

Policy brief #65

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The Databuzz 2.0: Data literacy education for the metropolitan context

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Almost all fields of today's society use and produce data and citizens must learn how to navigate this to be able to actively participate, but education (policy) does not necessarily pay attention to the competences related to data literacy. The DataBuzz aims to improve the data literacy of young people in Brussels through interactive data-themed workshops. The DataBuzz is a unique project that enhances synergies linked to data literacy between educational practice, ed-tech awareness, hands-on experience, and state-of-the-art research. The DataBuzz is an effort to put data literacy on the educational agenda, however, this is only one type of method that could be used to improve data literacy through education. This policy brief details aspects that need to be taken into account when setting up digital-focussed initiatives.

Highlights

- The DataBuzz raises **awareness of the value, limitations, risks, and prominence of data** by letting students work and play with data relevant to their reality.
- There is a tremendous need for citizens to be able to both **use** and **understand data** to (pro)actively, safely and critically **participate in society**.
- Being born in a digital world does not mean young people are 'digital natives', fluent speakers of the digital language. They **lack comprehensive data literacy** competences.
- Students in Brussels come from **diverse backgrounds**, with their competence levels being influenced by a migration background, multilingualism and low literacy, and unfavourable living conditions. There is a strong need for attention to **digital inclusion**.
- When setting up educational practices, it is important to **evaluate** and measure **effectiveness** to make sure learning goals are achieved and practices take into account the **target groups'** (students' and educators') **needs**.

1. Databuzz 2.0: bringing data literacy to schools

As first presented in our policy brief #28,¹ the DataBuzz is a high-tech bus that aims to increase data literacy and digital inclusion in Brussels. This project was launched with the support of the VGC (Vlaamse Gemeenschapscommissie), Vrije Universiteit Brussel, SMIT, and imec in 2019. After a successful evaluation, the DataBuzz project received a 3-year extension (2022-2025), funded by the VGC. The DataBuzz offers inclusive and participatory workshops with a focus on developing a critical societal perspective. It allows students in Brussels to work with digital technologies (touchscreens, smartphones, educational tech or 'edtech', etc.) and interact with well-developed timely content to

¹ Available at <https://smit.vub.ac.be/policy-brief-28-the-databuzz>

develop self-sufficient data literacy competences. Since its launch in 2019, the DataBuzz has reached over 3.800 Brussels students in primary and secondary schools (10-18 years old). Furthermore, the DataBuzz also visits adult education centers and student-teacher programs.

“The DataBuzz is an excellent interactive tool to help prepare youngsters in Brussels for their digital future by enhancing their data literacy. With this project, the VUB emphasizes its role as an urban engaged university” - Pieter Ballon, vice-rector of research at the VUB and director of imec-SMIT, VUB.

