DATA FRICTIONS:

INCLUSION AND DATA SKILLS IN ARTS, HUMANITIES, AND CULTURE

Zoetanya Sujon and Bea Wohl (2026)

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How to cite this report

Sujon, Z.; Wohl, B. (2026) Data Frictions: Inclusion and Data Skills in Arts, Humanities, and Culture. *University of the Arts London Research Online.* May. https://doi.org/10.58129/r55q-zj68.

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DAReS Co-designers

The DAReS co-designers are at the heart of this project and their thoughtful, engaged contributions have pushed the boundaries of how inclusion and arts and humanities focused data and digital research skills can be understood. This project would not exist without them and with thanks to each of them, in reverse alphabetical order, they are:

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Syeda Sana Batool
Scarlet Clark
Sarah Qian Gong
Sandip Kana
Pushpi Bagchi
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INTRODUCTION: FROM INCLUSIVE DATA SKILLS TO DATA FRICTIONS

> friction/ˈfrɪkʃn/ Friction is the force resisting the relative motion of two surfaces in contact, acting in the opposite direction of movement. It produces heat and causes wear.... Synonyms include resistance, drag, conflict, rub, and dissonance (Wikipedia).

This report builds upon the year long 'Transforming the Gap: Inclusive Digital Arts and Humanities Research Skills' (DAReS) project report (see Sujon et al. 2026). The report offers the concept of 'data frictions' as a lens to make sense of the many tensions and fractures involved in the intersections between 1) arts, humanities, and culture, 2) under-represented groups, and 3) data oriented research skills training. The impetus for this work was widening access to digital resources like infrastructures, compute, software, and digital research skills training for arts and humanities researchers, and under-represented and marginalized groups. Yet, for this project, widening access requires focusing on the *training and data environments*, rather than on individuals, specific 'protected characteristics' under the Equality Act (2010), or on under-represented individuals and their identities. This is not a project about enhancing individual or group literacies but instead about the *conditions and contexts* for thinking through, researching with, and engaging data skills and research methods for arts, humanities, and culture researchers with under-represented groups. Project partners included Wikimedia UK, and CRAC/Vitae, well known for their work on the 'researcher development framework' (Vitae 2026).

Responding to these challenges of enduring inequalities in data research skills, doubly amplified for arts, humanities, and culture researchers and those who identify with or as under-represented and marginalized groups. The DAReS project picked up this call to think about inclusion and skills differently, both by developing a bespoke inclusive co-design methodology, and by working *with 30 paid* arts and humanities researchers who identified with and/or as part of under-represented groups. The DAReS project involved three phases (excluding set-up and reporting): 1) co-designing 'inclusion', 2) delivering a data school with reflective sessions on inclusion throughout skills training, a 3) public Hackathon co-designed and delivered with Wikimedia UK and co-designers on themes emerging from the earlier project phases. Each phase built on the previous one and took an iterative approach, co-developing each new iteration. Notably, as a 12 month project, there was time to build trust and a pivot from a 'data' skills focus to sessions on data epistemologies, inequalities, colonialities, as well as research journeys.

As partners, CRAC/Vitae conducted an embedded evaluation of DAReS, led by Robin Mellors-Bourne, who found that overall, the project successfully engaged with under-represented arts and humanities researchers as co-designers to develop confidence with both data research skills and a space for sharing and valuing 'perspectives from diverse researchers' (2026: 28-29). At the mid-way point, co-designers reported that in terms of improvement, more time and introductory

material available in advance and greater connection between inclusion and data skills training would be welcomed. At the end, 17 of 18 co-deasigners who engaged with end of project reflection questions, said they would recommend the project to others with one reporting they would not as the data school was ‘rather introductory’ (as cited in Mellors-Bourne 2026: 28).

This point on skill level, although not widely picked up by co-designers, is important. DAReS focussed on ‘advanced’ data research skills, yet in terms of widening access, co-designers were not required to have any experience with data or digital research when joining the project. The difference between co-designer starting points was an additional challenge, and it is fair to say that the distance between ‘advanced’ and ‘very advanced’ can mean the difference between months and years of engagement. Data oriented research skills tend to align at the higher and more advanced end of the scale. Introductory approaches may be more widely available than advanced data oriented skills training which often require a longer term time frame as offered in formal education as offered in certificate, diploma, degree, and other educational programmes - many of which are often designed for those interested in becoming some kind of data professional rather than for those with already developed professional identities and careers.

Two other challenges emerged throughout the DAReS. Alongside the hype and harm narratives around the digital, data, and data research skills, come sometimes unrealistic expectations of what data (and data research skills) can do, in how long, and with what effect. For example, a lot of data work, even when automated, involves labour intensive processes of cleaning, checking, and processing and this can feel tedious and disappointing. Similarly, ‘inclusion’ implies an optimistic view of everyone-together with little to no conflict and a happy, easy mediation of difference(s). Both data skills and inclusion are complex, processual, and involve questions of what it is, where it comes from, who benefits from it, who uses it, and for what purposes. These questions require careful scrutiny as well as navigating between idealistic and realistic expectations of what data and inclusion mean (and can mean) in practice.

This report provides a reflection by two of the DAReS project team members, extending and elaborating on ‘data frictions’ as an analytical lens for making sense of the complexities around data, inclusion, and data research skills training. While this work is made possible by collaborative work with the DAReS team and co-designers, it also reflects our particular co-thinking post-project. To make this argument about data frictions, we outline constructive ways to understand and make sense of data. In particular, this includes the relational and linked nature of data as well as looking more closely at the data lifecycle which creates sometimes difficult and variable entry points for arts and humanities researchers - doubly amplified for under-represented and marginalized groups. The data lifecycle, as a learning foundation, may be more common in data, computer and information sciences than in the arts and humanities, yet it helps articulate important blockages and entry points for engaging data skills across disciplines. In addition, we introduce the concept of ‘data icebergs’ to link the hidden and submerged data systems and structures which enable data as visible ‘discrete values’. From here, we address data skills

broadly as well as the specific data wrangling, computational analysis, social media analysis, and data visualisation skills in the DAReS project

Data frictions, as a concept, provides a heuristic for making sense of learner movements and data journeys - as arts, humanities and culture researchers, and as part of under-represented and/or marginalized groups. These movements show real friction points and wear in often unintended ways. For example, we consider the tension between data / anti-data, based on those reflective sessions in the DAReS data school, where co-designers identified knowledge of how data research methods work as enabling skills of resistance and for social change. The learning point here is the call for an 'anti-data school', which articulates a frictional response to datafication and datafication of research through abstraction, categorization, and decontextualization.

To conclude, we identify the ways in which the data frictions concept helps articulate complexities around enhancing research and further entrenching inequalities. We also acknowledge wider contexts like increasing pressures to use and engage with data, as well as epistemological incongruencies and sometimes, canyons. Notably, the Higher Education (HE) sector is facing huge challenges, with staff facing increasingly intensive workloads, declining pay in relation to inflation, normalized and long-term precarity, and a wider crisis marked by economic instability, redundancies, and closure of departments. These are real barriers impacting research environments, and while they may prevent structural or systemic change, the DAReS project did develop an inclusive co-design methodology, as well as important insights to data skills training for arts, humanities, and culture researchers.

