



EXPERIMENTAL MODULES IN DESIGN

(POSTER PRESENTATION)

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Abstract: *It is a big challenge for students who study design mainly from the industrial part of it, to develop a specific approach in design methods. After their first year's basic studies of organic objects of nature they research different kind of structures of which one can build up new objects either for exterior or interior space.*

The starting points are small modules from various materials (paper, leather, plastic, textile etc.), and students have to find out the most suitable connections to produce a new form. We analyse the structures, the variability, strength and flexibility of these module architectures and the conclusions give solutions for further haphazard functions.

The start and the final outcome of this design process are uncertain. The end-product will perform the intended creativity as well as the conscious thinking of the student.

The result of such experimental work is that the developing and understanding is significantly easier compared to standard object-oriented design tasks.

Keywords: *design, module, structure*

1 INTRODUCTION

1.1 The aim of the research work

To learn the different features of the different materials through linking them into various module structures so as to expertise a new way of design thinking. On the other hand these projects highlight the importance of environmental consciousness as we give an alternative way for reusing or recycling the environmentally dangerous materials.

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The starting points are small modules from various materials (paper, leather, plastic, textile etc.), and students have to find out the most suitable connections to produce a new form.

Through experimental analyses we examine:

- laws of sequencing,
- linking between individual components,
- the quality of the building units' materials,
- the structures' stability,
- the variability,
- possibilities of expansion,
- strength and flexibility of these module architectures.

The conclusions give solutions for further haphazard functions.

Modularity in this case is a three dimensional systems concept defined as a continually buildable structure to which a system's components may be separated and recombined. In architecture and



interior design modularity refers to the construction of an object by joining together standardized units to form larger compositions.



Photo1. Paper modules 2009



Photo 2. Amanda Leveté: London Design Festival 2007

2 THE PROCESS OF METHOD

Our experimental work of one semester was based on three different materials: leather, paper and plastic. The global shape is formed by applying local rules.

The coupling between components depends on:

- the features of the materials of the elements used (leather, paper, plastic, metal, textile, glass etc.),
- the type and the features of the linking methods,
- the result is a tightly or loosely coupled system,
- the modules are piled up or compiled side by side or have a systemic distance among each other to form a trellis-work, any kind of geometric shape or curved surface,
- the structure will be two or three dimensional or it will have a relief effect.

Using loosely-coupled structures enables these form studies to achieve greater scope flexibility meanwhile the tightly coupled systems emphasize the strength of them.

2.1 Leather modules

The first material the students deal with is **leather**. Leather is a durable and flexible natural material as it is the skin of animals. Depending on types, tanning and finishing it gives multiple choices for using. Leathers have two sides of which only the top side gives an aesthetic view so they can only be curved, twisted or put together face to face while knotting them together.



Photo 3. Spiral and curved systems; works of students, 2010



Cutting out different organic and geometric shapes from the leftovers each student get the same amount and same colour of similar pieces. Relying on their previous study on techniques of knotting they try to link them with the help of the given leather lace. No other way of linkage is permitted. They make systematically holes in the leather pieces to interlace them into a new structure. One can immediately see if this structure is too loose and doesn't work because it collapses and doesn't stand safely on its own.



Photo 4. Different surfaces from modules; works of students, 2009



Photo 5. Forms of convex and concave modules

The best solutions are tightly linked three dimensional prototypes and can be movable which give ideas for further experiments.

2.2 Paper modules

The second material is **paper** which is a versatile material with many uses. Paper is often characterized by weight and in this work there is a great emphasis on the thickness/strength of paper. Depending on its character it can be folded, curved, gridded etc.



Photo 6. Curved stripes give different forms

Students can choose from various geometric shapes but within the given sizes. Cutted, folded and stapled forms are created out of a single sheet of paper and trimmed into different structures. Each square, triangle, circle is individually folded into other shapes. This can provide multiple choices of



forms: triangular prism shapes, geometric patterns, abundance of diagonals, such as concave view that is as equally interesting as that of its convex counterpart.

