

# Breaking Down Barriers to Undergraduate Design Students' Creativity and their Understanding of Product Meaning

## Abstract

This paper aims to encourage educators to approach design projects using a variety of methods. Design activities are described which should appeal to students of all ages, skills and backgrounds.

The paper describes curriculum development of the industrial design and technology undergraduate programmes at Loughborough University, UK. Product design project work to introduce undergraduate students to the subject of product semantics is discussed. The design project described provides a novel pedagogical approach to introduce students to the subject of visual meaning in products. Product semantics is that area of design knowledge concerned with the visual meaning or language of products; meaning which designers attempt to imbue and users perceive primarily from the visual appearance or *look* of a product.

Successful, integrated product design is a highly complex human activity. There is so much for designers to consider during the design process, everything from ergonomics, manufacturing, aesthetics, materials, the user, the retailer, and more. The issue of creativity and innovative thinking is crucial to all aspects of the designer's work. The authors believe that student designers would benefit from techniques and approaches to help them with issues of visual creativity and the integration of such activities into the overall design process.

## Introduction

Design at Loughborough University is taught as a multi-disciplinary profession and hence students are confronted with a combination of design issues, technology, skills and knowledge to assimilate into their design activities. As part of their studies most will encounter another aspect of the design of a product; semantics – the meaning of products (also known as product semiotics). This subject (one of human values rather than black and white technology) is currently important to industrial designers and is seen as an appropriate issue for our students to address.

Visual creativity, partly the ability to tackle design problems from a purely visual standpoint, is believed to be crucial to addressing semantic issues in products.

This paper describes a series of directed student activities which aim to improve student's skills and abilities in tackling and developing meaning in products. Included in these activities is a novel mark-making exercise to stimulate visual creativity. The authors suggest that the exercises described are also useful in enhancing general creative thinking abilities in design students.

The paper reflects on the overall product design project, from the student and teaching perspective.

## Background

The Department of Design and Technology at Loughborough University has approximately 350 undergraduate students. There are two major undergraduate programmes, Industrial Design and Technology and Industrial Design and Technology with Education. The second of these is a programme for prospective design and technology school teachers, who will follow a Post Graduate Certificate in Education (PGCE) after their undergraduate studies.

Core modules throughout the programmes are concerned with the knowledge and skills of designing and making *technological products*. In the second and third years students choose optional modules. The design project described in this paper is a coursework assignment in a second year optional module called Product Analysis (Artefacts). Typically there are approximately 70 students taking this module. Those students have a mixed A' level background but most have studied design and technology or design at A' level.

The Department encourages the use of techniques such as brainstorming (Lindley 1995) to generate ideas at the start of design projects but not all students have any formal training in any such *creativity-enhancing* exercises.

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Figure 1: Descriptor words used in product semantic design exercise

Friendly	Scary	Classic
Playful	Futuristic	Functional
Industrial	Inviting	Tactile
Fun	Retro	Decorative
Sporty	Clinical	Tasteless

