

# PRODUCT DESIGN EDUCATION: A JOURNEY?

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## ABSTRACT

Product Design education can be focused on training. Providing students with skills to use tools, computer programs and tried and tested methodologies to solve problems. It can be presented as a planned and structured process. Design is seen as a problem solving activity rather than a wider creative endeavor. Such an approach provides clear structure that, students find it hard to challenge. Universities are not being tested on their ability to train but will be assessed on their teaching. Teaching seems to be more about a relationship. In the craft world, between apprentice and master-there was another stage of a journeyman, the learning on the job. Design students are inspired to learn by doing and making. Yet, contact time and working together in workshops sessions are being cut back. The increasing number of students, costs savings and digitally based campuses, are all reducing the time and space allowed for making, nurturing and maintaining a supportive learning environment that applicants expect and need. Design Thinking might have its origins in design practice. Its starting place is about educating non-designers about the design process. In Product Design education we need to educate designers to think and experience things for themselves. The pressures, both internal and external, seem to be reducing the quality of independent design thought and creativity. The 'journey' is important to design education and not a cliché.

*Keywords: Teaching Product Design, change, Design Thinking, making, workshops, experience*

## 1 INTRODUCTION

Reflection is important. This paper is part commentary, part an analysis of the effect of change. Change in the institution, in staff and the wider community all have had an impact a Product Design course and its students. It has been a journey.

Change is a fascinating process. It is not linear, continuous or even directional. I teach design history but today even using chronology is questioned [1]. History is far more about ways of seeing [2] and interpretation. What if things had happened differently? That is a creative question [3]. It allows undergraduates to learn for the past but generate ideas for the future. I present a chronological sequence of design stories. They provide an account of the rise of the product design professional from guild membership to playing a part in corporate marketing teams. It is my interpretation of the past. I aim to provide students with the resources and skills to read other histories critically write their own accounts of design and discover their place within the design practice today. It also makes me very aware about how Product Design has been taught in the past. The methodological approaches in this paper are participant observation and historical research. I have accessed student and course data for the last five years, but statistically it is a very small sample. I also work as a design manager and researcher so I also bring the insights of someone working outside education.

## 2 CONTEXT OF CHANGE

Over the last six years the faculty has restructured systematically with a level of staff reapplying for posts annually. It was a managed change process from above. The campus is poised for a move. It will down size in order to grow. This in turn is causing a reappraisal of resource allocations and teaching approaches across the whole institution. It has been an experience. The course has continued unchanged on paper and each year another cohort of eager students has arrived.

Not all the changes are internal. Students have become paying customers. Their experience has become a new benchmark of quality for many outside observers [4]. The designs of University halls of residences are as relevant as teaching acumen and academic rigor. All of this local restructuring has happened within an era of the global recession and a digital revolution. Are there similar experiences across the sector? Or have other courses and institutions had less bumpy rides? How should Product Design courses change? Undergraduates are buying what they expect to be an entree to an exciting design career. Our institution promotes its graduates' employability. The University does well as we train a high proportion of teachers, nurses and business executives. Higher education courses have always been run to support local industries as well as the professions. Our product design graduates are working with local packaging, product and play equipment companies. In some countries specialist colleges, rather than Universities, provide training in technology and design. Did we lose something valuable when specialist higher education was given degree-awarding status?

### **3 WAYS OF SEEING**

In 2014, two new staff members saw Product Design from a very different viewpoint from the existing members and pushed for unilateral change. Product Design and particularly a BSc education, was to emphasize a specific model of the design process and design for "business to business" products such as heat pumps and tractor parts. Product Design using traditional making, craft skills and natural materials, for example such as metal casting, leather working and wood production were not encouraged. Consumer products, such as kitchen appliances and household products were also inappropriate. Computer-aided design (C.A.D) for global production of machine tools seemed to be the target. Personally, as a social scientist their view seemed extremely limiting. What about local production, green issues and socially relevant consumer products?

They also seemed to embrace Design Thinking [5] without question. Students were to be trained to use business models for design innovation and planning. Many of these approaches and techniques have been adapted from observational methods used in social sciences like Social Anthropology. Since the 1970s design educators, have taken up social theories to explain art and design, and in doing so established both Design History and Cultural Studies. Often they do not on adopt the built in scientific rigor of Economics or Sociology. Social Anthropologists and Economists state their methodology and their underlying assumptions. It seems to me that some Design Thinkers are falling into similar traps, in promoting the validity of these research methodologies without the necessary caveats.

