



LEARNING OUTCOMES

for the DaLiCo Data Literacy Learning Space

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PROJECT INFORMATION

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LEARNING OUTCOMES

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ABSTRACT

TEXT

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Learning Outcomes

Learning outcomes are composed with the **keywords** (content and condition) and verbs from the pyramid of Miller and level two from Bloom to describe the behavior (**learning activity**) we wish to see in a learning process. These three components will result in a **performance** that is measurable for a trainer as result. The colours **blue**, **red** and **purple** must all be identified within each outcome.

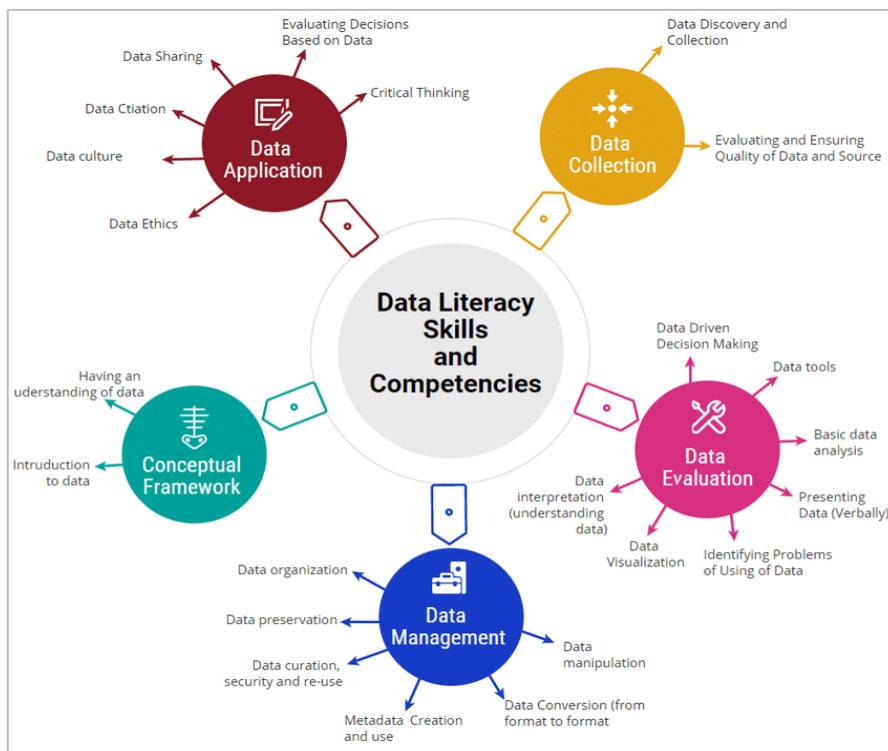


Fig. 1: Data Skills and Competencies (Source: Ridsdale et. al. (2015, p. 38))

Seven learning outcomes are formulated (with three colours and a maximum of 75 words in an understandable sentence) by the partners concerning conceptual framework, data collection, data management, data evaluation and data application. This is done to define the content for the learning environment and the possible use in the summer school 2022. We have coordinated them between all partners in Valencia:

1. Data collection (HAM)
2. Data quality (VAL, HAM)
3. Data manipulation and analyse (VAL)
4. Data visualization (UT)
5. Decision making (UT)
6. Data ethics (HAM, UT)
7. Data management (DEB)

0. Introduction to Data Literacy

Intro and understand data; data science differences with data literacy. This needs a learning outcome for raising awareness on the importance of data literacy as an introduction to Data. In a nutshell we call this a conceptual framework like having a mindset for data.

Keywords:

Data, measure level, structured versus unstructured data, web text/picture/audio/video, web 2.0 versus web 3.0, data science versus data literacy, data is beautiful. metrics, apply, application and use of data, illustrate, translate, describe, have the ability to explain.

Concept

Is familiar with ways that data is structured and analysed using Ridsdale and data life-cycle insights.

Final

You can **describe and explain** different **types of data** and what the implications of their measurement level (nominal-ordinal-ratio) is for the **use of descriptive** (uni versus multi-variable) statistics in a **report (verbal or written)** for non experts using data lifecycle (picture above).

