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MOVING TARGET: WHAT ARE THE KEY ELEMENTS THAT ARE CONDUCTIVE TO A CREATIVE ENVIRONMENT FOR INDUSTRIAL/PRODUCT DESIGN STUDY TODAY?

Karl Hurn BA, PGPLT, FHEA
Loughborough Design School, Loughborough University, Loughborough, LE11 3TU, United Kingdom
k.m.hurn@lboro.ac.uk

ABSTRACT

This paper outlines research undertaken for the development of the new product design undergraduate programmes at the University of Derby in 2010.

The pedagogic approaches to the delivery of the different aspects of industrial product design are examined as well as the varying emphasis given to the industrial product design skill set across programmes such as drawing, computer aided design, interaction design and sustainability and the impact this has on students grasp of the discipline as a whole as well as their employability after graduation.

The research found that there was a degree of ambiguity in the official benchmarking documentation and that this interpretation of the standards leads to variation between programmes at different institutions.

The paper concludes that the different emphasis given to design skill sets at different institutions has a direct impact on student employability and that regular revalidation of design programmes is essential to maintain employer confidence.

Keywords: Industrial/Product Design, Education, Pedagogy

INTRODUCTION

With the world's design landscape ever shifting due to social, economic, environmental and cultural changes, are the methods and focus of how industrial/product design is taught to undergraduates keeping pace with industry's requirements?

Product design is about solving problems with innovative and sustainable solutions, the product design programmes at the University of Derby, with the help of the research outlined here, have been built around this core philosophy with both the Bachelor of Arts and the Bachelor of Science programmes being designed to provide students with the breadth of skills required by industry, with the Bachelor of Arts programme having its emphasis in industrial design, focusing on aesthetic design and human interaction, and the Bachelor of Science programme giving its emphasis to functional and engineering design.

Industrial product design programmes must expose students to a broad range of teaching and learning styles and approaches which mirror the design environments they are likely to work in, as well as this, an environment must be created that is conducive to innovative thinking, not one that dictates specific design results (Loewy, 2008).

BACKGROUND

The University of Derby started offering a programme entitled BSc Product Design, Innovation and Marketing in September 1993 within the then School of Engineering. Based on both an externally perceived need from prospective employers and an internally perceived need to develop a programme offering a more commercial emphasis to what were then very traditionally based and focused engineering programmes.

In 1999, in an attempt to widen the appeal of the existing programme the BA Creative Product Design and Marketing title was introduced as it was clear there was a difference in attitude to design between engineering and industrial design students (Lee,

1990). This programme was developed with the help of the School of Art and Design and shifted the emphasis from an engineered view towards an industrial design view of the subject.

The creation of the School of Arts, Design and Technology and the subsequent re-location of the product design programmes to a new £25 million facility offered an opportunity to reinforce a more appropriate culture for the study of a BA programme with its industrial design orientation whilst also maintaining the science and engineering focus of the BSc programme through close proximity with the engineering foundation degrees which would be under the same roof. Further to this the enhanced studio facility which was not available at the old site would meet the expectations among prospective students from an art and design background for a studio based approach to the subject.

Despite these changes the programmes appeared to have become out of step with not only prospective students but also competing institutions and employers. Recruitment numbers were falling and employment figures within 6 months of graduation

were waning.

RESEARCH METHODS

Having identified a need to revalidate the programmes a pilot study was conducted that examined the Annual Monitoring Report (AMR) documents to ascertain the state of the current programmes. These reports compiled data from a range of sources that included external examiners reports, student module feedback data and statistical information as well as observations from the programme leaders and teaching staff. Information extracted from these reports then allowed the author to conduct a SWOT analysis that would determine what would be carried forward to the new programmes, what would need improving and also what would be left out.

In order to ensure the new programmes met with the university's and the Higher Education Authorities (HEA) guidelines for undergraduate design programmes, in parallel to the SWOT analysis a literature review of the Quality Assurance Agency for Higher Education (QAA) benchmarks was undertaken in order to extract and interpret the benchmarks



Figure 1. The University of Derby's Product Design stand at the New Designers Exhibition in London in 2010. Participation in national graduate events such as this increase the exposure of the programmes and is seen by academics and students as a key factor in enhancing employability after graduation.

that the programmes must adhere to. This was to form a key part of the resulting official programme documentation as diagrammatic evidence had to be included that mapped how individual modules met the requirements of the benchmarks. Because product design sits across the engineering and art boundary, the programme development team had the difficult task of extracting key elements from the separate engineering benchmarks and the arts QAA benchmark documents.

