LINGUA - Learning astronomy usING visUAlisations in a planetarium

A Data Management Plan created using DMPonline.be

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Project abstract:

Planetariums are science centres in which the public is exposed to the fascinating world of the (night) sky. The projections on the planetarium dome allow for an immersive experience that fosters the natural interest in astronomy. Most planetariums provide also educational services and many schools organise a planetarium visit in the context of the science curriculum. The impact of these planetarium visits on learning, however, is vastly unexplored. In this project, we will focus on the apparent motion of the Sun and stars and their daily and yearly changes. Our ongoing research on students' understanding of these apparent motions shows remarkable results: not only secondary school but also university students have difficulties explaining the apparent motions and do not use a correct model in their explanation. The goal of this project is to better understand student difficulties and the role planetarium visualisations can play to scaffold student understanding. Based on these insights, we will design and evaluate optimised learning materials to tackle the difficulties. We will do this in close collaboration with the Brussels Planetarium. By carrying out the proposed project, our multidisciplinary team will contribute to the international growing field of Astronomy Education Research. This project fits in a broader research endeavour and our ultimate goal is to develop an internationally recognised expertise centre on learning and teaching astronomy and astrophysics.

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DPIA

DPIA

Have you performed a DPIA for the personal data processing activities for this project?

Question not answered.

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1. Research Data Summary

List and describe all datasets or research materials that you plan to generate/collect or reuse during your research project. For each dataset or data type (observational, experimental etc.), provide a short name & description (sufficient for yourself to know what data it is about), indicate whether the data are newly generated/collected or reused, digital or physical, also indicate the type of the data (the kind of content), its technical format (file extension), and an estimate of the upper limit of the volume of the data.

				Only for digital data	Only for digital data	Only for digital data	Only for physical data
Dataset Name	Description	New or reused	Digital or Physical	Digital Data Type	Digital Data format	Digital data volume (MB/GB/TB)	Physical volume
Questionnaires	Written student answers to test items	Generate new data	Physical (paper) + digital (scans of the papers)	*observational*	*.pdf*	<100GB	several boxes of paper
Audio/video data study 1	Audio:video data of individual student interviews	Generate new data	digital	observational	.mp4	<100GB	
Livescribepen data study 1	Livescribe pen files individua student interviews	Generate new data	digital	observational	.pencast .pdf	<1GB	
Audio/video data study 2	Audio:video data of teaching interviews	Generate new data	digital	observational	.mp4	<100GB	
Livescribepen data study 2	Livescribe pen files teaching interviews	Generate new data	digital	observational	.pencast .pdf	<1GB	
AV-lectures	Audio/video files planetarium sessions and lectures	Generate new data	digital	observational	.mp4	<100GB	

If you reuse existing data, please specify the source, preferably by using a persistent identifier (e.g. DOI, Handle, URL etc.) per dataset or data type:

not applicable

Are there any ethical issues concerning the creation and/or use of the data (e.g. experiments on humans or animals, dual use)? Describe these issues in the comment section. Please refer to specific datasets or data types when appropriate.

- Yes, human subject data

For all datasets, ethical approval is needed, as we will collect personal data (names, age, study track in secondary school) and we will collect audio and video data. Informed consent of the participants will be obtained for each of the datasets separately.
As the development of the interview protocols is part of the research, measurement instruments are not ready yet and ethical approval cannot be applied for yet. As soon as we have ethical approval, the reference number will be added and the DMP will be updated.

Will you process personal data? If so, briefly describe the kind of personal data you will use in the comment section. Please refer to specific datasets or data types when appropriate.

- Yes

The following personal data will be collected for each of the studies:

- name and surname, age
- email address
- study track in secondary education

We will ask for PRET and SMEC approval. When needed, parents' consent will be asked.

Does your work have potential for commercial valorization (e.g. tech transfer, for example spin-offs, commercial exploitation, …)? If so, please comment per dataset or data type where appropriate.

- No

Do existing 3rd party agreements restrict exploitation or dissemination of the data you (re)use (e.g. Material/Data transfer agreements/ research collaboration agreements)? If so, please explain in the comment section to what data they relate and what restrictions are in place.

- No

Are there any other legal issues, such as intellectual property rights and ownership, to be managed related to the data you (re)use? If so, please explain in the comment section to what data they relate and which restrictions will be asserted.

- No

2. Documentation and Metadata

Clearly describe what approach will be followed to capture the accompanying information necessary to keep data understandable and usable, for yourself and others, now and in the future (e.g., in terms of documentation levels and types required, procedures used, Electronic Lab Notebooks, README.txt files, Codebook.tsv etc. where this information is recorded).

