Documentation of the RDMTraining4NFDI Template – Collection for Training Materials

Research Data Management Training for NFDI

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Wherever possible, categories were aligned with the preliminary work done by the *Working groups* (WG) of NFDI's *Section Training & Education* (EduTrain) as well as various stakeholders of the RDM community. Thanks to:

Linda Zollitsch and Swantje Piotrowski of the *Schleswig-Holstein State Initiative for RDM* (FDM-SH), who shared their experiences in developing their catalogue of quality criteria and graciously offered to collaborate, since the project *FDM-SH Kontor*[1] was aligned with the same objectives as *RDMTraining4NFDI*.

The members of the following projects / initiatives:

- DALIA: *DALIA Interchange Format* (DIF)[2]
- *Training and Further Education Sub-WG* of the *DINI*[3]*/nestor WG on Research Data* (AG Forschungsdaten)*: Metadata scheme for training materials on RDM*[4]
- DINI *WG Competence Centre for Interoperable Metadata* (DINI-WG-KIM)
- *Open Educational Resources Search Index* (OERSI)
- OER.net

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[1] A project emerged within the WG "Competence development" of FDM-SH.
[2] for further information on the DIF v1.4, please see: Geiger *et al.,* 2026.
[3] *German Initiative for Network Information* (DINI).
[4] for further information on the metadata schemata of the WG TFE, please see: Biernacka *et al.*, 2025.

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What to expect of this documentation

This documentation presents the findings of the base service *RDMTraining4NFDI* concerning training materials and guidelines. First, the initial situation at the start of the project is outlined and the original objectives are summarised. Second, the findings of *RDMTraining4NFDI* WP1 are presented. Following this, the methodological approach and the design of the collection template are described. Finally, considerations that have been incorporated into the respective categories of the collection template are documented.

Please note: Unless otherwise indicated, all text passages were translated from German into English using DeepL Translator[5], further refined with GPT-4.1 mini[6] , and subsequently edited by the author.

Introduction

Each NFDI consortium develops its own knowledge bases tailored to the specific needs of its target group. As research data management (RDM) gains increasing significance across all scientific fields, NFDI consortia provide essential training to support effective RD practices.. The NFDI *Section EduTrain* seeks to harmonise those efforts.

One key approach of *RDMTraining4NFDI* involved a design document for modular RDM training[7] which served as a content blueprint for analysing RDM training materials. To facilitate the establishment of a cross-consortia knowledge base for RDM training, *RDMTraining4NFDI* analysed samples of RDM training materials submitted between April 2025 and August 2025 by the use case consortia *BERD@NFDI*, *NFDI4Memory* and *NFDI4Microbiota*[8]. The analysis was complemented by semi-structured interviews[9] with representatives from these consortia. During this phase, additional training materials were also submitted by *NFDI4Biodiversity*[10].

Although *RDMTraining4NFDI* made every effort to comprehensively capture relevantt metadata, some information may have been overlooked or was unavailable within the referenced resources of the submitted training materials. Consequently, *RDMTraining4NFDI* presented an initial snapshot in December 2025, which was rwas subject to review by use case consortia throughout January 2026.

Please note: In this documentation, the term “snapshot” refers to a temporary dataset capturing the state of the sample RDM training materials at a particular point in time. The snapshot does not represent the complete collection of RDM training materials developed and/or curated by each consortium.

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[5] DeepL.com Translator, (2026).
[6] OpenAI, 2025.
[7] Please see: Bock and Keib, 2025a.
[8] Thanks to Jorge Murcia Serra and Markus Herklotz (*BERD@NFDI*), Marina Lemaire, Laura Döring and Anne Voigt (*NFDI4Memory*) and Justine Vandendorpe and Kassian Kobert (*NFDI4Microbiota*) who invested significant effort in sharing valuable insights and thoroughly reviewing the collection.
[9] For more information on *RDMTraining4NFDI*’s requirement analysis, please see: Wohltmann *et al*., 2025.
[10] Thanks to Juliane Röder (*NFDI4Biodiversity*) who also provided RDM training materials and made great effort with sharing critical thoughts and reviewing the snapshot.