DEFINING DATA: LIFE CYCLES, ICEBERGS, AND SKILLS

In this section, we unpack different approaches to 'data', illustrating its complexity and variability across contexts. Notably, many definitions identify data as simultaneously involving discrete values, as well as relational and social systems. Following the exploration of the meaning of data, we introduce the 'data life cycle', a common although frequently under-examined approach to understanding the different phases of data in the research process, beginning with curation and/or collecting to analysis and dissemination or sharing. Building on the DAReS experience of negotiating with IT departments and risk averse, corporate approaches to software and hardware, we introduce the concept of 'data icebergs' - to indicate how only small parts of discrete 'data' may be visible. The data systems, epistemologies, and governance contexts may be under the water line and much less visible to ordinary users, they have huge impact on what tools, methods, methodologies, and data practices are possible.

Data: meaning and practice

The meaning of 'data' is often traced back to its Latin roots, meaning 'to give'. Kitchin argues that this is not entirely accurate as, at least in general use, data are *capta*, meaning 'to take' or to extract 'through observations, computations, experiments, and record-keeping' (2014: 2). In the context of privacy, Livingstone et al. argue that digital data can be 'given, traced and 'inferred' via data subjects on the web and social media (2019: 16, DCMS 2022). All of these starting points define data in relation to the process of how it is gathered, suggesting a specific relation between data and its context or origin (e.g. giving, taking, traced, inferred, and/or extracted).

Building on this, Srnicek (2016) and Zuboff (2019) identify advanced stages of platform and surveillance capitalism (respectively) wherein new economies are built on the extraction and circulation of data. Couldry and Mejias further this argument where they compare new 'social quantification sectors' using extractive technologies in 'data grabs' equivalent to the land and natural resources 'grabs' made by colonialists (2019). In the *Data Gaze,* Beer argues that data reconfigure social relations, establishes data systems, and shapes new kinds of knowledge including 'data imaginaries' (2019). More recently, Sinnreich and Gilbert define data as 'discrete quantitative values extracted from larger, more complex phenomena' making up an 'industrialized process' with distinct professions and systems (2024: xiii). While all of these definitions include bits of data, they also provide varying degrees of breadth regarding the contexts of origin, including the social, knowledge, and economic systems that characterize our contemporary moment.

In terms of research, data is often understood as the 'stuff' that research produces and is often used as evidence for a particular line of enquiry or argument. In these contexts, data can be qualitative, quantitative, involve mixed methods, yet it can take on different meanings in different contexts for art, practice, and play. For example, Rohini Devasher, one of the artists from the Open Data Institute's *Data as Culture* programme, states:

> In my practice as an artist, I never used the word 'data' at all. I had a very specific definition or set of conditions around the word – data equals authority, data equals science, data equals truth, data equals objectivity.... Data is everywhere, [and] data is many things (as cited in Redler-Hawes and Freeman 2022).

In these conceptions, data is often positioned as property associated with rights and responsibilities by the data subject and 'data controller' - and as Devashar notes - is a stand-in for 'authority'. In this way, data is prescribed a kind of stand alone independence whether that is in isolation or combined in aggregate assemblages. Freeman et al. (2018) develop an arts oriented

'Taxonomy for Describing Data', which further expands how we can think of data. For example, including a range of biological, material, social, regulatory, and relational aspects of data:

Of living: Biological; Environmental
Of non-living: Object
Of social context: Commercial; Personal; Social; State
Of license: Closed; Open; Shared
Of time/space: Live; Real-time; Geospatial; Static; Temporal
Of type: Anecdata; Causal; Generated; Metadata; Processed; Retrieved; Streamed
Of disclosure: Anonymized; Identifiable; Unknown

When it comes to arts and creative methods, it is especially clear that 'focusing on data *alone* is insufficient to understand power in data-intensive digital systems' (European Commission 2021 as cited in Pavel 2022, emphasis added). Indeed, even standard definitions of data come into question and may not be recognizable across disciplines, practices, and contexts. As Freeman et al. (2018) demonstrate in their above taxonomy, the capacity to set parameters and categories for creative or analytical purposes are important - even if this sets limits on data shareability.

Viljoen (2020) argues for a relational theory of data, where data includes 'social relations' and 'legal and technical systems' in networked, systemic (in that it makes up systems), and value (economic, cultural, and in both negative and positive terms) based contexts. Viljoen links data processing and the digital economy, arguing that data are not individual 'discrete values', but instead are a collective and 'public resource' with capacity for individual, social, and economic harms (2020; c.f. Marwick and boyd 2014; Wong 2023). For example, genetic data shared by one family member, also reveals ancestral history about all family members, regardless of their consent or intention to (not) participate. Joining a social media site often requires sharing device and contact details, enabling platforms to build 'shadow profiles' from contacts that may or not be on the same platform (e.g. Aguiar et al. 2022, Quodling 2018). In these ways, data and the many things it can represent, are deeply connected.

One additional element of 'data' is that in the age of platforms and data intermediaries, the tendency is for public information, and data about the public, to be privatized (e.g. Couldry and Meijas 2019; Zuboff 2019). This is a business model popularized by 'big tech' and is now the modus operandi where social media data is difficult if not impossible to access, publicly funded research is often held behind paywalls with profits going to private companies, and the advance of entrepreneurial logics measured through likes, follows, views, shares, and other metrics. This is not the only model and creative commons, open data, and Wikipedia provide important examples of collaborative knowledge building, community movements, and open sharing for the public good (e.g. Alevizou 2026).

All of these definitions and approaches to data are crucial for understanding where data come from and how they work, as well as the epistemological foundations of data - all of which are essential from arts, humanities, and culture perspectives. There are multiple links between the meaning of data and data practices, sometimes shaped by discipline and context, and always shaped by the larger social and cultural ecosystems, as we see with the extractive datafication of human life in the contemporary moment. These aspects of data are very rarely discussed in data training or skills provision (e.g. The Carpentries (no date), Open Data Institute Strategic Data Skills, (no date)) - although are taken up in critical accounts of data and datafication (see 'Data Frictions' section). To further situate data skills in relation to these broader issues, we turn to the 'data life cycle', 'data icebergs' and then discuss 'data skills'.

Data life cycles: Origins and (closed) entry points

Data is not just a thing or an object, and although we often go back to the Latin root 'datum - given' - it is no longer something that is given. It is constructed, shaped, manipulated, driven, cleaned, ingested, scraped, found, observed, processed, analyzed. It is all of these things, and because of this broad multiplicity, it is also the floating signifier that shape shifts to fit whoever is making meaning from its use. One of the additional challenges to this multiplicity is that data is not the same thing at all times. For example, while widely referred to in network, computer, and data science approaches to data skills, there does not seem to be a definitive source in defining the 'data life cycle'. Instead, there are many minor (and sometimes major) differences. Generally, stages in the life cycle range from 4 to 12. Below, we offer an overview of 7 widely repeated themes in multiple versions of the data life cycle (see figure 1).

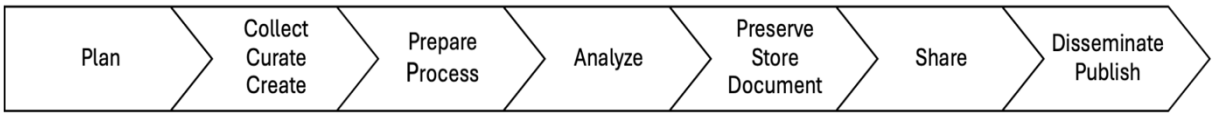

Figure 1: The data life cycle, adapted from Prouchard (2016), Kowalczyk (2017), and Data2X's 'data value chain' (no date), by Sujon and Wohl.

