

**H819\_1**

**The power of infographics in research dissemination**

**About this free course**

This free course is an adapted extract from the Open University course [H819 The critical researcher: educational technology in practice](http://www.open.ac.uk/postgraduate/modules/h819?utm_source=openlearn&utm_campaign=ou&utm_medium=ebook).

This version of the content may include video, images and interactive content that may not be optimised for your device.

You can experience this free course as it was originally designed on OpenLearn, the home of free learning from The Open University – [http://www.open.edu/openlearn/education-development/disseminating-research-and-evaluating-infographics/content-section-0.](http://www.open.edu/openlearn/education-development/disseminating-research-and-evaluating-infographics/content-section-0?utm_source=openlearn&utm_campaign=ol&utm_medium=ebook)

There you’ll also be able to track your progress via your activity record, which you can use to demonstrate your learning.

Copyright © 2018 The Open University

**Intellectual property**

Unless otherwise stated, this resource is released under the terms of the Creative Commons Licence v4.0 <http://creativecommons.org/licenses/by-nc-sa/4.0/deed.en_GB>. Within that The Open University interprets this licence in the following way: [www.open.edu/openlearn/about-openlearn/frequently-asked-questions-on-openlearn](http://www.open.edu/openlearn/about-openlearn/frequently-asked-questions-on-openlearn?utm_source=openlearn&utm_campaign=ol&utm_medium=ebook). Copyright and rights falling outside the terms of the Creative Commons Licence are retained or controlled by The Open University. Please read the full text before using any of the content.

We believe the primary barrier to accessing high-quality educational experiences is cost, which is why we aim to publish as much free content as possible under an open licence. If it proves difficult to release content under our preferred Creative Commons licence (e.g. because we can’t afford or gain the clearances or find suitable alternatives), we will still release the materials for free under a personal end-user licence.

This is because the learning experience will always be the same high quality offering and that should always be seen as positive – even if at times the licensing is different to Creative Commons.

When using the content you must attribute us (The Open University) (the OU) and any identified author in accordance with the terms of the Creative Commons Licence.

The Acknowledgements section is used to list, amongst other things, third party (Proprietary), licensed content which is not subject to Creative Commons licensing. Proprietary content must be used (retained) intact and in context to the content at all times.

The Acknowledgements section is also used to bring to your attention any other Special Restrictions which may apply to the content. For example there may be times when the Creative Commons Non-Commercial Sharealike licence does not apply to any of the content even if owned by us (The Open University). In these instances, unless stated otherwise, the content may be used for personal and non-commercial use.

We have also identified as Proprietary other material included in the content which is not subject to Creative Commons Licence. These are OU logos, trading names and may extend to certain photographic and video images and sound recordings and any other material as may be brought to your attention.

Unauthorised use of any of the content may constitute a breach of the terms and conditions and/or intellectual property laws.

We reserve the right to alter, amend or bring to an end any terms and conditions provided here without notice.

All rights falling outside the terms of the Creative Commons licence are retained or controlled by The Open University.

Head of Intellectual Property, The Open University

978 1 4730 2584 4 (.kdl)  
978 1 4730 2585 1 (.epub)

# Contents

* [Introduction](#Introduction1)
* [Learning outcomes](#LearningOutcomes1)
* [1 Getting noticed in an age of information overload](#Session1)
* [2 Visualising data](#Session2)
  + [2.1 Introduction to data visualisation](#Session2_Section1)
* [3 The power of infographics](#Session3)
* [4 Evaluating infographics](#Session4)
  + [4.1 Assessing the quality of infographics](#Session4_Section1)
  + [4.2 Compiling your own infographics – evaluation checklist](#Session4_Section2)
  + [4.3 Applying the evaluation checklist](#Session4_Section3)
* [End-of-course quiz](#Session5)
* [Conclusion](#Session6)
* [Keep on learning](#Session7)
* [References](#References1)
* [Acknowledgements](#Acknowledgements1)
* [Solutions](#Solutions1)

## Introduction

Start of Figure



Figure 1 [The conversation prism](http://jess3.com/conversation-prism-v1/) by Brian Solis and JESS3, The Conversation Prism 2.0. This file is licensed under the Creative Commons Attribution 2.5 Licence https://creativecommons.org/licenses/by/2.5/deed.en

[View description - Figure 1 The conversation prism by Brian Solis and JESS3, The Conversation Prism ...](" \l "Description1)

End of Figure

Infographics are becoming an essential tool in data representation, sense-making and research communication. In this free course, The power of infographics in research dissemination, you will explore when and how infographics can be useful to your work. You will look at some good and bad practice in making and using infographics and will learn how to evaluate infographics that appear to be presenting research evidence. The course concludes by introducing you to free resources that can help you produce effective infographics of your own and to critically evaluate the infographics of others. A key focus of this course – and the postgraduate Open University module on which the course content is based – is developing your skills and understanding as a critical researcher.

This OpenLearn course is an adapted extract from the Open University course [H819 The critical researcher: educational technology in practice](http://www.open.ac.uk/postgraduate/modules/h819).

## Learning outcomes

After studying this course, you should be able to:

* demonstrate an understanding of the ways in which infographics can be used to present research findings
* recognise the strengths and weaknesses of infographics as a method of displaying information
* demonstrate skills in critically evaluating infographics used for disseminating research.

## 1 Getting noticed in an age of information overload

Start of Quote

Our brains are busier than ever before. We’re assaulted with facts, pseudo facts, jibber-jabber, and rumour, all posing as information. Trying to figure out what you need to know and what you can ignore is exhausting.

(Levitin, 2015)

End of Quote

The sentiments expressed by Levitin in this quote are widespread. They neatly capture the phenomenon of information overload – a phrase popularised way back in the 1970s by Alvin Toffler (1970), who characterised it as ‘the difficulty a person faces when taking a decision in the presence of excessive information’. By 2002, Eppler and Menjis were identifying five causes of information overload:

* multiple sources of information
* too much information
* difficult-to-manage information
* irrelevance or unimportance of information
* lack of time to understand information.

As we speed through the twenty-first century, the data and information landscape, especially online, is growing without precedent. By January 2017 it was estimated that there were 4.6 billion pages on the World Wide Web ([WorldWideWebSize](http://www.worldwidewebsize.com/), 2017). This plethora of information ranges from commercially generated websites and adverts intended to sell us things (or persuade us to believe things) through to information that may be relevant, valuable and deeply interesting to the researcher but which may be obscured by more attention-grabbing web pages. Tim Wu’s The Attention Merchants, reviewed in the article ‘[Tim Wu: “The internet is like the classic story of the party that went sour”](https://www.theguardian.com/technology/2017/jan/08/tim-wu-interview-internet-classic-party-went-sour-attention-merchants)’ (Naughton, 2017), gives a particularly critical account of this situation.

As a consequence, it is ever more challenging for researchers to get their research findings noticed in the face of a staggering amount of competition. But for anyone interested in reading about the latest developments in a particular field, it is essential to question and critically engage with the information available. A further complication lies in the fact that, as already mentioned, there are few filters online and it is extremely easy to share information via the internet, irrespective of its quality or accuracy. 2016 and 2017 saw a rapid increase in the scale of ‘fake news’, indicating how easy it is to deceive and misinform online.

