

FACTFILE: GCE TECHNOLOGY & DESIGN

1.30 INFLUENCES ON PRODUCT DESIGN



Influences on Product Design

Learning outcomes

Students should be able to:

- Demonstrate knowledge and understanding of:
 - changes in fashion (miniaturisation, portability, flexibility);
 - cultural and social changes; and
 - scientific advances

Course content

Changes in fashion

Designers must be well informed, not only with current and future applications of technology, but with what has gone before. As a designer you cannot afford to design in a vacuum without external stimulus.

All the objects surrounding us have been designed – this is something intrinsic to our society. A well-designed product is not only characterized by its great practical utility; it also has to convey something more, in order to be attractive and to distinguish itself from the competition. A product's design has to take into account technological innovations, economic conditions, society's changing priorities and the latest developments in art and architecture. All these factors influence design and give rise to constant changes.



Product design as we understand it today is often traced to the birth of mechanized production during the Industrial Revolution. Before this, objects were made through craft production, where conception and realization were usually undertaken by an individual creator. The advent of industrial processes and the division of labour separated design from making. At the same time, design enjoyed no special status among the many interrelated aspects of mechanized manufacture. It was only through design reformers, such as William Morris, that it acquired theoretical and philosophical dimensions. As a result, the late nineteenth and early twentieth centuries witnessed an extraordinary flowering of design idealism in Europe from the Arts and Crafts Movement to Art Nouveau and the Jugendstil. The unification of design theory with industrial production came soon after, through the efforts of, among others, Walter Gropius.



Gropius founded the Bauhaus in 1919 in an attempt to both reconcile social idealism with commercial reality and to support the emerging industrial and technological culture. The principles were further developed by the New Bauhaus in Chicago – later named the Institute of Design. The influential fusion of design and industrial civilisation that they promoted became known as the Modern Movement of the International Style. However, by the 1960s the functionalism of the modern movement was being criticised leading to Pop Design and Post-modernism.

Mass production in the 20th century has ensured that good design is available and affordable to millions. The designer has achieved celebrity status formerly associated with fine artists. Charles Rennie Mackintosh, Eileen Gray, Le Corbusier, Philippe Starck – these are some of the names that epitomize 20th century and new millennium design. Their creations, originally intended as functional objects, have become desirable accessories and icons of style, and are now celebrated as works of art in their own right.



The connection between form and function has been one of the most controversial issues in the history of design. When products were first mass produced in Victorian times they were highly decorated to look like hand-made products, whether their decoration was appropriate or not. The development of 'reform' groups such as the Arts and Crafts movement gradually brought about change in the concept of design. The form of products was to be simplified and the products well made from suitable materials. At the turn of the 20th century, developments in materials and technology enabled the production of innovative new products such as the telephone. Many of these products were so innovative that there was no benchmark on which to base their designs.

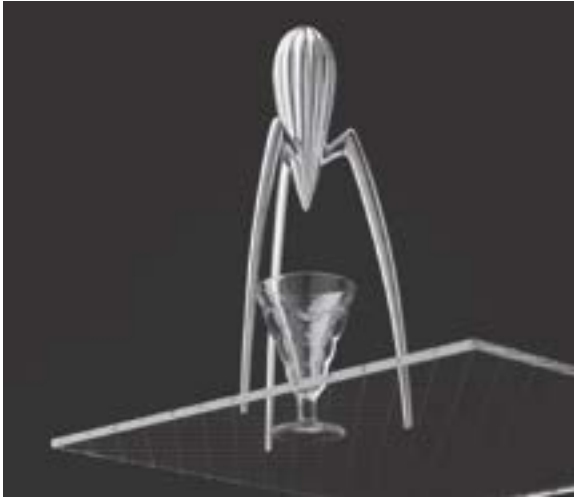


The development of mass production techniques required that products be standardised, simple and easy to produce. The modernist movement, which supported functionalism, suggested that the form of a product must suit its function and not include any excessive or unnecessary decoration. Therefore, for a product to be mass produced at a profit, it needed to be simple and easy to produce.

For many consumers nowadays, design has become an important means of self-expression. Consumers choose products not just for what they do, but for what they tell the world about their lifestyle choices. Many products are no longer simple, functional artefacts. For example, the purchase of a pair of trainers takes into account many factors such as how comfortable they are but the overriding reason for buying them may be their appearance and branding. Product performance and reliability are no longer real issues for the consumer as most products carry guarantees and are subject to rigorous QA procedures. The main reason for choosing one product from another with similar functions is its aesthetic qualities.

One of the roles of the designer then is to provide

the product with the right style or image for a particular target market group. Get this wrong and the product will not sell; get it right then it will become an object of desire for aspiring consumers.



Now that so many products are mass produced and sold in their millions, the designer must inject a sense of individuality or personality into an object. For example the Italian design company Alessi is famous for its playful design of affordable objects and appliances for the kitchen, using bright and colourful polymers and stainless steel to create contemporary and humorous products.

Miniaturisation

Miniaturisation has affected the design and development of many products including medical devices e.g. pace makers, telephones and computers. The demand for smaller products has been driven by many things including; research and development, technological advancements, consumer demand, cost and competition.

Portability

Portability is another factor which has influenced the development of many products. Technological advancements have allowed designers to consider



portability as a design feature in their concepts. The development of mobile technology such as the iPod, mobile phone and iPad have revolutionised our way of life.