1. Data Collection

Keywords:

Data search, search engines, data source, data portals, open data portals, accessibility of sources, relevance of sources, usability of sources, quality criteria of sources (neutrality, quality, standards), CRAAP-, research data, primary data, secondary data, data formats, CSV, encoding (UTF8), data fairness, open data, licences, meta data

Concept

Identify various data sources and evaluate their quality, search, evaluate and choose data sets.

Final

Learners can **analyze** the **quality of data sources** by criteria as accessibility, relevance, and usability to **identify** appropriate **data sources** for their studies. Learners **can develop and facilitate search strategies** for data, they **analyze data sets** by **exploring** the **data sets applying quality criteria**. As result of this process learners **choose and identify** relevant **data sets** to integrate into their studies.

Learners can provide **statement of reasons** for their selection on the basis of the quality criteria conveyed.

2. Data Quality

Keywords:

Data, measure level, structured versus unstructured data, web text/picture/audio/video, web 2.0 versus web 3.0, data science and data literacy.

Final

Learners identify the importance of data literacy and the utility of data for solving problems of different nature

Learners can inspect data sources and analyze the viability of the use of these data for tackle a proposed challenge, according to the quality of the data. They can also suggest different study designs for performing

3. Data Manipulation

Keywords:

data formats, basic statistics, data quality, application and use of data, illustrate, translate, describe, have the ability to explain basic data findings.

Concept

Learners are familiar with ways that data is structured and analysed using Ridsdale and data life-cycle insights.

Final

Learners can describe different types of data according to their origin and structure and the use of descriptive statistics and its implications.

Learners can incorporate structured data in simple formats (csv) into a data software perform basic curation tasks and check the data quality, exposing eventual limitations.

Learners can provide and interpret some basic descriptive statistics and propose the use of some basic models, reporting this analysis for non-experts using data lifecycle.

4. Data Visualization

Keywords:

Graph, chart, colour infographic, demographic, outliers storytelling, audio and video data, number of data points, compose, compare, have the ability to recognize a pattern

Concept

Feels confident using data as a resource to answer questions & identify new ones based on descriptive statistics like a chart, colour infographic and demographic visuals to tell a story or applies ways to visualize data and their respective benefits and drawbacks

Final

Learners will feel different in using a data manipulation as a resource to answer questions and identify new ones, based on descriptive statistics and pattern recognition from a chart, infographics, demographic or audio/video data with their respective benefits or drawbacks to produce a data story.

5. Data Driven Decision Making

Keywords:

interpret outcome analyse, dss data support system, prescriptive, data tools like Dataiku, risks and benefits (like revenue/treatment), how to read an article, give advice, can interpretate

Concept

Advocates for the effective usage of data in communication and decision making learn the language of data.

Final

You can **give advice** by **interpreting the outcome analyse** (e.g., in an article) from a dss data support system to produce a **prescriptive statement in a context for a specific target group** like in health or public domain.

6. Data Ethics

Keywords:

Ethics, stakeholders, regulation, quotation, research question, global sustainable goals, open data, science responsibility-society, critical thinking, validating sources, simulation, compose.

Concept

Is alert to common do's and don'ts into which people fall when working with data.

Final

You can **perform** a basic (critical) analysis on a research questions based on a limited number of theories on ethics **to adjust/change** the start (research question-hypothesis) of (open or not) a data research **using formal EU guidelines** for quotation and publishing like **validation and reliability** in a chosen magazine, data set or open public (social) media in order to **produce a presentation (oral or written) or organize a workshop** for a specific target group.

7. Data Management

Keywords

data, data types, metadata, DMP, data format, data quality, data ethics, data collection, data reuse, data share, tools for data management, data handle

Concept

Summarize all activities that can be linked to the data, taking into account the diversity and value of the data. /personal data management in academia/

Final

You will **feel confident** in **handling** different types and amounts of data, you **understand** the **importance of data** and **data sharing**, you can **create** your **own data management method**, you can **create** your **own data management plan**. You will **feel confident** in **data protection** when you **understand** how **data repositories works** and the **importance of metadata schema and**

PIDs, you can create your own policies and practices, you can create your own data format which allows others to easily reuse your work.

Sources

Ridsdale, C. et al. (2015). *Strategies and Best Practices for Data Literacy Education: Knowledge Synthesis Report*. Halifax: Dalhousie University