When presentating and disseminating research findings, we have to consider how to create precisely the right message to have maximum reach and impact upon our intended audience. There may need to be several different messages for different audiences. Imagine a medical researcher who has developed a novel technique for treating a particular condition. They may:

* publish a full presentation of their work in a medical journal
* publish a ‘lighter’ version with less technical jargon and fewer of the details in a more general ‘popular’ science magazine
* write a short piece with no technical language for national news media
* produce posters or infographics for grabbing people’s attention at conferences, in hospitals or on the web.

Each of these potential dissemination routes would require a slightly different message, different focus, different wording and different method of presentation. In this short course you’ll focus on just one of these methods – infographics.

## 2 Visualising data

Start of Figure

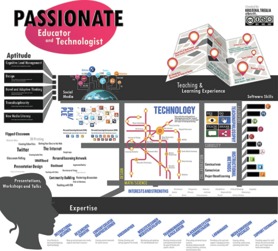


Figure 2 Paths in my ed tech landscape by Kristen A Treglia. This file is licensed under the Creative Commons Attribution-Non-commercial-Share Alike Licence http://creativecommons.org/licenses/by-nc-sa/2.0

[View description - Figure 2 Paths in my ed tech landscape by Kristen A Treglia. This file is licensed ...](" \l "Session2_Description1)

End of Figure

Infographics – graphical representations of abstract data – can serve two purposes:

* data analysis and sense-making
* communication.

Infographics can be fabulous, beautiful, powerful fusions of art and data that are well suited for disseminating through social-media channels, such as Facebook and Twitter, where images work particularly well. They also get some terrible press. The article ‘[Ending the infographic plague](http://www.theatlantic.com/business/archive/2011/12/ending-the-infographic-plague/250474/)’ gives examples of some of the ‘terrible, lying infographics, which have become endemic in the blogosphere, and constantly threaten to break out into epidemic or even pandemic status’ (McArdle, 2011).

In this short course, you will encounter the good, the bad and the absolutely stunning in the world of infographics. You will explore ways to evaluate the accuracy and effectiveness of infographics that are being used to present research data, as well as investigate good and bad practice in infographic design.

## 2.1 Introduction to data visualisation

Start of Figure

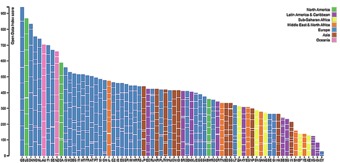


Figure 3 Open data index data visualisation. Open Knowledge International. This file is licensed under the Creative Commons Attribution-Non-commercial Licence http://creativecommons.org/licenses/by-nc/3.0/

[View description - Figure 3 Open data index data visualisation. Open Knowledge International. This file ...](" \l "Session2_Description2)

End of Figure

In the following activity you’ll watch a TED Talk by infographics celebrity David McCandless, which will give you an overview of how such representations of data can be used. Please note that in the TED Talk, David McCandless uses the term ‘data visualisation’ a lot, in addition to the terms ‘infographic’ and ‘visualisation’. Infographics are closely related to, but not quite the same as, data visualisations – the latter being ‘tool[s] to interactively explore data’ (Cairo, 2014), while the former tend to be static representations of data. However, it’s worth noting that the terms ‘infographic’ and ‘data visualisation’ are often used interchangeably. You’ll read more about the distinction between the two later.

Start of Activity

**Activity 1 Strengths and weaknesses**

Allow about 45 minutes.

Start of Question

1. Watch infographics celebrity David McCandless’s TED Talk (2010), which introduces data visualisation. The video lasts 18 minutes.
2. As you watch the video, make notes in the box below about the strengths and weaknesses of infographics and data visualisations.

Start of Media Content

Watch the video at [YouTube.com](https://www.youtube.com/watch?v=5Zg-C8AAIGg&hl=en&fs=1&rel=0).

[View transcript - Uncaptioned interactive content](" \l "Session2_Transcript1)

End of Media Content

End of Question

*Provide your answer...*

End of Activity

It is clear from the David McCandless TED Talk that infographics and data visualisations can be beautiful and engaging ways to present research, as demonstrated by Figure 4 (which has a marketing, rather than an educational research, focus).

Start of Figure

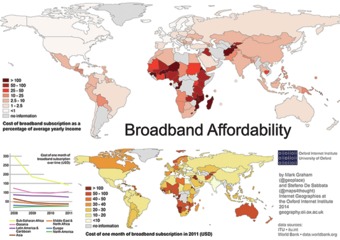


Figure 4 Broadband affordability. Oxford Internet Institute

[View description - Figure 4 Broadband affordability. Oxford Internet Institute](" \l "Session2_Description3)

End of Figure

In the next section you’ll investigate how the expressive power of infographics can be realised to help researchers compete for attention when disseminating research results. You’ll also study the ways in which the power of infographics can be harnessed to mislead, either intentionally or unintentionally.

## 3 The power of infographics

Infographics can be more eye-catching than the printed word, using images and colour to attract the reader’s attention. For example:

* the brain can see images that last for just 13 milliseconds (Trafton, 2014)
* our eyes can register 36,000 visual messages per hour (Jensen, 2008, p. 55)
* we can get the sense of a visual scene in less than one-tenth of a second (Semetko and Scammell, 2012)
* 90 per cent of information transmitted to the brain is visual (Hyerle, 2000).

Another enormous strength of infographics, especially those for complex datasets, is that it is easier to experience them non-linearly than with text. The viewer’s gaze can shift from point to point, or rescale from overall view to a narrow focus.

Infographics have the potential to create an immediate and lasting impact in communicating research results. They can also aid comprehension of a message, for example, by presenting statistical analyses in a format accessible to non-specialists (if accurately compiled). Perhaps, just as importantly, infographics draw on the techniques of visual artists in their use of colour, shape and figurative content. As a visual art form, they have the potential to affect our emotions in the same way that visual art can, heightening the impact of the message they are intended to convey.

Finally, as already mentioned, infographics are very easy to share via social media. Figure 5, an infographic depicting the plot lines of best-selling novels, shows that it’s possible to create infographics out of almost any type of data. You can click to see a larger version below, or on the [Slow Journalism website](https://www.slow-journalism.com/infographics/culture/plot-lines).

Start of Figure

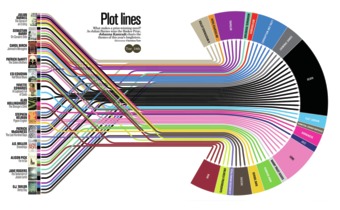


Figure 5 Plot lines infographic. Christian Tate, www.christiantate.co.uk

[View description - Figure 5 Plot lines infographic. Christian Tate, www.christiantate.co.uk](" \l "Session3_Description1)

End of Figure

We’ve already noted that infographics are closely related to, but not quite the same as, data visualisations, and that the terms ‘infographic’ and ‘data visualisation’ are often used interchangeably. While infographics present a static view of data, data visualisations are designed to allow the viewer to apply filters to explore a subset of the available data. For example, the ‘[World inequality database on education](http://www.education-inequalities.org/)’ (UNESCO, n.d.) shows the powerful influence of circumstances such as wealth, gender, ethnicity and location on people’s education and life opportunities. The visualisation draws on data from the Global Education Monitoring Report (UNESCO, n.d.) and allows filtering by several indicators, including by country. In addition, data visualisations sometimes allow chronological changes to be tracked – for example, changes in primary-school attendance over time.

Infographics can achieve their expressive power through combinations of many different elements. These two resources give an overview of the various components that can appear in infographics and data visualisations.

