JMLE
JOURNAL OF MEDIA LITERACY EDUCATION

Journal of Media Literacy Education, 12(3), 1-5, 2020
https://doi.org/10.23860/JMLE-2020-12-3-1
ISSN: 2167-8715

Data literacy and education: Introduction and the challenges for our field

Leo Van Audenhove

iMEC-SMIT - Vrije Universiteit Brussel, Belgium

University of the Western Cape & Flemish Knowledge Centre on Digital and Media Literacy, Belgium

Wendy Van den Broeck

iMEC-SMIT - Vrije Universiteit Brussel, Belgium

Ilse Mariën

iMEC-SMIT - Vrije Universiteit Brussel, Belgium

OPEN ACCESS

Essay

Citation: Van Audenhove, L., Van den Broeck, W., & Mariën, I. (2020). Data literacy and education: Introduction and the challenges for our field. *Journal of Media Literacy Education, 12*(3), 1-5. https://doi.org/10.23860/JMLE-2020-12-3-1

Corresponding Author:
Leo Van Audenhove
leo.van.audenhove@vub.ac.be

Received: November 11, 2020
Accepted: November 11, 2020
Published: December 14, 2020

Data Availability Statement: All relevant data are within the paper and its Supporting Information files.

Competing Interests: The Author(s) declare(s) no conflict of interest.

Editorial Board

ABSTRACT

Data literacy is a hot topic, which is currently discussed in many different fields from open data initiatives, statistics, computer societies, coding initiatives, and beyond. The resulting literature is inspiring but not always satisfying from the perspective of the media literacy scholarly field. The goals behind data literacy are often instrumental and utilitarian in the function of job-related skills or open data initiatives. We hope that this special issue will contribute to a broader discussion about *data literacy*. In this introductory essay we provide an overarching introduction, highlighting some of the main themes, questions, issues, and insights addressed in the different articles. We weave in our own insights, reflections, and conclusions as well.

Keywords: *data literacy, algorithms, education, media literacy*.

INTRODUCTION

In summer 2019, the *Journal of Media Literacy Education* launched a call for articles for a special edition on the theme of *Data Literacy and the Role of Education***.** After a one-year period of writing and reviewing – amidst a pandemic, lockdowns, and for many of us a move towards distance education and work – the issue before you is the end result of this journey. As an introduction to this special issue, we did not want to write a classical introduction, subsequently summarizing the different articles. Instead, we opted to write an overarching introduction, highlighting some of the main themes, questions, issues, and insights addressed in the different articles. We weave in our own insights, reflections, and conclusions as well. We have organized the contributions to this special issue in a logical order, which we believe tells the story of the role of education in data literacy. First, we start with conceptual contributions that focus on defining and theorizing data literacy and the role of education in data literacy. Second, we move on to focus on students and teachers as actors and agents in data literacy. We end with the concrete implementation of data literacy initiatives and what we can learn from them.

Data literacy is a hot topic, which is currently discussed in many different fields from open data initiatives, statistics, computer societies, coding initiatives, and beyond. The resulting literature is inspiring but not always satisfying from the perspective of the media literacy scholarly field. Literature often focuses solely on the skills and competences required to handle, analyze, and *using data*. The goals behind data literacy are often instrumental and utilitarian in the function of job-related skills or open data initiatives. We hope that this special issue will contribute to a broader discussion about *data literacy*. In this special issue, we will refer to author contributions with their names followed by (special issue) in brackets.

DEFINING DATA AND DATA LITERACY

Data is the new oil. This has become a commonplace saying that refers to an age in which everything that surrounds us is linked to data sources and everything we do in our lives is captured digitally (Mojsilovic, 2018). This datafication is not new in and of itself. What is new are the ideas that: 1) digitalization is entering all spheres of society from the economic to the deep personal; 2) (big) data is gathered through all of these processes from the political to the social; and 3) data analysis can increasingly be automated through algorithms and artificial intelligence to predict and steer in real-time economic, political, and social processes, and human behavior (Couldry & Mejias, 2019; Zuboff, 2019). On the one hand, some of the datafication processes are clearly situated in the field of media; these include (but are not limited to) search engines, recommendation engines, personalization of news, and the datafication of the user. On the other hand, some of these data driven evolutions are situated in fields outside of media, including smart cities, smart environments, traffic routing, and voter influencing. It is no wonder then that there are increasing calls for new types of literacy, such as data literacy, algorithmic literacy, coding literacy, platform literacy, or data infrastructure literacy (Gray et al., 2018). We prefer the term data literacy because the data are the defining element. Algorithms, artificial intelligence, deep learning, and platforms are the technologies and applications which depend upon data.

