Data stories: speculative methods for researching digital surveillance in higher education

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Abstract

Higher education systems have always involved monitoring through data collection, assessment, and evaluation, shaping the intellectual work, and tracking the bodies and activities of students and teachers. However, surveillance in many higher education settings has become increasingly pervasive and fine-grained as monitoring and data-gathering technologies grow in sophistication and as the quantification and measurement of everything from outcomes to student satisfaction to engagement is increasingly valued in universities. Concerns are growing about negative impacts on learning relationships, exploitative commercial uses of collected student data, discriminatory practices, and even political, social, or physical harm inflicted because of surveillance and monitoring. At the same time, the complex surveillance cultures of higher education make it difficult to disentangle personal and collective responsibility, understand the gap between intentions and impacts, or navigate the significant risks that can come, for some, with speaking about these matters. In 2020, a research project was funded to develop a 'data stories tool to support people working and studying in higher education, particularly learning technologists, to develop anonymous speculative stories about what the future of surveillance in higher education might look like, and to draw out themes, concerns about and hopes for that future. The methodology used to design this tool drew from speculative and co-design approaches. This paper discusses how these approaches were mobilised to produce a space for people to make new meanings around surveillance, and to share these with others in a networked environment, in the form of Participatory Speculative Fictions. It discusses a few of the stories produced, and how they shed light on the potential of speculative methods for working with and possibly reconfiguring networked learning futures.

Keywords

Surveillance, higher education, speculative methods, co-design, storytelling, datafication, participatory speculative fiction

Introduction

The datafication of many aspects of higher education has led to a situation of increasing visibility and monitoring of the activities of students, staff and processes of learning, teaching and assessment (as well as research, knowledge exchange, human resources and a range of other activity). The contemporary university is therefore enmeshed in complex surveillance cultures, where individuals and communities are negotiating and actively participating in an "attempt to regulate their own surveillance and the surveillance of others" (Lyon, 2017, p. 824). This has impacts on relationships both within and beyond individual institutions, with lines of reporting and visibility extending to government, corporations and other actors in each educational ecosystem. Such visibility of people and processes is used for purposes both benign and problematic: data is used to facilitate co-operation, but also to gain advantage in a competitive system; to understand patterns of information needs among students in the library, but also to monitor attendance (with severe implications for international students, for example). Harms and risks from surveillance and monitoring can be difficult to quantify, but are tied up in some students' and staff's experiences of inequality and mistrust. The use of learning technologies and digital environments produces significant opportunities for learning and teaching to be datafied, monitored and surveilled, and for those aspects which cannot be datafied to be rendered insignificant or undervalued. The globalised nature of the HE sector suggests that we are all on the same path, even if the extent to which surveillance cultures have developed to date varies across national, geographical and economic contexts. We are writing from within a UK higher education context, but at least some of the stories we discuss are from other higher education contexts, and the themes are similar.

The lack of clear consensus about the nature and potential futures of surveillance in universities should not be taken for a lack of concern. We have seen through the Covid-19 pandemic a greater sensitivity to the harms surveillance technologies can bring - not only to relationships and to learning environments, but to health and wellbeing. There is a need for more understanding of the experiences, hopes and fears of those affected by surveillance cultures in universities. At the same time, gathering such data can be complicated, as digital resignation (Draper & Turow, 2019), fears about repercussions and the complexity of the digital ecosystems that now exist in higher education work against forms of research that ask straightforwardly for experience or opinion on these matters. We need more creative methods for developing insights into these issues. This paper discusses one such approach - Participatory Speculative Fiction - and its use in telling data stories to contribute to an understanding of desirable and undesirable networked learning futures.

Surveillance cultures and networked learning in higher education

Learning technologies within the university help people communicate, collaborate and create, as well as make resources available, store data, keep track of activities, assess performance, remind us of due dates, check for plagiarism, and more. In addition to their specific functionality, many of these technologies offer the capacity for increased surveillance, and some are already being used to monitor or quantify learning activities. While networking learning approaches can support and help reimagine critical and emancipatory education (Networked Learning Editorial Collective (NLEC), 2021), some technologies that make them possible also bring increased opportunities for surveillance for purposes of both control and profit. Forms of monitoring can be helpful in increasing accountability, providing transparency that might improve quality, alerting people to risky situations, and providing opportunities for caring interventions. However, despite the potential benefits there are also potential detriments, especially when control and profit motivate the use of surveillance technologies, and when their unequal impacts are not recognised.