The complete training collection of each use case consortium is publicly accessible at:

BERD@NFDI

- Open Educational Resources Hub: https://www.berd-nfdi.de/oer/
- ASSURED: https://www.berd-nfdi.de/assured/

NFDI4Memory

- HISTOCAT: https://4memory.de/unterstuetzung/lehren-lernen/histocat/
- HISTOFOX: https://4memory.de/unterstuetzung/lehren-lernen/histofox/

NFDI4Microbiota

- Knowledge Base: https://knowledgebase.nfdi4microbiota.de/Getting-Started/introduction.html

KonsortSWD[11]

- RDM Compas: https://rdm-compas.org/

The analysis of training materials, incorporating feedback from both use case consortia representatives and broader RDM community stakeholders[12], culminated in the publication of *RDMTraining4NFDI*'s *Collection Template* (version 1) in January 2026[13].

RDMTraining4NFDI also provided targeted feedback on the training offerings of the use case consortia, including recommendations for improving search filters and identifying outdated or missing metadata.

For a second version of the snapshot, inaccessible workshop announcements and training materials were removed in consultation with the use case consortia. From over 200 modularised entries in the first version, 70 entries were included in the refined snapshot. Additionally, conceptual aspects were revised, categories refined, missing metadata added, outdated metadata updated and typographical errors corrected. The revised version was presented to the use case consortia in March 2026 for a final review before its publication as a complement to this documentation.

In parallel, *RDMTraining4NFDI* developed an interactive snapshot[14] of the analysed training materials for demonstration purposes

[11] During the first half of 2025 no contact person of *KonsortSWD* was available for discussing questions on their training materials in greater detail. Therefore *KonsortSWD* and *RDMTraining4NFDI* agreed on not analysing training materials of this use case consortium at this stage.
[12] Please see: "Preliminary work and contributions".
[13] Please see: Bock *et al.*, 2025b.
[14] Please see: https://rdmt.services.base4nfdi.de/demonstrator/.

Goal(s)

One objective of *RDMTraining4NFDI*, was to identify initial indicators of quality for Open Educational Resources (OER) on RDM that comply with FAIR principles. These quality indicators serve as criteria to assess the effectiveness, relevance, and usability of training resources, thereby contributing to the objectives of *EduTrain's WG 2*[15].

→ From the perspective of *RDMTraining4NFDI*, establishing consensus-based, community-curated quality criteria is an essential prerequisite for any future accreditation or certification process[16] within the NFDI – the overarching goal/objective of *RDMTraining4NFDI*.

Findings

At the outset of the analysis phase, *RDMTraining4NFDI* identified a lack of a consistent terminology related to RDM training. For example, the terms "teaching materials" and "training materials" are sometimes used interchangeably, while in other contexts, "teaching materials" tends to refer to conveying of conceptual knowledge (know-what) and "training materials" to procedural knowledge (know-how).

This ambiguity reveals the need to make implicit knowledge and diverse disciplinary perspectives explicit, which facilitates effective interdisciplinary collaboration across varied contexts.

To illustrate[17], the term "taxonomy" varies in meaning between disciplines:

- in biology "taxonomy" denotes the hierarchical classification of species (e.g., plants, animals or fungi) based on their evolutionary relationships to represent their evolutionary relatedness;
- in didactics, it refers to the classification of learning objectives or cognitive processes to guide teaching and training.

Once ambiguities had been discovered, they could be resolved through subject-specific adaptations of the LOM RDM framework.

→ To support semantic interoperability and to improve the quality of RDM training materials, *RDMTraining4NFDI* advocates expanding and harmonising existing terminologies with the assistance of the Base4NFDI basic service *TS4NFDI*[18].