Ferrie et al. (2022) provide a simpler framework, composed of 4 data-driven skill 'pillars', from 1) project management and design; 2) data collection; 3) data analysis; and 4) dissemination.

Each phase, whether simple or complex, involves more than one particular skill, sometimes these are all required for progression through every phase or pillar, and other times, data research skills may only be required for single elements. For some 'data' involves developing a suite of skills. For example, those researchers relying on software services like Communalytic, Brandwatch, Dedoose, Tableau - all of which come with personalizable dashboards and analytic tools - the data life cycle is not as clear as it may be for data wrangling. While these services / tools provide useful interfaces and systems for making sense of social media, public conversation, multi-media content and information, they also operate in some ways, as black boxes. For Dedoose and Tableau, researchers may import pre-existing primary or secondary datasets, but the early phases of the data life cycle become embedded within the process. In the DAReS data school, even data wrangling and low tech data visualisation where the first exercise introduced basic principles of data visualisation, did not reflect entry points into the data and corresponding stage in the research process.

While the lack of attention to the data life cycle may have been an oversight of the DAReS data school, we found it also marks a distinction between arts, humanities, culture, and social science approaches to data and those more directly influenced by computational methods, computer, data, and information science(s). The data life cycle may be highly variable, but it also does important work both in positioning the 'data' in terms of where it is and also in relation to where the researcher is in the research process and what kinds of skills they will be required to use and/or develop.

While the data life cycle can provide familiar and understandable research and skill touch points. The other complexity is that although 'life cycle' suggests progression from nothing (e.g. planning) to a finished output(s), it is also decontextualized. The life cycle's common stages remain common despite the kind of data, its source(s), and its context(s). For under-represented groups, this can be problematic, especially if the data is not findable, searchable, or visible enough to align with stages of research and/or the data life cycle. For example, co-designers raised points around language, particularly when search tools don't recognize characters that are not part of Latin based languages; or, when data on gender only included binary categories of male and female. These design choices have real consequences in who is included in datasets, analytic software tools, and pre-set search categories. More broadly, this shows how the grounds for inclusion are set long before research begins. This is more than just datasets that facilitate recognition of others like you; it is about tools, methods, and mindsets that actively prevent recognition and work to erase certain identities and block entry points for certain researchers. Both examples show how the close mapping of the data life cycle to research design also obscures *points of translation* as data moves through systems - unhelpful, absent, or biased categorical systems - disciplines, and often unintentionally, flatten important contexts.

Data origins and researcher positioning are especially important for arts, humanities and culture researchers who are often seeking the 'human' and 'meaning' in their research. The data life

cycle, especially when mapped to research design, provides entry points for researchers and important clues for corresponding skill sets; yet as discussed further below, there are still multiple points of friction and wear amplified for under-represented arts and humanities researchers.

Data icebergs: Systems and structures

The DAReS project intended to minimize barriers such as access to tools and resources. One way we operationalized access and lowered barriers was to set up the co-designer role as paid employment. This meant all co-designers were compensated for their labour and expertise as co-designers. Due to the AHRC funding, we were also able to provide individual lap-tops and software licences that lasted for the duration of the project (or longer where possible), UAL log-in details including access to UAL systems, and dedicated IT support.

In the DARes planning phase, setting up software, hardware, UAL digital access, and licences required getting buy-in from local IT departments, as well as developing new relationships and procedures for working together, because IT had never worked with research staff in this way. This was a time consuming and labour intensive process, not only because of requiring access and resources for 30 co-designers, but also because the nature of the project demanded permissions that were not normally given to research staff and 'risky' technical configurations. While the DAReS team allocated time and funding for an IT role on the project to support the DAReS team and co-designers, the set-up took much longer and was much harder than anticipated. This process, however, laid bare some of the challenges of cross-departmental work where objectives and aims may be in competition and collaborations are without any institutional precedence. In this way, data and digital can be doubly difficult for those departments who are new to the process, which has to be designed as and when needed, between departments speaking very different professional languages. This also points to the disciplinary impact supporting these kinds of collaborations are going to be radically different for computer science departments, for example, than they will be for those in arts, humanities, and culture.

This process highlights the infrastructural nature of data. Data has networked materialities from cabling to servers that shape not only individual devices but also software possibilities and choices. This also illustrates how much bigger 'data' are than just discrete values as:

> Focusing on data alone is insufficient to understand power in data-intensive digital systems. A vast number of interrelated factors consolidate both economic and societal power of particular digital platforms (European Commission 2021, as cited in Pavel 2022).

To make sense of this situation we propose the 'data iceberg' as a helpful framing metaphor for the links between these materialities and 'discrete values' or data instances. The data iceberg is

made of tiered systems, each of which is required to make data visible, usable, shareable - and possible to engage with. See figure 2 for an illustration of these tiered systems underlying data functionality.

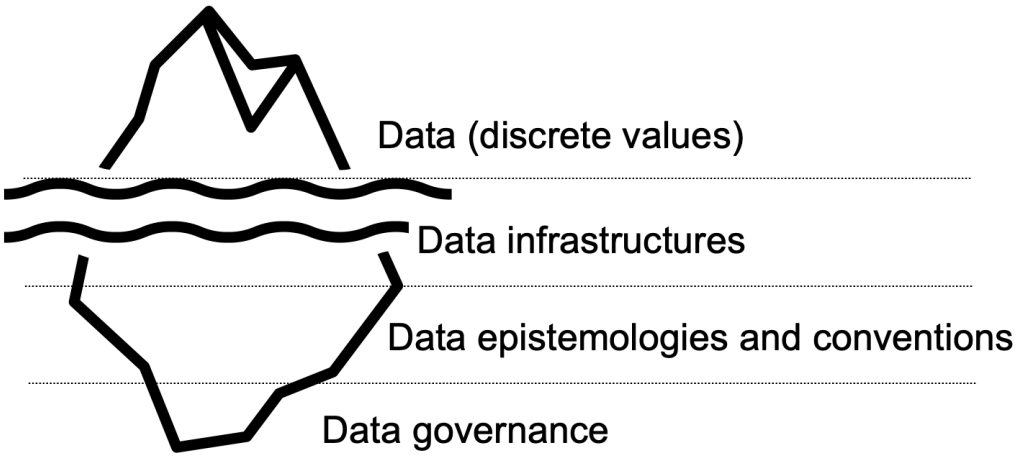

Figure 2: The 'data iceberg': tracing data from discrete values to lower and deepening levels within data systems (incorporating work from Bates 2018 and conceptualized by Sujon 2026).

For most researchers, only the very top tier is visible, and the other three are under the water line, out of visibility. For example, even working with the most basic data requires access to an updated device, software to run and work with data and documentation, as well as access to safe and secure data storage. Bates (2018) defines the 'under water' analytical categories as related and subject to political and market economies. Building on Bates' three categories (2018), we propose four expanded tiers:

1) Data - bits of information that are given, taken, inferred, extracted frequently as 'discrete values through particular tools, methods, software packages etc.;

2) Data infrastructures - material systems, institutional devices, operating and software systems, servers, cloud storage etc.;

3) Data epistemologies and conventions - disciplinary-based practices socio-cultural factors, such as epistemologies, 'systems of thought, forms of knowledge, subjectivities, communities, institutions', etc.; and

4) Data governance - regulation, policies, ethics, and governance processes or principles (e.g. data management practices, administrative rights, cybersecurity protocols etc.) (adapted from Bates 2018).

