DESIGNERS MANAGING TECHNOLOGY

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ABSTRACT

A version of this paper; 'Textiles and Translation' was presented at the Conference 'Creativity - Designer meets Technology' at Philadelphia University, May 10 & 11 2004.

In 1993 an undergraduate programme at Loughborough College of Art and Design [UK] in 'Embroidery' changed its name and broadened its curriculum to 'Multi-Media Textile Design'. Student's continued to employ traditional textile processes but were also encouraged to explore unconventional materials, emerging technologies and exploit processes from other disciplines. The results are often extraordinary. The design concepts produced have won many awards and have often been taken up by commerce and industry, however, as a result of taking unconventional approaches, there have often been problems in creating artifacts that would translate into replicable manufacture.

In 1998 the College merged with Loughborough University, well known for its comprehensive technological resources and expertise. Cross campus collaboration and the establishment of a graduate programme has produced new opportunities for textile design research students exploring emerging technologies. Their experiences are helping to establish the methodologies that are required to achieve the requisite understanding and skills to produce innovative textile products in the future.

Keywords: Research, Textile Design, Creativity, Technology

INTRODUCTION

To combine innovation and creativity with new materials and processes is a way for designers to create products that are a pleasure to the senses; meet the functional requirements needed in a changing world; are economical and environmentally friendly in production; and enhance emotional and intellectual pleasure. Or as Jack Lenor Larsen once said 'We need something around us in our lives to nourish our souls' - textiles appear to be rather good at this.

Since the end of World War II the field of textiles has struggled to meet the industrial and commercial challenges that globalisation, and a changing infrastructure for both manufacture and consumer behaviour have demanded. In a symposium

held in London 'Textiles an Afterthought' [1] in 1999 there was a view held by many delegates that British textile manufacturers had failed to respond to rapid change. A totally 'risk averse' textile industry was in steady decline. In the concluding remarks to the symposium I challenged the next generation of designers to become entrepreneurs and to work with technologists to create a new textile industry founded on innovation and creativity and the harnessing of the emerging technologies. It is argued that because our textile industry is often so unwilling to explore new ideas that it is the Universities who have a responsibility to encourage researchers and students to 'work outside the box'.

'Don Quixote' [2] was first published in 1605 and it had been translated into French, English, German and Italian by 1622. Cervantes would find it very difficult to recognise his original work. Countless reworkings and adjustments to suit contemporary taste would render it unintelligible to Cervantes. In his own lifetime it was known that he loathed translations of his work and considered that translation was like looking at a Persian carpet from the reverse side.

How many designers have felt the great dismay of seeing their original conception translated so poorly into a manufactured product?

A very special ceremony took place at Royal College of Art in 1974. An honorary degree was presented to Shoji Hamada at the venerable age of 80. He was one of Japan's greatest ceramists.

He thanked the congregation with this brief observation. He said that his ideal day would start with him imagining a beautiful vessel. He would select an appropriate lump of clay, throw it to the bottom of the garden and retire to have his breakfast. After a pleasant repast, in the company of his wife, he would walk to the bottom of the garden to discover the lump of clay transformed into a vessel that was even more beautiful

than the one he had earlier imagined. He then sat down!

This enigmatic statement can be interpreted in a number of ways but one might be that to produce an artifact that would satisfactorily concur with his original idea was a huge technical struggle that he would prefer to avoid if he could. But, of course, knew that he couldn't.

What does that effort and mastery mean in the context of the opportunities afforded by emerging technologies in the world of Textiles? How can we ensure that our ideas will be translated, to our satisfaction, into artifacts? And what should we do to develop the necessary skills and attributes in this generation of designers?

THE SCHOOL OF ART AND DESIGN

Loughborough University is a medium sized campus University with around 12000 students, in the centre of England about an hour and a half from London.

The original College of Art and Design, its neighbour was established in 1897 to provide skilled industrial artists for local industry - particularly textiles, furniture and ceramics. The foundation of this education was always the emphasis placed on the skill of drawing, an understanding of the nature of materials, methods of production, and an appreciation of history and contemporary contexts of manufactured goods. Although the pedagogy has changed these basic principles in the curriculum still pertain.

In 1998 the College of Art and Design merged with the University. There were a number of reasons for the merger but the overriding academic reason was that the context in which Designers now, and will, operate acknowledges the interdisciplinary nature of this activity.

In the context of this paper one area of collaboration that was recognised at Loughborough was the great opportunities afforded by being part of a University with an international reputation in applied

research in Engineering and Science. This included manufacturing engineering, computer science, and materials science. It also provided us with opportunity to offer Masters and Doctoral studies.

The undergraduate curriculum ensures that students become familiar with 'Discourses and Processes'. Or to put it another way 'knowing what one wants to say, and to whom, and by what means'. Although there is the expectation that students on graduating will become professional artists and designers the view is held that students should learn 'through' as well as 'in' the discipline. Or to put it another way; that by this academic experience a textile design graduate will be well equipped to take on the world in whatever field of endeavour they should choose.