* [Periodic Table of Data Visualization Methods](https://www.open.ac.uk/libraryservices/resource/website:104239&f=29143?utm_source=openlearn&utm_campaign=ol&utm_medium=ebook) (Visual Literacy, n.d.)
* [*Introduction to Data Visualization: Visualization Types*](https://www.open.ac.uk/libraryservices/resource/website:109403&f=29143) (Duke University Libraries, 2017)

In the next section you’ll explore ways of assessing the quality of infographics.

## 4 Evaluating infographics

While infographics can be an extremely effective research communication tool, the communicative power of infographics can also be deliberately harnessed to deceive; for example, by presenting a selective view of a dataset, designed to obscure or over-amplify key research findings. The competition for attention that exists on the web often means that research reporting – especially by journalists, but also by researchers seeking to enhance their professional reputation – tends towards simple, dramatic stories.

The disadvantage of infographics mirrors their advantage – that they present a quickly comprehensible picture of a subject, distanced not only from the raw data but also (perhaps more importantly) from the process of inference/analysis by which that picture is generated. This is why, when looking at any infographic, it is important to interrogate the data interpretation process, which the infographic actually makes it harder to see.

In addition, even when a researcher is intending to accurately represent their research, a disadvantage of infographics is that, although it is fairly easy to produce them, it is not so easy to produce them well. As a consequence, the internet is replete with some truly awful infographics masquerading as research reports – awful due to poor design, lack of background information, inadequate explanation and deceptive or inaccurate representation of numerical research data.

The critical researcher therefore needs a suitable strategy for evaluating infographics – a strategy that combines techniques for analysing any research with techniques more commonly used when engaging with visual art.

In his article, ‘[The many-faced infographic: Brooklyn, elephants, and the visualization of data](http://www.peachpit.com/articles/article.aspx?p=2153471)’, data visualisation guru Alberto Cairo tells us that:

Start of Quote

One of the keys to designing effective information graphics is to accept that function constrains form. This means that, if your goal is to communicate well, the visual shape you make your data adopt is not primarily a matter of aesthetic preferences, but should depend on the questions readers may want to get answered, or on the tasks they may wish to complete.

(Cairo, 2013)

End of Quote

## 4.1 Assessing the quality of infographics

A quick Google search will return many rubrics and checklists for assessing the quality of an infographic. Common among them are the following evaluation criteria:

* Relevance of the infographic to any related research reports.
* The authority/credibility of the infographic author, or of any connected institution.
* Accuracy of the data. It is important that sources are listed for any data or knowledge claims referred to in an infographic that reports research, as this allows you to cross reference with the original data.
* Apparent purpose of the infographic and whether this is realised in its design.
* Tone of the infographic (e.g. humorous, cynical, neutral, serious) and whether this is appropriate to its apparent purpose.
* Content of the infographic, including the use of charts, colour, text and images.
* Clarity of the infographic layout. Is it easy to follow? Typically, a good infographic might start with broader claims or statements and present data that gradually narrows in focus and adds more detail.
* Aesthetic considerations. How does the infographic present information? Is it visually pleasing? Does it achieve an emotional effect that complements the message being conveyed? Does the emotional effect actually contradict the apparent message?

Natalia Karbasova, a student on Alberto Cairo’s [Introduction to Infographics and Data Visualization MOOC](https://www.youtube.com/playlist?list=PLa4VFIBUKrgLao-DalwedOCiq9RV6MPk9) (which is no longer available for study), has published some useful notes on the topic in her blog post ‘[How to evaluate infographics](https://mediakar.wordpress.com/2013/03/22/how-to-evaluate-infographics/)’. Drawing on Cairo’s MOOC, Karbasova suggests asking:

Start of Quote

* Is this infographic really ‘functional’ in the sense of facilitating basic, predictable tasks (comparing, relating variables, etc.)? If not, how could it be improved?
* Does it tell a story? What are the most important or surprising points in the data? Can we highlight them somehow? What do the data mean? What kind of headlines, intro copy, and labels could it include to make it meaningful for a broad audience?
* What other variables (if any) should be gathered/analyzed if we want to give an accurate portrait of the topic the graphic covers? Could we go beyond what is currently presented? Can we provide a better context for the data?

(Karbasova, 2013)

End of Quote

The [Junk Charts Trifecta Checkup](http://junkcharts.typepad.com/junk_charts/junk-charts-trifecta-checkup-the-definitive-guide.html) (Fung, n.d.) offers a rather different way to critically engage with infographics and data visualisations (Figure 6). It involves three evaluation queries, for which the author, Kaiser Fung, proposes the answers should be one and the same:

* What is the question?
* What does the data say?
* What does the visual say?

Start of Figure



Figure 6 Junk charts: recycling chart junk as junk art. Kaiser Fung, http://junkcharts.typepad.com/junk\_charts/. This file is licensed under the Creative Commons Attribution NonCommercial ShareAlike 3.0 Licence http://creativecommons.org/licenses/by-nc-sa/3.0/us/

[View description - Figure 6 Junk charts: recycling chart junk as junk art. Kaiser Fung, http://junkcharts.typepad.com/junk\_charts/. ...](" \l "Session4_Description1)

End of Figure

## 4.2 Compiling your own infographics – evaluation checklist

Start of Figure



Figure 7 Data + design. © Infoactive. eBook licensed under the Creative Commons Attribution NonCommercial Share Alike 4.0 Licence https://creativecommons.org/licenses/by-nc-sa/4.0/

[View description - Figure 7 Data + design. © Infoactive. eBook licensed under the Creative Commons Attribution ...](" \l "Session4_Description2)

End of Figure

In the following activity you will explore [*Data + Design*](https://www.open.ac.uk/libraryservices/resource/website:111254&f=29143?utm_source=openlearn&utm_campaign=ol&utm_medium=ebook)(Infoactive and Donald W. Reynolds Institute, n.d.) – a Creative Commons-licensed, downloadable, remixable and shareable online textbook that is a great resource for advice on creating and evaluating infographics and data visualisations. It is a collaborative work written by more than 50 authors and includes chapters by the aforementioned Alberto Cairo.

Start of Activity

**Activity 2 Creating effective visualisations**

Allow about 1 hour.

Start of Question

Read Chapter 17 ‘Perception deception’ (Djukic, n.d., pp. 217–40) and Chapter 18 ‘Common visualization mistakes’ (Chang et al., pp. 242–61) of [*Data + Design*](https://orm-atlas2-prod.s3.amazonaws.com/pdf/13a07b19e01a397d8855c0463d52f454.pdf). These chapters can be found in the ‘Visualising data’ section of the book.

As you read, note:

* some of the ways in which an infographic can be made more impactful
* common errors to watch out for when consuming and preparing infographics and data visualisations.

End of Question

*Provide your answer...*

End of Activity

In the next activity you’ll draw on your reading of Data + Design to compile a checklist to use when evaluating the accuracy and effectiveness of infographics and data visualisations.

Start of Activity

**Activity 3 Devising your checklist**

Allow about 30 minutes.

Start of Question

Spend about 30 minutes devising your own infographics–evaluation checklist. Base it on the notes you made for Activity 2, and on your reading of the resources already mentioned. Do feel free to include additional criteria of your own.

End of Question

[View feedback - Activity 3 Devising your checklist](" \l "Session4_Discussion1)

End of Activity

In the next activity you’ll use the checklist you produced in Activity 3 as the basis for evaluating an infographic of your choice.