Thus, one's choice of data is shaped by related tools and methods and are directly connected to data infrastructures, such as servers, devices, operating systems and other materialities, as well as data epistemologies and governance.

Data icebergs help explain the highly differentiated HE data landscape in the UK. Centres of well-resourced excellence, featuring labs, numerous digital research technical professionals (dRTPs) such as research software engineers (RSEs), and groups of established experts. This illustrates how data systems take capacity to build capacity. Smaller institutions and lone arts and humanities researchers often do not have the resources and in-house expertise to take on well-guarded, risk averse IT departments, making it much harder to engage with data and data systems.

Julie Cohen, legal and data scholar, describes data infrastructures as 'extend[ing] vertically, in stacks that superimpose data-driven logics and imaginaries over preexisting physical infrastructures' in highly scalable and (re)configurable modes (Cohen 2024: 9, 2012). The important point here is that data may be understood as 'discrete values', yet in order to function as data, it requires deep infrastructures. The choices researchers make about what data to use-create-curate can have much longer term technical and social consequences, even if that individual researcher does not otherwise encounter such systems. For us, the 'data iceberg' helps to convey the relational and infrastructural aspects of data.

In this last data section, we address skills, which also intersect with every phase of the data life cycle and every tier, visible and invisible, of the data iceberg.

Data skills: Contexts

Although we began the DAReS project with a focus on 'digital' skills, it quickly became clear that this was too broad a term, referring to everything from basic access and digital life skills to much more complex skills such as working with high performance compute or high level programming. As a blanket term, it was unhelpful to discuss 'digital skills' as they meant radically different things, requiring different abilities and resources at different stages, often used for different purposes. While still in the planning stage, we began to narrow down what we meant by digital skills with a tighter focus on 'data skills', which we adopted to more concisely refer to working and engaging with data for arts and humanities research.

Even with this narrowing, digital research skills are often described as 'revolutionising' research and broadening impact, and as such, are key areas of training investment for future oriented researchers (DCMS 2019, Taylor et al. 2022). Recent evidence shows that while over 80% of arts and humanities researchers work with some textual, visual, audio and numerical data and 75% work with research software, there is still widespread uncertainty on what tools and skills to invest in (Ofsted 2022, Taylor et al. 2022). Again, for arts and humanities researchers, this uncertainty is both risky and a common deterrent to taking up digital or data skills.

Perhaps unsurprisingly, lack of time presents the single largest barrier both in arts, humanities and culture research, within and across the HE sectors, as well for project development. For example, 58% of HEI staff say they want more digital skills, yet only 13% say they have time to invest in training, pointing to the resource intensive requirements for digital skills take-up (Francis et al. 2019; DCMS 2017; Helsper 2021; Tsatsou 2022; Taylor et al. 2022). Over 65% of arts and humanities researchers invest in digital research skills training development on the job and in their own time (Sufi et. all 2023, Taylor et al., 2022). Co-designers also identified time, accessibility, and relevance as important constraints, like the wider field.

As detailed in the DAReS project report (Sujon et al. 2026), our inclusive do-design methodology allowed us to explore the meaning and experience of inclusion through a 'barriers to demands' exercise, which led to co-designed 'inclusive principles': 1) accessibility; 2) time; 3) relevance; 4) belonging; and 5) compassion. These principles captured important issues that when accounted for in learning environments, could enable better inclusion rather than blockades. These principles were also used to develop other DAReS deliverables, such as the data school and Hackathon.

Thus, barriers are common for arts, humanities, and culture researchers. In terms of wider HE environments, there is little to no consensus on what constitutes basic, core, or advanced disciplinary essentials for digitally oriented research - made more complex by increasing interdisciplinarity. In addition to an uneven landscape demanding high time and resource costs, many arts and humanities see no relevant benefits of digital or data skills for their research. Thus, while there is a promise of doing more research, better, and faster through data skills, there is also a scepticism of the actual costs which include deeply held legitimate disciplinary reticence amplified by experience inequalities and marginalization - a theme that became familiar throughout the DAReS project.

The DAReS team identified skills gaps and growth areas in arts and humanities as part of the bid development process (DCMS 2019; Giles 2025), choosing to focus on more advanced data oriented research skills most often used for data collection, analysis, and communication:

- data wrangling,
- social analytics,
- social network analysis,
- data visualisation, and
- computational data analysis.

More broadly and in part due to resource differentials discussed in the data iceberg sections, many arts and humanities disciplines are out of step with the growth of digital and computational approaches when compared to other disciplines and interdisciplinary areas. Yet, and at the same time, engaging new techniques, methodologies, and data skills with arts and humanities and under-represented researchers, can bring heightened awareness of how these systems work. Including a deepened understanding of the harms, bias, and discriminatory practices that come with these approaches (e.g. inaccuracies of facial recognition technologies, especially for Black and darker skinned people, women, and non-binary and trans people, see Bualamwini 2024). These critical and engaged perspectives are important for the ethical analysis of data at every level, comprising new and well-established kinds of skills. In the next section, we pick up on inclusion and data to reflect on common tensions and possibilities.

INCLUSION + DATA SKILLS

> As we know, as inclusive as we strive for a group to be, power dynamics are a natural and unavoidable part of co-building processes (a DAReS co-designer reflecting on inclusion in the data school, Oct/Nov 2024).

Similarly, like ‘data’, ‘inclusion’ has also become a floating signifier which can mean everything, something, and nothing. Based on this, we draw from the DAReS project to examine inclusion, followed by what data and inclusion mean as ‘inclusive data’ skills, and conclude with our key learning points. As the above quotation by a co-designer illustrates, ‘power dynamics’ and dissent are ordinary parts of human interaction, and this can get complicated when idealism and reality do not align (Slingerland et al. 2024).

Despite such dynamics, co-designers also recognized the importance of sharing diverse experiences for expanding one’s perspective:

> When a wider scope of people share their experiences in a casual environment, *that broadens your horizons in terms of what inclusion means for others and what barriers they have faced or highlighted … it definitely made me think* (co-designer feedback after inclusion workshops, June 2023, emphasis added).

Here, 'inclusion' can be an invitation and a promise, and simultaneously, also a threat of (dis)placement and disappointment. The multiplicity of 'inclusion' as positive and negative is worth attending to. For example, inclusion is often associated with fairer human rights, greater equality and an often idealized view of together-ness - where everyone has rights and can be heard. Ortega Alvarado et al. argue that inclusion 'centers the ways of being of those who act as "includers"… [and] as a result, all inclusion is necessarily preceded by acts of exclusion' (Ortega Alvarado et al. 2025: 11). Sara Ahmed notes that inclusion is '… the "happy point" of intersectionality, a point where lines meet' (2012: 12) and despite the emotive framing, recognizes 'diversity' and inclusion work as sidelining advocates from making too many disruptions. Despite the idealism the word carries, it comes with heavy responsibilities most often assigned to those who are most often excluded.

