

Adapting RDMO for the Efficient Management of Educational Research Data

Natalie Kiesler ¹, Daniel Schiffner ¹ and Axel Nieder-Vahrenholz¹

Abstract: Research data management has become a core element of research projects in educational technology research. Tools like the Research Data Management Organiser (RDMO) offer support to researchers by gathering metadata of (planned) projects, studies and their output in a structured manner. It further facilitates machine actionable components so that metadata and information can be exchanged by connecting metadata, repositories, and institutions. In this demo, we present a use case of RDMO at a German research data center. Therein, we adapt RDMO's export plugin so that it generates JSON in the data structure of the German Network of Educational Research Data, and thus allows the export of metadata from RDMO to research data centers. This proof-of-concept thus presents an application scenario of RDMO, and how it can contribute to an improved data management process in educational technology research.

Keywords: Research Data Management Organiser, metadata, export, interoperability

1 Einleitung

The Research Data Management Organiser (RDMO) is a tool that supports the structured planning and management of research projects and their data [K123]. RDMO further provides researchers with machine actionable data management plans (maDMPs) which enable a basic interoperability between RDMO [Mi20] and, for example, research data centers archiving data. This interoperability is crucial to support the full data life cycle of research, especially after its completion. Research data centers such as those within the German Network of Educational Research Data (GNERD) help with the long-term availability and accessibility of research data, thereby increasing its FAIRness, provenance, etc. [KS22]. Fortunately, RDMO offers export options in XML or CSV format by default. Moreover, maDMPs and their export as JSON files are supported. However, the maDMP default structure is less detailed so that it does not match the metadata scheme used within GNERD (e.g., project attributes, see Fig. 1). As a consequence, researchers willing to share their data with the network would have to enter and submit the entire metadata of their research into another system than RDMO.

¹ DIPF | Leibniz Institute for Research and Information in Education, Information Center Education, Rostocker Straße 6, 60323 Frankfurt am Main, {kiesler, schiffner, a.nieder-vahrenholz}@dipf.de, <https://orcid.org/0000-0002-6843-2729>, <https://orcid.org/0000-0002-0794-0359>

2 Adapting and Extending RDMO's Export Options

To avoid this repetitive and error-prone procedure, we adapted RDMO's Python code for the generation of the JSON files so that it represents the GNERD structure and metadata scheme. To be precise, the following tasks were conducted:

- Utilize the Python code generating maDMP's JSON scheme as template [Mi20],
- Adapt structure and metadata scheme of the generated JSON to reflect those of GNERD,
- Map RDMO's standard DMP with the metadata and attributes required by GNERD, and include controlled vocabularies.

To conclude, this new export option helps researchers in the context of education to manage their data after a project's end, especially with regard to long-term storage. It further proves the interoperability of RDMO and its contribution to a more sustainable research data management in educational technology research and related fields. This proof-of-concept opens the possibility for multiple research questions in the maDMP context: a) Does a unified tool actually avoid the repetitive and error-prone procedure of re-entering metadata; b) What metadata can be filled automatically by extracting it from either the user or the data; c) Can this be used as an iterative approach to update existing DMPs or research objects? We will investigate these questions in the near future.

Fig. 1: Excerpt of the newly generated JSON file reflecting the GNERD metadata scheme.

```

▼ project:
  title: "Metadata Export (in work)"
  ▼ subtitle: "In scheme of German Network of Educational Research Data"
    acronym: "XP-VFDB"
    duration_from: "2022-11-09"
    duration_to: "2023-05-31"
    funding_code: "DFG-0815"
    funding_agency: "German Research Foundation"
  ▼ programme:
    acronym: "EBF"
  ▼ description: "Export a Data Management Plan from RDMO tool in the JSON scheme of GNERD"
    comment_external: "(just a dummy comment)"

```

Bibliography

- [Kl23] Klar, J., <https://github.com/rdmorganiser/rdmo>, accessed 27/03/2023.
- [KS22] Kiesler, N.; Schiffner, D.: On the Lack of Recognition of Software Artifacts and IT Infrastructure in Educational Technology Research. In Henning, P. A., Striewe, M. & Wölfel, M. (Hrsg.): 20. Fachtagung Bildungstechnologien (DELFI) 2022. Gesellschaft für Informatik e.V., Bonn, S. 201-206, 2022. <https://doi.org/10.18420/delfi2022-034>
- [Mi20] Miksa, T., <https://github.com/RDA-DMP-Common/RDA-DMP-Common-Standard>, accessed 27/03/2023.