

LAMM – Learning Analytics Metadata Model (Version 0.1)

Levels of Obligation

- **Mandatory (M)** properties must be provided; (grey labeled in the table)
- **Recommended (R)** properties are optional, but strongly recommended for interoperability; and
- **Optional (O)** (but not specifically recommended) properties provide richer description.

Occurrence (Occ),

- 0-n = optional and repeatable
- 0-1 = optional, but not repeatable
- 1-n = required and repeatable
- 1 = required, but not repeatable

Reference to other metadata schemas: *dc: DublinCore, data: DataCite, ra: RADAR, pm: PREMIS*

No.	Element Name	Entity Name	Occ	Obligation	Definition	Examples/Vocabulary	Other Metadata-Schemas
Descriptive Data							
1	title	title	1	M	Title of the dataset.		dc:title ra:title
2	identifier	identifier	1	M	A unique string that uniquely identifies an object.		dc:identifier data:identifier data:alternateIdentifier pm:objectIdentifier ra:identifier
2.1	identifier type	identifierType	0-1	O	Handle or DOI.		data:identifierType
3	author	creator	1-n	M	The main researchers involved in producing the data, or the authors of the publication, in priority order. To supply multiple creators, repeat this property.	Max Mustermann	dc:creator dc:contributor data:creator data:contributor ra:creator

3.1	given name	givenName	0-1	O	Last name of the person.		data:givenName ra:givenName
3.2	family name	familyName	0-1	O	First name of the person.		data:familyName ra:familiiyName
3.3	name identifier	nameIdentifier	0-n	O	The name of the name identifier scheme.	Examples: ORCID ¹ , GND ² ORCID: https://orcid.org/0000-0000-0000-1234 GND: https://d-nb.info/gnd/12345678	data:nameIdentifier
3.4	affiliation	creator	0-n	O	The organizational or institutional affiliation of the contributor.	Otto-von-Guericke University	dc:contributer data:affiliation ra:creatorAffiliation
3.5	affiliation identifier	affiliationIdentifier	0-n	O	Uniquely identifies the organizational affiliation of the creator.	ROR (Research Organization Registry) ³	dc:identifier data:affiliationIdentifier
4	publisher	publisher	1	M	The name of the entity that holds, archives, publishes prints, distributes, releases, issues, or produces the resource.		dc:publisher data:publisher ra:publisher
5	project	project	0-n	O	Name of the research project.		
6	funding reference	fundingReference	0-n	O	Information about financial support (funding) for the resource being registered.		Data:fundingReference

¹ <https://orcid.org/>

² https://www.dnb.de/DE/Benutzung/benutzung_node.html#sprg225128

³ <https://ror.org/>

6.1	funder name	funderName	1	O	Name of the funding provider.	Example: Bundesministerium für Bildung und Forschung (BMBF)	ra:funderName
6.2	funder identifier	funderIdentifier	0-1	O	Uniquely identifies a funding entity, according to various types.		data:funderIdentifier ra:funderIdentifier
7	publication year	publicationYear	1	M	Year in which the data package was published.		data:publicationYear ra:publicationYear
8	subject	subject	0-n	R	Subject, keyword, classification code, or key phrase describing the resource.	DDC (Dewey Decimal Classification) - class 300 for social science and the division 370 for education	dc:type data:subject ra:subjectarea
8.1	controlled subject area	controlled subject area	0-1	R	Classification in the subject areas. The English-language GEPRIS list of the DFG served as orientation. ⁴	Computer Sciences	ra:controlledSubjectArea
8.2	additional subject area	additional subject area	0-1	O	Specified subject area.	Learning Analytics	ra:additionalSubjectArea
9	resource	resource	1	M	Categorization on the type of research data.	The format is open. Here, information about the type of research data should be provided.	ra:resource
9.1	resource type	resourceType	1	M	An indication of the categorization of the resource type must be given here. Controlled list: -Dataset -Software		data:resourceType

⁴ <https://gepris.dfg.de/gepris/OCTOPUS?language=en&task=showKatalog>

					-Workflow (learning concept)		
10	rights	rights	1	M	Any rights information for this resource. The property may be repeated to record complex rights characteristics.		dc:rights data:rights pm:rightsStatement ra:rights
10.1	controlled rights	controlledRights	0-n	R	Re-use rights for data packages if the data provider has opted for a service (archiving or publication).	CC license, MIT software license	ra:controlledRights
11	description	description	0-n	R	All additional information that does not fit in any of the other categories. May be used for technical information.		data:description ra:description
12	keywords	keywords	0-n	O	Allocation of keywords.		ra:keywords
13	language	language	0-n	O	Predominant language in which the data is documented.	Language abbr.: ISO 639-3 Example: eng, fre, ger	dc:language ra:language
14	geo location	geoLocation	0-n	R	Spatial region or named place where the data was gathered or about which the data is focused.		data:geolocation ra:geolocation
14.1	geo location country	geoLocationCountry	0-n	R	Description of a country in which data were collected or to which the data relate.	Controlled vocabulary: English country name according to ISO 31667 Example: GERMANY	
15	version	version	0-1	O	The version number of the resource.		data:version
16	production time	productionTime	0-1	R	Survey period, time where the survey took place.	DD/MM/YYYY – DD/MM/YYYY	ra:productionTime data:date