Design Thinkers aim to share the way a designer approaches problem solving and is valuable and worthwhile. It demonstrates that the design process is a useful one for understanding and solving social problems in particular. Is there one agreed "design process" such as the Design Council's Double Diamond? [6] Should there be only one defined process? I teach across disciplines and it is only an ideal type [7]. The promotion of design thinking has on the whole been at its most valuable to an outside audience - allowing encouraging inter-disciplinary work, client and community input. The value to companies and corporations is well reported [8]. It can be argued that it is just repackaging design with social and business theories. How valuable is it in Product Design education? It seems to be adopted by some without question.

### **4 SOFTWARE, TEACHING & THE DESIGN PROCESS**

This blind trust in others' methodology also seemed to effect how we were encouraged to integrate computer-aided design into the course. The software systems are assumed to be right and have the answers. You only have to learn to use the software and any student's questions would be answered. Need to test your design for weaknesses? There is software for that. Need to know how much it will cost to produce? Complete the drawing and machine will give you optional prices for different materials. This leads students to be completely divorced from the reality of production, sales and distribution - let alone any wider social consequences for the worker, community or planet.

Design Thinking, C.A.D. software and the Design Council Double Diamond model were all presented as the only future of Product Design education. It was planned and structured. Team cohesion broke down as alternative methods of thinking, creativity or teaching approaches were considered wrong. No divergence or questioning of THE model was considered acceptable. As I teach Design History,

Contextual Studies and act as third year research tutor, my approach was seen to be in complete opposition. My role provides students with skills to be questioning, critical and analytical in their research and design work. Who writes the software? Who have the developers 'mined' for information? It seems to be at the core of a degree level education to develop a critical and analytical approach to what is being taught. Product design graduates must be able to think for themselves.

## **5 MAKING & NEW TECHNOLOGY**

It feels like that the aim is teach Product Design from a manual. Ideally, from a website accessible globally. Everything one needs will be found on-line. Lectures are to be factual, recorded and reviewed by students whenever they choose. The University as a whole, not just within the design school, seems to see this as their future approach to teaching. Skilled technicians will take the C.A.D files and make the physical models. Much of the value of learning by making and doing will disappear. A level of understanding is about to be lost in our institution.

Display models are still costly, for fee-paying students. They are visual, primarily created to sell or convey an idea in three dimensions and not test a product's function. These are often 3-D printed, when in reality they would be made from different materials. The production process will require machine tools and people to assemble and pack the actual products in quantity. Design for production is not considered enough. Where manufacturing is occurring on the other side of the world it is harder to share the necessary knowledge. Products are often redesigned when they arrive at the factory to suit production facilities. Teaching approaches were challenged in the studio; in particular around the value of more traditional workshop and studio based design development; sketching, paper and soft modeling. The importance of rough prototypes from foam, wood, metal and clay were sidelined. This new education model can be summarized as a computer based templates that can be fitted to every problem or client. Design in this new world, is seen purely as a problem solving activity rather than a wider creative endeavor. Follow the instructions and you will get a result.

## **6 STUDENTS' EXPERIENCE**

Such an approach provides a very clear structure that students find it hard to challenge. Those who miss a step find it hard to back track, take time out to think, or pick up missed stages. They are referred increasingly to the computer for answers and opt to stay away from the studio. The model also appealed to the diligent student, investing heavily - in time and money - in their degree. They know what is required, what they need to deliver, there is a right and wrong and they expect an A grade if they meet the requirements. They expect the virtual manual of teaching, to be taught the software and have access to skilled technicians to turn their design into physical models. They may feel they are getting what they have paid for, a solid training as a designer; but can they really design for the future? Can they adapt? Can they innovate?

The table shows the last five cohorts' progression on the course. It seems to indicate that those with poor language, weak entry grades, or personal challenges soon stayed away. Formal sanctions and one to one tutorials have brought some back in order to complete, but few have found it easy to overcome a set back. The new model makes the challenge more difficult.

Why do we loose their focus? What is the evidence? Many of these students were not strong applicants. We compete with other local Universities. They sell their courses on industrial links, a choice of BA or BSc routes, a sandwich year, and a four-year MDes approach. We do not insist on high entry grades in Mathematics or English, so we attract those who have seek support in those areas. We have a Higher National Diploma (HND), which attracts a different type of entrant: the adult returner, the more practical or less academic student who did not choose A' levels. An HND attracts students with concerns about funding or making commitment to higher education.