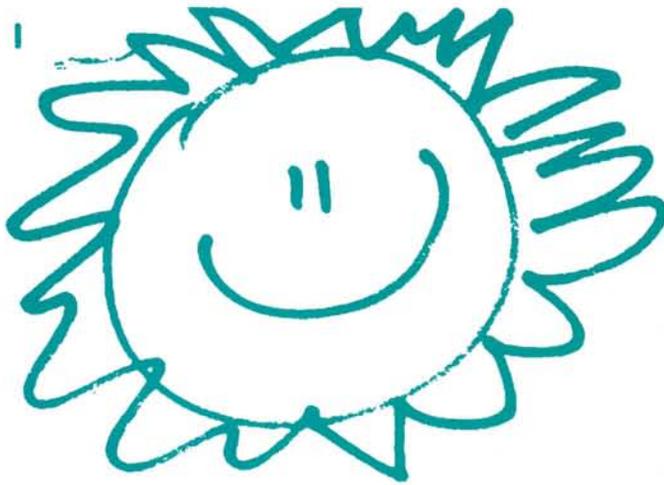
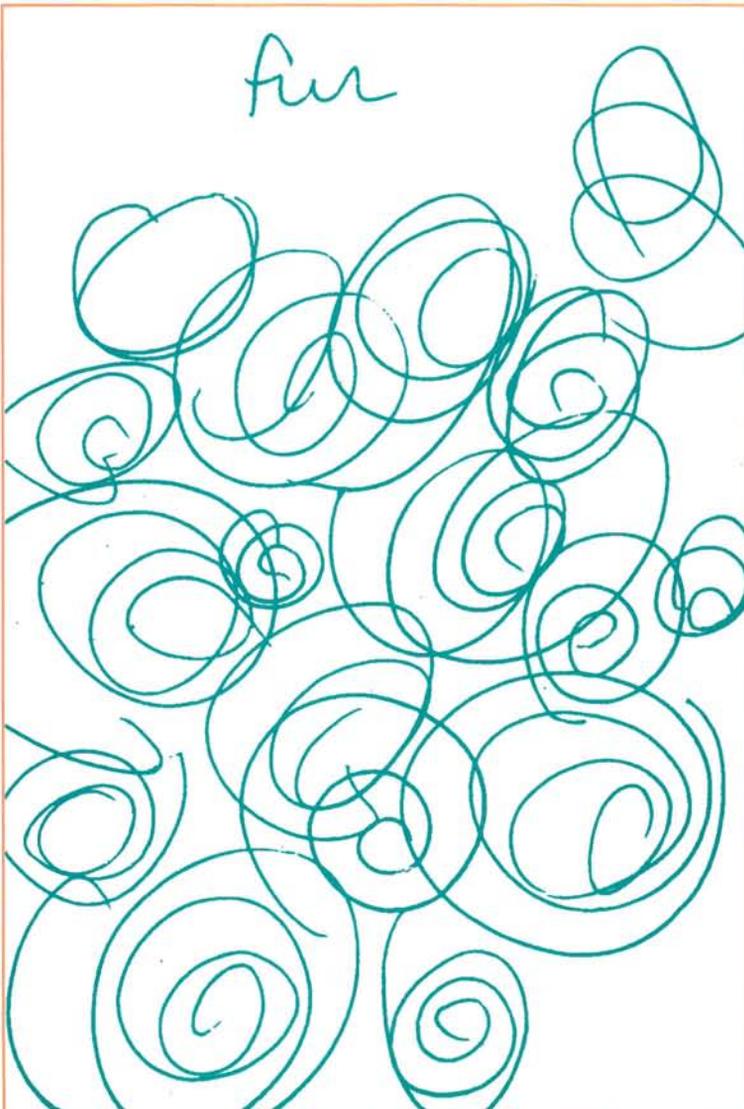


Figure 2: Student mark-making drawing ('Friendly')

Figure 3: Student mark-making drawing ('Fun')



### The Product Semantics Project Background

The term product semantics refers to the non-verbal communication of a product to the user. Designers refer to this form of communication as the product's language. It is vital that a product communicates to the user how it should be handled, how it should be used, switched on and so on. A product's shape, form, use of materials contribute to the level of communication to the user. Poor product language often leads to a poor product.

*Without the ability to be expressed in language, the meanings of designed objects cannot be shared, and ignoring the role of language in designing things may produce functional, but at the same time, socially useless devices.*

(Krippendorf 1990: 17)

The project was introduced to the students as a means of stimulating and exciting them into realising the visually creative potential of their profession. There is an aim that students realise that industrial design has a role to imbue meaning and sense into products through choice of form, colour, materials and finishes.

The assignment was a design exercise to challenge their ability to explore the semantic quality of products. Each student was given an adjective at random (Figure 1) and a mainstream consumer product (e.g. telephone, toaster, alarm clock). The challenge was to explore the semantic issues of combining the adjective with the product type (e.g. scary telephone) and to devise an appropriate concept for the product.

The student handout that formed the briefing sheet started with the following:

*As potential industrial designers you may be presented with difficult proposals for products and product concepts. The resourcefulness of the individual designer has an impact on the success or failure of each design project. As creative individuals it is important to develop problem solving skills early on as this is a major factor in product development. Problem solving often involves a degree of lateral thinking, and this design exercise will assist in encouraging each student to further develop these vital skills.*

The assignment was deliberately abstract. It was a consumer product design exercise but one quite divorced from the standard requirements of ergonomics, costs, materials etc. This was a strategic tactic by the authors to remove as many of the potential inhibitors to visual creativity as possible. The project

Figure 4: Student mark-making drawing ('Scary')

was not without structure however. The authors wanted to encourage lateral thought processes into product forms. It is important to remember that although freed from some of the constraints of typical product design there was still the requirement for a product. It was not a form of *art foundation* exercise, the outcome could not be abstract sculpture or art.

