

DALIDA: Data Literacy Discussion Workshops for Adults

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Data literacy is the ability to identify, collect, process, and interpret data to gain and communicate insights. It relies on many disciplines ranging from maths and statistics to language and arts. Its importance is recognized for industry and business, but learning opportunities outside of tertiary education are lacking. In an increasingly data-driven society, the importance of data literacy is not limited to a professional context. Data literacy involves critical thinking and is crucial to becoming responsible, involved, informed, and contributing members of society. Unfortunately, we believe that socially, economically, or educationally disadvantaged groups do not have access to resources that help them gain (at least) an awareness of the topic. DALIDA is a public engagement project that aims to design workshops about this topic for that particular audience. Recognizing that data literacy is a very complex subject matter, we avail of co-creation activities to ensure that the workshops are attractive and engaging. This paper presents DALIDA, which commenced in 2021, and report on our approach and current progress.

Additional Key Words and Phrases: Data Literacy, Public Engagement, Co-creation

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1 INTRODUCTION

Data literacy is a skill set that not many adults acquire, and one can observe that learning opportunities are limited. However, data literacy is essential in assessing and comprehending information presented in various media, ranging from politicians presenting data to global stories about COVID19 deaths. Data literacy implies critical thinking, and the skills involved are crucial to becoming responsible, involved, and contributing members of society. An understanding of data literacy should, therefore, be accessible to all.

DALIDA, which stands for Data Literacy Discussion workshops for Adults, will design and deliver a novel workshop on data literacy that will help the public understand how to think critically about data and its provenance and presentation. While open to the general public, the workshops are designed with, and developed for, people from socially, economically, or educationally disadvantaged groups. We believe these groups are more prone to struggle with data literacy and have fewer

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opportunities to learn about the topic. Co-creation will ensure that the format and material resonate with the target audience.

The workshops are designed to:

- increase awareness and appreciation of data literacy (and the various skills and disciplines involved);
- illustrate the importance and relevance of data literacy at the individual and societal level; and
- provide participants a starting point to encourage skill development.

In this paper, we present the motivation for, and the current progress, on DALIDA.

2 MOTIVATION

Data literacy is the ability to identify, collect, process, and interpret data to gain and communicate insights. Data literacy became increasingly important in our data-driven society, especially in a professional context [3]. Efforts have been made to determine the skills and competencies knowledge workers must develop to become data literate [4].

Not everyone, however, has had the opportunity to develop some of these skills. Yet, these skills are essential to assess and comprehend information presented in various media (such as on government portals, in newspapers, and on social media). Recent studies have shown that data literacy is still complex for most people [1]. The danger is that those people might be misinformed or misled, which may have dire consequences as those people may take ill-informed actions (e.g., voting).

Mis- and malinformation are prevalent. In 2020, the COVID pandemic has shown the importance of data literacy. The US administration misrepresenting Belgium's mortality rate¹ and misleading insights gained from connecting cases to geospatial dimensions² are merely two examples. While we cannot prevent third parties from presenting data with a particular (political) agenda in mind, we can help the general public acquire an awareness of the skills necessary to think critically about data, its provenance, and its presentation. Data literacy implies critical thinking, and the skills involved are crucial to become a responsible, involved, and contributing member of society.

Those who have gone through tertiary education, especially in STEM, have developed skills pertaining to data literacy. People pursuing such studies and specialized knowledge workers also have access to additional formal and informal learning opportunities to improve and develop their skills, e.g., the "Digital Methods and Data Literacy" elective, which can be taken by UCD undergraduate students³. One can observe that such training is often limited to these people, even though it is crucial for the general public.

This project proposes to develop an interactive workshop to raise awareness of and appreciation for data literacy in Irish communities. The primary target of these workshops is adults (both young and over the age of 25). As we believe that people from socially, economically, or educationally disadvantaged groups are more prone to struggle with data literacy, that specific demographic will be taking into prominent consideration in developing the workshop. Community liaisons will be key in achieving this.

¹Van Dongen, R. (May 18, 2020). The Daily 202: Coronavirus death toll is possible casualty of growing rift between President Trump and CDC. Washington Post. <https://www.washingtonpost.com/news/powerpost/paloma/daily-202/2020/05/18/daily-202-coronavirus-death-toll-is-possible-casualty-of-growing-rift-between-president-trump-and-cdc/5ec1918788e0fa17cde01dac/>

²Pipitone, T. (April 8, 2020). ZIP Code Maps Showing Virus Impact May Be Misleading. NBC. <https://www.nbcmiami.com/news/local/zip-code-maps-showing-virus-impact-may-be-misleading/2217580/>

³<https://www.teachingandlearning.ie/project/digital-methods-and-data-literacy/>

3 APPROACH

3.1 Identifying an Audience

We first had to decide which local community corresponded with our intended audience we wanted to reach. Trinity College Dublin is planning the development of an innovation campus, at the heart of the proposed Grand Canal Innovation District (GCID), focusing on big data and AI technologies. It turns out that local consultations have indicated that residents are fearful that this campus will provide opportunities only for the young and highly educated. This local community fits the profile. Involving that community in the co-creation activities, which we will discuss later on, will furthermore ensure that these communities are and feel involved. Moreover, it is hoped that education programs such as DALIDA increase knowledge and interest in STEM careers for residents' children and grandchildren. Parents play a crucial role in their children's career choices [2].