Mieke De Cock will provide the necessary documentation for each dataset, which gives insights in the used methodology, the analytical and procedural information, definitions and abbreviations of variables, etc. This will allow all researchers involved in this project to understand the various datasets.

Will a metadata standard be used to make it easier to find and reuse the data? If so, please specify (where appropriate per dataset or data type) which metadata standard will be used. If not, please specify (where appropriate per dataset or data type) which metadata will be created to make the data easier to find and reuse.

- No

3. Data storage & back-up during the research project

Where will the data be stored?

We will collect physical data which will be transformed to digital data in order to analyse the data. All data will be stored on the storage facilities of the research unit. This data can only be accessed by the researchers of this project.
The Data will be stored for 10 years in line with the KU Leuven RDM policies.
During this research project Mieke De Cock will be responsible for the data preservation. During this term, the physical data will be stored in a locked cupboard in room 00.32 building C, Celestijnenlaan 200 - Heverlee. the digital data will be stored on a shared folder on OneDrive. This digital data will automatically back-upped since the data is saved on the shared drives of the research unit. Data will never be stored on a personal device.
After the research project, Mieke De Cock will be responsible for the data preservation. The physical data will be persevered in the archive of the research unit, whereas the digital data will be stored on OneDrive.

How will the data be backed up?

By using KU Leuven Onedrive, data will be automatically backed up.

Is there currently sufficient storage & backup capacity during the project? If yes, specify concisely.
If no or insufficient storage or backup capacities are available, then explain how this will be taken care of.

- Yes

Digital data will be stored on KU Leuven drives, accessible only to supervisors and researcher. We expect we have sufficient storage & backup capacity.

If not, digital vault provided by KU Leuven comes with a default capacity of 50 GB, but is easily extendible for an additional cost (for which budget was requested). Standard, a secure server and operating system in ICT's secure environment for private data, application software on the server and storage and backup capacity for data, including automatic backups are provided. .

How will you ensure that the data are securely stored and not accessed or modified by unauthorized persons?

Physical data will be stored in a locked cupboard. Digital data will be stored on a shared folder on OneDrive, which can only be assessed by the researchers involved in this project. This is a shielded drive, preventing the access or modification by unauthorized persons.

What are the expected costs for data storage and backup during the research project? How will these costs be covered?

The costs for data storage during and for ten years after the project are covered by the project/the department.

4. Data preservation after the end of the research project

Which data will be retained for at least five years (or longer, in agreement with other retention policies that are applicable) after the end of the project? In case some data cannot be preserved, clearly state the reasons for this (e.g. legal or contractual restrictions, storage/budget issues, institutional policies...).

All data will be retained for 10 years, following the KU Leuven RDM policy

Where will these data be archived (stored and curated for the long-term)?

After the research, Mieke De Cock will be responsible for the data preservation. The physical data will be persevered in the locked cupboard in room 00.32, Celestijnenlaan 200C, whereas the digital data will be stored on OneDrive.

What are the expected costs for data preservation during the expected retention period? How will these costs be covered?

The costs for data storage during and for ten years after the project are covered by the project/by the faculty.

5. Data sharing and reuse

Will the data (or part of the data) be made available for reuse after/during the project? In the comment section please explain per dataset or data type which data will be made available.

- No (closed access)

Most data are handwritten student answers, video and audio files. Because of privacy issues, we will not share these data.

If access is restricted, please specify who will be able to access the data and under what conditions.

not applicable

Are there any factors that restrict or prevent the sharing of (some of) the data (e.g. as defined in an agreement with a 3rd party, legal restrictions)? Please explain in the comment section per dataset or data type where appropriate.

- Yes, Privacy aspects

Most data are handwritten student answers, video and audio files. Because of privacy issues, we will not share these data.

Where will the data be made available? If already known, please provide a repository per dataset or data type.

not applicable

When will the data be made available?

not applicable

Which data usage licenses are you going to provide? If none, please explain why.

not applicabe

Do you intend to add a PID/DOI/accession number to your dataset(s)? If already available, you have the option to provide it in the comment section.

- No

What are the expected costs for data sharing? How will these costs be covered?

not applicable

6. Responsibilities

Who will manage data documentation and metadata during the research project?

Mieke De Cock and the appointed PhD student

Who will manage data storage and backup during the research project?

Mieke De Cock and the appointed PhD student

Who will manage data preservation and sharing?

Mieke De Cock and the appointed PhD student

Who will update and implement this DMP?

Mieke De Cock