Observation of the last three years final year cohorts shows that best students go on to graduate with First Class Honors. They went on and acted as **mentors** to weaker 2.2/2.1 students. They understood the software and the methodology well enough to explain and teach it, in effect, to their classmates, but they had to be pushed to analyze or critique the approach.

Table 1. Produce Design (Higher National Diploma and Degree Entry): Five Years Observation of Student's Engagement in Studio and Final Degree Awarded

| Year         | Course | No. | 1 | 2.1 | 2.2 | 3 | Pass | Fail | % Good Degree |
|--------------|--------|-----|---|-----|-----|---|------|------|---------------|
| 2010-11      | BSc    | 9   | 2 | 4   | 2   |   | 1    |      | 66.70         |
|              | HND    | 8   |   |     |     |   |      |      | N/a           |
| 2nd Language |        |     |   |     |     |   |      |      |               |
| HND Top up   |        |     |   | 2   | 2   |   | 1    |      |               |
| Mentor       |        |     | 2 |     |     |   |      |      |               |
| Team         |        |     |   | 4   |     |   |      |      |               |
| Drifted      |        |     |   |     | 2   |   | 1    |      |               |
|              |        |     |   |     |     |   |      |      |               |
| 2011-12      | BSc    | 19  | 4 | 7   | 8   |   |      |      | 67.90         |
|              | HND    | 7   |   |     |     |   |      |      |               |
| 2nd Language |        |     |   |     |     |   |      |      |               |
| HND Top up   |        |     | 1 | 1   | 2   |   |      |      |               |
| Mentor       |        |     | 2 |     |     |   |      |      |               |
| Team         |        |     | 2 | 6   | 6   |   |      |      |               |
| Drifted      |        |     |   | 1   | 2   |   |      |      |               |
|              |        |     |   |     |     |   |      |      |               |
| 2012-13      | BSc    | 14  | 3 | 6   | 3   | 2 |      |      | 84.30         |
|              | HND    | 4   |   |     |     |   |      |      | 75            |
| 2nd Language |        |     |   |     |     | 2 |      |      |               |
| HND Top up   |        |     | 2 | 3   | 1   |   |      |      |               |
| Mentor       |        |     | 2 |     |     |   |      |      |               |
| Team         |        |     |   | 5   | 2   |   |      |      |               |
| Drifted      |        |     |   | 1   |     | 2 |      |      |               |
|              |        |     |   |     |     |   |      |      |               |
| 2013-14      | BSc    | 14  | 3 | 3   | 8   |   |      |      | 42.90         |
|              | HND    | 4   |   |     |     |   |      |      | 50.00         |
| 2nd Language |        |     |   |     |     |   |      |      |               |
| HND Top up   |        | 4   |   |     |     |   |      |      |               |
| Mentor       |        |     | 2 |     |     |   |      |      |               |
| Team         |        |     |   | 4   | 5   |   |      |      |               |
| Drifted      |        |     |   |     | 3   |   |      |      |               |
|              |        |     |   |     |     |   |      |      |               |
| 2014-15      | BSc    | 9   | 2 | 4   | 1   | 1 |      | 1    | 75.00         |
|              | HND    | 5   |   |     |     |   |      |      | 50.00         |
| 2nd Language |        |     |   |     |     |   |      |      |               |
| HND Top up   |        |     |   | 2   | 1   | 1 |      |      |               |
| Mentor       |        |     | 1 |     |     |   |      |      |               |
| Team         |        |     |   | 4   |     |   |      |      |               |
| Drifted      |        |     |   |     | 2   | 1 |      | 1    |               |

**Mentors** find their own design solutions. Their effort was rewarded. On the whole, it is model to confirm rather than challenge assumptions. The best graduates continue as mentors working with local firms, transferring the methodologies. They bring live projects back to the University: offering advice, work-experience and junior positions to students. The second group - their classmates - became skilled **team** players and together with the mentors they developed a studio atmosphere building prototypes in together. Only when they acted as a group did they become creative, analytical and critical in their approach. This generally happens only in the last 6 months of the course, far too late in their journey. This can cause a visible divide in the studio between a dominant team the rest. So this can add to a feeling of alienation amongst weaker students.

