

## 2.1a Design innovation and influences

- *Interrelationship of materials, components and performance*

Manufactured products involve multiple materials, components parts, processes and techniques. Designers need to discriminate between each of them, select appropriately for use in order to improve, refine and realise a design. The success of a product depends on it.

- *The process of innovation*

Innovation is about introducing new and useful ideas or products to the market place that are relevant and add value. Innovation also refers to the use of materials in a new way or can be applied to new process such as 3D printing.

- *Collaborative and commercial approaches*

Collaborative design strengthens design integrity by bringing together ideas from people who play different roles within a team as well as relying on feedback from user experiences.

- *Inversion*

A design strategy for turning a problem around and approaching it from a different perspective. It could also mean considering what else a product might do.

- *Morphological analysis*

Morphological analysis explores all possible solutions to a problem or new idea. Problems can be split into partial problems and solutions found for each of those. In this way any problem is thoroughly investigated.

- *Analogy and lateral thinking*

Analogy refers to applying a known solution to a similar problem in order to solve the new problem. Lateral thinking refers to problem solving by taking an entirely new approach that is not immediately obvious.

- *Reverse engineering*

This is deconstructing a product or device to see how it functions and the processes used to construct it. This is a design strategy that allows designers and manufacturers to closely examine all aspects of a competitor product or for manufacturers to improve on an existing product.

- *Historical influences*

Influential designers or design movements make a significant contribution to product design and in fashion and textiles.

Bauhaus is one movement where many design classics originated for example, the Barcelona chair by Mies van der Rohe. Tutors and students from Bauhaus were influenced by the following design principles:

- ◆ Form follows function
- ◆ Everyday objects for everyday people
- ◆ Products for a machine age
- ◆ Geometrically pure forms

Other design movements include Post Modernism, The Memphis Group, Art Nouveau, Art Deco, Pop Art and minimalism.

Fashion designer Vivienne Westwood is known for the influence fashion history has on her work. Her reinvention of the corset was a direct result of this.

- *Technological developments*

Development in technology in recent years is unprecedented and has influenced all aspects of product and fashion design from 3D printing, wearable technologies to the internet of things.

Nano-technology has reduced the size of many technological components. Batteries, for example, have reduced in size but are no less powerful. Conductive fibres can be seamlessly woven into fabric.

- *Product analysis*

A useful design tool to analyse and learn from a competitor product. Factors to consider include: form, function, style, materials and components, construction, quality, performance characteristics, environmental factors – overall strengths and weaknesses.

- *Performance modelling*

A prototype is a model of a new design proposal. It could be a functioning model or a concept model that is finished to a level that fully resembles the finished product.

In fashion and textiles, a performance model would resemble the finished product so that wearer or user trials could take place.

- *Virtual modelling*

3D models of products or components can be modelled using specialist software. Products can be viewed from different angles before manufacture saving time and costs.

In fashion, 3D simulations of catwalk shows are possible. Products can be viewed from different angles and helps to visualise what they would look like on a person.

- *Rapid prototyping*

3D CAD drawings can be transferred to a printer that will make a 3D prototype model of the design. This is also known as additive manufacture as several layers are 'printed' to build up the 3D model. These models can be life size and can be fully tested for functionality, performance and form.

- *New technology and design needs*

Developments in new materials and fabric owe much to new technology such as smart or technical materials. Examples include: carbon fibre, micro-encapsulated fabrics, Kevlar, shape memory alloys and electroluminescent materials.