The project experience included lecture inputs on product semantics as an academic and designerly subject. These included many exemplars of products from well-known designers and companies such as Philip Stark and Alessi. These products exhibited abundant character and meaning through their form, colour, finishes and materials. These examples helped the students in their gradual understanding and realisation of the validity of the subject.

#### The mark-making exercise

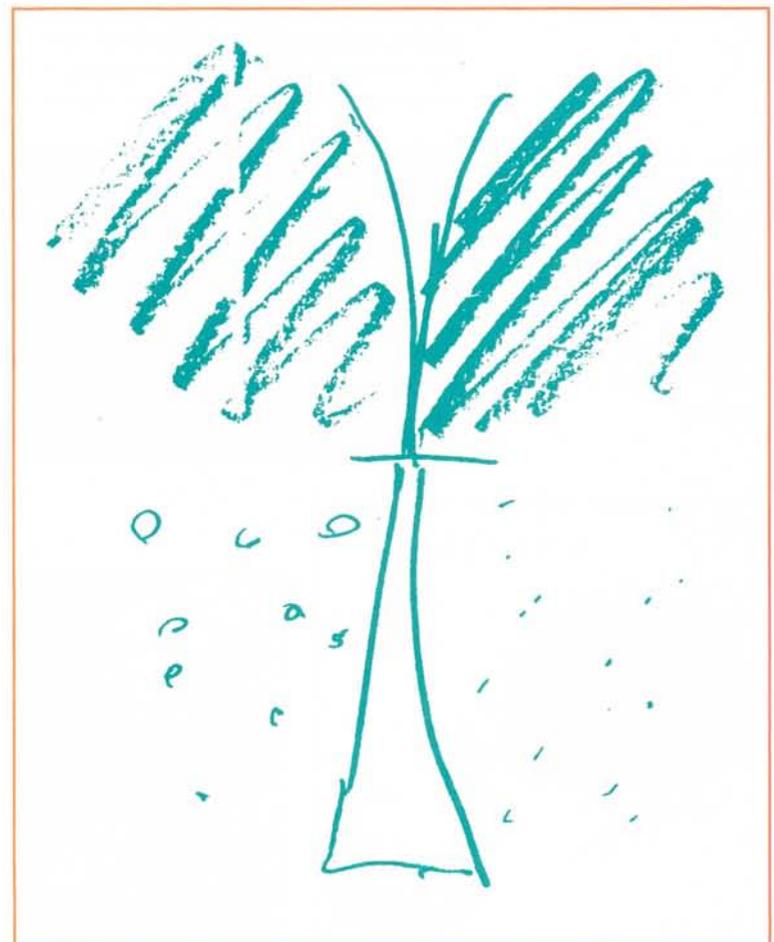
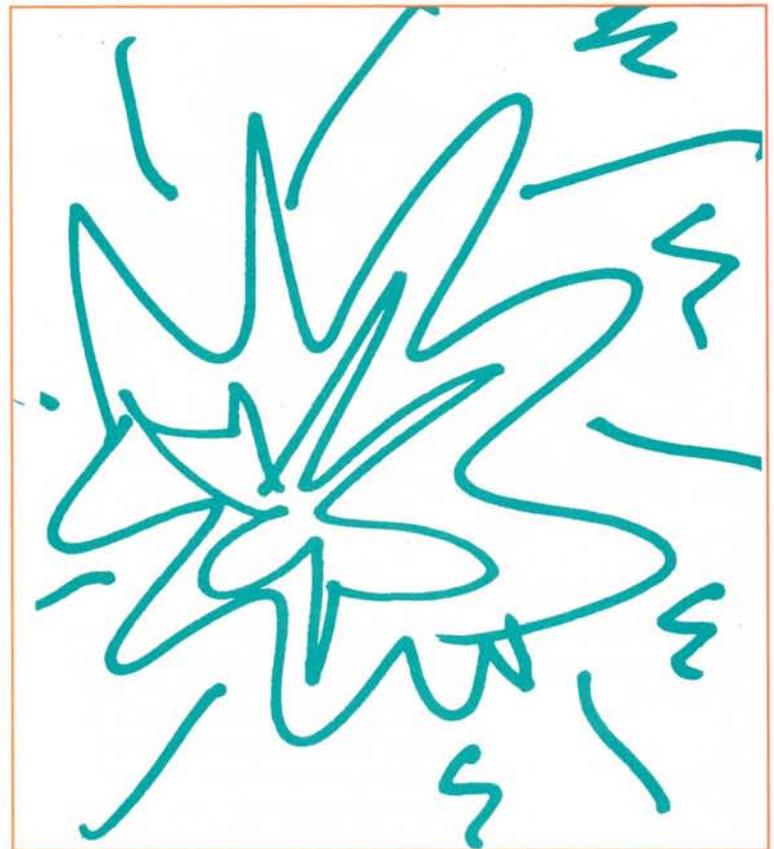
It is generally appreciated by design educators that creativity is difficult to define (Frayling 1997) and difficult to teach. Despite this, various methods have been developed and have become widely used such as brainstorming, which is one of the most common creative thinking techniques. This section describes the authors' novel approach to a form of visual brainstorming activity.