The Data-Pop Alliance defines data literacy as "the desire and ability to constructively engage in society through and about data" (Bhargava et al., 2015). This is a very high-level definition, but it has the merit of pointing at two basic components of data literacy: *using data* and *understanding data*. This is in line with many definitions and competence models on media literacy (Van Audenhove et al., 2018), and it is a recurring distinction we make in this special issue. In relation to data literacy, many studies tend to focus on technical, computational, and statistical competences for working with datasets; these studies specifically refer to *using data* (Gray et al., 2018). Prado and Marzel (2013), for instance, define data literacy as "[…] the component of information literacy that enables individuals to access, interpret, critically assess, manage, handle and ethically use data". The underlying assumption of many of these works is that fostering competences for *using data* will automatically and inevitably lead to *understanding data.* As we will argue later, in Seymoens et al. (special issue) we do not presume this relation. *Using data* and *understanding data* are different competences that both need attention.

In this special edition, several authors stress the importance of *understanding data* but moving beyond "[…] the 'outer shell' of machines – their interfaces – through to the technology itself and the data and algorithms which make it function" (Knaus, special issue). On the basis of a review of changes in the media literacy domain, Knaus argues for developing an analytical, reflexive, and ethical *critical media literacy* in relation to data and technology. Knaus offers a

criticism of technology that also looks into the technical and organizational context behind media and data production. Seymoens et al. (special issue) uses the *Data Literacy Competence Model (DCLM)* as developed by the Flemish Knowledge Center for Digital and Media Literacy. The DCLM combines two clusters of data literacy competences (i.e., *using data* and *understanding data* in one comprehensive model). The *DataBuzz Project* demonstrates that it is feasible to develop educational content that combines both sets of competences.

THE NEED FOR DATA LITERACY

The contributions in this special issue each indicate in their own way the need for data literacy. Claes and Philippette (special issue), for example argue, that complex systems like recommender engines, which organize and shape our online activities, require a new type of digital literacy. Transparency, critical and active user behavior can help to address the challenges of online recommender systems such as news recommenders. According to Claes and Philippette, the key focus should not be on developing a technical understanding of how algorithms and recommender systems work, but on how to critically evaluate and interpret recommendations.

This insight leads us to the important role of education in enhancing a critical data literacy. The critical data skills of educators and students are insufficiently developed and integrated in the current curriculum. Teachers are often lacking the right skills and tools to grasp the complexity and diversity of data and its societal importance, making it difficult for them to pass on the right knowledge to their students. In their research project, Fontichiaro and Johnston (special issue) focus on high school librarians as a potential intermediary for data literacy education because of their interdisciplinary knowledge. In their workshops, they noticed that the range of participating educational profiles was very broad, stressing the need for the development of data literacy skills amongst high school staff. By listening to specific needs of participants, the right programs for educators can be developed.

Robertson and Tisdall (special issue) warn us not to develop programs just on the basis of a top-down approach. As future data citizens, children and youngsters, need to be given a voice in the discussion. The authors focus on the actual data awareness and interests of children. Their results are promising, as they indicate a clear interest in specific critical data literacy courses in primary and secondary education. Adding this to the curriculum can be useful, as research indicates that even college students with proven media literacy skills experience difficulties in understanding the role of algorithms in the everyday online tools they use (Brodsky & Brooks, special issue). Students are often not aware that content on Facebook is influenced by algorithms. Their study on online shopping provides similar results. This indicates that there is a clear need of integrating critical knowledge on algorithms in our educational programs. Initiatives to educate the educators, as well as initiatives aimed towards children and youngsters, need to be stimulated.

DATA LITERACY IN PRACTICE

The need for practical implementations of data literacy projects is clear. However, while we are able to learn a great deal from existing media literacy initiatives, data literacy requires its own specific approach. The end product of media are texts that can be registered by our senses. These texts can be seen, heard, read, and analyzed. They convey a message, distract and entertain us, and/or have aesthetic value. On top of this, they are everywhere; they demand a significant amount of our time, every single day. Media therefore have a natural appeal to people. On the contrary, data – big data and algorithms – are odorless. They run in the background or on top of processes but are not visible to the general user. They make decisions without our knowledge, an action that is difficult to grasp, even for seasoned experts. Algorithms are black boxes that are fearlessly protected, as they are the geese that lay the golden eggs of the data-based industry. This makes working on data literacy in an educational context more difficult and stresses the need for action-oriented approaches, which focus on both *using data* and *understanding data*, as prominent skills to be developed.