In 2014/5 the new methodology was taught in year one. Voluntary live projects were offered in the final term. The most confident students took these up and seemed to flourish. They tested the new system - design thinking, rigorous design process and applied C.A.D. software. The external clients really valued their contribution. When I sat in on two presentations of their designs it became clear that there were large gaps in their understanding in particular of manufacturing processes, costing, marketing and distribution. They relied on the software provide THE answers. The designs were not taken through to workshops, let alone design ready for production, and this had to be undertaken by tutors or the client's staff.

In the three third year groups and with the new second year group, the cohort has split and a group **drifted**. The weaker students could be split in to those who suddenly tried to catch up and demanding staff time and one to one input and those that failed to attend. The analysis indicates that there have always been weak students that need to be guided through to graduate. Some students become more dependent the more guidance they were offered. Some did just what was required to pass and then seemed to walk away from a design career. Others chose to work at home and seek their own mentors elsewhere. They often turn up at critiques with models expensively commissioned. In some cases their sketchbooks were filled with ideas and development sketches. The advice they found outside is good. Is it their work? Often these students come across as stubborn and defensive but their ability to work alone was clear. They had gone and done their own thing. Does this create someone able to work in industry?

## **7 TEACHING AND EDUCATING**

These debates around teaching and education are not only effecting newer institutions. All British Universities are not only being tested on their ability to educate and research but will be assessed on their teaching [9]. No longer do we hear undergraduates being asked "what are you reading"- instead "what are you studying" or "doing". Teaching seems to be more about a relationship, master and apprentice, teacher and pupil, tutor and student. The new Product design new model seems to take personal relationships and practice out of the equation. In the traditional craft world, between apprentice and master there was another stage of a "journeyman", the learning on the job. Those that pay the University fees: parents, funding bodies and employers, expect to see evidence of "the journey".

I hear: I forget

I see: I remember

I do: I understand

(Maxim of Design Education)[10]

Courses are being judged on the ability of their staff to share and pass on expertise and knowledge. Design students are inspired to learn by doing and making. This is not only true of the design profession but farmers, teachers, doctors, journalists, policeman and pilots to name a few highly skilled jobs. We can only learn so much from books and screens. Yet, contact time, sharing through demonstration, working together in studios and workshops are being devalued. On the job training generally comes after a degree. We encourage work experience and live projects. A common suggestion from students is that there should be a formal option a year in industry. A patient faced with a student doctor expects a level of practice or expertise. Design firms and employers expect a level of hands on skills from Product Design graduates.

The system is devaluing time for mentoring, team working and vital practical skills. Why are the studio and workshop facilities disappearing? The increasing number of students, costs savings and digitally based campuses, are all reducing the time and space allowed for making and collaboration. We are loosing the nurturing and supportive learning environments that applicants expect and need. Our cohorts are small and have personal studio space, but this is under threat. Design workshops do not seem to be protected like laboratories. The high price for medicines and treatments are justified because of the cost of research and development facilities, but in design we are cutting back on similar investments in design spaces. Our students consistently choose to design products to improve health and well-being. This year alone we have three aids for the elderly or handicapped, a chair to improve

office health, two clean water devices, a shelter for the homeless and a communication device for those recovering from mental illness. The funding for should be in place for design education. Graduates need to know how things are made and assembled, even if robots will be handling the making and assembly. Graduates are still just "journeymen" when they leave and need more industrial and social practice. Is it ideal for many to go straight onto Master's programs, with no experience?

## 8 CONCLUSION

'Design Thinking' might have its origins in design practice. It is about trying to train and teach non-designers about the design process. In some literature reduces the design process to meetings with post-it notes and diagrams, when design education is an exciting, experimental and social process; full of colour, texture, sound, smell, triumphs and disasters. In Product Design education we need to educate designers to think and try things for themselves; so that they can challenge the tried and tested ways of doing things and generate something new. Educating undergraduate students to think for themselves seems to be at the core of Higher Education. The pressures to change, both internal and external, seem to be reducing the quality of independent design thought and creativity. As educators we have been challenged to change to be more computer based and more structured in our approach to teaching the design process.

Change remains constant. Lecturers move on and share their approaches elsewhere. The Product Design course will be part of a new faculty combining Art and Science for 2016-17 and in a new building in 2018. We have learnt from each other and will take on the best from these new tools and processes. They will strengthen our individual ways of teaching Product Design. The journey is important to design education, for staff and students and there is not just one right way. Undergraduates must leave on that journey, prepared for the unexpected and a challenging future.

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