Over the past twelve months, *RDMTraining4NFDI* has worked to identify common ground amid the diverse requirements and perspectives reported by the RDM community and to integrate emerging approaches and related work within the RDM community. Among other

[15] As a part of EduTrain WG2 the sub-WG "Qualitycriteria" of OER.net currently is finalising a first version of a catalog for quality criteria for training materials. For more information about this work, please contact: Jonathan Geiger (jonathan.geiger@adwmainz.de).
[16] For further information on *RDMTraining4NFDI*'s suggested steps towards a certification of RDM competences, please see: Bock *et al.*, 2025b.
[17] Thanks to Juliane Röder, who provided and highlighted this example.
[18] For more information on terminologies, please see the work done by TS4NFDI: https://base4nfdi.de/projects/ts4nfdi.

findings, the following aspects appear to be essential criteria for high-quality RDM training materials:

Didactical aspects:

- Measurable learning objectives and transparent learning outcomes
- Alignment with skills and competencies required for RDM multipliers
- Instructional materials that effectively explain procedures
- Inclusion of learning resources to assess learning outcomes
- Consistent and coherent terminology
- Accessibility considerations for learners with disabilities

Content Aspects:

- Regular review and updates, treating training materials as “living documents”
- Support for Open Science principles (OER)
- Reflection of discipline-specific knowledge, standards, methods and practices[19]

FAIR principles:

- Availability in open, machine-readable formats
- Provision of rich metadata
- Distribution under open licenses

Technical aspects:

- Accompaniment by technical documentation or installation guides
- Granular, modular implementation of training components

→ In assessing the quality of RDM training materials, *RDMTraining4NFDI* recommends applying quality criteria that cover:

- Descriptive information, including classification, standards and controlled vocabularies, to facilitate organisation and aggregation of training materials;
- Contextual information, including keywords, rating and usage instructions, to assist learners and RDM multipliers in evaluating training materials;
- Technical information, including schemas and data formats, to enable automated indexing and retrieval;
- Knowledge representation addressing both conceptual clarity and technical implementation.

[19] *RDMTraining4NFDI* is not able to validate subject-specific content. This task can only be carried out by the respective NFDI consortia.

RDMTraining4NFDI's content blueprint illustrates the interrelations among three key concepts developed within the RDM community in recent years:

a) Train-the-Trainer RDM concept,
b) Learning Objective Matrix RDM and
c) EduBricks.

Both the Train-the-Trainer RDM concept as well as the LOM RDM are widely accepted within the RDM community. Regular Train-the-trainer RDM workshops are conducted within the RDM community. The LOM RDM, along with its discipline-specific adaptations, are utilised by various NFDI consortia, DALIA, and projects from other initiatives as a tool for organising training materials.
EduBricks, a concept designed for modular and scalable teaching materials that supports the idea of teaching-as-a-service, has been fully implemented and validated the consortium DATAPlant[20].

→ *RDMTraining4NFDI* aims to transfer the knowledge inherent in these concepts into technically ready-to-use templates for RDM training. This facilitates the consistent application of the Train-the-Trainer RDM concept, the LOM RDM framework, and the EduBricks concept, thereby enhancing harmonisation and interoperability across training materials and knowledge bases of NFDI consortia[21].

During the development of the snapshot, *RDMTraining4NFDI* adopted a technical perspective. In the context of database programming, "NN" is an abbreviation for "NOT NULL", a constraint applied to a database column that mandates the presence of a value, thereby preventing the field from being left empty (NULL) and ensuring data integrity.
But a historian[22] or textual scholar[23] might recognise the abbreviation "N.N." (derived from the Latin *Nomen Nominandum*, meaning "name to be determined") differently. In some scholarly digital editions "N.N." serves as a placeholder to denote an entity (individuum or legal entity) whose identity remains unknown.
Recognising and documenting such distinctions is essential for effective interdisciplinary collaboration and semantic interoperability within RDM.