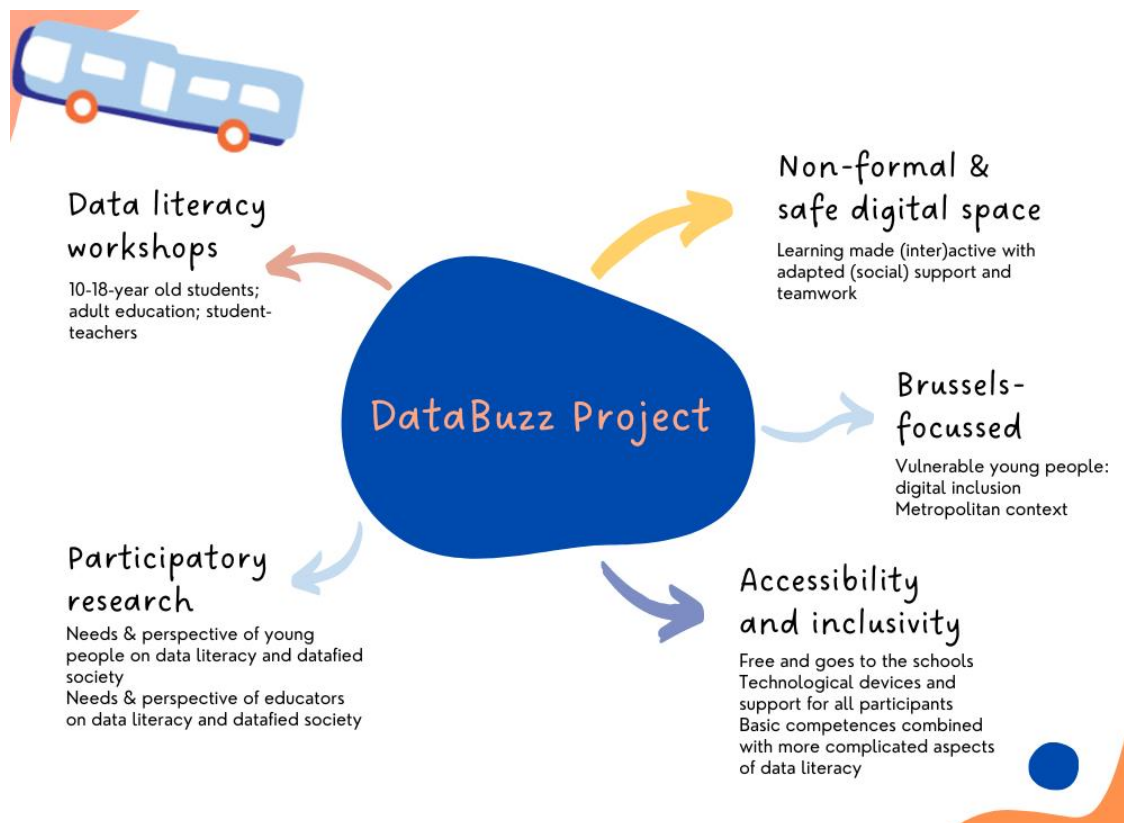


Figure 1. The DataBuzz in a nutshell.

In this policy brief, we first zoom in on what the DataBuzz aims to accomplish with 10-18-year-old students in Brussels. Next, we will explain data literacy and its importance in our current society. Last, we discuss how the impact of a project like the DataBuzz can be evaluated.

2. Activities for 10-18-year-olds

The DataBuzz offers 10 **thematic workshops** for children and youngsters between 10-18 in Brussels to improve various aspects of data literacy (see Table 2). Our workshops aim to nurture more affinity (using and understanding) with the complexity of data. The bus raises awareness of the value, limitations, risks, and prominence of data by letting students work and play with data relevant to their reality. During the workshops, students playfully discover various aspects of data while looking into real-world questions/problems in different contexts, for example, the ethical aspects of self-driving cars or bias in algorithms. Students capture, analyse, interpret, and even visualise data.

The DataBuzz also helps students actively evaluate and reflect on the consequences of data use and recent technologies in society. Hence, we let students explore both the opportunities data and technology can offer and the potential risks and limitations. For example, youngsters should be aware of the possibilities offered by e-health and smart devices, like tracking your blood pressure or recognising symptoms. But also, about the downsides, such as prejudices in AI-based devices. In this way, the DataBuzz equips children and youngsters with the competences they need in a datafied and technology-rich society.

Different DataBuzz workshops:

Workshop	Target group	Theme	Data literacy competences
<i>Escape the DataBuzz jr.</i>	10-13 Adult education	Online privacy	Understanding data: all Using data: interpreting
<i>Escape the DataBuzz sr.</i>	14-18 Adult education	Online privacy	Understanding data: all Using data: interpreting
<i>Cookies & Bubbles</i>	14-18 Adult education	Cookies & filterbubbles	Understanding data: all
<i>AI-AI-AI?</i>	14-18 Adult education	Artificial intelligence	Understanding data: all
<i>Bye Bye Bias</i>	16-18 Adult education	Artificial intelligence	Understanding data: all
<i>e-Health: smart devices</i>	16-18	e-Health & smart devices	Understanding data: all Using data: interpreting, navigating
<i>AI & the media: deepfakes</i>	14-18	Artificial intelligence & fake news	Media literacy Understanding data: all Using data: presenting
<i>Breaking News!</i>	10-18	Data journalism & data visualisation	Understanding data: all Using data: all
<i>Fact or Fiction?</i>	16-18 Adult education	Fake news	Media literacy
<i>Netiquette & Cyberbullying</i>	10-12 (special needs education)	Netiquette, cyberbullying & online privacy	Media literacy Understanding data: analysing, evaluating & reflecting

Table 1. Databuzz workshops for youngsters. See www.databuzz.be for more information (in Dutch).