## 4.3 Applying the evaluation checklist

For this activity you’ll apply some of the skills needed by the ‘critical researcher’ when you use the evaluation checklist that you developed in Activity 3. First though, you’ll search for examples of great (and not so great) infographics related to educational-technology research.

Start of Activity

**Activity 4 Being a critical researcher**

Allow about 1 hour 30 minutes.

Start of Question

1. Conduct an internet search either for ‘educational technology infographics’ or for infographics covering an education or training sector in which you’re interested. .
2. As you search, note any infographics that appear to be particularly effective or appealing, and any that seem to be particularly poor. (You can record the web addresses for all of these examples in the box below.)
3. Select one infographic on which to conduct an evaluation, either an example you think is particularly effective or an infographic that you feel is flawed in some way.
4. Using your evaluation checklist from Activity 3, evaluate your chosen infographic by giving it a score against each of your criteria. You should divide the total score by the number of criteria to achieve a mean score for the infographic. You may find it useful to look again at the two resources mentioned in [section 3](#sess3), which list some of the typical components of infographics.

End of Question

*Provide your answer...*

[View feedback - Activity 4 Being a critical researcher](" \l "Session4_Discussion2)

End of Activity

## End-of-course quiz

You’ll end your study of this short course with an [End-of-course quiz](https://www.open.edu/openlearn/ocw/mod/quiz/view.php?id=71964) designed to assess your knowledge of some of the concepts covered.

## Conclusion

By now, you should have an appreciation of some of the key things to look out for when evaluating infographics, and will have used your own checklist to critically assess an infographic of your choice for its accuracy and effectiveness. The evaluation skills you’ve developed should help you as a critical researcher to navigate the plethora of infographics claiming to present research findings. They are also good preparation for creating your own infographics.

At the time of writing, free tools for creating infographics included [Easel.ly](http://www.easel.ly/), [Google Charts](https://developers.google.com/chart/), [Infogr.am](http://infogr.am/), [Piktochart](http://piktochart.com/), [Venngage](https://venngage.com/), [Visual.ly](http://visual.ly/), and [Vizualize.me](http://vizualize.me/), among others.

We can’t be certain these tools will still exist by the time you study this course. However, a quick web search for ‘free infographics tools’ will help you to find up-to-date tools that are available.

We hope you’ve enjoyed this short course and soon find an opportunity to apply the knowledge and skills you’ve gained.

This free course is an adapted extract from the Open University course [H819 The critical researcher: educational technology in practice](http://www.open.ac.uk/postgraduate/modules/h819?utm_source=openlearn&utm_campaign=ou&utm_medium=ebook).

## Keep on learning

Start of Figure

D:\AaaF\OUT\httpswwwopeneduopenlearnocw_cmid69234_2020-08-27_12-27-25_js34827\word\assets\_d3c986e615af52d98ee2159f5114e2c4bec9ff99_ol_skeleton_keeponlearning_image.jpg

End of Figure

## Study another free course

There are more than **800 courses on OpenLearn** for you to choose from on a range of subjects.

Find out more about all our [free courses](http://www.open.edu/openlearn/free-courses?utm_source=openlearn&utm_campaign=ol&utm_medium=ebook).

## Take your studies further

Find out more about studying with The Open University by [visiting our online prospectus](http://www.open.ac.uk/courses?utm_source=openlearn&utm_campaign=ou&utm_medium=ebook).

If you are new to university study, you may be interested in our [Access Courses](%20http://www.open.ac.uk/courses/do-it/access?utm_source=openlearn&utm_campaign=ou&utm_medium=ebook) or [Certificates](%20http://www.open.ac.uk/courses/certificates-he?utm_source=openlearn&utm_campaign=ou&utm_medium=ebook).

## What’s new from OpenLearn?

[Sign up to our newsletter](http://www.open.edu/openlearn/about-openlearn/subscribe-the-openlearn-newsletter?utm_source=openlearn&utm_campaign=ol&utm_medium=ebook) or view a sample.

Start of Box

For reference, full URLs to pages listed above:

OpenLearn – [www.open.edu/openlearn/free-courses](http://www.open.edu/openlearn/free-courses?utm_source=openlearn&utm_campaign=ol&utm_medium=ebook)

Visiting our online prospectus – [www.open.ac.uk/courses](http://www.open.ac.uk/courses?utm_source=openlearn&utm_campaign=ou&utm_medium=ebook)

Access Courses – [www.open.ac.uk/courses/do-it/access](%20http://www.open.ac.uk/courses/do-it/access?utm_source=openlearn&utm_campaign=ou&utm_medium=ebook)

Certificates – [www.open.ac.uk/courses/certificates-he](%20http://www.open.ac.uk/courses/certificates-he?utm_source=openlearn&utm_campaign=ou&utm_medium=ebook)

Newsletter – [www.open.edu/openlearn/about-openlearn/subscribe-the-openlearn-newsletter](%20http://www.open.edu/openlearn/about-openlearn/subscribe-the-openlearn-newsletter?utm_source=openlearn&utm_campaign=ol&utm_medium=ebook)

End of Box

## References

Cairo, A. (2013) ‘The many-faced infographic: Brooklyn, elephants, and the visualization of data’, Peachpit, 25 November [Blog]. Available at [www.peachpit.com/ articles/ article.aspx?p=2153471](http://www.peachpit.com/articles/article.aspx?p=2153471) (Accessed 13 September 2016).

Cairo, A. (2014) ‘Infographics to explain, data visualizations to explore’, The Functional Art, 16 March [Blog]. Available at [www.thefunctionalart.com/ 2014/ 03/ infographics-to-reveal-visualizations.html](http://www.thefunctionalart.com/2014/03/infographics-to-reveal-visualizations.html) (Accessed 8 March 2016).

Chang, K., Eyler-Werve, K. and Cairo, A. (n.d.) ‘Common visualization mistakes’, in Infoactive and Donald W. Reynolds Institute (eds) Data + Design: A Simple Introduction to Preparing and Visualizing Information [Online]. Available at <https://orm-atlas2-prod.s3.amazonaws.com/pdf/13a07b19e01a397d8855c0463d52f454.pdf> (Accessed 11 January 2017), pp. 242–61.

Djukic, M. (n.d.) ‘Perception deception’, in Infoactive and Donald W. Reynolds Institute (eds) Data + Design: A Simple Introduction to Preparing and Visualizing Information [Online]. Available at <https://orm-atlas2-prod.s3.amazonaws.com/pdf/13a07b19e01a397d8855c0463d52f454.pdf> (Accessed 11 January 2017), pp. 217–40.

Duke University Libraries (2017) Data Visualization: Visualization Types [Online]. Available at <https://guides.library.duke.edu/datavis/vis_types> (Accessed 13 October 2017).

Eppler, M. and Menjis, J. (2002) ‘The concept of information overload: a review of literature from organization science, accounting, marketing, MIS and related disciplines’, Information Society, vol. 2, no. 5, pp. 325–44.

Fung, K. (n.d.) ‘Junk charts trifecta checkup: the definitive guide’, Junk Charts [Blog]. Available at [http://junkcharts.typepad.com/ junk\_charts/ junk-charts-trifecta-checkup-the-definitive-guide.html](http://junkcharts.typepad.com/junk_charts/junk-charts-trifecta-checkup-the-definitive-guide.html) (Accessed 11 January 2017).

Hyerle, D. (2000) A Field Guide to Using Visual Tools, Alexandra, VA, Association for Supervision and Curriculum Development.