A recent discussion within the sub working group "RDM basic module" of OER.net and the EduBricks team revealed distinctive perspectives on the categorisation and structure of RDM training materials. For example, when cataloging a training component (descriptive aspect), the property "proficiency level" can be attributed to the OER. In contrast, within the EduBrick framework, this property is associated with the EduPath (training path).

Another example concerns the definition of the target group" On one hand, the target group can be understood as the audience for whom the OER was developed, often reflecting entry

[20] For more information, please see: https://nfdi4plants.org/nfdi4plants.knowledgebase/.
[21] At the beginning of 2026 there are some sophisticated examples, e.g. "FDM Basiskurs aus OER Net", URL: https://github.com/anvoice-ger/fdm-basis/tree/main and NFDI4Objects Quarto-Template for Open Educational Ressource, URL: https://github.com/nfdi4objects/oer-template-skript.
[22] Thanks to Juliane Röder, who highlighted this example.
[23] E.g., as part of the uncertainty concept of the *Correspondence Metadata Interchange Format* (CMIF) used in the web tool "CorrespExplorer" https://dhcraft.org/CorrespExplorer/vault.html.

requirements. In contrast, the LOM RDM defines target group as the audience whose needs "the development and implementation of teaching and learning concepts that are orientated towards"[24], indicating a target level.

→ *RDMTraining4NFDI* advocates for documenting these differing perspectives. This can be particularly important for new RDM trainers, as the transfer of implicit knowledge empowers them to engage actively with ongoing and future developments. Furthermore, it reinforces the notion of training materials as "living documents" – dynamic resources that are continually updated and refined to remain current and effective.

Outlook: During the Integration Phase, *RDMTraining4NFDI* will intensify collaboration with use case consortia to further advance the harmonisation and standardisation of RDM training across the NFDI. Additionally, *RDMTraining4NFDI* will explore opportunities for alignment with national and international standards and standardised competency frameworks. This alignment aims to facilitate progress towards formal accreditation and certification processes, thereby enhancing the quality assurance of RDM training. Through these efforts, RDMTraining4NFDI seeks to contribute to a sustainable, scalable, and interoperable infrastructure that supports effective RDM training across diverse disciplines.

How to use RDMTraining4NFDI's collection template

To ensure that the proposed quality criteria and indicators for RDM training materials adequately address the diverse perspectives and requirements of stakeholders, *RDMTraining4NFDI* relies on continuous feedback from the entire RDM community. Contributions, questions, and suggestions from all interested parties are welcomed and encouraged to foster an inclusive and iterative development process. Stakeholders are invited to engage with the team via the *RDMTraining4NFDI*'s mailing list[25].

Design of the collection template

The *Microsoft Excel* spreadsheet "RDMTraining4NFDI-Collection_Template_RC_v2.xlsx" consists of nice worksheets.

The primary worksheet "Collection_Template" (grey) consists of two parts: recommended (column A-N) and optional (O-Z). The following eight worksheets "LOM_Index_en_de" (red), "RDMT_Teaching_Format" (orange), "RDMT_Target_Level" (yellow), "LOM_Learning Objectives_en" (green), "LOM_Learning_Objectives_de" (green), "Learning_Resource" (dark green), "Learning_Methods" (dark blue) and "Consortia_Authors" (blue) serve as reference tools and for the documentation of perspectives to support harmonisation efforts within the RDM community. Each worksheet is elaborated upon in the description of categories.

[24] README_LOM-RDM_V3_eng.pdf, Petersen *et al.*, 2025a, p.6.
[25] rdmtraining4nfdi@lists.nfdi.de

Description of categories (Columns)

Please note: In the collection template, specific conventions have been adopted to maintain methodological consistency and data integrity. Where certain information regarding training materials was unavailable during the analysis phase the value “NN” in the corresponding cells of the snapshot. This abbreviation denotes “not null” and was used to avoid empty cells in the worksheet “Collection_Template”, a requirement for the successful conversion of tabular data into JSON format[26] utilised by the interactive demonstrator.
Additionally, metadata entries modified or supplemented by RDMTraining4NFDI are marked with the prefix “RDMT:” to ensure transparency in the curation process.