The authors view creativity as the ability of the individual to think and problem solve laterally which in itself provides the creative potential. If this activity is not harnessed by the individual or at least directed by the educator, such activity proves non-productive (Apicella 1997: 16). It is vital that design educators identify and encourage the student to become focused whilst at the same time not becoming too restricted.

Creativity has been identified as one of the most important contributions to new product development (Swift 1997: 57). Even if it is problematic to define creativity, most design educators recognise that so called creative activity is paramount during design assignments. As discussed by Evatt (1997)

"one of the best ways of doing this was through the medium of sketching and drawing. Stimulation and rapid access to the subconscious would therefore appear to be of paramount importance for the designer."

Figure 5: Student mark-making drawing ('Tactile')



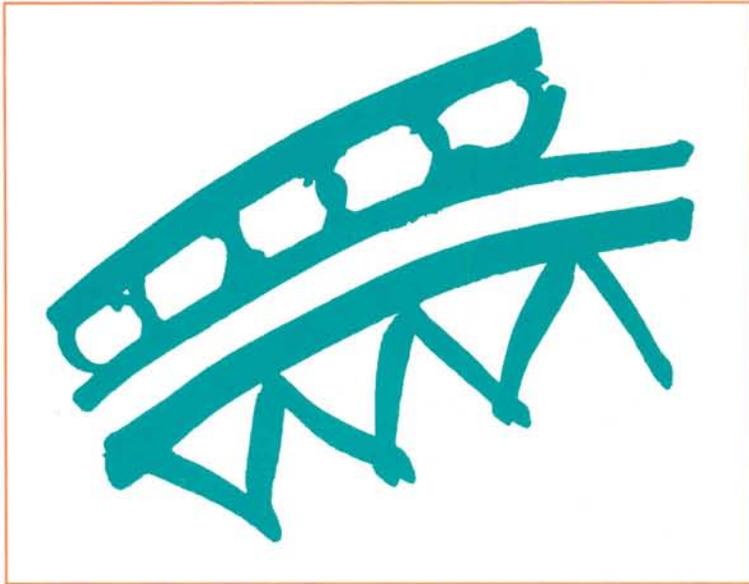


Figure 6: Student mark-making drawing ('Decorative')

This viewpoint initiated the mark-making exercise. This was a novel activity for the students. The exercise consisted of each student responding to specific words by drawing. The students were required to respond to a series of words in a non-figurative and non-textual way. They were requested to make a series of *marks* on one A3 size sheet of drawing paper, one after the other in rapid succession. This was intended to assist the *graphical loosening up* (Humphries and Law, 1995) of the student prior to starting a new assignment. The students were required to

use their 'wrong' hand and both hands simultaneously for some of the words. This activity aimed to reinforce the nature of mark-making and lessen the preciousness of the marks being produced, in order to reduce the barriers to creativity.

The exercise lasted 30 minutes, the students produced 15 separate visual images. Samples of how some of the 15 words were translated into marks are given in Figures 2-6. It can be seen in the early stages that students were figurative with their marks. Non-figurative mark-making was then encouraged.

### Progress of the product semantics project

The project had started with the mark-making exercise and then the students had been randomly allocated their product and the descriptor word (Figure 1). An early challenge was often to find out the literal meaning of the word. Many students opened dictionaries for the first time in years. From the literal verbal meaning of the descriptor words (or the students' interpretation of them) students had to generate the product – but not without developing skills in how to achieve it. The mark-making exercise was one of those. Another was the mood board (Figure 7). A mood board is typically a 2D board with many images – often to evoke the lifestyle of the desired target market (e.g. texture, colour schemes). Most of the students were at least familiar with this concept. Students were asked to gather images which simply evoked the descriptor word, sometimes literally or often abstractly through materials, colour, form, emotions etc. In an attempt to capture the *essence* of their descriptor word.