Infoactive and Donald W. Reynolds Institute (n.d.) Data + Design: A Simple Introduction to Preparing and Visualizing Information [Online]. Available at <https://orm-atlas2-prod.s3.amazonaws.com/pdf/13a07b19e01a397d8855c0463d52f454.pdf> (Accessed 11 January 2017).

Jensen, E. (2008) Brain-based Learning, 2nd edn, Thousand Oaks, CA, Corwin Press.

Karbasova, N. (2013) ‘How to evaluate infographics’, Mediakar, 22 March [Blog]. Available at <https://mediakar.wordpress.com/2013/03/22/how-to-evaluate-infographics/> (Accessed 13 September 2016).

Levitin, D. (2015) ‘Why the modern world is bad for your brain’, Guardian, 18 January [Online]. Available at [www.theguardian.com/ science/ 2015/ jan/ 18/ modern-world-bad-for-brain-daniel-j-levitin-organized-mind-information-overload](https://www.theguardian.com/science/2015/jan/18/modern-world-bad-for-brain-daniel-j-levitin-organized-mind-information-overload) (Accessed 11 January 2017).

McArdle, M. (2011) ‘Ending the infographic plague’, Atlantic, 23 December [Online]. Available at [www.theatlantic.com/ business/ archive/ 2011/ 12/ ending-the-infographic-plague/ 250474/](http://www.theatlantic.com/business/archive/2011/12/ending-the-infographic-plague/250474/) (Accessed 11 January 2017).

McCandless, D. (2010) The Beauty of Data Visualization [TED Talk]. Available at [www.ted.com/ talks/ david\_mccandless\_the\_beauty\_of\_data\_visualization](https://www.ted.com/talks/david_mccandless_the_beauty_of_data_visualization) (Accessed 13 September 2016).

Naughton, J. (2017) ‘Tim Wu: “the internet is like the classic story of the party that went sour”’, Guardian, 8 January. Available at [www.theguardian.com/ technology/ 2017/ jan/ 08/ tim-wu-interview-internet-classic-party-went-sour-attention-merchants](https://www.theguardian.com/technology/2017/jan/08/tim-wu-interview-internet-classic-party-went-sour-attention-merchants) (Accessed 24 March 2017).

Semetko, H. and Scammell, M. (2012) The SAGE Handbook of Political Communication, Thousand Oaks, CA, SAGE Publications.

Slow Journalism Company (n.d.) ‘Booker Prize infographic: plot lines’, Slow Journalism [Online]. Available at <https://www.slow-journalism.com/infographics/culture/plot-lines> (Accessed 12 April 2017).

Toffler, A. (1970) Future Shock, New York, NY, Bantam Books.

Trafton, A. (2014) ‘In the blink of an eye: MIT neuroscientists find the brain can identify images seen for as little as 13 milliseconds’, MIT News, 16 January [Online]. Available at [http://news.mit.edu/ 2014/ in-the-blink-of-an-eye-0116](http://news.mit.edu/2014/in-the-blink-of-an-eye-0116) (Accessed 12 April 2017).

UNESCO (n.d.) ‘World inequality database on education’, Global Education Monitoring Report, UNESCO [Online]. Available at [www.education-inequalities.org/](http://www.education-inequalities.org/) (Accessed 12 April 2017).

Visual Literacy (n.d.) A Periodic Table of Visualization Methods [Online]. Available at [www.visual-literacy.org/periodic\_table/periodic\_table.html](http://www.visual-literacy.org/periodic_table/periodic_table.html) (Accessed 13 October 2017).

WorldWideWebSize.com (2017) The Size of the World Wide Web (The Internet) [Online]. Available at [www.worldwidewebsize.com/](http://www.worldwidewebsize.com/) (Accessed 12 April 2017).

## Acknowledgements

This free course was written by Leigh-Anne Perryman and reworked for OpenLearn by Simon Ball.

Except for third party materials and otherwise stated (see [terms and conditions](http://www.open.ac.uk/conditions)), this content is made available under a [Creative Commons Attribution-NonCommercial-ShareAlike 4.0 Licence](http://creativecommons.org/licenses/by-nc-sa/4.0/deed.en_GB).

The material acknowledged below is Proprietary and used under licence (not subject to Creative Commons Licence). Grateful acknowledgement is made to the following sources for permission to reproduce material in this free course:

Every effort has been made to contact copyright owners. If any have been inadvertently overlooked, the publishers will be pleased to make the necessary arrangements at the first opportunity.

**Course image:**

© Thomas Hawk via Flickr. This file is licenced under the Creative Commons Attribution Non-Commercial 2.0 licence https://creativecommons.org/licenses/by-nc/2.0/

**Figures:**

Figure 1: Brian Solis and JESS3, The Conversation Prism 2.0. This file is licensed under the Creative Commons Attribution 2.5 Licence https://creativecommons.org/licenses/by/2.5/deed.en

Figure 2: Kristen A Treglia. This file is licensed under the Creative Commons Attribution-Non-commercial-Share Alike Licence http://creativecommons.org/licenses/by-nc-sa/2.0

Figure 3: Open Knowledge International. This file is licensed under the Creative Commons Attribution-Non-commercial Licence http://creativecommons.org/licenses/by-nc/3.0/

Figure 4: Oxford Internet Institute

Figure 5: Christian Tate, www.christiantate.co.uk

Figure 6: Kaiser Fung, http://junkcharts.typepad.com/junk\_charts/. This file is licensed under the Creative Commons Attribution NonCommercial ShareAlike 3.0 Licence http://creativecommons.org/licenses/by-nc-sa/3.0/us/

Figure 7: © Infoactive. eBook licensed under the Creative Commons Attribution NonCommercial Share Alike 4.0 Licence https://creativecommons.org/licenses/by-nc-sa/4.0/

**Quiz:**

Question 5: Hyerle, D. (2000) ‘Thinking maps: Visual tools for activating habits of mind’, in Costa, A. L. and Kallick, B. (eds) Activating and engaging habits of mind, Alexandria, VA, Association for Supervision and Curriculum Development, pp. 46–58.

**Don’t miss out**

If reading this text has inspired you to learn more, you may be interested in joining the millions of people who discover our free learning resources and qualifications by visiting The Open University – [www.open.edu/openlearn/free-courses](http://www.open.edu/openlearn/free-courses?utm_source=openlearn&utm_campaign=ol&utm_medium=ebook).

## Solutions

## Activity 3 Devising your checklist

#### Feedback

You should now have a useful checklist to use when evaluating any infographics you encounter, and when creating your own. If you’d like to read more about the design principles applied to creating infographics, Kibar and Akkoyunlu’s paper ‘Fostering and assessing infographic design for learning: the development of infographic design criteria’ is a good place to start.

[Back to - Activity 3 Devising your checklist](" \l "Session4_Activity2)

## Activity 4 Being a critical researcher

#### Feedback

The final score for your infographic will obviously depend on which infographic you’ve chosen, and which criteria you applied in your evaluation. However, an infographic scoring 5 across all criteria is likely to be a very successful one. An infographic scoring 3–4 is likely to be fairly effective but lacking in a few important areas. An infographic scoring lower than this is likely to have some substantial defects.