3.2 Co-creation and Application Domains

DALiDA has, at its core, engagement of adults in Ireland with informal education experiences that incorporate discussion, dialogue, and deliberation around data literacy. We ensure engagement via co-creation, which is the development of concepts, projects and initiatives with people and not for them. Through this process, participant groups are actively engaged in the design, production, and the iterative stages of projects and initiatives. This allows us to gather and incorporate insights from the participants to learn if the topic, the stories, activities and tools proposed make sense and are of value to them and the audience they represent.

The are various challenges when it comes to the topic of data literacy:

- Firstly, while open to the general public, the workshops are designed *with* and developed *for* people from socially, economically, or educationally disadvantaged groups as they are more prone to struggle with data literacy. Attracting this audience and keeping them engaged will be a challenge.
- Secondly, data literacy is complex (as illustrated in Fig. 1). Data literacy encompasses many activities (both with passive and active elements such as creating a plot and comprehending it), which draw on many disciplines ranging from maths to art. Even superficially covering all these disciplines or a particular activity or discipline in depth is impossible within the scope of a workshop.

Via our community liaisons, it is hoped that the so-called "community leaders", who either know or are part of our intended audience, will contribute to the design of the workshops. The goal of the workshop is to raise awareness. Via two co-creation workshops and a pilot workshop, the community leaders will help us answer two questions: "What do you want to learn (about data literacy)?" and "How do you want to learn this?"

To tackle the second problem, we have decided to choose an "application domain" to demonstrate data literacy. The choice of the application domain is the misrepresentation of Irish slave history on social media, claiming that many Irish people were sold as slaves in the past and badly treated, or even worse than African slaves. This particular example is, we deem, sufficiently far from current controversial topics (i.e., vaccines and anti-vaxxers) and may appeal to the local community both in terms of the social media angle and local history.

3.3 Extrapolating Data Literacy to Other Examples and Domain

We stress again that the topic of the misrepresentation of Irish Slave trade is "merely" a domain in which the topic is illustrated. The examples discussed in the workshops show how subtle misrepresentation can be and the nefarious impact they have on society. During the (co-)creation

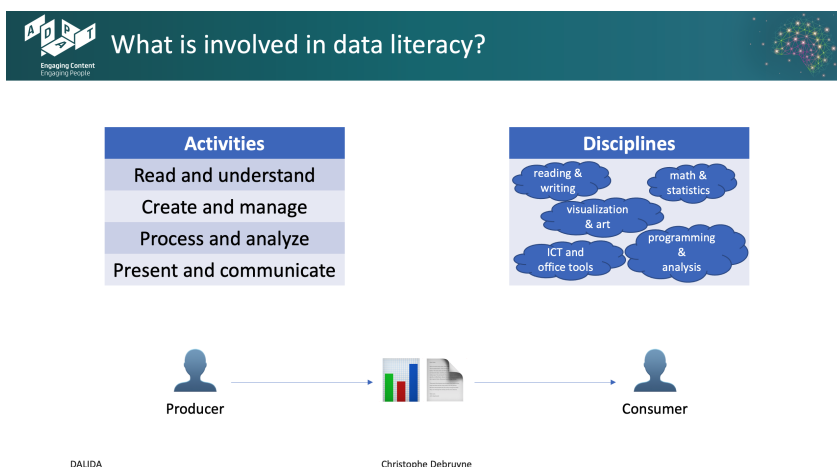


Fig. 1. The activities involved in data literacy on the left and the various disciplines involved on the right. This image, taken from a presentation used for the co-creation workshops, conveys the complexity of data literacy. It also conveys the two roles of a person: producing and consuming data.

workshops, participants are encouraged to reflect on and discuss other examples they might have seen. Currently, our approach is to enable participants to first discuss data literacy and then the relationship between mis- and malinformation and data literacy. In later stages, we encourage discussions about examples outside our application domain and with less context (e.g., misleading graphs).

4 SUMMARY

We presented DALIDA, which is a public engagement and outreach project to raise awareness of data literacy among young adults, focusing on young adults from underprivileged backgrounds. The goal is to develop the material or discussion workshops and deliver those workshops in 2021. As data literacy is quite complex, we avail of co-creation to ensure that the topic of data literacy and the workshop activities remain accessible and enticing for our intended audience. We also strive to render data literacy accessible by exemplifying it in the domain of mis- and malinformation on social media using the misrepresentation of Irish slaves to push racist agendas.

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