

Ethics

Engineering

Design

1701767

Surface Pattern Design BA Hons

2,718

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For my proposal for my independent inquiry I will be exploring three keywords that will be supported by three images, in synthesis with three visual artists, philosophers and theorists. Through research I will attempt to link the three keywords of *ethics*, *engineering* and *design* in order to form a question which will be for my independent inquiry. The three keywords I have chosen to look at reflect aspects explored within my own professional practice.

According to the Oxford English Dictionary *ethics* are 'Moral principles that control or influence a person's behaviour' (Oxford English Dictionary, 2020). Social influence plays a significant role in our opinions and behaviour. To put this into context, small numbers of society engage in crime because they are able to eliminate the moral and ethical consequences of their behaviour. Whereas the rest of society adhere and conform to social norms and values because they accept social ideology of what is morally acceptable and what is not (Psychologist World, 2020). To put this into context, small numbers of the population will engage in criminal activity because they believe it is acceptable to do so. The rest of society adhere and conform to social norms and values which is considered to be morally correct. However, it can be argued that crime is inevitable and is a necessary part of society as crime will keep society healthy and avoid anomie (Breathnach, 2002). Without these norms and values society would not be functional.

We are more aware than ever before the detrimental impact we are contributing to our environment, as designers we have adapted this consciousness because we know the repercussions of what will happen if we choose not to do anything about it. Our own

personal beliefs are instilled into our professional practice and this inspires a new type of designer (Sherin, 2013). This new type of designer has a moral responsibility to design in a way that will significantly reduce the harm caused to the planet. Having the knowledge of what could happen should act as a deterrent in not engaging in such harmful or throw away design. The probing of ethics is being explored within the development of weapon technologies. In *Tricky Design: The Ethics of Things* (Fisher and Gamman, 2019) the assessment of the relationship between morality and weapons are explored. When guns are used from a militaria perspective they are deemed as self-defence mechanisms and are justified because of the threat imposed on us. When guns are used to display capability to injure or kill, they act as a deterrent from the other person inflicting injury on us (Fisher, 2019). The moral consequence of the potential harm guns can cause have serious connotations.



Figure 1: *3D Printed Gun* (2018)

Gun ownership is not something that is taken lightly in the UK and firearms control is amongst the toughest in the world. Owning a gun lawfully requires a firearm certificate which grants permission to possess a firearm, to purchase one or to acquire. In the UK the firearms policy is based on two facts, one being that firearms are dangerous weapons and the second that the State has a duty to protect if someone chooses to misuse (Home Office, 2016). Mistreatment of guns causes judgements and stereotypes to be made, as well as the questioning of ethics.

Figure 1 shows a 3D printed gun which has been downloaded as a printable file accessible by the public. This makes accessibility of guns easy as they come as downloadable files which can be downloaded from the internet for free by anyone. It's founder *Cody Wilson* argues that gun culture will not go away so eliminating the secrecy and judgement associated with guns will only have positive effects (Howarth, 2018). Having such easy access to guns eliminates background checks and negligence by its user which will only lead to catastrophic events taking place. The ethical question then would be who's to blame, the people responsible for producing these files, the people or persons downloading them or the creators who have designed and sell these 3D printers. But ethics related to 3D printers are not just limited to the manufacturing of guns, they are also used in science laboratories to produce bio-printed organs (Inter Focus, 2020). This makes 3D printers fundamental for preservation and quality of life. Bioengineers have been able to replace organs with 3D printing mimicking the body's natural vascular networks, bioprinting functional organs reduces the need for organ transplants. The implications of donor organs are the lifetime of immune-suppressing medication needed to prevent organ rejection (Science Daily, 2019). This is a hurdle to overcome and a massive breakthrough in bioprinting but that does not

eliminate the serious ethical conundrum linked to 3D printers. Involvement with biomedical technology prompts the questioning of ethics as preservation of life could be viewed as acting in a way of playing God (Warmflash, 2019).

