

Key Stage 5 Worksheet

Podcast: Is there a 'digital darkness' descending? Professor Matt Jones



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From the series: Exploring Global Problems,
by Swansea University

What is it about?

- Digital technology and global inequalities of access to things we take for granted, for example, people in certain remote areas not having access to the internet.
- Divisions technology causes in society. People having different opinions on whether certain technology is good or bad.
- Conflicts between technology and human values.
- Challenges from Artificial Intelligence and big data.
- Human-centred computer science.



EXPLORING
GLOBAL PROBLEMS

Listen to the podcast:

[swansea.ac.uk/research/
podcasts/matt-jones/](https://swansea.ac.uk/research/podcasts/matt-jones/)

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the links.

Background

In this podcast, professor Matt Jones talks about:

Human-centred technology

Human-centred technology means thinking about a user's needs and how they will use a piece of technology, then building that into the design.

Research with voice assistants (like 'Siri' and 'Alexa')

Voice assistants are becoming a common digital tool in UK homes. One thing we can use them for is asking questions and getting an answer in response. Around the world though, people have very different home cultures. Matt and his team have been investigating how people use voice assistants in different cultures.

Background continued...

In Dharavi, Mumbai (in India), Matt and his team put voice assistants in the streets, rather than in people's homes, to find out how people interacted with them to help in the future design of these technologies. In their 'street Alexa' study, people could choose to ask a question to a human if they were not happy with the answer given by the voice assistant. Matt and his group could then compare the quality of the answers from the machine and from humans and how satisfied people were when they interacted with a voice assistant and a human.

'Digital Darkness'

There have been many surveys by governments; non-governmental organisations and the media which show that people have concerns about technology-use in society. Parents and carers often worry about the use of technology by their children, people also often worry about how much information governments and companies are able to gather about populations through their smartphone etc. There have also been research projects exploring how accurate online information is particularly in relation to emotive topics such as climate change. Matt points out though that there have often been moral panics about many forms of 'new technology' throughout the past, including radio, films and types of pop-music.

Big technology companies like Google and Facebook use human-centred design in their products and need to consider the ethical, privacy and security concerns that come with designing new technology.

Find out more about it

- **Use this BBC Bitesize study guide** to learn about the ethical, legal and environmental impact of technology.
- **Read this Wired article** about why human-centred design matters.
- **Watch this TED Talk** on machine learning and how computers are learning to be creative.
- **Read more** about the Computer Science research groups at Swansea University.
- **Find out** how you can improve your digital well-being with Google.
- **Discover** how social media can affect mental health.
- **Read the research** on how people interact with different devices.

Questions

Interactive: Click on box to start typing



When you ask a voice assistant (like an Amazon Alexa) a question and it gives an answer, what is the input and output of this process? What data type is the input? What data types could the output take (think carefully – there is more than one answer)?

Matt mentions the search engine 'DuckDuckGo'. How is DuckDuckGo responding to ethical concerns about data security?

What are Artificial Intelligence and big data?

Exercise



You are going to investigate the limitations of human-computer interactions.

To do this, you should use your knowledge of artificial and natural intelligence to design 6 questions in each of the following categories:

1. Questions that could easily be understood and answered by both a human and a computer.
2. Questions that could easily be understood and answered by a human, but not by a computer.
3. Questions that could easily be understood and answered by a computer, but not by a human.

Next, you will need to test your questions. Ask all 18 questions to:

- As many humans as possible.
- As many different types of voice assistants as possible. This can include the voice assistants in smart speakers, smartphones, tablets, smart TVs, smart watches, cars and other devices. If you do not have any devices with a voice assistant in your home, you can also get a Google version on your computer or laptop **here**.

Describe what happened and analyse your results – did the people and machines answer your questions as you expected? What assumptions did you use when designing your questions and were they confirmed?

What can this tell you about the similarities and differences between artificial and natural intelligence?

Explain how we could use these ideas into the design of future technologies.

For teachers and home schoolers

Links to Science in the National curriculum for Wales (KS5)

AS Level Computer Science

Fundamentals of computer science: Data representation and data types: Data types: Describe the following different primitive data types, Boolean, character, string, integer and real.

Fundamentals of computer science: The operating system: Consideration of human-computer interaction: Explain the need to design systems that are appropriate to the variety of different users at all levels and in different environments.

Fundamentals of computer science: Economic, moral, legal, ethical and cultural issues relating to computer science: Describe social and economic changes occurring as a result of developments in computing and computer use, and their moral, ethical, legal, cultural and other consequences.

Fundamentals of computer science: Economic, moral, legal, ethical and cultural issues relating to computer science: Legislation: Explain how relevant legislation impacts on security, privacy, data protection and freedom of information.

A2 Level Computer Science

Programming and System Development: Principles of programming: Identify ambiguities in natural language and explain the need for computer languages to have an unambiguous syntax.

Programming and System Development: System design: Human-computer Interaction: Discuss contemporary approaches to the problem of communication with computers.

Programming and System Development: System design: Human-computer Interaction: Describe the potential for a natural language interface.

Programming and System Development: System design: Human-computer Interaction: Describe the problems of ambiguity that can be associated with input that is spoken.

Computer Architecture, Data, Communication and Applications: The need for different types of software systems and their attributes: Internet and Intranet: Discuss the possible effects of the internet upon professional groups and the wider community.



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