3. Data literacy, a must-have skill

Data literacy, being able to understand, use, and create data actively and critically, has become crucial to navigate our society. New data are continuously and rapidly created by numerous applications; think about our smartwatch counting our steps, healthcare professionals capturing our health data, and us constantly sharing and liking posts on social media. All these data are captured, stored, analysed, and used for multiple purposes. There is a tremendous need for citizens to be able to **use** and **understand data** to (pro)actively and safely participate in our society.

Data literate citizens are proactive citizens, educated to think about data in a critical way, beyond a mere focus on becoming data-skilled workers and consumers. The Data Literacy Competence Model highlights that data literacy is a multi-faceted concept that encompasses specific competences such as using and understanding data (Seymoens et. al, 2020; see Table 2 for more specific competences).

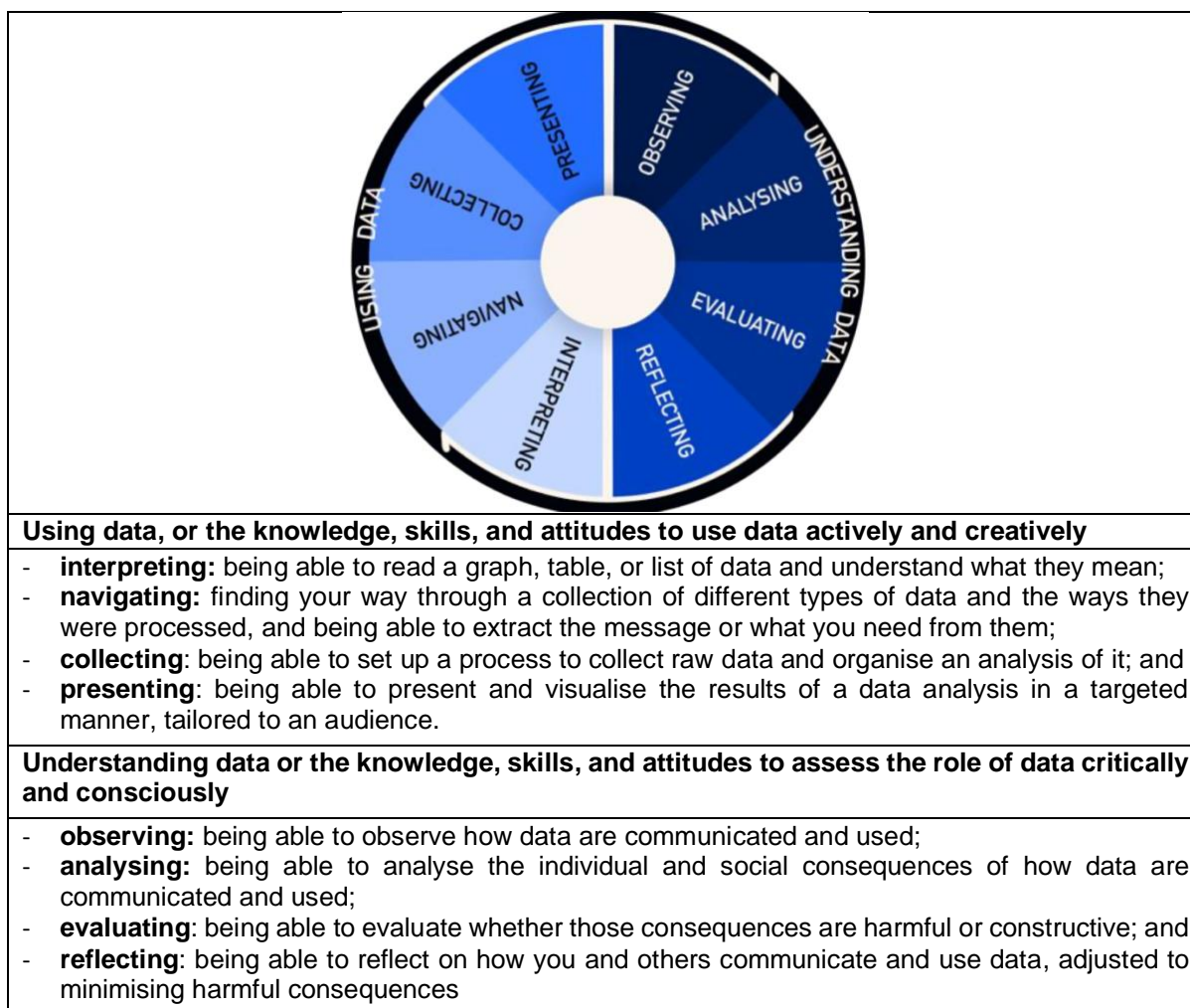


Table 2. Data Literacy Competence Model.²

This Data Literacy Competence Model was developed to offer researchers and other stakeholders a user-friendly model to map educational practices. Using this model to reflect on educational activities (e.g. workshops, lectures) offers a clear overview of the type of competences to focus on, and in what way an activity empowers participants. All DataBuzz workshops have been mapped on this model.

3.1. Importance of data literacy

The datafication of our society underlines the importance of data literacy. We are evolving into a data-driven and datafied society, in which data-driven decision-making (e.g., evidence-based policymaking and business practices) are gaining ground. Although this directly impacts our daily life, few people properly understand data, how data are used, and its consequences. Data literacy is a crucial competence to become and be a critical adult. Yet, during our workshops on the DataBuzz, we noticed that a lot of young people lack comprehensive data literacy competences.

² Seymoens, T., Van Audenhove, L., Van den Broeck, W., & Mariën, I (2020). Data literacy on the road: Setting up a large-scale data literacy initiative in the DataBuzz project. *Journal of Media Literacy Education*, 12(3), 102-119. <https://doi.org/10.23860/JMLE-202012-3-9>