For those cultures who believe that life stands within the hands of God organ bioprinting would not be an option for them. However this new innovative technology is changing science and the potential to change the world of scientific research, this leads onto my second keyword of *Engineering* which can be defined as ‘the making and invention of things, to make something from nothing by applying problem solving principles and innovation’ (Barzowska, 2015). Preservation of life is undoubtedly important, instinctual to us and both ethically and morally relevant. But what if preservation of life wasn’t even an option nor question to us if we are designed in a way to combat the most serious of illnesses and diseases. Altering genetical engineering within DNA isn’t new as humans have been using breeding methods to modify organisms for thousands of years (National Geographic, 2020). Genetically modifying animals has been explored through the work of Rudolf Jaenisch, using mice he was able to stop the spread of cancers and neurobiological diseases in human beings. His research increased the understanding of mammalian cloning and embryonic stem cells (Warran, 2020). With this great breadth of knowledge would it be so wrong as to genetically engineer a human being.

Engineering can be defined as ‘the making and invention of things, to make something from nothing by applying problem solving principles and innovation’ (Barzowska, 2015)

Without question genetically engineering a human being would raise a lot of questions, but as society is changing and family dynamics are changing could we see genetically engineered human beings in the not so near future. As it stands the nuclear family has become a social norm in modern society and can be defined as 'a family that consists of father, mother, children, when it is thought of as a unit in society' (Oxford English Dictionary, 2020). This theory is a functionalist perspective on the family, they believe that the family is functional to society and argue that without it no individual nor society could survive without it (Murdock, 1949). This theory restricts the view that other family set ups are not normal and that new types of families are not functional to society. With these new types of families emerging many families are going through the consequences of divorce meaning they have to co-habit and become single parents. As society is becoming increasingly fragmented with the breadth of diversity we are no longer living in the modern world as orderly structures within the family are not predictable anymore (Stacey, 1977). The family is gradually becoming more and more complex. With new technologies dissolving the barrier of time and space it has accelerated the pace of life and is making it less predictable with social change meaning that family life has become very diverse. So diverse that generalisations about society can no longer be made (Parsons, 2013). Family set ups are not the only thing that is changing, how the family originates now is also changing.

Adoption and IVF are amongst the options for parents who cannot naturally conceive their own children or single parents who wish to have their own children. Many children cannot be raised by their own biological parents so adoption provides both child and parents or parent the opportunity to become a family unit. Providing that child with a secure family unit ensures a life out of fostering and care (Family Lives, 2020). However adoption is not for

everyone and some hopeful parents may choose to go down the route of IVF to have their own biological child. For those who wish to have a baby but natural conception is not possible IVF is a way of making that achievable. Steptoe and Edwards were the first scientists to pioneer the first 'test-tube baby' after the successful birth of the first baby conceived by IVF (Brian, 2013). This marked the start of a revolution in fertility treatment which also lead to gender selection. Figure 2 below shows Steptoe and Edwards with the world's first test-tube baby and amongst them is the biological mother of Louise Joy Brown.



Figure 2: Steptoe and Edwards who pioneered IVF holding the world's first test-tube baby Louise Joy Brown in 1978 (1978)

Since then new possibilities in IVF has meant that you are now able to choose the sex of their baby. However for many hopeful parents having a healthy child is the only concern for them. However, many prospective parents would prefer to choose the sex of their baby via gender selection for many different reasons. Cultural factors such as religions favouring males so this way they can prioritise and try to eliminate distinction. Also prospective

parents who are older than most may want to have control over preferred gender (Strange, 2010). Reproduction is an essential part in society and is fundamental for all living organisms.

Each reason is personal to the prospective parents but it is hard to not think about the moral and ethical implications that can be associated with gender selection. Selecting the gender for non-medical reasons may end up distorting the natural sex ratio which could cause a gender imbalance. As well as the discrimination and sexist stereotypes of women that results in devaluing of females (World Health Organisation, 2020). But the want for a child may override any thoughts of women receiving any kind of abuse for why they would want to choose the sex of their baby. Preimplantation genetic screening works along with IVF, during this process a few cells are removed from the embryo to test for genetic and chromosomal disorders which can be linked to the sex of the embryo. During this process no harm is caused as the cells are removed from the outer shell (The Fertility Centre, 2016). Understanding this process is very complex and until you are that person in that position only then can you understand the full extent of the process and for many parents IVF is only a choice when they cannot naturally conceive their own.

