Why we need data-literate citizens

by Adrian Smith

Sir Adrian Smith PRS, is Institute Director and Chief Executive of The Alan Turing Institute and became President of the Royal Society in 2020. He is also a past President of the Royal Statistical Society and Chair of Diamond Light Source, the UK's national synchrotron. His previous positions include Vice-Chancellor of the University of London, Deputy Chair of the UK Statistics Authority, and Director General, Knowledge and Innovation in BIS (now BEIS). He carried out a review of 16 – 18 mathematics education on behalf of Her Majesty's Treasury and the Department for Education in 2017, and is currently a member of the government's Artificial Intelligence Council and a Non-executive Director of the UK Atomic Energy Authority. He holds a number of Honorary Doctorates and was awarded the Royal Statistical Society's Guy Medal in Bronze (1977), Silver (1993), and Gold (2016), as well as being appointed Knight Bachelor in 2011.

In the past, many citizens of this country were disenfranchised because they were unable to read. If you couldn't read about the issues, analyse manifestos and, ultimately, understand the ballot paper, it took away some of the power of having the vote.

Literacy was a mission that was driven – at least in part – by democratic zeal. Its purpose was to create citizens who could play a vibrant and active role in our democracy.

In today's world, mass illiteracy is largely – and thankfully – a thing of the past. However, we are faced with a new challenge – data illiteracy – which risks alienating millions of people from the national conversation.

Creating an internal warning system
In our daily lives, we are continually faced with an avalanche of data, figures, numbers and statistics across both legacy and social media. The ease with which anybody can go online and potentially make up information is truly frightening. In order to combat this, it is crucial that people can make sense of all this information and evaluate what is true and what is false. We need to develop some kind of 'internal warning system' to know how data are used to influence thought and behaviour.

In modern Britain, too many people have not been taught the skills to process all this digital data. And while we need many more scientists and mathematicians who can create and manage complex algorithms, we also need to upskill the many millions who lack these essential 21st century skills.

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COVID and data literacy
Our recent experiences of the COVID-19 pandemic show us how misleading data can quickly lead to myths and misinformation taking hold. When people hear a scientist saying something like: 'The risk of suffering a major consequence from a standard vaccine dose is one in X million', how do they respond to this? How do they understand it? What do they do with this information? They need to be able to put this advice in perspective, and to understand that the risk is vanishingly small – no riskier than stepping out of your front door and walking down the street. We need an educated way to calibrate risk. And as we saw during the vaccine roll out, too many people are currently unable to do this effectively.

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This is not just a problem amongst the wider public, it's a particular problem in public life as well. A recent survey by the Royal Statistical Society led to the *Times* newspaper describing "the pandemic of ignorance about statistics among Members of Parliament". Certainly, very few MPs have a science background. A recent LSE blog showed that of MPs with a higher education degree in the 2015 – 2017 Parliament, only 17% were in a STEM subject (compared to a national figure of 46%). This problem is also apparent in the civil service, where those advising on issues relating to science often do not have a science background. This echoes the wider finding by Cambridge University's Policy Links that considerably fewer STEM graduates than non-STEM graduates enter public service (4% versus 7%).

In 2022, this is something we should be hugely concerned about. In the modern world, we should expect anyone involved in policymaking to be, at a bare minimum, literate in data collection, management and analysis. As computer databases, models and algorithms become ever-more sophisticated, the need for these skills increases. This is why the Royal Society has been working with the British Academy to identify how quantitative skills can be developed by people studying humanities and social sciences, so that they too can develop the ability to understand, analyse and evaluate data.

Education and data literacy

Underpinning all of this is, of course, education. How should our education system be reformed so that both the governed and those who govern are literate in the use of data? It's not enough to just get schools to provide more statistical education – we need to think about how we do this.

It's sometimes said that every teacher is an English teacher because every teacher is a teacher in English. In the 21st century, we might say that every teacher is a Maths teacher. Thinking in this way would help avoid shoehorning everything to do with numbers into a box labelled 'Maths', which has negative connotations for many. If you use that box as a place to pigeonhole quantitative literacy, you are shooting yourself in the foot. Rather than putting any new statistical subject into the Maths box, we need a different box of 'skills for the citizen' which would help students understand data, use IT safely, prevent online harm and improve quantitative awareness. As the data and technology which can spread information grows, so too does the need for these skills.

Adopting such an approach could be part of a wider shift towards a baccalaureate-style system. For example, the introduction of Core Maths as an alternative to A level has been a popular and positive change. The base of those who continue to study maths post-16 has been broadened, and this is extremely encouraging news. We should try and use this change as a springboard for wider changes, as has happened elsewhere in the world.

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Social mobility and 'levelling up'

We should also be talking about the further education and technical sectors, not just schools. And because knowledge and skills have an impact on the economy and innovation, we should be looking at the links between the education system and industry. Digital and data-based technology is transforming the future of jobs, from finance to engineering and many more sectors. If we don't make changes in our education system, today's young people are not going to be prepared for the future, and the existing regional, gender and socio-economic inequalities will continue. Educational reform could help the most disadvantaged in terms of their participation, aspiration and attainment, and lead to a significant and positive impact on social mobility and 'levelling up'.

In short, it's time to rethink the basic skills which are needed to be an active citizen in the 21st century.