This is, of course, not dissimilar from the mission of many institutions but it is perhaps in the nuances and where the emphasis is placed that provides some differences. In the case of Loughborough an onus is placed on the need to integrate theory and practice; to provide open access studio, workshop and lab environments to support learning through doing and learn using simple technologies; to establish a skills base as a vehicle for personal expression. It is, above all, to place great significance on imagination, creativity, experimentation, innovation and risk taking even at the cost, occasionally, of coherence!

The excellent "'Boyer Report'- Reinventing Undergraduate Education – A Blueprint for America's Research Universities" [3] was published in 1998. Its publication at the same time as the merger at Loughborough was timely. A number of its recommendations not only resonated with what we were doing but also were certain to be facilitated by becoming part of the University, namely: To make research based learning standard; and remove the barriers to interdisciplinary education.

TEXTILE DESIGN AT LOUGHBOROUGH

Textile design at Loughborough is well established and has an enviably high reputation both nationally and internationally. Students win many awards and accolades for their work and our graduates are working in every corner of the world in hugely diverse fields from Haute Couture to automotive textiles; from the gallery to mass market retail; from magazine styling to e-publishing, etc.etc.

On these programmes students employ traditional textile processes but are also encouraged to explore unconventional materials, emerging technologies and exploit processes from other disciplines. The results are often serendipitous - 'the happy accident – the result of trial and error' or the superficial appropriation of a technical process. At undergraduate level the fact that students ideas do not necessarily translate to a manufactured product is not, in our view, so important as the student's ability to recognise a good idea and to exploit and communicate it as effectively as they can. There is time after graduation to get grips with the constraints of industry and commerce.

DESIGNER MEETS TECHNOLOGY

When it comes to acquiring technical knowledge a designer's ability to exploit that knowledge will often be dependent on how well the designer is able to communicate with technologists. If that communication is poor then the results of that collaboration will yield poor products and enforce some commonly held perceptions of technologists that designers are arrogant, superficial and technically incompetent and for designers to view technologists as patronising, unimaginative and inflexible.

Product design, and in this case textiles, should be the result of informed and purposeful thinking - to create something new that is appropriate and of value in a specific context. To achieve commercial success today will often require the collaboration of a group of people from various disciplines. The prime stumbling

block to successful collaboration is language. Academic disciplines have different terminology and practices. The terminology and practices provide a secure form of communication within a given discipline but also create a wall around that discipline, hindering the sharing of knowledge.

HIGHER DEGREES IN TEXTILE DESIGN

The PhD is training in research and how to structure knowledge and communicate the results of research. The current lively debate about what constitutes design research may be found in a small but expanding number of journals and Internet chat rooms. To observe the antics of a chat room like 'PhD Design' [4] show that there is an anxiety prevalent that perhaps 'Design' isn't an academic discipline at all. The desire to situate the discipline within the academy means that the debate has become particularly theoretical. The words Epistemology, Ontology, Typology and all the other –ologies sprinkle the texts. Is there an attempt to legitimise the subject academically by using such language? Occasionally, however, someone will talk about Praxis [Oxford English Dictionary – action, practice]. This is the area that particularly interests us here.

At the present time the majority of Doctorates in the Arts and Humanities do not hold academic posts. Why therefore do they wish to go through this challenging process to gain a Doctorate? The view held by most of the applicants who apply to Loughborough is that it provides the opportunity to dig deeply into an area of interest and acquire a body of knowledge and a method of working which will enhance their practice as textile designers. They are looking for what might be described as a 'Professional Doctorate'.

TECHNICAL SUPERVISION

When setting up joint PhD supervision for a design researcher between the technical and design specialists the technologist is going to ask 'what is in it for me?' The most common argument is that although the technologist's focus is invariably on the technology itself they recognise themselves that that technology has no value if it is not translated into products eventually. From recent experiences there is little difficulty, in the first instance, in persuading the technologist to collaborate in supervision. The breakdown occurs pretty quickly, however, as the project moves from generalities to specifics. Particular problems have been encountered when discussing the method of investigation for example or how a project is to be expedited - The technologist often requiring continuous certainty where the designer would prefer periods of uncertainty. How to resolve this problem? It is the design researcher who is going to have to make the running.

To avoid the breakdown in communication in a collaboration the designer wishing to engage in product development using a new technology must be willing to learn the underlying principles of that technology and develop a competence in using the appropriate terminology. This should be done during the period of initial research training and ideally before any advanced literature search. Most designers surprise themselves how quickly they can pick up the fundamentals of another discipline that will be fit for their purposes. This new found confidence enabling them to enjoy what was alien often makes them think of themselves as 'technologists'. This is dangerous and to be avoided as designer's enthusiasm for the technology can take the designer down a route that will take them away from what was their stated ambition of producing new products and artifacts. It must always pertain that the designer is a designer wishing to manipulate technology not be dominated by that technology.

CASE HISTORIES

Savithri Bartlett came to Loughborough after gaining an M Phil from the Royal College of Art. Her research considered the use of lasers in textile manufacture and to see what opportunities existed particularly in

the area of marking a material surface. Laser technology is a 'second wave' technology in as much that it has been around for some time and a substantial body of knowledge is already in the public domain. Nevertheless there remain areas of potential exploitation with respect to textiles that are worthy of investigation by designers.