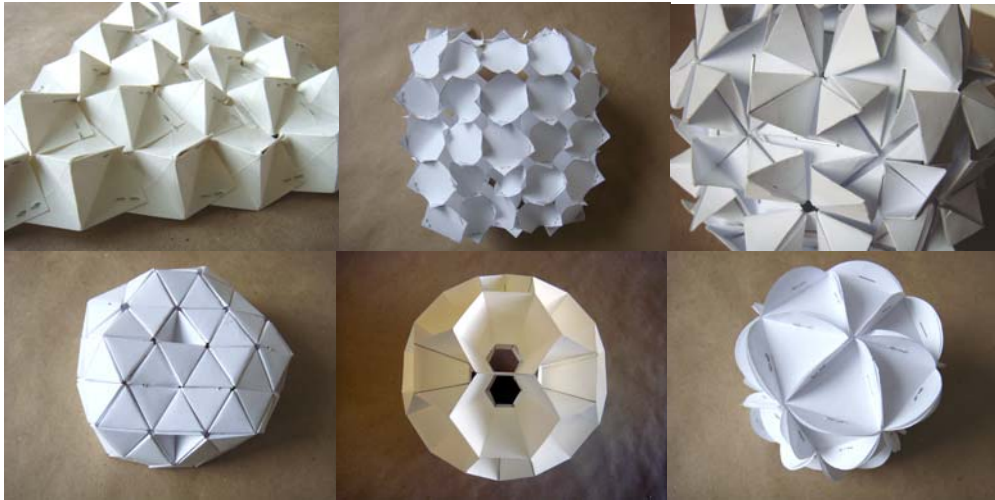


Photo 7. Folded , stapled and origami forms

It is also allowed to make maximum three cuts on the paper modules and the connections have to be buildable to all directions. This is valid for the other task of a paper stripe.

The starting point is an average A/4 format copy paper of 80 grammes. When students develop their structures they can choose other, heavier papers as well. For design a form through folding paper origami is a popular choice creating a surface as a continuous substance.

The connections can form the same systems as the leather modules, but the stripes give a unique opportunity of design. The stripes interfered as circles show a chain effect and as it can be continued one can get an endless, enlarged, loose knitted fabric effect. In this case students can examine different linkages with changing the numbers of knots.



Photo 8. The chain effects

2.3 Plastic modules

The third material used is **plastic**, namely all kind of already used pet bottles, plastic forms, cups, bins etc. Spatial units – such as a plastic bottle or even a folded paper shape – can replace planar elements which create three-dimensional structures in accordance with a sequence of rules given.



Photo 9. New form from plastic bottles

A see-through plastic bottle has an own shape which can be manipulated by cutting out similar individual pieces of it and then create a new construction of structure. One has to follow the rules of the already given shape and reuse them by twisting, cutting and fixing them to a coherent system.

Stapling is the most advanced technique for that but wires, lines and rubbers also can be used. The task is to find out an ideal sequence of the manipulated plastic pieces and to originate a new shape, a new pattern.

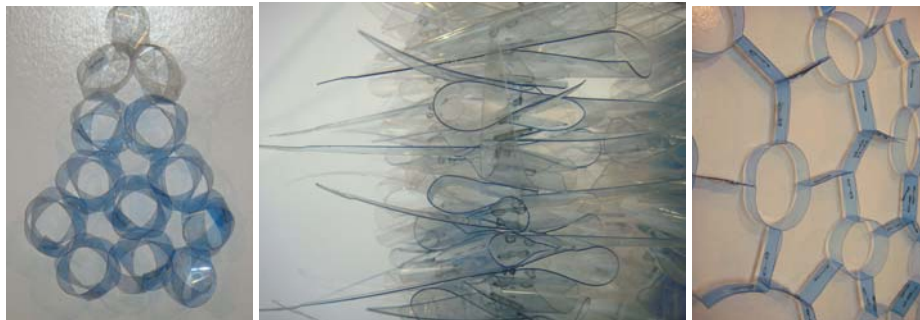


Photo 10. Form patterns from plastic modules

No colours are expected to use working with these two projects mentioned above because the sheer form and structure is very exciting and inspirational. Colours can give another meaning to the three-dimensional shapes which don't improve the original idea but perhaps show a different, unexpected image. In spite of this students often insist on this kind of complexity.

3 CONCLUSIONS

The start and the final outcome of this design process are uncertain. The end-product will perform the intended creativity as well as the conscious thinking of the student. The examples of students demonstrate that the subject of these transformations are different materials with different solutions with the help of which the external qualities and logics of operations are examined.

This is a creative form-seeking process which is a real design problem. All the experiences obtained through these manual modelling generate new ideas to their future projects. Any kind of objects for interior design, toys, or space installations from nearly all kind of materials could be developed in a similar manner.

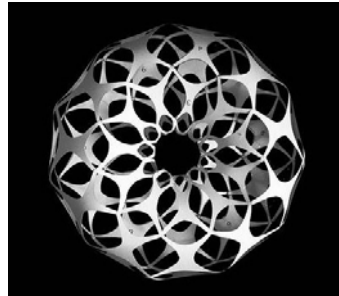


Photo 11. Module system for interior design. Liam Hopkins, Lazerian studio: Mensa coffee table, 2009

The result of such experimental work is that the developing and understanding is significantly easier compared to standard object-oriented design tasks.

4 REFERENCES

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