But is choosing the sex of your baby a step too far and how would society feel about the prospect of future generations designing their own baby. This leads onto my next keyword, *Design* which is defined as '*The general arrangement of the different parts of something that is made, such as a building, book, machine, etc.*' (Oxford English Dictionary, 2020).

Technology is advancing at an ever growing rate so if we could eliminate major health implications such as diabetes, asthma, autism and behavioural and mental disorders then

what is truly stopping us from designing babies (The Guardian, 2017). For prospective parents advances in IVF and genetic research has meant that they have more control in the type of baby they want. Author of 'Never Let Me Go', Kazuo Ishiguro described this kind of reproductive control will produce children that are superior to others and this may act as a way of creating organ donors (Ishiguro, 2005). Inevitably if this is the case then surely our ageing population will increase as a result of possible donors being out there to save the lives of those who need them.

Gene editing is believed to be inevitable in the future, giving the option to customise eye, skin and hair colour. As well as eliminating the risk of any illnesses, diseases or heredity conditions that could implicate a child. But that's when it becomes very controversial when they ask whether you would like to eliminate baldness, obesity or vision loss (Reddy, 2017). This makes gene editing more ethically challenging. Currently embryos provided by patients who are undergoing IVF are not allowed to develop beyond a 7 day period. This type of human experimentation would mean that these changes made within genetic editing would be irreversible (National Geographic, 2018). Because of this we are not aware of any potential implications this could cause both short and long term if the embryo was to live over a longer period of time.



Figure 3: *Gene editing technologies allow scientists to remove mutations from human embryos (2018)*

What we can assume about gene editing technologies is that it is a very controversial topic, figure 3 shows a foetus in someone's hands. Holding such power and control over a foetus has its pros and cons. By editing out defective genes within the embryo would result in the retainment of the healthy ones, this would increase overall life expectancy. It would reduce the chances of getting genetic disorders or diseases increasing the baby's chance of survival (Minchin, 2019). Extending the time on Earth by living longer would also improve overall quality of life. With genetic engineering, on the other hand, is it the right thing to do.

Besides its ethical objections there is also the concern about overpopulation as living longer is already proving to cause social issues, and may cause more issues further down the line. It may also have a detrimental effect on the genetic diversity within society, and choosing the child's eye, skin and hair colour may present a worry for the future (Conservative Energy Future, 2020). If there starts to become a demand for 'designer babies' if one gender is

preferred over the other and the same eye, skin and hair colour is in demand this would present a significant worry and isn't dissimilar from cloning.

The role of design is evolving as the speed of innovation is generating a competitive table of ideas across the world. Everything is designed and is one of the most powerful forces in our lives as design is inspiring, empowering and enlightening (Rawsthorn, 2018). The role of design is functionality, purposefulness, conceptual, analytical and seamless, it is no longer about how something looks. Design holds great importance but there is a lack of design, especially in healthcare which puts both patients and doctors at risk. Hospitals are in desperate need of designers to improve the way they tackle coronavirus. *Dr Sam Smith* a clinical physician stated that "We need designers at every turn, but they are infrequently consulted". The lack of well-designed cognitive and physical spaces help process the information smoothly (Fairs, 2020). Designers and engineers must merge so that the focus is not only to be functional but to consider the wider healthcare environment that it operates.

Concluding my independent inquiry proposal I have explored, explained and deconstructed how *ethics*, *engineering* and *design* all work hand in hand within the design world. For something to be functional it needs to include the consideration of *ethics*. *Ethics* hold greater importance now than ever before and so does our moral responsibility as designers. This is followed by why and how we *engineer* things, today we need to look at the bigger picture. Ideas need to be deconstructed into many different categories but primarily it's pros and cons. Theorists, Scientists and Designers throughout history have paved the way we *design* and *engineer* our ideas into reality. It is only more recently we have had to consider the moral and *ethical* consequences of what we do. Society is always pushing for

better and greater things but what if we become a product of that rather than see parts of society fail. Society doesn't have to fail to make the rest of us look good, society needs to thrive and succeed because of the way *design* is rapidly advancing. Therefore this has finally lead into the question for my independent inquiry '*What would society look like if we designed our future human race?*'.

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