A ‘sensibility of surveillance’ in higher education (Ross & Macleod, 2018) is not just top-down, and often intended to be benign or helpful, but nevertheless contributes to surveillance cultures which “alter teaching and learning environments in complex ways that are often surprising and at odds with their original intent. What matters is not practice or purpose, but presence” (Knox, 2010). These technologies also contribute to a hidden curriculum of datafication, where being visible, tracked and monitored without meaningful consent is normal and expected. Even where consent is sought and given, it can be difficult for staff and students to carry out an informed cost-benefit analysis. Claims about the potential benefits of monitoring technologies like Learning Analytics are not always borne out by evidence of positive impact (C. Watson et al., 2017; Wilson et al., 2017). All of this can lead to what Draper and Turow (2019) call “digital resignation”, where people take no, limited or inconsistent action in relation to privacy concerns, because "while these people feel dissatisfied with the pervasive monitoring that characterizes contemporary digital spaces, they are convinced that such surveillance is inescapable" (p.1825). Such resignation sits uncomfortably in a system of higher learning where critical thinking and the ability to question taken-for-granted ways of working is valued.

In addition, the privacy that is being surrendered has particular, and perhaps fundamental, value in the university. As Cohen (2012) argues it functions to shelter subjectivity "from the efforts of commercial and government actors to render individuals and communities fixed, transparent, and predictable. It protects the situated practices of boundary management through which the capacity for self-determination develops” (p.1905) and “the processes of play and experimentation from which innovation emerges” (p.1906). Without an expectation of control over privacy, practices that might otherwise be noted and debated may instead become normalised. Macfarlane (2016) highlights how "bodily performativity" has become established in students university experiences, where attendance (physical or virtual) is treated as a proxy for engagement in a range of problematic ways. He argues that "attendance policies demonstrate both a lack of trust in students and failure to respect their freedom to learn as an adult" (p.81). Threats to self-determination, trust and respect are at the heart of why surveillance cultures are of urgent importance for networked learning scholarship and practice.

The pivot to online teaching, learning and assessment during the Covid-19 pandemic has exacerbated many existing issues and ushered in new forms of surveillance (Beetham et al., 2022), partly due to the speed at which institutions were forced to act, as a result of which:

> existing checks and barriers to technology adoption and digital learning were often set aside. At national or regional levels, for example, regulatory privacy laws were relaxed to enable widespread adoption of communication tools… and some countries with legal constraints regarding the limits on residential universities providing distance education relaxed those constraints. Within universities, contracts with software vendors were signed quickly. (p.17)

Along with current intensification of surveillance, there has been increasing pushback against the impacts and harms of monitoring and datafication, and its unequal effects. Formal, informal, individual and collective responses to surveillance technologies have taken the form of resistance, advocacy, education, regulation, engagement and investment (ibid, p. 24). Future possibilities for digital participation are tied up with questions about visibility, anonymity and openness, and the spaces between them, with practices like critical disengagement, challenges to social media practices of value extraction, avoidance of controversy, and strategic concealment (Bachmann et al., 2017) offering visions for the "'renovat[ion]' of conventions of digital space" (Duffy & Chan, 2019, p. 127). Alternative ways of thinking about and enacting authenticity, including in anonymous spaces, may need the contemporary university to examine "principles and frameworks which respect [anonymity's] social value" (Bayne et al., 2019, p. 104). And technical knowledge may need to be mobilised in the service of alternatives to intrusion and toxicity – not in the form of a temporary 'digital detox', but in genuinely different forms of engagement (Natale & Treré, 2020).