'Digital inclusion' has increasingly provided an umbrella concept for more problem-oriented terms, such as: indices of multiple deprivation, inequalities, uneven access, digital poverty, digital divides, and discriminatory resource allocation. The harshness of systemic racism, ableism, heteronormativity, and misogyny are normalized and fighting back is both emotionally demanding and labour intensive, requiring breaking the 'institutional flow' and working through complex systems of minoritization (Ahmed 2012). The 'social model of disability' is also important here, as it is not impairments which are disabling, but a world that is not equipped to accommodate those impairments (Oliver 2013). Since the early 2000s such research has increasingly formed the basis of social policy as well as corporate practices in the technology sector. Similarly, Helsper's 'corresponding fields' model positions wider social, economic, and cultural contexts as directly impacting persistent 'socio-digital' inequalities (2021).

More broadly, inclusion and 'inclusive data' is gaining cultural traction, touching on many collective concerns about the social importance of data and advocating for minimizing its many harmful impacts. There is now widespread recognition of the intrusive and extractive digital technologies making up platformed ecosystems, that not only privatise *public* data and knowledge but do so for economic gain (e.g. Zuboff 2019; Couldry and Mejias 2019; Gray 2025). This is another useful illustration of the double edge of inclusion. Social media, for example, lower the barriers for civic expression and community participation, yet also sell behavioural data to digital advertisers for profit. Data oriented research is also subject to 'big tech' publishers and private knowledge brokers, like Elsevier or Brandwatch, increasingly big data intermediaries. In these contexts, 'inclusion' and 'inclusive data' can be used to virtue signal or perform inclusion, rather than signpost genuine inclusive practice.

One of the challenges in the digital and data skills space is the enduring nature of inequalities as seen in the socio-demographics of those in leadership roles in HE, research, grant awardees, and professorial roles across the HE, computing, technology, and digital skills sectors. While there are some highly successful projects in this space, many tend to be designed to support those in developing more 'basic' digital or intermediate skills. There is a vibrant landscape in the UK of these kinds of project: e.g. Tech Up; Tech Yard (now closed); Institute of Coding; Open Data Institute's Strategic Data Skills; Data Apprenticeships (level 4); Coding Black Females; Next Tech Girls; Code First Girls; Rainbow R, and many more.

These are helpful initiatives and resources. While it is not the purpose of this report to analyze these kinds of 'inclusive' initiatives, taken together, they point to a broader demand for understanding and building opportunities for inclusion and data to come together in theory and practice.

On such initiative is 'The Carpentries', which offers *inclusive* computational and data intensive research skills training through a non-profit global community using a 'suite of open source, collaboratively-built, community-developed lessons' across data, library, and software skills (https://carpentries.org/about-us/). Building on almost 30 years of experience, the carpentries has also developed 'The Carpentries Toolkit of IDEAS (Inclusion, Diversity, Equity, and Accessibility Strategies)' (Robertson et al. 2026). As a global community organization, lessons are collaboratively built, tested, delivered, and continually updated. There is a pricing structure for membership and workshop 'seats' which means it is probably not affordable for many individual researchers seeking data research skill development but is an important resource. While the toolkit provides useful definitions and tactics for carpentries' instructors in some sciences and social sciences, the IDEA Toolkit presents a 'checklist' approach - identifying key steps for organizers and digital skill providers to consider in their planning.

Yet, Huijg and Acton (2020) critique this approach as they can close down opportunities for disabled and neurodivergent people to meaningfully engage providers. This is an essential point. Ortega Alvarado et al. pick up on this, noting that 'inclusion or exclusion' can happen 'without any dialogue or process of acknowledgment' (2025: 10); pointing to checklists as a tool for 'discursive closure' (Miltner 2025; Louw 2001). This doesn't mean that checklists are completely unhelpful for creating better environments, but they can disable deeper engagement with what inclusion means in practice. To make this engagement possible, Acton and Hujig make an argument for a 'relaxed pedagogy' (2020) facilitating comfortable environments that account for different paces of learning, energy levels, and capacities of *staff and students*. The acknowledgement of staff is important, as so often, there is an assumption in institutional practices that usability requirements such as time, access, and energy apply only to learners.

More broadly, disability studies have pioneered 'inclusive research' as a research style including people with disabilities in research design, research, analysis, and dissemination (Reason et al. 2024; Strnadov et al. 2014). This requires collaboration and clear communication, with intentionality and deep reflection on inclusive practices, equality, and access (Reason et al. 2024). While some have questioned how equal 'inclusive research' can and has been, they also note a shift towards working more with disabled people than those with formal research roles (García Iriarte et al. 2021).

It is here where it becomes useful to make distinctions between the different applications of 'inclusive' to data, skills, research, and systems. Inclusion, as a broad umbrella term, can overlap so in relation to data, research, and skills, these can be differentiated as follows:

- **Inclusive data** - improving the quality of data by including more information about under-represented groups and missing data for better information and decision making. Some prioritize the disaggregation of data to speak to specific groups and their specific needs

- **Inclusive data skills** - providing inclusive practices in training, skills provision, and capacity building with participants (e.g. co-design, co-creation, co-production etc.)

- **Inclusive research** - working and researching with rather than to or for under-represented groups throughout every stage of research. Well established in disability studies with a 30 year record

- **Inclusive data systems** - focused on the connections between data collection, creation, storage, analysis, and dissemination with care and responsibility (e.g. data commons, data cooperatives, data donation, open data, data stewards, etc.)

These distinctions are important, although these terms are often used interchangeably. They illustrate different levels of focus for inclusion, and indeed, different ideas of inclusion.

For example, The Global Partnership for Sustainable Development, 'a network of over 700 private sector, academic and civil society organizations, and governments', spanning 80+ countries, launched the *Inclusive Data Charter* in 2018. From there, the UK's Office for National Statistics signed up to this charter, launching the Inclusive Data Taskforce in 2020 and its subsequent report (2021). Both ambitious initiatives focus on expanding the quality and quantity of data, with the assumption that this will lead to better and more inclusive policy. Some of these are useful recommendations, such as 'building trust through engagement', 'engaging all communities', and 'diverse partnerships' (ONS 2021).

Yet, the 2025 (DSIT) independent review of data, statistics and research on sex and gender, recommends 'a biological definition of sex', effectively erasing data on trans, non-binary, intersexed and others on the gender spectrum. This has real consequences for trans and non-binary people, not only in forcing harms at the point of data collection but also in obscuring and further entrenching inequalities. For example, inaccurate data on gender impacts specific communities who don't fitas negatively impacting LGBTQI+ health services, designed for cis-gendered users and closing down (e.g. Kartik 2024; Guyan 2022). Similarly, disability studies have a long tradition of working with people with disabilities and 'inclusive research' that prioritizes disabled people in the design, conduct, analysis, and dissemination of research (Reason et al. 2024; Strnadov et al. 2013). Notably, listening, openness and flexibility are key factors in designing and doing inclusive research (Nind and Vinha 2014). The DAReS project report, particularly **appendix 2** provides an overview of *inclusive* training programmes as further evidence of the work being done in the UK on inclusive data and data training (Sujon et al. 2026).

Data is constructed and choices around data collection and categorization can entrench and challenge inequalities. As Kevin Guyan notes, 'data is a record of the social world mediated through decisions made about what or whom to include or exclude' (2022: 20). At the same time, there is a huge and growing body of work critiquing techno-solutionism and offering critical accounts of digital technologies and data as furthering systemic inequalities, social hierarchies, and prejudices - very much in line with the backwards steps of the ONS's Inclusive Data Task Force's recommendations on using biological sex over gender in guidance and data collection (c.f. Madianou 2025; Benjamin 2022, 2019; Chun 2021; Noble 2018). See also Figure 3.