Int_Notes (Column A)

Snapshot: In this column *RDMTraining4NFDI* recorded feedback provided during the review phase.

LOM-Index (Column B)

As a tool for orientation the LOM RDM can contribute to a more coordinated organisation as well as enable the aggregation of RDM training materials across knowledge bases of NFDI consortia.

RDMTraining4NFDI assigned each training component to one of the LOM RDM topics. This approach served as foundation for reflections on the LOM RDM topics on both sides, the use case consortia as well as *RDMTraining4NFDI*. The resulting feedback was forwarded to EduTrain’s WP1 and WP4.

Please note: For reasons of methodological clarity, the subjects, topics and their respective identifiers from the English and German LOM RDM v3[27] were copied into the worksheet “LOM_Index_en_de”.

Title_Training_Component_Unit (Column C)

For reasons of methodological clarity, *RDMTraining4NFDI* documented the titles of the provided training components in this column. If possible, each (sub-)unit contained by a training component was treated as an entry on its own in order to improve the comparability of individual training component units.

[26] *JavaScript Object Notation* (JSON).
[27] for further information on the LOM RDM, please see: Petersen *et al.*, 2025a (Englisch) and 2025b (German).

RDMT_Training_Format (Column D)

Despite existing collections from various stakeholders[28], to *RDMTraining4NFDI*s knowledge in the beginning of 2025 there were no harmonised definitions of training formats the RDM community commonly agreed on, yet. *RDMTraining4NFDI* therefore collected a few definitions which appear to meet the formats stated in the provided training materials best.
This information can be used to assist RDM multipliers in evaluating training materials.

Please note: *RDMTraining4NFDI* listed some exemplary suggestions and definitions of training formats in the worksheet "RDMT_Training_Format". Further suggestions can be submitted through *RDMTraining4NFDI*'s mailing list or *RDMTraining4NFDI*'s GitHub Issues page[29].

Language (Column E)

RDMTraining4NFDI used the International Organization for Standardization (ISO) Standard 3166 (Alpha-2) to track the language.
This information can be utilised to assess the coverage of relevant RDM topics identified in the LOM FDM framework and to identify additional, as yet unaddressed, discipline-specific RDM topics.

Date (Column F)

If available, *RDMTraining4NFDI* tracked the year materials were created. If the creation date was not specified within the materials provided during the analysis phase (April 2025 - September 2025), *RDMTraining4NFDI* tried to track the date the training component was published or most recently updated.

The creation date of a training component reflects the time period of the knowledge, technologies, standards, or practices included. The date of the most recent update provides context about the potential relevance and accuracy of the training component.

Version (Column G)

If specified, *RDMTraining4NFDI* tracked the version of the training component. If no version was specified within the materials provided during the analysis phase (April 2025 - September 2025), *RDMTraining4NFDI* assumed that there were no prior versions available and therefore added the value "1".

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[28] e.g the "Teaching formats" of the *Technical University of Munich* (TUM), URL: https://www.tum.de/en/studies/teaching/teaching-methods/teaching-design/teaching-formats, "Lehrpfade. Begriffe der digitalen Lehre of the *TH Köln*, *Zentrum für Lehrentwicklung* (ZLE), URL: https://lehrpfade.th-koeln.de/begriffe-digitale-lehre/, "Lehrformate & Methoden" of the *Ruhr Universität Bochum* (RUB) https://lehreladen.rub.de/lehrformate-methoden/ or the "Didactics: Teaching Concepts using Digital Tools" of the *Universität Greifswald*. URL: https://www.uni-greifswald.de/en/study/contacts/quality-assurance/digital-education/didactics-teaching-concepts/. Each URL last accessed: March 4th, 2026.
[29] GitHub Issue Page: https://github.com/RDMT4NFDI/rdmt4nfdi-website/issues.