Our research has shown that society believes that young people have good digital competences, yet their skills and knowledge are lacking.³ The Flemish Digimeter⁴ showed that 18% of Flemish youth may avoid digital media/technology in order not to make mistakes, and 24% do not understand or are confused by digital terminologies. Further, both young and older adults experience difficulties with online banking. Moreover, for nearly half of the Flemish population, technological innovations follow each other too quickly, and for 28%, terminology linked to digital applications is too confusing. Lastly, lowly educated youngsters are often less aware of privacy risks and have less confidence in their digital skills. This also lowers their chances in the labour market.

Our currently ongoing research shows that so-called 'digital natives', as well as older adults (65+), are 'societal blindspots' concerning digital competences, with young people more often digitally excluded than expected. Youngsters' lives might be digital-by-default, but this does not necessarily mean that they are digitally competent for a datafied society. Especially in Brussels (and other metropolises), the need to enhance data literacy amongst youngsters is high. The Brussels educational context is truly diverse, due to many pupils with a low socio-economic status, the multilingualism of pupils, large regional differences, and inequality of opportunity.

To conclude, data literacy is a must-have competence in our society. Combined with the need to improve digital literacy in young people, and the challenging context in Brussels related to inclusion, it becomes clear that the DataBuzz has a lot of work cut out for itself now and in the future.

4. Evaluating impact and effectiveness of the workshops

When setting up educational practices, it is important to evaluate and measure effectiveness. A practice must map out its goal(s) and establish how the organizers will achieve those goals (learning goals – learning methods). To know if these goals have been achieved, there is a need for research: how effective was this practice? Has the practice been meaningful for the target group, and in what way? Were all goals achieved? If not, how do we redesign the practice to be more impactful? These are all questions that need to be considered when setting up educational activities. Verifying the meaningfulness of the practice allows organizers to redesign if necessary. For the DataBuzz, this refers to the impact the workshops have on the data literacy level of students.