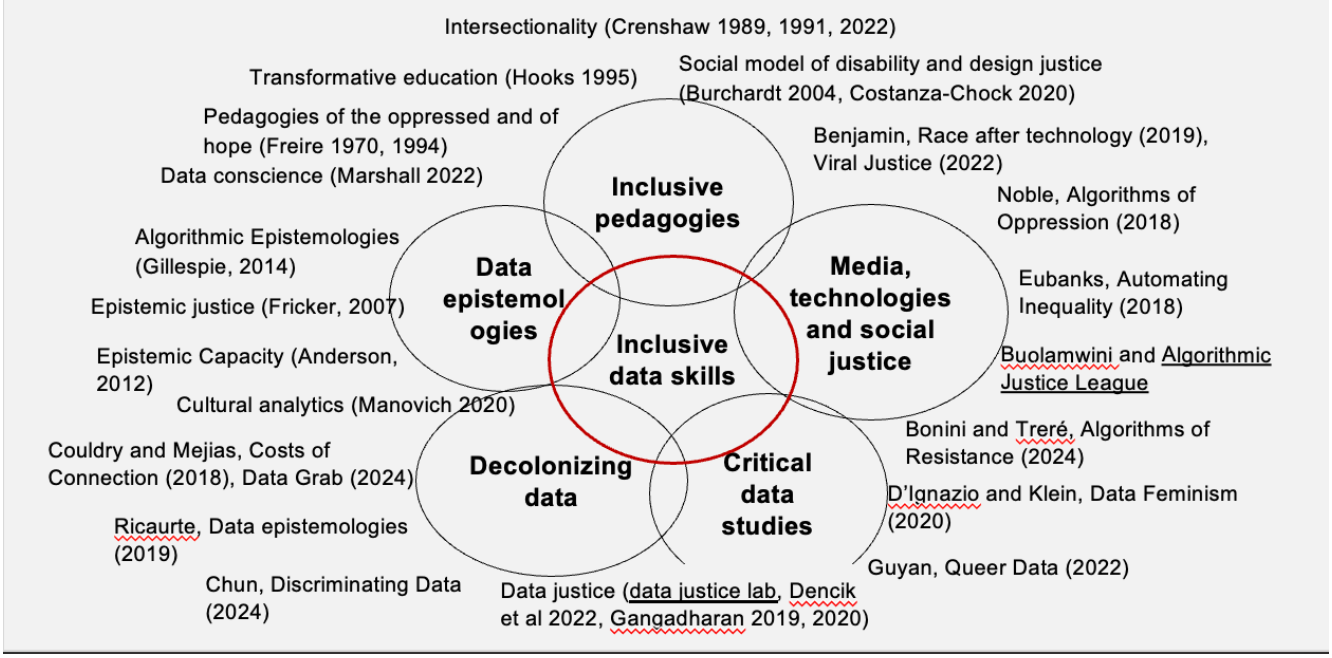

Figure 3: Critical literature map of authors and scholarship addressing technological and data inequalities, and which evidences multiple harms on and to under-represented and marginalized groups (compiled by Sujon 2026).

Figure 3 illustrates some of the emerging fields of research and practice, such as critical data studies, data feminism, data colonialism, data cooperativism, race and technology studies, and queer data make visible the harms that come bundled up in the 'revolutionising' rhetoric and data-oriented technologies (e.g. Madianou 2025; Tekobbe 2024; Chun 2024; Broussard 2023; Guyan 2022; D'Ignazio and Klein 2020; Benjamin 2019, 2022). Thus, one of the first challenges meant navigating this contradictory tension between hype and harm in digital skills, datafication, and data-oriented processes. Figure 3 does document a growing body of significant evidence and thinking on the data and technology harms, which legitimates many co-designers' - and arts, humanities, and culture researchers - robust data skepticism.

As many have noted in critical studies of data and technology, data can be used as a tool for both oppression and liberation (Costanza-Chock 2020: 10). Guyan picks this up in terms of 'data dilemmas' - the capacity for LGBTQ+ data to be used to provide better health information about the specific needs of under-represented communities, for example, and to weaponize that information to target those communities.

The DAReS project, notably, provided an opportunity for mutual listening, openness and flexibility which facilitated a sense community brought together by shared concerns around excluded groups and the will to create better inclusive practices (c.f. Nind and Vinha 2014). This sense of community and shared vision was crucial for building a shared understanding of the ways under-representation, inclusion, and data skills can come together. As Ortega Alvarado et al. suggest:

> … inclusion is not simply the opposite of exclusion but *rather a process of constant interplay* that continually generates new inclusive/exclusive conditions and possibilities…. This interplay represents a form of dynamism that can be interpreted as frictional and counterproductive (Ortega Alvarado et al. 2025: 12, emphasis added).

A sentiment echoed by a co-designer in project feedback:

> Inclusion, to me, is an umbrella term that means myriad things to different community groups who may benefit from an organisation's inclusivity practices. I think true inclusion arises when we acknowledge that it is a gradual and iterative process that requires a consistent willingness to adapt and evaluate our practices as programmers, researchers, academic institutions, and organisations. A fundamental element of inclusivity, for me, is

> intersectionality and acknowledging/welcoming breadth of experiences (Co-designer feedback after the DAReS Data School, November 2023).

Again and again throughout the DAReS project, we reflected deeply on how inclusion was not just about a feeling and not something that could ever be completed or ticked off a list. Instead, and as so eloquently articulated by the co-designer above, inclusion was about being attuned to others as partners in research and thinking processes. It was also about listening carefully to pinch points, concerns, complaints, and engaging what people said they needed. There were also multiple moments when this was not enough. For example, standing in the halls of an old and rather complicated building, realizing how inaccessible some spaces could be in terms of acoustics and access to nearby working toilets. Or for example, scoping different tools and realizing how little information was available on compatibility with screen-readers, the use of exclusionary categories, or if it were possible to include culturally relevant examples and case studies. All of these things had to be considered and, in some cases, developed under pressure and with limited time, by the project team.

Of course, we also made mistakes - speaking too much on topics we cared about, not preparing enough in advance, or having co-designers repeat their requirements to several members of the team and then not fully being able to address these requirements. Inclusion, for us, was about being aware of language and context, doing our best, and genuinely engaging with co-designers to learn and share with them. In this way, we considered each principle of inclusion and very specifically of co-designers, in the design of the DAReS data school, accompanying materials, the Hackathon, and future planning.

Drawing from our own experience, co-designer feedback and reflections, as well as the 'DAReS Project Evaluation' (Mellors-Bourne 2026), the project was effective in facilitating co-designers to build confidence with data and arts and humanities data research skills. Perhaps more importantly, the DAReS project was also able to co-design a shared understanding of inclusion, data, data skills, and research, and this has significant consequences in forming knowledge communities.

Having provided an overview of the DAReS project, the learning points about data, how it works, and the ways that data can be understood beyond and within arts, humanities, and culture researchers (e.g. through 'data life cycles' and 'data icebergs'). Both data and inclusion are complex concepts, and like learning new skills, involve on-going processes and movement from one place to another. We explore this further in the next section on data frictions.

