

Article 1:

Using Design Fiction to teach new and emerging technologies

Introduction

The introduction of new and emerging technologies in the National Curriculum and GCSE specifications may have filled some with dread and left you wondering 'how do I teach this?'. Instead of the fall-back position of a theory lesson, in this article we explore how design fiction could be the answer.

This is the first of two articles about using design fiction to teach new and emerging technologies. In this first article, I explain what design fiction is, give examples of how it has been used and a guide for using it. The second article is written with Natalie Cooke, an NQT, who has used design fiction in her lessons to teach year 9 students about robotics and artificial intelligence.

Another theory lesson?

Often, theory lessons are when students learn about materials and technologies. The lessons are usually de-coupled from a design context because the (understandable) focus is on students learning and retaining the facts so they can pass their exams. But, we know this is not the only (or best) way students learn and we know that in D&T students learn about materials and technologies so they can make informed decisions about their designs and judgements about other designers' work.

The topic of new and emerging technologies is exciting, current and introduces students to new ideas they haven't considered before. It would be too easy to teach this topic as a theory lesson, only passing on information, another approach is to use debates to explore the ethical and economic implications of, say, autonomous vehicles and robotics.

Teaching students about new and emerging technologies doesn't have to become another de-contextualised theory lesson; by using design fiction, teachers can contextualise the facts about how new and emerging technologies might feature in a future world which the students can visualise and understand. It involves them designing without the limitations of making a functioning product, as well as talking about the ethics and implications of new technologies. But first – what is design fiction?

What is Design Fiction?

Each time we design, we create objects or systems which are part of a story. A story with our new idea at its centre, a storyline that explains how our idea is used, how it improves people's lives and opens up new possibilities. We create a new world, a previously unimagined possibility. In design fiction, the story becomes part of the designing process.

The term 'design fiction' was first used by Julian Bleeker, from the Near Future Laboratory, and Bruce Sterling, a science fiction writer. Sterling's view is that design fiction is 'an

approach to design that speculates about new ideas through prototyping and storytelling'. The most common definition of design fiction also comes from Sterling:

'Design fiction is the deliberate use of diegetic prototypes to suspend disbelief about change.'

Diegesis is a term from film studies referring to 'things which are inside the fiction world'. In the TV series *Black Mirror* and film *Minority Report* diegetic artefacts are used to explore the potential and unanticipated consequences of new and emerging technologies, and could be viewed as 'design fiction'. Diegetic prototypes only exist in the created story world but in that world they exist as fully functioning products.

Before moving on, it's important to note two key points about design fiction. First, it is NOT science fiction. And the designs are realised as prototypes not fully functioning saleable products.

So, what's the difference between design fiction and science fiction? Starting with the similarities – they are both fiction, they are both imagined narratives. But whereas science fiction is more speculative and about futuristic scenarios, design fiction is set in a context that is a known reality – a 'near future'. This reality could be a problem we know about today, an emerging need or a developing technology. For example, a current problem in the news is our over-reliance on plastic, an emerging (and pressing) need how we will look after our aging population and we are beginning to see the potential of artificial intelligence. These three realities are all known, we can research them and use them to create new designs. This is where design fiction is different to science fiction – the reality is known and can be established. But design fiction is not about solving the problem instead it is used to explore the problem.

Often in D&T, children's creativity can be inhibited by the focus on the commercial aspect of their design ideas, considering who will use their product, its saleability and feasibility. But one of the key values of D&T is that it allows children to explore possibilities, to speculate and debate the rationale for a new design. Design fiction explicitly requires the commercial aspect to be put to one side and the agenda to be on investigating the process. James Auger and Jimmy Loizeau, two designers using design fiction, argue it 'is a tool for questioning rather than problem solving' and allows designers to 'comment on consumer culture; the role of products in shaping human behaviour and experience and the role of technology'.

In design fiction, the prototype is central to the story's narrative; in other words, without the design the story does not make sense. It is a method to design in such a way that designers can speculate about new ideas through prototyping and storytelling, and the designer is freed from thinking about whether the design can be made or is technically possible. They can also explore the social and ethical feasibility of their idea.

James Auger and Julian Hanna outlined three essential features of good design fiction:

1. Establishing the co-ordinates of reality
2. Creating a fictional story world
3. Designing in the fictional world.

Establishing the co-ordinates of reality involves learning about, understanding and defining the design context. This is the starting point for creating design fiction, if the designers does not know about the reality they are designing for their ideas will not show a possible future but an impossible one. In using the term 'establishing co-ordinates of reality' Auger and Hanna hint at the reality being located in a position which can be recognised and understood by others, similar to map co-ordinates on OS maps. Factors informing the coordinates can be political, economic, ecological, material, behavioural, historical, and social.

Now the co-ordinates are defined, the fictional story needs to be created. What is the context we are designing for? Who are we designing for? An existing story or novel that aligns with the established reality could be used, such as Taking the existing storyline alternative stories add outcomes could be explored – 'counterfactuals' (for a fun example of using counterfactual look for Sheldon and Amy's game of counterfactuals in The Big Bang Theory). The story world is an alternative version of something we are already familiar with. Starting with a 'what if...?' question we can write a new story world in detail.

Once the reality and the story world are defined designing begins. This is when new ideas are tested out in the fictional world. The story we have created allows us to explore possible designs and test them out. When testing prototypes in the fiction world designers explore the unintended and unexpected consequences of their design. As Matthew Ward says, 'Pretend before you mess the world up'. Testing the ideas in an everyday world means we can imagine the idea in use, without the fiction world imagining life with the idea is more difficult. Because the design is created without the limitations of technical know-how or availability of materials, reality is suspended and designers can experiment fully. Designers can discern whether their ideas are culturally or socially feasible.

Using Auger and Hanna's three-point framework I believe design fiction opens new pedagogical possibilities for D&T. Opportunities for cross-curricular learning through linking with creative writing in English, ethics in RE, and learning from history (for instance, looking back at news articles that attempted to predict the future - see <http://bit.ly/2BDACFc> from the BBC as an example).

Design fiction has been used with primary-aged children but we have only come across one or two examples from secondary schools. In part 2 of this article the experiences of xxx and other alumni from Nottingham Trent University's D&T teacher education programmes will give you some ideas about how you can use design fiction to teach students about new technologies through design.

Want to know more about design fiction?

Before you amble off down the internet rabbit hole of design fiction, I recommend you look at these articles if you want to know more about design fiction:

Julian Bleecker's blogpost 'Design Fiction: A Short Essay on Design, Science, Fact and Fiction' <http://bit.ly/2JFVfXR>

Interview with Bruce Sterling <https://slate.me/2HE37Z2>

James Auger and Julian Hanna's three stages of design fiction <http://bit.ly/2z1a1Wv>

Sheldon and Amy playing counterfactuals can be found on YouTube: <http://bit.ly/2FlkMmv>

I have also written a blogpost with more links to examples of design fiction on my website:

www.alisonhardy.work