The risks of and further possible responses to surveillance cultures in higher education are in urgent need of exploration. However, there are barriers to this exploration – in the risks it poses to individuals at this point in time (Beetham et al., 2022); and in the power of sociotechnical imaginaries (Jasanoff, 2016) and discursive closures (Markham, 2021) that make certain technological futures seem inevitable. For this reason, creative, inventive and speculative methods are useful and necessary, and we move on now to discuss these approaches and their value in researching networked learning futures.

Speculative methods for researching networked learning futures

Themes of automation, personalisation, efficiency, visibility and ubiquity have been the focus of attention, discussion and often heated debate in digital education contexts over many decades, with implications for how networked learning futures are conceived and anticipated. The role of digital technologies tends to be viewed in instrumental terms (Bayne, 2014), contributing to narratives of education that see the future as a site for optimisation, colonisation or protection (Facer, 2016), and educational research overemphasises a 'what works' agenda which limits productive futures work in the field (Ross, 2017). In addition, powerful sociotechnical imaginaries are in circulation: "collectively held, institutionally stabilized, and publicly performed visions of desirable futures, animated by shared understandings of forms of social life and social order attainable through, and supportive of, advances in science and technology" (Jasanoff, 2016, p. 4). Among these are 'edtech imaginaries' (Friesen, 2020; Watters, 2020), expressing ideals of education in terms of scale, personalisation, commercialisation and innovation. These imaginaries underpin policy and practice in both overt and subtle ways, and teachers, learning technologists and others have an important role to play in their generation, reception and development.

To work in a more critical and questioning way with digital education futures, and their impacts on the present, requires methods that can bring particular ideas or issues into focus by envisioning or crafting conditions which may not yet currently exist, working against established imaginaries and countering discursive closures, where "practices or technological designs are… removed from any chains of causality or results of decision-making, so that they seem like processes that just exist" (Markham, 2021, p. 392). Speculative methods offer a generative approach to this work (Ross, 2017). The authors of a 2013 manifesto called Speculate This! propose that there are two registers for speculation – economic and cognitive – and these are connected by "investments [that] project into and stake claims for the future" (Uncertain Commons, 2013, p. 7). They differ, however, in their attitude to uncertainty, aligning with either 'firmative' or 'affirmative' modes of speculation. Firmative speculation attempts to solidify, pin down, or enclose the future (p.9). It is what permits measurement and calculation of risk, making it "indispensable for thinking and acting within systems of advanced capitalism everywhere, anywhere, across the board" (Cortiel et al., 2020, p. 9). Affirmative speculation, on the other hand, "creatively engage[s] uncertainty" using intuition and play, and "seeks to act in shifting, multiscalar worlds" (Uncertain Commons, 2013, p. 10). It is this second register that forms the focus of speculative methods as we define them here.

Speculative methods function within a complex interplay of past, present and future; they are "overtly constitutive" of the problems, topics and questions they engage with (Wilkie et al., 2015); and they centre engagement and audience in a way that adds to the glitchiness (Bodden & Ross, 2020) and unpredictability of their effects. Michael (2012) describes them as "'inventive problem making' in which the parameters of the issue are reconfigured" (p.536). In their foundational speculative design text, Dunne and Raby (2013) critique the "downgrading of dreams to hopes" (p.8) that characterise the contemporary moment and its wicked problems, and identify in speculative design a way to use futures as:

> a medium to aid imaginative thought… Not just about the future but about today as well, and this is where they become critique, especially when they highlight limitations that can be removed and loosen, even just a bit, reality's grip on our imagination. (p.3)

In this sense, speculative methods are not solely about designing preferable futures, but about using the uncertainty of the future creatively in the present, to reveal and develop insights about our current situation, what has led to it, and what might (conceivably) be different. Speculative approaches include fictions, researcher-made objects, participatory design or storytelling activities, and speculative analysis (Ross, in press). The project discussed in this paper used a participatory speculative fiction approach, and so the remainder of this section focuses on speculative storytelling methods.