Flexibility

Flexibility in the design of products is important because it allows for changes and improvements



to be made to a product at any stage during the design process. The changes made to the product



may be made because of changes in, amongst others fashion, technology and consumer demand. A designs ability to be redesigned so flexibility can lead to savings and improved design offerings.

Cultural and Social Changes

Design and technology have improved the lives of millions of people world-wide. The changes brought about by developments in technology, however,

have resulted in far-reaching social consequences. The invention of the steam engine by James Wyatt in 1765 marked the beginning of the 'industrial revolution', which fundamentally changed life world-wide. Industrialisation and specialisation led to changes in production, the workforce,



transportation and infrastructure. Many new fields of design were needed to accommodate this and the professional designer came into being. Population explosions occurred in towns and cities where production was centred and a new urban way of life was created. More people needed more products and mass production responded to this need. Expensive and time-consuming crafted work could now be replaced by machine work. Products once exclusively for the rich could now be made at an affordable price for ordinary working people. The modern mass-consumer society is a feature of the affluent developed world where people's wants are satisfied by a continual stream of new products. It is also referred to as a 'throw away' culture with an increasing demand for convenience products such as fast food and over-packaged goods.

Mass consumerism, as we know it, developed during the 1930s out of popular culture, lifestyle and fashion. This was a time when international commerce and transportation systems developed and, with them, new opportunities for product design such as luxury ships, aeroplanes, hotels, theatres and department stores designed in an Art deco



style. Innovative new products and materials were introduced, especially in electrical consumer goods such as radios, refrigerators and washing machines. As people's standard of living improved, their demand for new products increased. Advertising and marketing became an important new industry, using market research, packaging and product styling to sell new products. The design of aesthetically pleasing products, most notably 'streamlining' became an important marketing tool.

After the Second World War (1939-1945), for many, there was a period of hardship and very few luxuries as countries struggled to recover. By the mid-1950s, however, a new consumer society was developing. It started primarily in America and soon spread to Europe – the teenager was born. Up until this point young men and women wore the same type of clothes as their parents and listened to the same type of music. The advent of Rock 'n' Roll was to change this and soon teenagers were rebelling against their parents' values and began carving out a style of their own. Design evolved rapidly to meet the expanding needs of the teenage market, incorporating high fashion and consumer goods such as portable radios for the beach and cars, motorbikes and scooters for the increasingly mobile and independent youth culture.



Built-in obsolescence is a method of stimulating consumer demand by designing products that wear out or become unfashionable after a short period of time. First proposed by an engineer working for General Electric in the 1930s, built-in obsolescence had been embraced by a range of industries, particularly in the American motor and domestic appliance sectors by the 1950s.



Scientific Advances

In the 20th century, developments in materials and manufacturing technologies, together with changes in lifestyle, revolutionised product design. New materials such as metal alloys, polymers and composites enabled new ways of designing and manufacturing. In particular, the development of digital computers in the 1940s and the silicon chip in the 1960s enabled relatively inexpensive portable computer technology, which transformed modern industrial society.

The most important technological development



in recent years has been in the field of microelectronics. Not only have products reduced in size through technological advances but multi-functional products have become possible. For example, the mobile phone has reduced in size considerably from models first introduced in the 1980s, when most were too large to be carried in a jacket pocket so they were typically installed in vehicles as car phones. The miniaturisation of mobile phones has been possible due to three key



developments.

- Advanced integrated circuits (ICs) or microprocessors that allow more circuitry to be included on each microchip, increasing functionality and power.

- Advanced battery technology including Lithium-Ion rechargeable batteries, providing a lightweight means of storing a lot of energy resulting in smaller and thinner fuel cells.
- Advanced liquid crystal displays (LCDs) enabling colour screens that are brighter and require much smaller current, meaning greater energy efficiency and slimmer housings.

The widespread use of these technologies has also led to advances in manufacturing that have reduced unit costs considerably, enabling low-cost electronic products. The mobile phone is now multi-functional. It is now much more than a telephone. Communication, entertainment and computing services are converging within the same device, offering substantial choice to consumers. Mobile phones often have features beyond sending text messages and making voice calls. Product convergence has enabled Bluetooth connectivity, Internet access, built-in cameras, camcorders, games and MP3 players to be included on a single device.



The continued development of smart materials has seen them being applied to a whole range of innovative products and systems where their ability to respond to changes and return to their original state is a real advantage. Some smart materials are:

- Smart glass – used to change light transmission properties of windows or skylights when a voltage is applied i.e. changes opacity from transparent to translucent.
- Shape memory alloys (SMAs) – Used in spectacle frames as the crystal structure of this advanced composite, once deformed, can regain or remember its original shape.

Smart fluid/oils/grease – Used in a car's suspension system to dampen the ride depending upon road conditions, e.g. second generation Audi TT. The fluid contains metallic elements that alter the viscosity of the fluid when a magnetic field is applied.

? Revision Questions

1 Scientific advances and changes in fashion can have an influence on the design of products. With reference to a product of your choice, describe one main scientific advancement and one main change in fashion and explain how each of these changes have influenced the design of the product.

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2 Cultural and social changes can have an influence on the design of products. With reference to the car, outline one main cultural change and one main social change and explain how these changes have influenced the design of the car.

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3 ABS and polystyrene are used in a range of products.
a) Give **two** main characteristics of ABS which make it suitable for certain parts of children's toys.
b) Give **two** main characteristics of polystyrene which it suitable for cups in vending machines or yoghurts pots.

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