DATA FRICTIONS: ON THRESHOLDS, AGENCIES, AND EPISTEMOLOGIES

Originally coined by Paul Edwards, data frictions provided a metaphor for the multiple challenges in moving climate data over time and across disciplinary fields and contexts. Edwards writes:

> …computational friction expresses the struggle involved in transforming data into information and knowledge, the complementary concept of *data friction* expresses a more primitive form of resistance. Like computation, data always have a material aspect. Data are *thing*s. They are not just numbers but also numerals, with dimensionality, weight, and texture. 'Data frictions' refers to the costs in time, energy, and attention required simply to collect, check, store, move, receive, and access data' (2010 n.p.).

The concept has been picked up by information science, science and technology studies (STS), infrastructure and platform studies, communications, among others. Bates elaborates on the concept of data frictions beyond 'costs in time, energy and attention' to better understand 'the dynamics of research data circulation' particularly around the problems of metadata in restricting data sharing (2018: 10-11). The lack of time to develop and correct metadata for sharing was cited as the number one barrier to data sharing - and remains a significant barrier for researchers, including DAReS co-designers and team 25 years later (Bates 2018: 11). Bates notes that platformization and datafication are industry led mechanisms to streamline extractive technologies and reduce frictions that cost time. In this way, data frictions are political and socio-cultural. The other significant point made by Bates (2016) and Edwards (2010) is that frictions occur because data *moves* from source to data collector / creator, and from collector to dissemination and sharing across knowledge domains.

Movement is what causes friction, as it is not a 'material property' but instead it is the reaction or force that emerges between two properties or materialities (Kato 2000). Identifying points of wear, sometimes visible, sometimes invisible, is challenging when ideas of data and skills involve fixed processes and steps. Wear and friction have radically different outcomes for different groups where some, particularly excluded and under-represented groups experience *more wear and burn* than others who experience welcoming entry points (e.g. Ortega Alvarado et al. 2025).

This concept aligns with Ahmed's work 'On Being Included', where she identifies diversity work as both disrupting institutional flow and requiring repeated 'fighting' for institutional attention and thinking and having to break the flow (2012). This does not have to be antagonistic to break the

flow, as like a current, standing still can be disruptive. Ahmed's focus on diversity work is also helpful here, particularly in that contextual forces from institutional inertia or active resistance exist in institutional flows, environments, and data infrastructures.

Data research skills are also embedded in institutional flow, in between data literacies and data systems, in between tools and methodologies, and in between data agencies and data subjects. It is at these points that 'data frictions' become felt realities, particularly when experienced from marginalized or under-represented positionalities (c.f. Ortega Alvarado et al. 2025: 11).

We would like to expand this point beyond *data only* frictions - that primarily impact the efficiency of data sharing and adding costs to the movement of data across disciplines. Instead, and particularly in the context of learning, we conceptualize data frictions as the result of two kinds of movements - the movement of data and the movement of learners. Attending to these movements reveals how and why inequalities are so entrenched - and how 'frictions' can be particularly harsh for those who identify with or as part of excluded groups.

'Threshold concepts,' the idea that some concepts and some skills are so essential for fields of knowledge, that they are not only considered 'tricky knowledge', but also transformative to the learner (Pinnock et al. 2019; Sanders et al. 2012). While pedagogical theory seems to have moved on from 'threshold concepts' (e.g. Salwén 2021), they also make clear the movement learners must make in terms of familiarity, investment of time, and repeated practice of new skills. The other implication of this is that to master threshold concepts, which for data research skills include abstraction, categorization, and objectivity, sacrifices to important epistemological foundations must be made to 'cross the threshold'. Again, in the case of data skills, data frictions can be intentional resistance to such epistemological sacrifices as well as to skills that erase the human in humanities.

Drawing from the data school, we explore the frictions between 'data' and 'anti-data' schools.

Data and anti-data schools: Building skills of resistance

Within the framework of the AHRC, the DAReS project started with the assumption that there was a need for Art and Humanities researchers to have better digital skills to engage and make better use of new digital infrastructures for our research.

While the DAReS project started by looking at digital skills broadly throughout the project, we found that more narrowly, the skills and concepts were grappling with were more specifically rooted in 'data' and 'datafication'. Whatever terms are used to describe the required skills (e.g. digital, data skills, digital or data literacy), these are not neutral terms. Instead, they carry with them an inherent view of the world, which, if not examined critically, becomes more pervasive.

While data literacy for example, initially seems to be a term that could be used more specifically for a range of data professionals (such as librarians and data professionals), it has been noted that those, such as researchers, who have access to large databases have increased. The same could be said for research or even research councils with any number of digital or data skills. Within this context, the role of digital and data skills training and curricula should always be examined critically. The purpose of this sort of training will either implicitly reproduce a logic that is grounded in an overall trend toward extractive datafication which benefits industry, 'Big Tech' and private corporations. The alternative is to deliberately consider how these skills can be used to articulate a kind of resistance, an intentional data friction to slow down, stop, and challenge the swell of techno-solutionism and data hype.

In the DAReS project, we encountered (or created) data frictions. The data school could have ended up reproducing the very logics that had made these skills less easy to access by underrepresented groups – but by implementing and developing an inclusive co-design methodology, we found ourselves questioning the very assumptions built into the skills we were teaching. It is from this starting point that we learned with co-designers that digital skills can be skills of resistance – what we see as an 'anti-data school' approach, specifically attuned to the needs of and questions asked by arts, humanities, and culture researchers.

Within this datafied world and research landscape, the challenge is to find where resistance can be located. One useful signpost could be to look towards Philosopher. Rosi Braidotti's extensive work on the post-human (2019), she notes that by being bound to human subjectivity, there is always a narrowing (and an exclusion). Where the post-human is inherently expansive and resistant to limitation, the ost-human allows a taking seriously of the importance of more-than-human assemblages and forcing recognition that those who have been excluded from the human (throughout history) are essential for opening new possibilities. Specifically, it is useful to reflect on how the experience of exclusion breaks down the site of pedagogy:

> splitting the binary student-teacher relationship allows the bypassing of the individualism and a broader ensemble to emerge in the process of these joint activities (Braidotti 2019: 142).

What do We mean by Resistance?

The DAReS project finds itself at the confluence of two distinct discourses of resistance. On the one hand, there is resistance literature in the context of digitalisation. As briefly touched on above, works like 'Algorithms of Resistance' (Bonini and Treré 2023), 'Design Justice' (Costanza-Chock 2020), 'Imagination: A Manifesto' (Benjamin, 2024), and 'Teaching to Transgress' (hooks 1994),

raise questions of subjectification in and to the digital landscape and position transformative, critical education as key pathways to a better digital world.

Bringing together philosophies of educational resistance, for example through Freire (1972), Boal (1979) and Braidotti (2019), helps to visualize resistance. With digital and data skills, and in line with the critical approaches characteristic of arts and humanities, it becomes possible to address systems of knowledge/power and the datafication's contingent hegemonies. The DAReS data school could be a site of power reproduction, and the concept of resistance has to be a response to that reproduction. However, following Deleuze, resistance can be a flight from that status quo (Smith 2016). In literal terms, resistance is a form of sometimes intentional friction, literally slowing down processes, data movements, and abstraction from data that erases the specific and the contextual (Madsen et al. 2023).