Researcher-written speculative stories go by a number of names: most commonly social science fiction, design fiction or speculative fiction. They mostly take the form of short stories or vignettes, often incorporated into or cited in scholarly articles. In educational research such approaches have been influenced by the use of speculative fiction in broader technology studies and sociological fields (see for example: Benjamin, 2016; Graham et al., 2019), and they are typically set in schools or universities. They tend to focus on the implications of data-driven education and platformisation, and are more often than not dystopian. This may be because they are informed by the significant amount of critical work done in the past decade that has highlighted the inequalities and risks that come with increasing datafication and privatisation. A 2020 special issue of the journal Learning, Media and Technology, focused on speculative futures, is a prime example of the use of speculative fiction in this field. For example, Hillman, Rensfeldt and Ivarsson's (2020) three speculative scenarios cover feature creep & privatisation, data exploitation, and recentralisation in a future Swedish school system, building on their review and analysis of the current state of the system. They highlight the risks, the persuasiveness and, eventually, the ubiquity of such a system. Selwyn et al (2020), building stories around a Melbourne, Australia-based school of 2030 they call Lakeside, look at the mundane realities that people in this school might experience. Their linked stories paint a picture of a "standardized, benchmarked and centralized" system that has "little room for affective, embodied and spontaneous action" (p.104). Cox (2021), analysing possible futures for artificial intelligence in higher education, observes the complex temporalities involved in telling stories about this topic:

> rather than a single technology, something like AI is an idea or aspiration for how computers could participate in human decision making. Faith in how to do this has shifted across different technologies over time; as have concepts of learning… confusingly from a temporal perspective, uses of AI and robots in HE are past, present and future. (p.2)

Cox situates his own use of fiction as a research output, but observes that fictions are also used to elicit research data or can be co-created with publics (p.3). This co-creative approach – what we have called Participatory Speculative Fiction (PSF) – informed the Data Stories project.

Story-based research methods are well established in the social sciences and other disciplines, including in the form of narrative and fictional inquiry (Clandinin & Connelly, 2000; Clough, 2002), transmedia and digital storytelling (Hancox, 2017), and in futures-focused social science fictional methods (Gerlach & Hamilton, 2003; Suoranta et al., 2021; A. Watson, 2021; A. Watson & Gullion, 2021). Surveillance as a subject of social inquiry has been the focus of a number of storytelling projects in recent years (Cahill & Newell, 2021; Screening Surveillance, 2019). The PSF approach also takes inspiration from participatory modes of design fiction. Participatory modes provide a response to the tendency of design fictional or speculative approaches to foreground 'elite' or powerful voices (Forlano & Mathew, 2014, p. 11; Light, 2021) – those of researchers, for example. The elicitation of speculative stories from research participants, combining speculative fiction and co-design or co-creation, also offers a powerful way to enable participants to engage in public discussion of subjects or topics that they may be reluctant to talk about, perhaps because of complex loyalties, or perceptions of risk (Wilson et al., 2022). They are also effective in surfacing fears (and to some extent, hopes) about what has not yet happened, but might. Building on the development of a novel approach to the creation of Human-Computer Interaction (HCI) design personas and scenarios (Wilson et al., 2018), our project's PSF approach was intended to put potential users of a system's ethical and political values at the centre of the design process. It did so by creating a scaffolded storytelling process that prompted authors to step away from the confessional or the accusatory, instead imagining what might happen and shifting actors and interactions into new configurations. Working in this speculative register produced some fascinating and important visions of the contemporary and future university and the role of surveillance within it.

Telling data stories

Between February and July 2020, the project team undertook the development of a scaffolded storytelling tool that uses fiction writing to explore aspects of an interaction with technology, and hopes or concerns it raises, by speculating about what could happen. Authors can choose to publish their stories anonymously on the Data Stories web site: http://datastories.de.ed.ac.uk .

The storytelling tool consists of a three-stage process: prompts, mapping and writing. In the first stage, users of the tool are asked to think of "a time when you have used, or become aware of, a bit of technology (software or hardware) that was either explicitly being used for surveillance or might be used for surveillance, even if unintentionally". With this example in mind, they are invited to select and answer questions from a drop-down list, including prompts such as:

- What is being scrutinised/quantified?
- What technologies enable the scrutiny?
- What is the purpose – e.g. monitoring, audit, resource allocation, control, comparison, correlation?
- What form might an action or intervention take?
- Who benefits? What are the benefits?

