b>Rights, licensing, cost</b>	Includes rightsholder, licence, conditions and cost of access, timeframes around access, renewal dates	<b>DCMI:</b> rights (and sub-elements), rightsHolder <b>LRMI/schema.org:</b> licence (or useRightsUrl), copyrightHolder, isAccessibleForFree <b>MLR:</b> rights			Y		
<b>Time required to complete/use</b>		<b>LRMI/Schema.org:</b> timeRequired <b>MLR:</b> Learning Activity.typical learning time			Y		
<b>Relations</b>	Relationship between resource and other resources, including the semantics of that relationship	<b>DCMI:</b> relations (and sub-elements) <b>LRMI/schema.org:</b> hasPart, isPartOf, mentions, position, sameAs, isBasedOnUrl or isBasedOn <b>MLR:</b> relation, source, prerequisite					Y
<b>Meta-metadata</b>	Metadata publisher, publication date, metadata schema, and licensing	<b>LRMI/schema.org:</b> sdDatePublished, schemaVersion, sdLicense, sdPublisher					

### 3 Proposed suggestion engine and its corresponding system integrations

The following diagram represents the digital content specifications and the technical standards for how external systems could access a federated system and align resources to the National Literacy and Numeracy Learning Progressions.

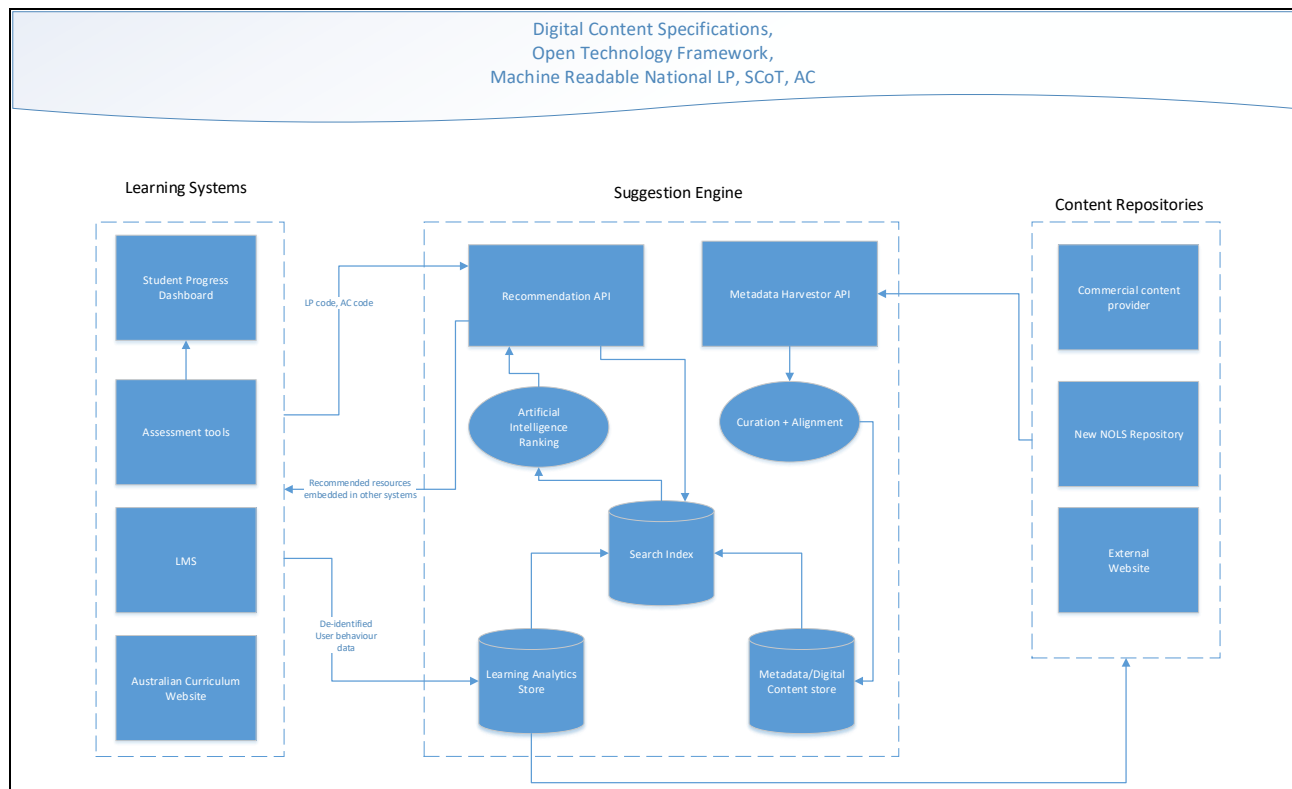


Figure 1: Proposed suggestion engine and its corresponding system integrations