[Back to - Activity 4 Being a critical researcher](" \l "Session4_Activity3)

# Figure 1 The conversation prism by Brian Solis and JESS3, The Conversation Prism 2.0. This file is licensed under the Creative Commons Attribution 2.5 Licence https://creativecommons.org/licenses/by/2.5/deed.en

## Description

The conversation prism. This is a very complex, detailed infographic containing a very large amount of information. Visually it resembles a daisy flower, with 30 petals radiating outward from the centre, each overlapping the prior petal by almost half. The petals are coloured in a continuum of all colours of the spectrum, but this appears to have no meaning. Each ‘petal’ contains examples of tools for achieving particular tasks – for example, the ‘petal’ entitled Social Bookmarks contains the logos of tools such as Diigo and Mister Wong, along with several others; the ‘petal’ entitled Virtual Worlds contains the logos of Second Life, Entropia, Poptropica and more; and the ‘petal’ entitled Reviews and Ratings contains logos or icons for Yelp, Amazon, TripAdvisor and the like. Often the icons or logos are not accompanied by the name of the tool they represent, meaning the reader would need to recognise the logo to know which tool it represented. There are four concentric circles in the centre of the ‘daisy’. The central circle contains one word: brand. Around that are the words Observation, Listening, Identification, Internalization, Prioritization and Routing. The third circle reads: Support, Product, Sales, Marketing, PR, Community, Crisis, and the fourth reads Ongoing Feedback and Insight, Participation, Real world, Online.

[Back to - Figure 1 The conversation prism by Brian Solis and JESS3, The Conversation Prism 2.0. This file is licensed under the Creative Commons Attribution 2.5 Licence https://creativecommons.org/licenses/by/2.5/deed.en](" \l "Figure1)

# Figure 2 Paths in my ed tech landscape by Kristen A Treglia. This file is licensed under the Creative Commons Attribution-Non-commercial-Share Alike Licence http://creativecommons.org/licenses/by-nc-sa/2.0

## Description

A complex infographic entitled ‘Passionate Educator and Technologist’ by Kristena Treglia. The layout is loosely a grid format with three columns and two rows plus a header row. At the top of the diagram five boxes feed into the beginning of the 'header row'. These boxes read Cognitive Load Management, Design, Novel and Adaptive Thinking, Transdisciplinarity, and New Media Literacy. The 'header row' contains three 'column headings'. The first is Social Media, accompanied by a graphic showing the top portion of the globe with a variety of social media icons around it. The second is Teaching and Learning Experience, accompanied by a graphic of a partially folded map, and the third is Software Skills. In the Social Media column, row 1 contains the heading PLN/PLE and a diagram of interlinked nodes, many of which bear a social media icon. These icons are repeated beneath, sorted into either PLE or PLN categories. The second row under the Social Media column contains the heading Presentations, Workshops and Talks and features a word cloud containing phrases such as 'flipped classroom', 'personal learning network' and 'community building'. In the column headed 'Teaching and Learning Experience', the first row contains the words Teaching Philosophy, and the second Instructional Methods. Beside both of these is a map resembling that for an underground train network, but the text is too small to determine the accompanying text. The final column, Software Skills, contains a bar chart, with a variety of software icons against the bars, but it is unclear what these relate to. At the bottom of the graphic is the word Expertise, a silhouette of a woman's head, and a list of role titles including Instructional Designer, Videographer, Training Manager And Facilitator, and Support Technician.

[Back to - Figure 2 Paths in my ed tech landscape by Kristen A Treglia. This file is licensed under the Creative Commons Attribution-Non-commercial-Share Alike Licence http://creativecommons.org/licenses/by-nc-sa/2.0](" \l "Session2_Figure1)

# Figure 3 Open data index data visualisation. Open Knowledge International. This file is licensed under the Creative Commons Attribution-Non-commercial Licence http://creativecommons.org/licenses/by-nc/3.0/

## Description

An interactive bar chart which visualizes the ‘openness’ of countries in terms of the availability of open datasets in a range of sectors. Countries from each continent are allocated a colour. From this it can be seen at a glance that European, North American and Oceanian nations tend to have higher Open Data Index scores, and countries from sub-Saharan Africa and Middle East and North Africa lower scores, with Asia and Latin America and Caribbean distributed widely although tending towards the lower half of the chart. The five countries at the top end of the chart are Great Britain, USA, Denmark, Norway and Netherlands, whilst the five at the bottom end are Cyprius, St Kitts-Nevis, British Virgin Islands, Kenya and Yemen. Each bar is broken down into ten constituent subcategories, each of which can also be selected from a dropdown menu to display a new bar chart relating to that subcategory.

[Back to - Figure 3 Open data index data visualisation. Open Knowledge International. This file is licensed under the Creative Commons Attribution-Non-commercial Licence http://creativecommons.org/licenses/by-nc/3.0/](" \l "Session2_Figure2)

# Figure 4 Broadband affordability. Oxford Internet Institute

## Description

An infographic of global Broadband Affordability. Two global maps are shown. The upper map depicts the cost of broadband subscription as a percentage of yearly income. The countries with the highest cost are in sub-Saharan Africa and central Asia, whilst the lowest costs, broadly speaking, are found in North America, Oceania and Europe. In approximately 15 countries the cost of broadband is greater than 100% of the mean annual income. The lower map depicts the cost of one month of broadband subscription in 2011. The highest costs (over 100 US$ per month) are found in Tajikistan, Iraq, Djibouti, Malawi, Namibia, Congo, Guinea and Cuba. However the overall distribution is less generalisable than for the other map, with countries like Australia and Norway towards the more expensive end of the spectrum, and Egypt, India and Mongolia at the cheaper end. The infographic also includes a small line graph illustrating the cost of broadband subscription over the period 2008-11 by continent. In 2008 the cost in sub-Saharan Africa was more than twice as high as anywhere else, but this dropped dramatically, although it remained slightly higher than other continents by 2011. Most continents saw a slight decrease in cost over the period, although there was a slight increase in Oceania and North America.

[Back to - Figure 4 Broadband affordability. Oxford Internet Institute](" \l "Session2_Figure3)

# Figure 5 Plot lines infographic. Christian Tate, www.christiantate.co.uk

## Description

An infographic demonstrating that data can be presented in a visually beautiful way. A series of fiction book covers are arranged in a column on the left-hand side of the graphic. From the right-hand side of each novel emerges between four and seven coloured lines, each representing a plot theme of the novel. Themes include such diverse concepts as love, death, betrayal, jazz, cannibalism and escaped tigers. Each theme has its own consistent colour, so all the lines representing death are black, those representing jazz are navy blue and escaped tigers are orange, for example. Rather than simply listing the plot themes on the right-hand side and linking with straight lines, the designer has arranged the plot themes in a three-quarter circle, the opening facing the column of novels on the left. The lines emerging from the novels enter the circle through the gap on the left side and then fan out to reach the relevant plot theme. Any crossing of lines is done near to the novel covers, so that by the time the lines enter the partial circle of plot themes they are in perfect order and the lines fan out towards the plot themes equally in a visually pleasing manner.

[Back to - Figure 5 Plot lines infographic. Christian Tate, www.christiantate.co.uk](" \l "Session3_Figure1)

# Figure 6 Junk charts: recycling chart junk as junk art. Kaiser Fung, http://junkcharts.typepad.com/junk\_charts/. This file is licensed under the Creative Commons Attribution NonCommercial ShareAlike 3.0 Licence http://creativecommons.org/licenses/by-nc-sa/3.0/us/

## Description

This image, entitled ‘Junk Charts: Recycling chart junk as junk art’ features an abstract art piece constructed from elements of infographics and statistical data representations. It is not possible to make out specific information, but sections of bar and pie charts are evident, plus a cartoon face, a dartboard and ‘paint splodges’. Each incorporated element is broadly circular, with a gathering of around a dozen overlapping circles slightly offset to the right of centre, and other solo circles like ‘bubbles’ elsewhere on the image. The artist has used pieces of red, green, brown and black in the central agglomeration, whereas the individual ‘bubbles’ are shades of grey, as is the background of the image.