17	related publication	relatedPublication	0-n	O	Bibliographic information about related publications to the dataset.		data:relatedItem
Learning Analytics-Specific Metadata							
Environment							
18	research design		0-1	O	Type of research design.		
19	learning concept	learningConcept	0-n	O	Description of the learning concept used for the teaching scenario.		
19.1	learning concept uri	learningConceptUri	0-n	O	Uri to the learning concept used for the research.		dc:context
20	learning platform	learningPlatform	0-n	O	Description of the learning platform used by the observed learner and for the learning process measurement.	e.g., Moodle	
20.1	software	software	0-n	O	Software used by the learning platform.		
Learner							
21	observed learner	observedLearner	0-n	O	Format is free. A description about the group of learners observed.		
22	number	number	0-n	O	Number of observed learners.		
23	educational institution	educationalInstitution	0-n	O	Definition of the educational institution, where the learners got observed.	e.g. - primary school - secondary school - high school - higher educational sector	
24	demographic characteristics	demographicCharacteristics	0-n	O	Information about the learner from questionnaires.		

24.1	questionnaire uri	questionnaireUri	0-n	O	Link to the questionnaire data set.		
Measurement							
25	measurement instrument	measurementInstrument	0-n	O	Description of the type of measurement instrument with detailed information.		ra:dataSource
26	type	type	0-n	O	Information about the type of measurement instrument.	e.g., Software Questionnaire Performance test Interview Video recording	
26.1	software type	softwareType	0-n	O	Description of the software.	Specifies the type of software that is used to create, edit, view or otherwise exploit the data source.	ra:softwareType
26.1.1	software name	softwareName	0-n	O	Name of the software.	Information on the designation of the software.	ra:softwareName
26.1.2	software version	softwareVersion	0-n	O	Version(s) of the software.	Mandatory field if the software field was specified. The format is open.	ra:softwareVersion
26.2	questionnaire	questionnaire	0-n	O	Description of the questionnaire.		
26.2.1	scales	scales	0-n	O	Scale used in questionnaires.		
26.2.2	scale type	scalesType	0-n	O	Definition of the scale type used in questionnaires.	e.g. likert scale, point scales	

26.3	performance test	performanceTest	0-n	O	Description of the performance test.		
26.3.1	scoring	scoring	0-n	O	Definition of the scale type used in the performance test.		
26.4	interview	interview	0-n	O	Description of the interview.		
26.5	video recording	videoRecording	0-n	O	Description of the video recording.		
27	activity	activity	0-n	O	Activity executed by the observed learner.	e.g. programming, collaborative programming	
28	attributes	attributes	0-n	O	Description of all attributes measured.	e.g. programming experience	
29	data processing	dataProcessing	0-1	O	Indication of any further, secondary modifications to research data.		ra:dataProcessing
29.1	computation	computation	0-1	O	Details of the computation used for data processing.		
Learning Process Measurement							
30	variable	variable	0-n	O	Description of the variable.	Quantity	
30.1	units number	unitsNumber	0-1	O	Number of units (cases) in the data set.		
30.2	unit of analysis	unitsOfAnalysis	0-1	O	Information about the units of analysis.	Quantity	
30.3	variable dataset	variableDataset	0-n	O	Information of the variable Dataset.		
30.3.1	variable dataset uri	variableDatasetUri	0-n	O	Uri to the variable dataset.		dc:context
31	calculation	calculation	0-n	O	Representation of the calculation used to make the learning process visible.		

31.1	computation	computation	0-n	O	Representation of the computation used to make the learning process visible.		
Linked Data							
32	data type	datatype	0-n	O	Information about the data type.	e.g., questionnaire, grades	
32.2	other dataset uri	otherDatasetUri	0-n	O	Link to the data set.		dc:context
33	type of relationship	typeOfRelationship	0-n	O	Information about the type of relationship to research data 1.	Is part of the measurements of research data 1	
34	other linked datasets	otherLinkedDatasets	0-n	O	Information about the dataset.		
34.1	name	otherLinkedDatasetName	0-n	O	Name of the dataset.		
34.2	description	otherLinkedDatasetDescription	0-n	O	Description of the dataset.		
34.3	other linked dataset uri	otherLinkedDatasetUri	0-n	O	Link to the dataset.		dc:context
Technical Metadata (File)							
35	file size	size	0-1	O	Size (e.g., bytes, pages, inches, etc.) or duration (extent), e.g., hours, minutes, days, etc., of a resource.		data:size
36	file name	storage	0-1	O	Name of the resource.		pm:storage
37	file type	format	0-1	O	Technical format of the resource.		dc:format data:format
38	checksum	checksum	0-1	O	Checksum of the data.		pm:signatureInformation
39	data protection	dataProtection	0-1	R	Details about the level of anonymization on a dataset. Further details in the field level of anonymization.		

39.1	level of anonymization	levelOfAnonymization	0-1	R	Details and description about the grade of anonymization.	e.g. fully anonymized, pseudonymized	
------	------------------------	----------------------	-----	---	---	--------------------------------------	--