Our approach to inclusive co-design broke down the barrier between facilitator and participant, teacher and student, where the data school was both a site of learning and a site for questioning the nature and outcome of the data school itself and questioning the datafication of the subject (both in terms of discipline and individual). Within the space of digitisation, resistance in terms of electronics, can encourage the slow down of the movement of power, and at the same time use, challenge the status quo itself.

In the humanities, the very need for DAReS demonstrates a different kind of resistance - the assumed resistance to take up the opportunities of digital skills. We have been taught by Lorde (2023) to beware of picking up the master's tools, and our training in biopolitics has taught us to be careful with the tools that quantify, that count, that reduce the individual to only being a statistic. New technologies make this quantification ever more seamless and could give us new avenues to better understand the world of the humanities. Braun et al. (2025) warn that even the new era of large language models can't help with data analysis; these tools don't support context, meaning making, or situatedness. These tools are not designed to support the human in humanities, arts, and culture research.

Resistance in this context is about rejecting a worldview from a point of understanding. While we do not need to use the master's tools, we should examine them and understand how they work.

Why an anti-Data School? Reflection on teaching data skills

The DAReS project collected feedback from co-designers and the project team at various points throughout the project. As part of the breaking down of barriers, this feedback provided direct documentation and reflections on the process, including insights into what was or was not working. Across this collective feedback, there is an observable movement from the early reflection there is an anticipatory expectation towards data skills. For example, one co-designer

wrote in their feedback a growing knowledge of the 'data skills' terminology and a hope that these skills will be generally useful:

> I would like to hear more about this, because, as my knowledge (and confidence) in digital skills grow, I can see myself relying more on skills such as data analysis and interpretation in future research. These skills will enable me to extract meaningful insights from large datasets, identify patterns, and draw conclusions. This will all ensure that my research is more well-informed and up to date. I think more could have been said about this, maybe because we were online, I had started to brain fog a bit towards the end! (Co-designer feedback after the DAReS data school, November 2023).

Rather than having a sense of the tools being useful for a specific type of research, there was a feeling that the tools would be generally useful. At the early inclusion session, the co-designers were broadly curious and optimistic. This optimism at times tended towards a degree of something like techno-optimism or techno-solutionism, bringing to the sessions a belief in the promise of new technology, data tools and the opportunities of data sets. In one conversation I (Bea) had, a co-designer wanted to use digital tools to analyse dance movements in a dataset of YouTube videos. This, alongside other conversations demonstrated a distance between what the co-designers hoped the tools could achieve and the reality of what was possible or realistic.

What are the Digital Skills that are Skills of Resistance

The DAReS Project set out to co-design an inclusive data curriculum for arts and humanities researchers, much of the focus was on the inclusion aspect. The 'anti-data school' starting point is that on the most basic level much of what is taught in a data school might look a lot like what is taught in an anti-data school. However, in this 'looking glass world' where learning is focused on resistance rather than compliance, the reason to learn data skills is explicitly to learn to not use them. As we learn from Walker (2021) in the sciences, the language of oppression is so pervasive that unless you set out to deliver not to use it, one contributes to the oppression. In the anti-data school, we are learning the language of data, datafication, and digitalisation to look for limitations and failures. When the tools turn out to be unable to do something, this is a site of opportunity and discussion. This example also illustrates the double movement of learners and of data. Opening up entry points to (dis) engage are crucial for disciplinary and epistemological preservation.

The anti-data school approach gives a language to understand how these techniques can only tell a portion of the story and explore what other stories might be revealed. For example, data wrangling is a skill of cleaning and presenting data – this can mean changing entries in a form (as a hypothetical example) that include 'Transwoman', 'Trans woman' and Trans-woman' but the arts and humanities researcher will understand that none of these are the same term, and that they

are all showing up in one field reveals a great deal about who has entered that information. An example of how this works can be found on the WiGeDi projects which obliterates gender binaries into a sophisticated and nuanced map of gender labels (c.f. Melis et al. 2025). Similarly with social media analysis where we focus on high power tools and APIs to extract and withdraw information from social media platform, the anti-data approach looks for the negative space, considers who is included and excluded, and what are the ways users might be hiding from or gaming those very systems (Bonini and Treré, 2024), what does the data that is there tell us about who is not there. Anti-data is the search for the absence and the resistance; not to fill in the gaps, but to define and explore them (c.f. Barnes 2020; Mejias 2010).

Most importantly, the anti-data school is doubly context-aware; it is context-aware of the data, where it comes from, who it benefits, and where it will go. Data does not exist in a vacuum; it is collected by (and often about) people. It is not dead; it is living. Secondly, the anti-data school is context aware of the learner, what they bring into the room, both in terms of skills and background – teaching anti-data can only be responsive, and it refuses to reduce even a student to being only a number. As an example, the arts and humanities research tend to be better versed in areas

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such as critical thinking – these don't need to be taught but should be built on inherently.

One of the unique aspects of the DAReS project, aside from the fact that it is the kind of project that would not be funded in the USA or in the many countries in armed conflict. The political back lash against equity, diversity, and inclusion is a sign or geo-political strife and a wrestling with humanity. During such dark times, it is more important than ever to remain critical and also to hold on to hope. Ruha Benjamin (2024), Payal Arora (2024), bell hooks (1994), and many others remind us of the urgency in imagining different worlds, with strong human rights and renewed care for all of humanity. Inclusion and inclusive thinking are not necessarily about problem solving. Instead, inclusion is about the process of listening and engaging with others and recognizing the inherent value of lived experience – because people's experiences matter.

This report set out to reflect on the DAReS project, a 12 month funded project running from 2023-2024 that involved hiring 30 co-designers from under-represented and marginalized groups to work *with* us to develop an inclusive approach to a data research skills curriculum for arts, humanities, and culture.

The key learning points are that both inclusion and data are processual. Skills and data are also not still, both require movement even if that movement generates friction, wear, or traction. The progression of learning demands movement in the learner's perspective, thinking, and understanding. Similarly, data – to be data – must move from one context where it can be given,

extracted, taken, inferred or otherwise manipulated into discrete values which hold meaning, sometimes very different meanings, for knowledge communities. This report details some important aspects of how data moves through a life cycle and how it is positioned in the world. Data is not just machine-readable values that stand-in for some kind of phenomena. Data, like icebergs, have only small peaks that are visible. Most of the data iceberg, from infrastructures, epistemologies, to governance, remain under the water line and are not visible to the untrained eye. Both the data life cycle and iceberg reveal complex entry points that are not accessible for most people in under-represented or marginalized groups. The chances of engaging relevant examples or of seeing oneself in the data narrows in almost every stage of the data life cycle. The friction that occurs as data move in different directions from learners provoke closure and resistance.

The DAReS data school as simultaneously an ‘anti-data’ school illustrates these frictions clearly. The points of conflict at every tier of the data life cycle and iceberg trigger refusal, resistance, and pausing. As discussed in the section on inclusion, the scholarship one the harms that come along with datafication, technologies, and extractivism are significant. This body of knowledge supports the value of lived experience as expertise, even when that expertise is used to resist, challenge, and call for radical change. The final point we would like to make in this report is that DAReS set out to understand inclusion – and the barriers to inclusion – as environmental rather than individual. As we hope to have demonstrated, data systems are big and complex. There is much to be gained socially and culturally when arts, humanities, and culture researchers pick up data tools and skills, including new perspectives and new research directions prioritizing the human.

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