1.16 Use of different Design Strategies

Methods to over come Design Fixation

Design fixation can be described as getting stuck on an idea; regurgitating old ideas; the inability to make creative leaps or to innovate; being blinded to alternative ideas. This could be a result of:
- Exposure to prior solutions
- Self-doubt and the assumption that early ideas are better
- Limited budgets can restrict research and development
- Fear of failure/culture of blame make it hard to take risks
- Pushy clients can restrict the creative process

↓ **Covered in topic 1.7** ↓

Systems Thinking:
Is used by designers to solve complex problems and find solutions. It looks at a whole system or product and how each part or stage contributes and feeds back into the system. The systems approach breaks a problem down into a series of actions. **Flowcharts** are used to describe systems - different symbols are used to signify **inputs, processes** and **outputs.** The overall design process can also be broken down into more manageable sub-systems.

In products or designs that involve quantitative data or a definite flow of information a systems approach is used to outline the most efficient steps within a process. *Example:* a troubleshooting guide for a mobile phone.

Use systems thinking by:
- Breaking down the use of the product or system into simple stages
- Considering the different options available at each of the stages.
- Asking your user to describe the stages they would go through when using a particular product or system.

Collaboration:
It is rare for only one person to be responsible for the whole design process when creating products. Working with others enables discussion and a greater flow of ideas. Students are likely to collaborate with each other, with their teachers and with other manufacturers in the development of their own products.

The speed of working within a team can vary enormously; sometimes production is faster, at other times teams can slow down progress. Team members may not all agree, some may find it difficult to be subjective about others' ideas. Time zones and distance working may also be possible, but can add complications too.

User centred design:
Revolves around putting your user's needs at the centre of every decision. Students are likely to have a real 'user' in mind when developing their own project ideas to fulfil the brief.

Designers will need to employ strategies to understand the users' ideas and needs (questionnaires or prototypes). Designers may also need to consider the environment in which the client will use the product, the type of person who will use it and whether it can be used by people with disabilities. *Example:* web design companies use this approach for creating websites, apps and programs. By gathering feedback designers can understand if the users can follow the different steps in completing a process or can locate an icon.

Focusing on the user can be achieved by:
- Having your user requirements as a starting point for your designs.
- Asking your user to draw out some ideas or create a simple model.
- Modelling your ideas in 3D to gain user feedback to aid development (prototypes).
- Using **Anthropometric data** from your user to influence your design ideas.

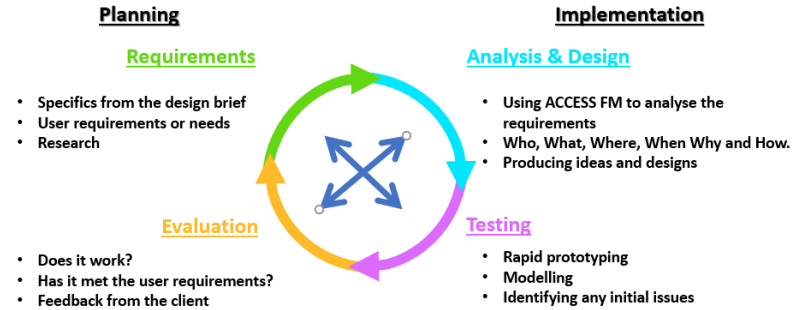**Anthropometric Data:** measurements of the human body.

Evaluation:
Evaluating a piece of work enables a designer to see what can be improved. Evaluation is a continual process of improvement. Feedback and evaluation can also be a useful strategy for avoiding design fixation. The final product should be measured against the original design brief to ensure that it fulfils every requirement stated by the client and that the detail of the manufacturing specification has been met.

Iterative Design: iterative cycle enables the designer to refine their work in progress. Designers are encouraged to try things, make mistakes, improve on their designs, test and repeat until they have fulfilled all of the design objectives set out in the brief, so that the end product or prototype is as good as it can be within the time available. At the end of the process, the whole cycle starts again as the final product is reviewed and evaluated with the intention that a second edition, or new version may be created.

Example: Sir James Dyson is a firm believer in using failure to drive success. His first Dual Cyclone cleaner that hit shelves in 1993 took fifteen years and 5,127 iterations

Planning

Requirements
- Specifics from the design brief
- User requirements or needs
- Research

Implementation

Analysis & Design
- Using ACCESS FM to analyse the requirements
- Who, What, Where, When Why and How.
- Producing ideas and designs

Evaluation
- Does it work?
- Has it met the user requirements?
- Feedback from the client

Testing
- Rapid prototyping
- Modelling
- Identifying any initial issues

Scamper:

Is a technique that is used to generate ideas quickly using different steps.
The stages are:
Substitute – could you consider different materials or components?
**Combine** – could you take successful parts from other ideas to form a new idea?
Adapt - could you incorporate a different function or make use of a different technology?
Modify – could you change the aesthetics, shrink or expand it?
Purpose – could your design have a second or third function?
Eliminate – could you take away part of your design? Have you over thought it?
Reverse – could you look at your design completely differently, think about it inside out/upside down, could you move parts around?

Substitute   Combine   Adapt   Modify   Purpose   Eliminate   Reverse
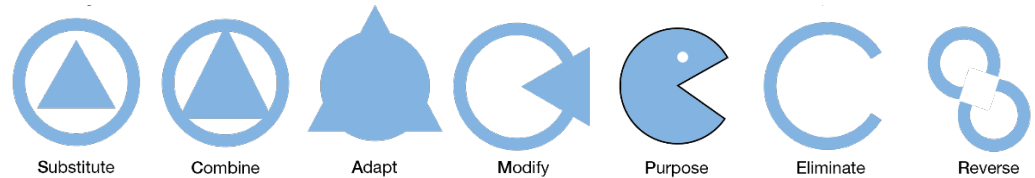
Testing:

Destructive testing involves testing a prototype to breaking point. This can be expensive and time-consuming but give valuable data on how to improve the product, particularly in terms of safety.

Non-destructive tests use a variety of different methods to test for faults without destroying or damaging a prototype/product. Non-destructive testing methods include visual tests with the naked eye or microscope can spot surface defects while x-rays, ultrasound, electro-magnetic tests help to identify flaws in the material below the surface.

Market testing is integral to user centred design as user needs and preferences are placed at the forefront of the creative process

A consumer group may be employed to test out a new product or design. They may test parts and components for size and fit, the quality of manufacture and finish, and the function – does it do what it's meant to do? They will also consider the aesthetics – will people like it? Does it look appealing?