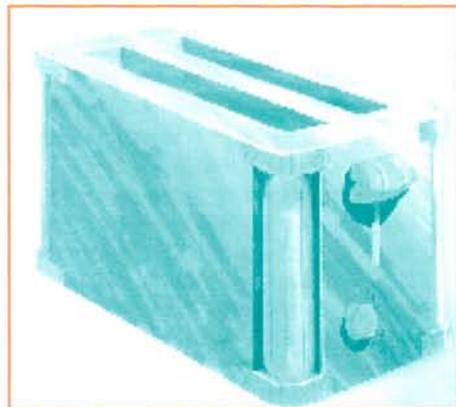
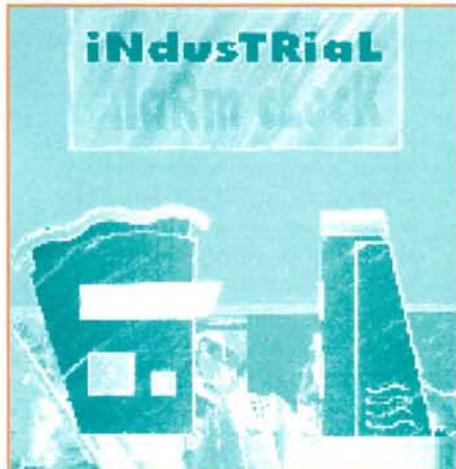
Initially sceptical and unsure of their ground, students began to realise what was being asked of them and during the weeks of the project they grew in confidence and momentum. The project lasted four weeks, that is contact between lecturer and student consisted of a 50 minute lecture and 40 minute tutorial with a small number of students each week. Students were given weekly targets for work to be completed by the following week in their own time.

A feature of the assignment was the nature of the assessment and requirements of the submission. Although students were encouraged to work in a typical manner – drawing, design sheets, possibly sketch models – the requirements for submission were as minimal as possible to enable the students to focus solely on the product semantic issues. A single presentation board with a product rendering was required (Figures 8-12). This is the most basic form of product communication, reflecting an aim in the

Figure 7: Mood Board  
Below left: Figure 8  
Product presentation board ('Scary Telephone')  
Below: Figure 9  
Product presentation board ('Friendly Toaster')



module as a whole, which was to improve students' abilities and skills in professional presentation. In the same spirit students were asked to give a short verbal presentation of their designed product.



#### Summary and Reflection

The authors feel that overall the students benefited from the product semantics project and particularly the mark-making exercise. We believe that such activities are most useful at the early expansive stages of product designing activity.

The students seemed to find the mark-making exercise enjoyable, which in itself is an important factor in this sort of exercise. The authors gathered feedback during tutorial sessions informally throughout the duration of the project and individually if students sought direct lecturer contact. The authors believe that a contributory factor to the success of the project was that every effort was made to make activities as *energised* as possible. The mark-making exercise, for example, was very rapid and full of student input and interaction.

There was a perception amongst some of the students that they thought their design task would be made simpler if they had an *easier* descriptor word. Responding to these comments the authors have subsequently reviewed the list of words offered in the future, taking out some that have been perceived to be too *difficult*.

This exercise is of value to the Department not only if it contributes to improving the grades for the students, but also because it has brought into the module an alternative approach to preparing for an assignment that requires a degree of creativity. The exercise offered the student body an alternative approach to creative thinking prior to the commencement of a design assignment. The exercise did energise the student body and evidence exists that highlights the use of this approach by students in later non-related assignments.

The authors believe that the undergraduates have been provided with a new and useful technique for their creative *toolkit* when they tackle future design projects. Identifying the most appropriate approaches and exercises to harness creative energy is one of the many tasks design educators must tackle.

The authors will continue to refine and improve the project and exercises and to use them on future design and technology undergraduates at Loughborough. The authors believe that the project is valuable in terms of student motivation, learning alternative avenues of approaching design problems and exploring the impact of the educational environment upon the student body. Additionally, the authors feel that similar or adapted approaches could be appropriate to a range of student groups and ages in design education.

Top Left: Figure 10 Product presentation board ('Industrial Alarm Clock')

Middle left: Figure 11 Product presentation board ('Tasteless Toaster')

Bottom left: Figure 12: Product presentation board ('Classic Toaster')

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