[Back to - Figure 6 Junk charts: recycling chart junk as junk art. Kaiser Fung, http://junkcharts.typepad.com/junk\_charts/. This file is licensed under the Creative Commons Attribution NonCommercial ShareAlike 3.0 Licence http://creativecommons.org/licenses/by-nc-sa/3.0/us/](" \l "Session4_Figure1)

# Figure 7 Data + design. © Infoactive. eBook licensed under the Creative Commons Attribution NonCommercial Share Alike 4.0 Licence https://creativecommons.org/licenses/by-nc-sa/4.0/

## Description

A simple pale blue image with white text. The largest text at the top reads ‘Data + Design’. Beneath, in smaller font, is ‘A simple introduction to preparing and visualising information’. Under this are four outlined text elements as if representing ‘buttons’ on a web page: read online, PDF, mobi, ePub.

[Back to - Figure 7 Data + design. © Infoactive. eBook licensed under the Creative Commons Attribution NonCommercial Share Alike 4.0 Licence https://creativecommons.org/licenses/by-nc-sa/4.0/](" \l "Session4_Figure2)

# Uncaptioned interactive content

## Transcript

[MUSIC PLAYING]

DAVID MCCANDLESS

It feels like we're all suffering from information overload or data glut. And the good news is there might be an easy solution to that, and that's using our eyes more. So visualising information so that we can see the patterns and connections that matter. And then designing that information so it makes more sense, or it tells a story or allows us to focus only on the information that's important.

Failing that, visualising information can just look really cool. So, let's see. This is the Billion Dollar o-Gram, and this image arose out of frustration I had with the reporting of billion dollar amounts in the press. That is, they're meaningless without context. 500 billion for this pipeline. 20 billion for this war. It doesn't make any sense. So the only way to understand it is visually and relatively. So I scraped a load of reported figures from various news outlets and then scaled the boxes according to those amounts. And the colours here represent the motivation behind the money. So purple is fighting and red is giving money away and green is profiteering. And what you can see straight away is you start to have a different relationship to the numbers. You can literally see them. But more importantly, you start to see patterns and connections between numbers that would otherwise be scattered across multiple news reports.

Let me point out some that I really like. This is OPEC's revenue, this green box here, 780 billion a year. And this little pixel in the corner, 3 billion, that's their climate change fund.

Americans are incredibly generous people. Over 300 billion a year donated to charity every year compared with the amount of foreign aid given by the top 17 industrialised nations at 120 billion.

And then, of course, the Iraq war predicted to cost just 60 billion back in 2003, and the mushroomed slightly Afghanistan and Iraq mushroomed now to 3,000 billion.

So now it's great. In fact, we have this texture and we can add numbers to it as well. So we can say, well, a new figure comes out. Let's see, African debt. How much of this diagram do you think might be taken up by the debt that Africa owes to the West? Let's take a look. So there it is, 227 billion is what Africa owes.

And the recent financial crisis, how much of this diagram might that figure take up? What did that cost the world? Let's take a look at that. Doosh, I think is the appropriate sound effect from that much money. 11,900 billion.

So, by visualising this information we turned it into a landscape that you can explore with your eyes. A kind of map, really. A sort of information map. And when you're lost in information, an information map is kind of useful.

So, I want to show you another landscape now. We need to imagine what a landscape of the world's fears might look like. Let's take a look. This is mountains out of molehills, a timeline of global media panic. So I'm going to label this for you in a second, but the height here I wanted to point out is the intensity of certain fears as reported in the media. Let me point them out.

So this - swine flu, pink.

[CROWD LAUGHING]

Bird flu, SARS, brownish here. Remember that one? The Millennium bug.

[CROWD LAUGHING]

Terrible disaster. These little green peaks are asteroid collisions.

[CROWD LAUGHING]

And in summer here, killer wasps.

[CROWD LAUGHING]

So these are what our fears look like over time in the media. But what I love - and I'm a journalist - and what I love is finding hidden patterns. I love being a data detective, and there's a very interesting and odd pattern hidden in this data that you can only see when you visualise it. Let me highlight it for you.

See this line? This is a landscape for violent video games. As you can see, there's a kind of odd regular pattern in the data. Twin peaks every year.

If we look closer, we see those peaks occur at the same month every year. Why? Well, November - Christmas video games come out, and there may well be an upsurge in concern about their content. But April isn't a particularly massive month for video games. Why April? Well, in April 1999 was the Columbine shooting. And since then, that fear has been remembered by the media and echoes through the group mind gradually through the year. You have retrospectives, anniversaries, court cases, even copycat shootings all pushing that fear into the agenda.

And there's another pattern here as well. Can you spot it? See that gap there. There's a gap and it affects all the other stories. Why is there a gap there? You see where it starts? September 2001 when we had something very real to be scared about.

So, I've been working as a data journalist for about a year, and I keep hearing a phrase all the time, which is this - data is the new oil. And data is this kind of ubiquitous resource that we can shape to provide new innovations and new insights. And it's all around us, and it can be mined very easily. And it's not a particularly great metaphor in these times, especially if you live around the Gulf of Mexico, but I would perhaps adapt this metaphor slightly, and I would say that data is the new soil. Because for me, it feels like a fertile, creative medium. Over the years online, we've laid down a huge amount of information data. And we've irrigated it with networks and connectivity, and it's been worked and tilled by unpaid workers and governments. All right, I'm kind of milking the metaphor a little bit, but it's a really fertile medium. And it feels like visualisations, infographics, data visualisations, they feel like flowers blooming from this medium. But if you look at it directly, it's just a load of numbers and disconnected facts. But if you start working with it and playing with it in a certain way, interesting things can appear and different patterns can be revealed.

Let me show you this. Can you guess what this data set is? What rises twice a year, once in Easter and then two weeks before Christmas, has a mini peak every Monday, and then flattens out over the summer? I'll take answers.

AUDIENCE

Chocolate.

DAVID MCCANDLESS

Chocolate. You might want to get some chocolate in. Any other guesses?

AUDIENCE

Shopping.

DAVID MCCANDLESS

Shopping. Yeah, retail therapy might help. Sick leave. Yeah, you'll definitely want to take some time off. Shall we see?

[CROWD LAUGHING]

[APPLAUSE]

So the information guru Lee Byron and myself, we scraped 10,000 status Facebook updates for the phrase ‘break up’ and ‘broken up’, and this is the pattern we found. People clearing out for spring break.

[CROWD LAUGHING]

Coming out of very bad weekends on a Monday, being single over the summer, and then the lowest day of the year, of course, Christmas day. Who would do that?

[CROWD LAUGHING]

So, there's a Titanic amount of data out there now, unprecedented. But if you ask the right kind of question or you work it in the right kind of way, interesting things can emerge.

So, information is beautiful. Data is beautiful. I wonder if I could make my life beautiful, and here's my visual CV. I'm not quite sure I've succeeded. Pretty blocky, colours aren't that great. But I wanted to convey something to you. I started as a programmer and then I worked as a writer for many years, about 20 years in print, online, and in advertising. And only recently have I started designing. And I've never been to design school. I've never studied art or anything. I just kind of learned through doing. And when I started designing, an odd ... I discovered an odd thing about myself. I already knew how to design. But it wasn't like I was amazingly brilliant at it, but more like I was sensitive to the ideas of grids and space and alignment and typography.

