Social, Cultural and Moral Influences

Designers need to take into account the impact the products they create will have on the society and culture in which they are used. There are also moral issues to consider.

Social Issues

In Design and Technology, social issues can arise when a new product has an unforeseen side effect on a group of people. This can be a good or a bad thing. For example, the rise in use of mobile phones to send text messages has increased the demand for such phones. This:

- provides employment for factory workers.
- enables people to keep in touch more easily.
- means that there is less need for people to meet each other in person.

Cultural Issues

Cultural issues can arise when a new product does not take into account the fact that a particular shape, colour or name can have very different meanings to different groups of people. Designers need to take care not to offend groups of people with different traditions and beliefs. For example, different cultures celebrate religious festivals in different ways. However, a careful choice of name, shape and colour can help promote a sense of unity between different global cultures.

Moral Issues

Moral issues occur when a new product could help someone do something that might be considered undesirable or illegal. For example, children enjoy playing with toy guns, but some people think that this encourages them to be more violent. So, designing a toy gun might raise moral issues.

Another example might be designing a bugging device that could invade someone’s privacy. This would be considered by the majority of people to be morally bad. However, designing an environmentally friendly product is generally considered to be morally good.

Written question

Spend about 10 minutes answering the following question. You will need some paper and something to write with.

i) Explain what you understand by the terms:
   a) a social design issue. (2 marks)
   b) a cultural design issue. (2 marks)
   c) a moral design issue. (2 marks)

ii) Give an example of a specific existing product design and briefly discuss the social, cultural and/or moral design issues that might have been involved. (4 marks)
What is Ergonomics?

Ergonomics is the study of people in relation to their living and working environment. Ergonomics helps designers make everyday things that:

- are the best size and shape.
- have their controls and displays in the right place.
- are easy and satisfying to use.

Ergonomics concerns both what people can do physically – how easily they can turn a handle, for example – and how their senses respond to the appearance, touch, sound, smell and taste of a product.

The Same, But Different

Creating products that worked well would be easier if everyone was the same. Unfortunately, people come in a wide range of sizes and physical capabilities, and react to different things in different ways.

Some products are aimed at a very specific market, such as a toy for a child under 3 years, which makes things a bit easier. Special products are designed for the elderly or handicapped to meet their particular requirements. Others need to be suitable for a much wider consumer group – a door is a good example of a product that has to meet the requirements of a high percentile of the population.

One solution to the problem is to provide a range of products in different sizes and/or appearances. For example, bicycles can have different frame, handlebar and wheel sizes, and come in a range of colours. In this way they become suitable for a wide range of people, from a fashion-conscious teenager to a middle-aged racing enthusiast, or even for someone with special needs.

Collecting Ergonomic Information

There are two main ways in which a designer can obtain information about the ergonomics involved in a particular product. One is to consult information that has already been documented about people’s physical and mental capabilities in undertaking specific tasks. For example, someone designing a vacuum cleaner would need to find out a lot about how users grip the handle in order to steer the machine, what weight they can comfortably carry upstairs, what height to make the handle, etc.

The other method is to consult existing statistical data about ranges of people’s physical sizes and capabilities. This is known as anthropometric data. This is discussed in more detail in the next section.

Written Question

Spend about 8 minutes answering the following question. You will need some paper and something to write with.

i) What do you understand by the term ‘ergonomics’? (2 marks)

ii) As a designer you have been asked to undertake an ergonomic evaluation of the telephone shown on the left. Identify three things you would test. (6 marks)
What is Anthropometrics?

Anthropometrics is the scientific measurement of the human body. It is concerned with gathering statistical data about the dimensions and physical capabilities of different groups of people. Designers use the data for guidance, and it saves them having to collect large amounts of measurements for themselves.

The data is not just about the overall height or width of people, but provides detailed analysis of all parts of the body, such as the size of hands and fingers. It also involves things like how far people can reach, the weight they can lift, the pressure they can exert, the extent to which the wrist can rotate, what angles of vision they have, etc.

Anthropometric data can be measured in two ways:

- static, i.e. when the body is still, e.g. sitting, standing or lying.
- dynamic, i.e. when the body is moving, e.g. twisting, stretching, pressing.

Different, But Similar

Anthropometric data is sub-divided into many different categories. For example, British males aged 20–29 years, British females aged 20–29 years, Japanese males aged 50–59 years, and so on. Sizes can vary widely according to age, gender and racial origin. Other factors such as diet, injury or disability can also have an effect.

Designing for Mr Average?

Using anthropometric data is more than just using averages of the population. The number of people who are exactly average is very small. The data is mainly used to identify the extremes of size. Generally designers aim to accommodate 90% of likely users. This means that a product can be used by all but the smallest 5% and the largest 5% of the target market.

Anthropometric data is usually published in table form, showing the measurements for different sexes, ages and races at the 50th percentile (i.e. the ‘average’), and the 5th and 95th percentiles.