A first practical example of how to conceptualize a data literacy program is the *Databuzz* (Seymoens et al., special issue). This 100% electric bus brings workshops to schools and adult educational programs and focuses on making data and its applications more tangible. This project integrates both the *using* and *understanding* dimension of data literacy. A second practical example is discussed by Werning (special issue). Werning analyzes a project aimed at making data more tangible by adding a gamification element. “Making data playable” could enable a different kind of engagement with and reflection on data. Initiatives like this, together with an enhanced attention for data literacy in our

educational programs, are crucial in a society where data is becoming increasingly omnipresent.

CRITICAL QUESTIONS AND REFLECTIONS FOR OUR FIELD

The different contributions in this special edition all struggle to delineate data literacy in its relation to media literacy. Some authors such as Knaus (special issue) and Claes and Philippette (special issue) talk about data solely in relation to media. Mertala (special issue) clearly moves beyond data in the field of media and stresses the role of data in the field of education itself. Mertala talks about a "hidden curriculum" in our current educational system, and he identifies two main issues. The first issue is the representation of data as cognitive authority, in which data is presented as direct measurements instead of as indicators. In this form of representation, the accuracy of data can be overestimated. Second, Mertala looks at the datafication in schools themselves, in which all kinds of data are collected from students. Although this may seem to be self-evident, Mertala (special issue) points out this is a top-down system in which students and their parents are seldom involved. If we identify the field of data literacy in a broad way, looking at the role of data in all social processes, the media literacy community will have to broaden its scope. This provides new opportunities to work with other fields in a more interdisciplinary way.

In general, media literacy and data literacy more specifically tend to award agency to the individual to engage with media and data. To quote Claes and Philippette (special issue), data literacy can "[…] give citizens the critical tools to be able to maintain control of their technical environment". However, the question arises, does our *surveillance society* (Zuboff, 2019) leave the individual enough room to take appropriate action on the basis of the competences gained? The question is all the more relevant as "the time in which media *use* was optional and in which it was possible for the subject to adopt responsibility in the sense of *informational self-determination*, has passed" (Knaus, special issue). What Knaus is essentially saying is that escaping processes of decision making on the basis of data and algorithms, impacting our individual life, is less and less possible. This is also the reason why *understanding data* is of utmost importance, as *using data* might not always be an option.

This revelation brings us back to the field of media and data literacy. There is a tendency within the community to shy away from involvement with government policy and industry strategy. We believe that the media literacy community should be much more active in policy making. Much of the research in our field can and should inform policy and strategy making. In relation to privacy, automated data-based processes, algorithmic decision making, and so-called smart solutions in particular, there is a real danger that the space for the individual to act will diminish (see also Knaus, special issue). The role of media and data literacy is threefold: 1) to empower the individual; 2) to protect the individual; and 3) to ensure that the individual has the choice and space to act. The last right can only be secured through policy, advocacy, or protest.

In the field of education, the community of media literacy is well placed to: 1) advocate the integration of data literacy into the curriculum; and 2) develop new didactical approaches and initiatives to foster data literacy competences. What is needed is a balanced approach in which both practical skills for *using data* are combined with critical competences for *understanding data.* In the new data age, we need both sets of competences to engage in society as informed, engaged, and critically-thinking citizens.

REFERENCES

Bhargava, R., Deahl, E., Letouzé, E., Noonan, A., Sangokoya, D., & Shoup, N. (2015). *Beyond data literacy: Reinventing community engagement and empowerment in the age of data*. Data-Pop Alliance & Internews.

Couldry, N., & Mejias, U. A. (2019). *Costs of connection: How data Is colonizing human life and appropriating it for capitalism*. Stanford University Press.

Gray, J., Gerlitz, C., & Bounegru, L. (2018). Data infrastructure literacy. *Big Data & Society*, *5*(2), 2053951718786316. https://doi.org/10.1177/2053951718786316

Mojsilovic, A. (2018). The age of data and opportunities. *IBM Big Data & Analytics Hub*. https://www.ibmbigdatahub.com/blog/age-data-and-opportunities

Prado, J. C., & Marzal, M. Á. (2013). Incorporating data literacy into information literacy programs: Core competencies and contents. *Libri*, *63*(2), 123-134.

Van Audenhove, L., Vanwynsberghe, H., & Mariën, I. (2018). Media literacy policy in Flanders-Belgium: From parliamentary discussions to public policy.

Journal of Media Literacy Education, *10*(1), 59-81. https://doi.org/10.23860/JMLE-2018-10-1-4

Zuboff, S. (2019). *The age of surveillance capitalism: The fight for the future at the new frontier of power* (main edition). Profile Books.