Once a question is answered and saved, it becomes a story object that is placed in the second stage of story creation, the story map. In the map, the objects first appear as unconnected nodes, which can be clicked and dragged around the map space, with lines added between them and labelled to indicate the relationship between them. This map then forms the inspiration and possible structure for a multimodal story, written and submitted in the 'write' tab of the tool. The story can contain text, images, hyperlinks, social media objects such as tweets, GIFs and emojis. The length and style of each story is not prescribed, and stories are submitted and published anonymously, with no personal information collected, no attribution and no link to an author.

Two research questions informed the project design initially:

- How can the role of surveillance in higher education be interrupted, reduced or reconfigured through speculative storytelling and co-design?
- What questions, narratives and issues will shape research in the ethics of data-driven higher education?

A third question developed along with the Data Stories creator:

- What would people publicly imagine about surveillance if they were free to do so?

The published stories on the site at the time of writing are characterised by an interplay of present concerns and potential future issues, trajectories and imaginings. The main characters in these stories tend to be individual students or academics, but there are also stories told from the perspective of a student union, a cleaner, a director, and several ambiguous characters experiencing aspects of surveillance culture in or beyond a contemporary or imagined university. Many of the platforms are familiar in these stories – learning management systems, online exam proctoring services, productivity or collaborative software, student request management systems – but some of the technologies, data forms and data uses are novel. Characters in the stories experience neuro- and bio-scanning, health & wellbeing metrics and measurements, DNA-driven decision-making, competition for lecture views, and a mirror that quizzes students about their first year experience.

For the most part, ways of understanding surveillance in these stories tend toward the dystopian, with a sense of technology developments impacting the university that are undesirable but unstoppable – more on this below. At the same time, the ways people are imagining the future of higher education allows us to explore networked learning principles of relationships, connection, collaboration, and the complexity of the assemblages of technologies, infrastructures and actors that constitute learning settings. We draw here on four stories that shed light on these complex interactions, exploring the nature of connection and collaboration, the datafication of emotion, and the individualisation of learning that may come with increasing monitoring in future digital university settings.

In the story "DNA-fueled universities"[i], the protagonist, a student called Kari, reflects on the role of DNA sampling and analysis in a future university system. From the application process onwards, DNA plays a role - though what, exactly, the role constitutes is not made explicit. Kari guesses that it is used to personalise her own and others' experiences beyond their expressed goals and preferences, identifying the right 'fit' of university, campus experiences, roommates and even meals. This personalisation works for her - she describes the 'perfect match' she found in her roommate, house, meal plan and overall university experience. At the same time, she describes 'deep personalisation' as feeling invasive and restrictive, and observes how it 'tormented' some of her friends with its decisions on their behalf. Above all, it seems to create a feeling of doubt about the limits of self-knowledge and perhaps even free will - casting a shadow on the notion of the 'perfect match' in a way that is potentially damaging to relationships that are generated through the datafication of self.

Datafication takes on an even more sinister role in "William Stone P267"[ii], where the main character, Will, is subject to intensive online monitoring of his involuntary reactions, posture, body temperature, heart rate and other metrics in test conditions, all aimed at scoring his social-emotional learning and other capacities alongside his knowledge. The results of this "classification day" testing will have important consequences, though these are not spelled out in the story. In response to this monitoring, Will hones “an ability to fake his feelings”, including by leveraging embarrassing or happy memories at appropriate moments. While apparently successful, this self-hacking comes at great personal cost to Will, who must banish 'anger, regret and exhaustion' in order to perform appropriately, and can only see other students as competitors for the coveted 'P' classification.

Other imagined consequences of intensive monitoring and individualisation are seen in a story set in a future where teachers’ lack of ability to fully know their students in an evidence-based way is justification for their removal from all but “innocuous” tasks. Like the DNA story, this is a future characterised by personalised education that gives students "what (it calculates that) [they] need", and here it is made explicit that those needs are of interest only "in order to satisfy the needs of society” (Remembrance[iii]). The narrator is a teacher, kept around to provide a "human touch" in a system that is "still improving" in its ability to deliver personalised teaching to each student. They trace a trajectory from the pandemic pivot to online teaching, to the automation of student profile-building, to a system in which students are "pretty transparent", while algorithmic processes are obscured.