The DataBuzz is currently working with several evaluation methods (see Table 3). First, the DataBuzz team gathers data on visits. Specifically, the team checks how many bookings we get each year, how many students we reach, and which workshops are most popular. This is interesting for both SMIT and VGC, knowing which areas we reach more and where we can improve our service.

Second, after each workshop, the educational coaches fill out the Keep-Stop-Start file. This method was introduced in the Databuzz in 2021, based on a method proposed by Bartholomees.⁵ The method offers guidelines for observation and reflection about the workshops and is a way for trainers to offer (informal) feedback. We use it to reflect on and evaluate content and context. Based on this feedback, several workshops have been updated or redesigned, to better fit the needs of the students. Observation through reflection among students also allows the team to make sure that students have reached the learning goals.

Third, the DataBuzz team sent out evaluative surveys for schools and teachers that booked one or more of our workshops during the academic year 2021-2022. The results show that teachers appreciate the small group workshops (all the students are activated), the friendly and flexible demeanor of the coaches, the well-organized practical arrangements and that the DataBuzz visits the school for free. Most of these teachers believe that the DataBuzz had a positive effect on the data/media literacy of their students, but also on soft skills, such as teamwork. They mentioned that students are not always

³ Vermeire, L., Van den Broeck, W., Van Audenhove, L. & Mariën, I. (2022). Digital Youth Work in Flanders: practices, challenges, and the impact of COVID-19. *Seminar.net*, 18(1), 1-17.

⁴ See the Digimeter: <https://www.imec.be/nl/kennisuitwisseling/techmeters/digimeter/imecdigimeter-2021>

⁵ Bartholomees, B. (2021, 23 November). Keep-stop-start: snel juist beslissen. *Klasse*. <https://www.klasse.be/519353/keep-stop-start-methode-snel-juist-beslissen/>

as data/media literate as assumed, especially relating to understanding data, such as the positive and negative aspects of AI, or interpreting news media. Teachers often offer several other data/media literacy activities such as learning how to program (focus on using data). Most often, they see the importance of being data literate in our society but tend to have a vague understanding of the concept.

Fourth, the Data Literacy Competence Model was used to analyse the DataBuzz workshops. The DataBuzz workshops namely focus on understanding data, an area that is most often forgotten when looking at other data literacy practices. However, it is important that DataBuzz focuses on the combination of understanding and using data, as both competence areas are needed within our society.

Last, the DataBuzz team is adapting an evaluation framework from colleagues that analyses mobile digital literacy training in South Africa,⁶ to set up a pre- and post-evaluation of the workshops. Hence, the DataBuzz can evaluate its impact, but also create opportunities for participatory research with Brussels' students regarding their level and perspective of data literacy. The results of this type of evaluation can be used to formulate policy recommendations linking the need for certain competences and literacies in Belgium and Brussels. However, when setting up and evaluating educational practices, not only should attention to competences be paid, but also to its accessibility and educational support. Especially in major cities, the digital inclusion of its citizens should be analysed and investigated, and attention to the diversity amongst students should not be brushed aside.

Effectiveness & impact measurement methods:

Method	Stakeholders	Summary
Data on visits	VGC, schools	<ul style="list-style-type: none"> - Information on the number of students & participants, schools, type of visit (non-formal playgrounds, adult education, teacher education), other educational events. - Information on the number of days booked. - Information on types of workshops booked.
Observation	Students, coaches	<ul style="list-style-type: none"> - Filling in Keep-Stop-Start-files: <ol style="list-style-type: none"> 1/ 'What went well, and do you want to keep for the future?' 2/ 'What is not working? What went wrong?' 3/ 'What can we do to improve? What can we change to achieve our goal?' - Reflection on data literacy themes among students.
Teacher surveys	Educators	Surveys were sent out to schools that booked the DataBuzz in the school year 2021-2022 for an evaluation of our practice and to gain understanding of the data literacy level of teachers and students.
DCLM mapping	-	The mapping offers a clear overview of what DataBuzz already offers and what is lacking or should be updated regarding the focus of the workshops.
Evaluation framework ⁷	Students	Mixed method evaluative framework; This tool will help with the overall analysis of the effectiveness of the DataBuzz and of the specific impact each workshop has on the data literacy of participants; analysis starting in 2023.