It's almost like being exposed to all this media over the years had instilled a kind of dormant design literacy in me. And I don't feel like I'm unique. I feel that every day all of us now are being blasted by information design. It's being poured into our eyes through the web, and we're all visualizers now. We're all demanding a visual aspect to our information.

And there's something almost quite magical about visual information. It's effortless. It literally pours it in. And if you're navigating a dense information jungle, coming across a beautiful graphic or a lovely data visualisation, it's a relief. It's like coming across a clearing in the jungle. And I was curious about this, so it led me to the work of Danish physicist called Tor Norretranders. And he converted the bandwidth of the senses into computer terms. So here we go.

This is your senses - pouring into your senses every second. Your sense of sight is the fastest. It has the same bandwidth as a computer network. Then you have touch, which is about the speed of a USB key. And then you have hearing and smell, which has the throughput of a hard disk. And then you have poor old taste, which is like barely the throughput of a pocket calculator. And that little square in the corner, 0.7%, that's the amount we're actually aware of. So a lot of your vision is pouring - the bulk of it is visual, and it's pouring in, it's unconscious. And the eye is exquisitely sensitive to patterns in variations in colour, shape, and pattern. It loves them. It calls them beautiful. It's the language of the eye. And if you combine the language of the eye with the language of the mind, which is about words and numbers and concepts, you start speaking two languages simultaneously, each enhancing the other. So you have the eye, and then you drop in the concepts. And that whole thing is two languages both working at the same time.

So we can use this new kind of language, if you like, to alter our perspective or change our views. Let me ask you a simple question with a really simple answer. Who has the biggest military budget? It's got to be America, right? Massive. 609 billion in 2008 - 607, rather. So massive, in fact, that it can contain all the other military budgets in the world inside itself. Gobble, gobble, gobble, gobble. Now you can see, Africa's total debt there and the UK budget deficit for reference. So that might well chime with your view that America is a warmongering military machine out to overpower the world with its huge industrial military complex. But is it true that America has the biggest military budget? Because America is an incredibly rich country. In fact, it's so massively rich that it can contain the four other top industrialised nations economies inside itself. It's so vastly rich, so its military budget is bound to be enormous. So to be fair and to alter our perspective, we have to bring in another data set, and that data set is GDP or what the country is earning. Who has the biggest budget as a proportion of GDP? Let's have a look. That changes the picture considerably. Other countries pop into view that you perhaps weren't considering, and America drops into 8th. Now you can also do this with soldiers. Who has the most soldiers? It's got to be China. Of course, 2.1 million. Again, chiming with your view that China has a militarised regime ready to mobilise its enormous forces. But, of course, China has an enormous population. So if we do the same, we see a radically different picture. China drops to 124th. It actually has a tiny army when you take other data into consideration.

So absolute figures, like the military budget, in a connected world kind of don't give you the whole picture. They're not as true as they could be. We need relative figures that are connected to other data so that we can see a fuller picture. And then that can lead to us changing our perspective. As Hans Rosling, the master, my master, said, let the data set change your mindset. And if it can do that, maybe it can also change your behaviour. Take a look at this one.

I'm a bit of a health nut. I love taking supplements and being fit, but I can never understand what's going on in terms of evidence. There's always conflicting evidence. Should I take vitamin C? Should I be taking wheat grass? So this is a visualisation of all the evidence for nutritional supplements. This kind of diagram is called a balloon race. So the higher up the image, the more evidence there is for each supplement. And the bubbles correspond to popularity as regards to Google hits. So you can kind of immediately apprehend the relationship between efficacy and popularity, but you can also, if you grade the evidence, sort of do a worth it line. And so supplements above this line are worth investigating, but only for the conditions listed below. And then supplements below the line are perhaps not worth investigating.

Now this image constitutes a huge amount of work. We scraped like 1000 studies from PubMed, the biomedical database, and we compiled them and graded them all. And it was incredibly frustrating for me, because I had a book of 250 visualisations to do for my book, and I spent a month doing this. And I'd only filled two pages.

But what it points to is that visualising information like this is a form of knowledge compression. It's a way of squeezing an enormous amount of information and understanding into a small space. And once you've curated that data and once you've cleaned that data and once it's there, you can do cool stuff like this. So I converted this into an interactive app, so I can now generate this application online, this visualisation online. I can say, yeah, brilliant. So it spawns itself. And then I can say, well, just show me the stuff that affects heart health, so let's filter that out. The heart is filtered out, so I can see if I'm curious about that. I think, no, no. I don't want to take any synthetics. I just want to see plants and - just show me herbs and plants. And we get all the natural ingredients. Now this app is spawning itself from the data. The data is all stored in a Google Doc, and it's literally generating itself from that data. So the data is now alive. This is a living image. And I can update it in a second. New evidence comes out, I just change a row on a spreadsheet. Doosh. Again, this imagery recreates itself. So it's cool. It's living.

But it kind of can go beyond data, and it can go beyond numbers. I like to apply information visualisation to ideas and concepts.

This is a visualisation of the political spectrum, an attempt for me to try and understand how it works, and how the ideas percolate down from government into society and culture, into families, into individuals, into their beliefs and then back around again in a cycle. What I love about this image is it's made up of concepts that explores our worldviews, and it helps us - it's helped me anyway - to see what others think and to see where they're coming from. And it feels just incredibly cool to do that.

And what was most exciting for me designing this was that when I was designing this image, I desperately wanted this side, the left side, to be better than the right side, being a journalist, a left-leaning person. But I couldn't, because I would have created a lopsided, biased diagram. So in order to really create a full image, I had to honour the perspectives on the right-hand side. And at the same time, kind of uncomfortably recognise how many of those qualities are actually in me, which was very, very annoying and uncomfortable.

[CROWD LAUGHING]

But not too uncomfortable, because there's something unthreatening about seeing a political perspective versus being told or forced to listen to one. So actually you're capable of holding conflicting viewpoints joyously when you can see them. It's even fun to engage with them, because it's visual.

So that's what's exciting for me, seeing how data can change my perspective and change my mind midstream. Beautiful, lovely data.

So, just to wrap up, I want to say that it feels to me that design is about solving problems and providing elegant solutions, and information design is about solving information problems. And it feels like we have a lot of information problems in our society at the moment when the overload and the saturation to the breakdown of trust and reliability and runaway scepticism and lack of transparency, or even just interesting us. I mean, I find the information just too interesting. It has a magnetic quality that draws me in.

So, visualising information can give us a very quick solution to those kinds of problems. And even when the information is terrible, the visual can be quite beautiful. And often we can get clarity or the answer to a simple question very quickly.

Like this one. The recent Icelandic volcano - which was emitting the most CO2? Is it the planes or the volcano? The grounded planes or the volcano? So we can have a look. We look at the data, and we see - yep. The volcano emitted 150,000 tonnes. The grounded plane would have emitted 345,000 if they were in the sky. So essentially, we had our first carbon neutral volcano.

[CROWD LAUGHING]

Yeah.

[APPLAUSE]

And that is beautiful. Thank you.

[APPLAUSE]

[Back to - Uncaptioned interactive content](" \l "Session2_MediaContent1)