The frequency of updates to training components often reflects how current and relevant the content is.

License (Column H)

During the 2024 community workshop several NFDI consortia[30] emphasized the importance of open and permissive licenses to encourage sharing, reuse and collaboration.

RDMTraining4NFDI primarily focused on training materials licensed in accordance with the Open Source Definition. Where specified, *RDMTraining4NFDI* recorded the licence associated with each training component.

RDMT_Target_Level (Column I)

RDMTraining4NFDI assigned proficiency levels (novice, advanced beginner, competent, proficient and expert) suggested by DALIA[31] to each training component unit based on the proficiency level stated in the materials provided during the analysis phase (April 2025 - September 2025). If no proficiency level was specified, *RDMTraining4NFDI* tried to assign a proficiency level based on the target group stated in the materials. This has been used as a foundation for further reflections with use case consortia.

Depending on the discipline-specific context and level of competence, different tools, learning resources and didactic approaches appear to be suitable for knowledge transfer. This information can be used to assist RDM multipliers in evaluating training materials.

Please note: *RDMTraining4NFDI* exemplary investigated a few competence frameworks which could be adapted to the needs of the RDM community.

Target_Group_as_stated (Column J)

For reasons of methodological clarity, if available *RDMTraining4NFDI* tracked the target group stated in the provided training. If not stated in the training component, *RDMTraining4NFDI* assigned proficiency levels to each training material component based on the target group stated in the provided training materials.

Tracking the audience for whom the training materials are intended can help with reflecting on the proficiency levels and learning objectives assigned to a training material component. This information also can be used to assist RDM multipliers in finding reusable training materials tailored to their respective needs.

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[30] for further information on the community workshop, please see: Müller et al., 2024

[31] suggestions "*according to Dreyfus's 'Novice' to 'Expert'. The proficiency level refers to the topic of the OER on RDM and data literacy, not to the target group. Dreyfus, Stuart E. (2004). The Five-Stage Model of Adult Skill Acquisition. In: Bulletin of Science, Technology & Society 24 (3), S. 177–181. DOI: 10.1177/0270467604264992. The labels are from Benner (1982).*" Geiger *et al.,* 2026.

LOM_Learning_Objective (Column K)

Learning objectives guide decisions on the scope, content, and selection of suitable exercises and assessments. Moreover, they play a crucial role in aligning learner and instructor expectations prior to the considerable investment of time and resources in the development of learning materials.[32]

In the beginning of *RDMTraining4NFDI*'s analysis phase (April 2025 - September 2025) learning objectives were specified in almost all training components, but often did not follow the recommended three-part structure[33] for formulation learning objectives:

1) Learning objective start,
2) Learning objective verb and
3) Learning objective content for formulating learning objectives.

Rarely the learning objectives stated in the training materials contained references to the *learning objective identifier* (LO-ID) of the LOM RDM.

Please note: For reasons of simplicity, the learning objectives of the English and German LOM RDM v3[34] were copied into the spreadsheets “LOM_Learning Objectives_en” and “LOM_Learning Objectives_de”.

Learning_Objective_as_stated (Column L)

For reasons of transparency, if available, *RDMTraining4NFDI* tracked the learning objectives stated in the provided training materials since this information was partially used to assign related proficiency levels to each training material component.

Learning_Resource (Column M)

In this category, *RDMTraining4NFDI* sought to track the types of reusable learning resources in order to

a) evaluate the suitability of existing controlled vocabularies for harmonisation,
b) assesses the compatibility of vocabularies related to existing metadata schemata,
c) and identify resource types and definitions subject to varying interpretations.

During the update from DIF 1.3 to DIF 1.4, DALIA gathered community feedback on their types of learning resources defined in MoDALIA[35]. Therefore, *RDMTraining4NFDI* stopped working on this task.