Table 3: DataBuzz measurements methods

Since the start of the DataBuzz, 10 workshops (and review materials) have been developed. The themes of the workshops correspond to the learning objectives related to media/data literacy in formal education and the objectives of lifelong learning. These workshops were adapted or expanded where necessary, according to the abovementioned methods, e.g. making the groups smaller for more in-depth interactions, adding more verbal feedback moments with the students, etc., for maximum

⁶ Katunga, N., Keating, C., Craffert, L. & Fortuin, J. (2022). *Exploring critical factors for effective digital skills delivery towards meaningful outcomes in an online-first South African context*. WesternCapeCoLab.

⁷ In development.

effectiveness and efficiency. The project focusses on broad development opportunities for all youth, giving them the chance to not only interactively work on their data literacy but also develop their other talents and competences, to offer them equal educational opportunities in relation to digital inclusion, diversity, and multilingualism, to focus on urban education and offer a professionalised learning environment with adaptive guidance.

5. Food for thought: societal impact

Data literacy is necessary for active participation in our society, but there is currently a lack of understanding of this concept. There is a clear need for developing a data literacy (educational) framework through research and evaluation of educational initiatives. This will better prepare young people for the evolutions in our society and will create workers able to perform and understand jobs regarding data infrastructure, data analytics, and more. It is however also important to note that societal funds used for data literacy purposes should be used in a meaningful way. Thus, the impact evaluation of data literacy initiatives is crucial. We need to go beyond theory and use our research results to increase societal impact. Not only to improve data literacy amongst youngsters but also to make sure that all youth is digitally included and prepared for their digitised future.

Recommendation 1 – Data literacy education policy attention

European, national, and internal policies (e.g. schools) should be developed in regard to what being data literate entails, what education can focus on and what its (lifelong) learning goals are, and how organisations can strive for these goals internally (e.g. school projects) and externally (e.g. training seminars).

The Flemish government can empower and support data literacy education through 1/ impact evaluation by the projects, impact measurement can be integrated into a funding framework/call, 2/ involving policymakers, experts, and end-users in the development of policy and policy-related questions, and 3/ providing information aimed at the educational sector with the focus on awareness and networking/knowledge sharing through official channels. Here the Flemish government can base itself on the outcomes of the Digital Competence Framework 2.2 developed by the European Commission.

Recommendation 2 – Strengthening knowledge sharing amongst educators

As mentioned above, many educators do not have a clear or correct idea of what data literacy and being data literate entails. Policy can provide clarity and knowledge sharing through the clear communication mentioned in recommendation 1, but also 1/ through a comprehensive policy framework on data literacy (and its relation with media and digital literacy, already mentioned in policy), 2/ by providing participatory interventions, and 3/ offering training opportunities in collaboration with existing good practices (e.g. Knowledge Centre Mediawijs).

Recommendation 3 – Meaningfulness and effectiveness measurement of initiatives

We need to develop an evaluation framework to assess the impact and effectiveness of data literacy policies, particularly for initiatives aimed towards youngsters. This should include attention to data literacy and to digital inclusion.

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Andy Demeulenaere is the coordinator of the Flemish Knowledge Centre for Digital and Media Literacy. Empowering people is at the core of his work, and as an experienced organisation manager achieving societal impact with reasonable resources is an essential focus.

Dit onderzoek werd uitgevoerd binnen de MUX Unit van imec-SMIT-VUB. De Unit omvat 14 junior en 7 senior onderzoekers en specialiseert zich in Media innovaties, marketing en Living Lab methodologieën. De unit wordt gecoördineerd door Prof. Dr. Wendy Van den Broeck. Meer informatie: Wendy.Van.den.Broeck@vub.be