These three speculative stories give a rich picture of the kinds of concerns and possibilities people anticipate in future educational settings. The final story we shall discuss here is a reflection on current practice - the use of online collaborative work spaces. The narrator here describes feeling responsible for knowing “who has access to what - but this became impossible to manage properly. No-one knew who could ‘see’ what, and what is Microsoft doing with all this data?” (Microsoft Teams and the cost of collaboration). Matters of visibility, responsibility and the difficulties of managing privacy and access in 'black boxed' digital environments foreshadow the fears expressed in the other three stories.

The future told through these future-focused data stories has clear connections with fears expressed about loss of control in the present. However, these fears are not separate from efforts to create positive learning experiences with and for students in networked environments. In these stories we can see frustration and anxiety but also, in telling and sharing them, glimpses of different positions and relationships that could exist. The telling of stories is an active rejection of digital resignation (Draper & Turow, 2019). That they tend towards the dystopian is perhaps not a surprise given the current moment and mood around surveillance and datafication, but dystopian imaginings are not the same as resignation and not the opposite of hope, as Priyadharshini has argued:

> the affects of dystopia do not work in predictable ways – they seem to indicate that hope and despair are not clearly separable in the monstrous, and that there is something to be gained from knowingly engaging with such visions of the future. (Priyadharshini, 2019, p. 7)

For this reason, we see PSF as beneficial in exploring controversial and difficult topics. By tapping into complex experiences of surveillance and monitoring through a creative and speculative approach, shared understandings and new possibilities come to the surface, and from there, a better chance for collective action around data practices. One way this might emerge in this particular context is through the development of a higher education surveillance observatory, which we discuss in the final section.

Conclusions

In the recent Networked Learning redefinition paper (Networked Learning Editorial Collective (NLEC), 2021), the authors note a rich set of questions about "trust, power, identity, belonging, difference, affection, reciprocity, solidarity, commitment and time"; "the socio-material, affordances, instruments, access, appropriation, ownership"; and "knowledge, values and action, learning and doing, meaning-making, negotiation, shared projects and praxis, scale, scope, pace and duration and the capabilities needed to shape a world worth living in" (p.314). These questions are also at the heart of the speculative approach undertaken to elicit the Participatory Speculative Fictions created using the Data Stories creator tool, with a focus on generating "a deeper understanding of the role surveillance has played and continues to play in universities and tactics and strategies for interrupting and perhaps reducing or reconfiguring its impacts" (Collier & Ross, 2020).

Like most speculative fiction, the scenarios described in the stories are likely to have grown from the seeds of experiences that are germinating in the contemporary university. This suggests that, if we wish to influence the direction of growth and change, now is the time to act to make these contemporary experiences and the factors and conditions that make them possible more visible and themselves open to scrutiny. We suggest there is a

need for a Surveillance Observatory, through which surveillance itself can be monitored, productive approaches can be identified, and methods of resistance exchanged. Our vision for such an Observatory involves the collection and sharing of speculative stories, as well as the collection and aggregation of facts and accounts of practice and policy.. The PSFs being created through our project are a first stage of co-design, allowing the articulation of key themes, concerns and practices that will serve as organising principles for the Observatory's structure and functionality. What is clear from the stories that are being told with the Data Stories tool is that near-futures are being imagined in which academic (staff and student) identities have been disrupted and dislocated; in which trust is replaced by knowledge gained through surveillance; and in which personalisation may stifle and normalise as well as create ease and wellbeing; any future Observatory needs to allow the people being affected by these changes to record and share their experiences.

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[i] http://datastories.de.ed.ac.uk/datastories/view/165
[ii] http://datastories.de.ed.ac.uk/datastories/view/186
[iii] http://datastories.de.ed.ac.uk/datastories/view/187