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[32] Manske & Petersen, (2025).
[33] For further information on the formulation of learning objectives, please see: README_LOM-RDM_V3_eng.pdf, Petersen *et al.*, 2025a.
[34] for further information on the LOM RDM please see: Petersen *et al.*, 2025a (Englisch) and 2025b (German).
[35] Geiger *et al.,* 2026.

Please note: In addition to the learning resource types defined in DIF 1.4[36], *RDMTraining4NFDI* looked into the "Material Types" of OER commons[37] and the "*Higher Education Resource Types* (HERT)" of Dini AG KIM[38].

PID (Column N)

This category can help with investigating whether training components already have *persistent identifiers* (PIDs). If PIDs for training components and/or complementary didactic instructions, learning resources and data sets are needed, please contact the team of the basic service *PID4NFDI*[39].

Optional (Column O)

Please note: The following columns serve as optional categories that *RDMTraining4NFDI* introduced to support ongoing investigation into further possibilities of aggregating training materials. These fields also address feedback and perspectives gathered from the RDM community during and after the initial analysis phase and serve to document potential directions for development during the Integration Phase.

Consortia (Column P)

Instead of detailed administrative metadata such as author names or ORCID – which were not the focus of the initial analysis – in this column *RDMTraining4NFDI* records the associated NFDI consortium.

RDMTraining4NFDI suggested additional categories for tracking these metadata which can be copied and or adapted from the worksheet "RDMT_Consortia_Authors".

Learning_Methods (Column Q)

Several stakeholders expressed a desire to search for training materials by specific learning methods.. Despite existing collections from various stakeholders[40], to *RDMTraining4NFDI*s

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[36] DIF 1.4 compiled the HERT from DINI AG KIM and expanded this list with definitions from other sources. For further information, please see: Geiger *et al.,* 2026.
[37] Material Types of OER commons, URL: https://help.oercommons.org/support/solutions/articles/42000046908-material-types-
[38] "Higher Education Resource Types" of Dini AG KIM, URL: https://w3id.org/kim/hcrt/
[39] PID4NFDI, https://pid.services.base4nfdi.de/.
[40] e.g the "Teaching formats" of the *Technical University of Munich* (TUM), URL: https://www.tum.de/en/studies/teaching/teaching-methods/teaching-design/teaching-formats, "Lehrpfade. Begriffe der digitalen Lehre of the *TH Köln*, *Zentrum für Lehrentwicklung* (ZLE), URL: https://lehrpfade.th-koeln.de/begriffe-digitale-lehre/, "Lehrformate & Methoden" of the *Ruhr Universität Bochum* (RUB) https://lehreladen.rub.de/lehrformate-methoden/ or the "Didactics: Teaching Concepts using Digital Tools" of the *Universität Greifswald*. URL: https://www.uni-greifswald.de/en/study/contacts/quality-assurance/digital-education/didactics-teaching-concepts/. Each URL last accessed: March 4th, 2026.

knowledge at the beginning of 2025 there were no harmonised definitions of learning methods the RDM community commonly agreed on, yet.

Please note: Learning methods and their definitions can be documented in the worksheet "Learning_Methods". Suggestions can be submitted through *RDMTraining4NFDI*'s mailing list or *RDMTraining4NFDI*'s GitHub Issues page[41].

Accessibility (Column R)

Within the RDM community, new approaches are emerging to reduce or eliminate barriers for people with disabilities. From *RDMTraining4NFDI*'s perspective some of these conceptual strategies can be transferred into re-usable technical templates to facilitate and promote the dissemination of this knowledge.[42]

FAIR (Column S)

Within the RDM community, new approaches are emerging to better align training materials with the FAIR-Principles (data) and principles of the *Open Science* community (OER). From RDMTraining4NFDI's perspective some of these conceptual strategies can be transferred into re-usable technical templates to facilitate and promote the dissemination of this knowledge.