Written Question

Spend about 9 minutes answering the following question. You will need some paper and something to write with.

i) What do you understand by the term ‘anthropometric data’? (2 marks)

ii) What are the three main ways in which anthropometric data is usually classified? (3 marks)

iii) You have been asked to design a toy for a 3- to 6-year-old to be sold only in the UK. The brief states that it must include a simple wind-up mechanism. Identify two items of anthropometric data that would be helpful to know when choosing the wind-up mechanism. (4 marks)

A Calculated Decision

For example, a design team needed to determine the best height for a push button on a calculator, after it had been pressed. They wanted to reduce the amount of surface scratching caused by long fingernails. Measurements of the right forefinger nail lengths of a wide variety of the population were taken to the nearest 0.5mm.

The results revealed that the push button would need to be 4mm above the surface to avoid all scratching. However, only 5% of people had a nail length of more than 3mm, so 3mm was used as an acceptable height.
Consumer Choice and Right

Any Colour You Like!
Different people like and want different things. Exactly what we buy is often determined by our age, social status and cultural background. Not so long ago there was very little choice of products in the shops – one style or colour or brand had to do for everyone. Today, however, manufacturers produce a much wider range of goods so we can choose much more closely the product that does exactly what we want it to, and looks the way that closely reflects our taste and individual lifestyle.

Finding Out What’s Wanted
To discover exactly what people want, extensive market research is carried out. Surveys are undertaken to discover consumers’ habits, attitudes and aspirations. A common method of obtaining such information is a questionnaire, targeted at a particular market that the manufacturer is interested in – there’s not much point asking a senior citizen about their favourite computer game, or a teenager about pension plans.

Data from such questionnaires can be recorded on a computer database and analysed in sophisticated ways. Understanding patterns of purchase can be very useful – for example, if someone buys a certain type of car, they are also likely to be interested in a particular holiday location.

Designers need to ensure that the features, shapes, sizes, materials, colour, etc. of their products will specifically appeal to the consumer market it is aimed at.

Consumer Rights
Manufacturers have a moral responsibility to ensure that the products they sell are fit for their purpose, i.e. they do what they claim to do, and continue to do so. They must also be safe to use. A child’s toy should not be so fragile that it breaks almost immediately, or contain parts that could be dangerous. There are extensive safety regulations and standards that designers and manufacturers must legally comply with, such as those produced by the British Standards Institute.

Read the Instructions First!
Providing the consumer with appropriate information about the product is also important, such as what it’s made from, what it is or is not intended to do, whether it’s suitable for young children, etc. Again, there are a range of British Standards to refer to for guidance. Packaging and labels are used to communicate this information.

Satisfaction Guaranteed?
The consumer needs clear instructions about what to do if a product is found to be faulty in some way. Manufacturers have a legal and moral obligation to refund payment, repair or replace a product that does not perform as stated.

Written Question
Spend about 9 minutes answering the following question. You will need some paper and something to write with.

On the right are three portable music devices. They are each aimed at different target consumer markets. For each of the three devices, give an explanation of which market it is aimed at and how it achieves it.  (9 marks)
Green Technology

Making products uses up the earth’s resources and can cause environmental damage. Waste materials need to be disposed of carefully. Designers, manufacturers and consumers have a moral responsibility to ensure the damage to natural resources is kept to a minimum. Environmental design issues are concerned with the impact a new product has on nature and how nature’s resources are used.

A product may be made with a high proportion of materials that cannot be replaced, or using chemicals that pollute the atmosphere. This can also be harmful to wildlife and cause changes to weather patterns and the land. Some production processes use high levels of non-renewable energy.

Wood

Paper and wood are made from trees. In many parts of the world forests are being destroyed. This is known as deforestation. A high percentage of paper and wood can be used again if recycled, reducing the number of trees that need to be cut down. It is also important to ensure new trees are grown to replace the ones cut down. In general terms wood is a very environmentally friendly material, as it can be replaced comparatively easily and quickly if managed properly.

Plastics and Metal

Plastics are made from oil and metals are mined from the earth. There are only limited supplies of oil and metal. Converting metal ore into usable material consumes large amounts of energy. The amounts of plastic and metal used in a product need to be reduced to the minimum. Some plastics and most metals can be recycled.

Find a Bin to Put It In

A product may also be difficult to dispose of when it has been finished with. This can cause further environmental problems. An aluminium can takes up to 100 years to decompose. A plastic product can take much longer.

The 3 Rs

When designing products it’s important to remember the 3 Rs: Reduce, Recycle and Reuse. The 3 Rs provide guidance on how to minimise the damage done to the environment by a product.

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<thead>
<tr>
<th>Reduce</th>
<th>Recycle</th>
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<tr>
<td>Use the least amounts of materials and energy in making a product.</td>
<td>Use recycled materials and/or materials that can be recycled after use (e.g. untreated papers, glass). Recycled materials are those which can be used again in new products. This usually involves separating the materials into different types and then cleaning and re-preparing them.</td>
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Rewritten Question

Spend about 6 minutes answering the following question. You will need some paper and something to write with.

On the right is a photograph of a torch. Explain how a designer might have applied the 3 Rs (Reduce, Recycle and Reuse) during the development and manufacture of this product. (6 marks)

Disadvantages

While these approaches help save the environment, they can bring disadvantages in terms of increased costs of materials, manufacturing and recycling processes, and may result in products being produced that may not perform as well as required. However, the most successful designs manage to combine environmental friendliness with low-cost, quality production.