Working with an academic from another discipline, in this case engineering was not very rewarding for either party. It has to be said that it was initially a conversation between two people who for the most part spoke different languages. It would not be an understatement to say that it was extremely problematic and in the end Savithri decided that she needed to become as independent as possible by undertaking a major programme of learning. It was necessary to learn sufficient scientific theory to grasp the fundamental principles of laser technology and to establish a *modus operandi* for her experiments to arrive at a sufficiently rigorous but appropriate methodology that followed science based experimental framework. Her intended approach did not fit comfortably with the supervisor from engineering and so after the first year the collaboration was dissolved. This might have been disastrous but for the fact that Savithri had decided to undertake that training in science. It has in the end held her in excellent stead because as this project has progressed she needed to work alongside many engineers, chemists, machine manufacturers, and fibre and fabric producers. With each encounter she has found the most appropriate mode of engagement based on this fundamental understanding of their differing domains and terminologies.

Savithri also recognised that it was quite easy to become completely immersed in the technical process and forget that prime objective was to produce 'beautiful textiles'. To this end she has established a close working relationship with 'Boudicca' [5], fashion designers that have a major following in Europe.

This gave her an opportunity to test her ideas in the 'real world' and has given her an opportunity to establish the efficacy of her concepts.

Her challenge now is to present her findings using a jargon free language that will be comprehended by her targeted audiences of both textile designers and textile technologists in 2005.

In the case of Faith Brown her initial investigation was not dissimilar to Savithri but in the field of Non-Wovens. After a thorough survey of the subject she realised, however, that the existing technology and industrial production, as a means to an end, was not going to produce the aesthetic outcomes she aspired to without other forms of processes and interventions and therefore she had to reconfigure her project. If Savithri's approach had become 'hard/high tech' Faith's had to become soft/low tech.

The research aimed to identify elements within certain non-woven production processes, such as carding and thermal calendaring, that offer opportunities to manipulate the visual and tactile qualities of the resulting materials. It aimed to develop a range of samples and prototype interior products that can be produced on a small - scale production level. The approaches and methods taken to carry out this work aimed to take into account the requirements of academic research, producing knowledge and information relevant to textile designers.

The initial approach to the research was based on notions of scientific experimentation. As the project developed a greater understanding of what that meant within the context of research in designing and making textiles emerged. Emphasis has been placed on valuing craft and design practice as a research method. Reflective practice has become the central research method. However, as the project continues to develop it is clear that both intuitive practice and more structured experiments will play important roles in different aspects of the research.

The third example is what can be called 'first wave' technology for textiles namely the area of 'Rapid Manufacturing' - first wave in as much that unlike lasers or non-wovens this technology has no existing function in textile design and manufacture - although it most certainly will! There are a number of processes where objects are made by the deposition of materials by such methods as stereo lithography and Laser Sintering.

An example of rapid prototyping is the creation of three dimensional objects using a production method of Laser Sintering where a computer generated 3D object is translated by using a laser to selectively form a semi-solid or solid object from a polymer powder. Rapid Manufactured Textiles is in its infancy but there is vast potential for the future. At this time the work is done almost exclusively by engineers using the first generation of rapid prototyping sampling machinery. We are however working with the engineers in developing concepts for seamless garments with variable texture and fabric construction and fabrics that transition from soft to solid configurations.

A network has now been established between a number of Universities in the UK but we are also working with external design groups, as well, for example 'Freedom of Creation' [6] from Holland. The collaboration here is different. Here is where the technologists working in this field are looking for new projects to test the technology and are therefore willing to accept the 'no question is stupid' approach from those less familiar with the technology.

CONCLUSION

In the school we believe that, through providing an environment that encourages creativity and innovation, we support the development of a mindset which is willing to challenge the status quo when needed. A culture that is more likely to produce designers who will embrace the future challenges needed to produce successful design and manufacture. We also recognise the importance of collaboration with other disciplines to enrich that environment.

In this environment, as the undergraduate synthesises their ideas, it dawns on them that they have run out of time in their final year and often wish they had more time to dig deeper. We are now able to offer our graduates this opportunity on our practice based higher degrees.

When a student comes for advice about studying for a doctorate, where technology is going to play a major part, the following principles apply:

- A designer researcher should work with the technology to acquire sufficient expertise to ensure the production of innovative products – technology is merely a means to an end for a designer.

- To manage a technology effectively a designer will need to understand the underlying scientific and engineering principles.

- It will be essential to have a good rapport with technical experts. That means being able to ask the right questions and understand the answers. It is not always necessary to collaborate on such a project but it can be the best way of finding reliable design solutions.

- It will be essential to understand a range of both quantitative and qualitative research methods but it will almost certainly require refinements to these methods to ensure that the required intention of the development of creative design solutions is achieved without wasted effort.

- To achieve a 'Professional Doctorate' the ultimate aim of the project will be to exploit acquired technological expertise for creative purposes.

It will be from these doctoral students that a future generation of entrepreneurs should come.

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