Duration (Column T)

Specifying the intended duration of a training component or learning resource enables other trainers to select suitable training component units and associated materials for constructing tailored teaching pathways.

P_Libraries (Column U)

RDMTraining4NFDI aimed to investigate additional criteria for aggregating training materials across the knowledge bases of the NFDI consortia, for instance, based on the programming libraries they utilise.

P_Language (Column V)

RDMTraining4NFDI aimed to explore additional criteria for aggregating training materials across the knowledge bases of the NFDI consortia, such as grouping by the programming libraries utilised.

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[41] GitHub Issue Page: https://github.com/RDMT4NFDI/rdmt4nfdi-website/issues.
[42] e.g.: Fisseler (2026). For more information on accessibility, please see: Beer *et al.*, 2025 as well as the work of the *AG Inklusion im Forschungsdatenmanagement,* URL: https://go-unite.de/index.php/ag-inklusion-im-forschungsdatenmanagement.

Data_Types (Column W)

Certain operations are predefined with specific data types.[43] For instance, *Optical Character Recognition* (OCR), and *Natural Language Processing* (NLP) represent common areas of interest among NFDI consortia that work with (unstructured) text data, including as *Text+*, *NFDI4Memory* and *BERD@NFDI*. Similarly, *Geographical Named Entity Recognition* (GNER) is employed to identify and extract geographical locations from unstructured text sources

RDMTraining4NFDI aimed to investigate additional criteria for aggregating training materials across the knowledge bases of the NFDI consortia, such as categorising resources according to the principal data types utilised within their respective disciplines.

Tool_Software (Column X)

During the 2024 community workshop, several consortia emphasised the need for training in software management, including good practices for coding and research software engineering.[44]

In response, *RDMTraining4NFDI* sought to investigate additional criteria for aggregating training materials across the knowledge bases of the NFDI consortia, such as categorising resources based on the tools and software employed in their RDM training programmes—for example, *Jupyter Notebooks* or *electronic laboratory notebooks* (ELNs).

TC_File_Format (Column Y)

“The NFDI consortia employ a wide range of file formats for their training materials, with common formats including PowerPoint (pptx), PDF, and Markdown. Some consortia also utilize interactive formats such as Jupyter notebooks and LiaScript to enhance learning experiences. This diversity in file formats reflects the varying needs and preferences of the consortia in delivering effective and accessible training materials.”[45]

RDMTraining4NFDI sought to explore additional criteria for aggregating training materials across the knowledge bases of the NFDI consortia, focusing on file formats and the software or tools employed. Such an approach may reveal further synergies that could improve the reusability of training materials.

Platform_Implementation (Column Z)

The 2024 community workshop revealed that “[t]he NFDI consortia use various platforms and methods to create and share their training materials, ensuring accessibility and wide dissemination.”[46]

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[43] LOM RDM Glossary, Petersen *et al.*, 2025a, p. 6.
[44] Müller *et al.*, 2024b, p. 8 and 10.
[45] Müller *et al.*, 2024b, p. 5.
[46] Müller *et al.*, 2024, p. 6.

In response, *RDMTraining4NFDI* examined the platforms utilised by the use case consortia to investigate whether, and to what extent, these perspectives can be harmonised by identifying overlaps relating to discipline-specific requirements.

Questions and Answers

Q: Is *RDMTraining4NFDI* developing a new collection or aggregation of RDM training materials?
A: No. *RDMTraining4NFDI*'s objective is to facilitate the harmonisation of existing collections of RDM training resources, rather than creating a separate, standalone collection.

Dear readers,
We invite you to submit any questions or suggestions through the RDMTraining4NFDI mailing list → rdmtraining4nfdi@lists.nfdi.de. RDMTraining4NFDI is dedicated to providing responses to all inquiries whenever possible and values your contributions to the ongoing dialogue.

Kind regards,
The RDMTraining4NFDI Team

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