Following these preliminary investigations, a formal development team was established by the author consisting of the core teaching team, technical staff, the Head of the School and the Assistant Dean of the Faculty. The development team met regularly from the inception of the project and the members jointly agreed the aims and overall framework of the degrees. Most of the initial meetings included most of or the entire group, and this is where the main thrust of the programmes took shape. As development progressed, this began to filter down to smaller meetings where specific details and specialisms of the individual programmes or modules were considered with key members of staff.

A period of internal and external consultation then took place to draw together the views of the key stakeholders such as employers, external examiners and the student body. It was felt that these would be key to any planned improvements as these three stakeholders effectively combine to represent our 'client', both in sense of the student who interfaces directly with the teaching, learning and assessment, the external examiner who monitors the performance of the programmes and the students and ensures that academic standards are maintained, and the employer who ultimately judges the effectiveness of this when they seek to employ our graduates.

Formal and informal interviews were carried out with current and recently graduated students to gather feedback on their views of the programmes. Current students were informally interviewed in a design studio environment in groups of ten to fifteen with a mix of individuals from all three year groups. Open style questions were used to start the feedback

process, allowing the students to express their views and concerns rather than any preconceptions that the interviewer may have had. Questions focused directly on teaching, learning, delivery and resource issues. The responses were recorded and analysed by mapping each interviewee's perceptions on top of each other around corresponding issues relating to both the programme structure and module content. Appropriate lines of enquiry were then followed up to gain the required detail in order to allow possible remedies to a problem to be formulated. Students who had recently graduated were invited in to the university and more formal individual interviews were conducted with six graduates where open questions centred on the overall feel and dynamic of the programmes within the context of the university as well as how they thought the programmes are perceived by employers.

Employers such as Rodd Industrial Design Ltd, MediaSphere Ltd, Indesit Ltd and dg8 Design Ltd were consulted with a view to determining what they required from a graduate employee. Professional individuals within these companies who were in most cases known to the development team prior to the commencement of the research were contacted by email and sent provisional programme titles, module content descriptions, programme structure diagrams as well as a skill set profile for a graduate product designer that they were asked to comment on. Feedback received was then correlated and cross referenced against what was being proposed by the development team to determine where and how suggestions could be implemented.

The feedback received from all parties covered a wide range of views on all aspects of the programmes and allowed the development team to build a clearer picture of the key stakeholders requirements. To help correlate the research, market research was also carried out to further ensure that there was still a market for the programmes, particularly in the context of up-to-date competitor information such as programme titles, module structure and content, student cohort; UCAS entry points for prospective students, study mode (full-time and/or part-time) and target audience. This research was facilitated by the

collection of prospectus's and other marketing literature from competing institutions, analysis of their website programme pages and where possible telephone conversations with programme leaders or admissions tutors.

RESEARCH FINDINGS

Feedback from employers initially centred on the complexity of the programme titles as employers stated that they preferred titles that directly linked to department or job titles in the commercial world. This was backed up by research into other institutions where the previously elaborate titles of the late 1990's had been dropped in favour of more specific titles, with De Montfort University for example even going as far as moving away from having a long running BSc Industrial Design degree to re-branding this as BSc Product Design to sit alongside its BA Product Design programme.

Employers also identified a broader skill set than was first envisaged, companies questioned had employed previous graduates, but the scope of their individual projects and clients was quite diverse, although still considered to be under the product design banner. Existing graduates it was found use the skills they have learnt on the programme to varying levels, with one graduate finding say that they are focused heavily in their day to day work on materials selection, with another graduate using the same skill very little or not at all.

Feedback from the external examiner centred on the importance of live projects, he stated that "the practice of 'live' projects is one that is appreciated by the student body and forms an important part of exposing students to 'real' world scenarios".

The external examiner also expressed a concern towards the ratio of written reports to design projects in the existing programmes. Students also expressed concerns in this area, for example stating that they believed there should be more emphasis on practical work.

Successful dissemination of staff scholarly activity to students and the transparency by which students are able to clearly identify the impact that membership

of professional accrediting bodies has on their learning were seen as important to students' confidence in the teaching team and the programme, with students clearly wishing to be taught by people they see as practicing designers who are up to date with current methods and trends, as well as having industrial contacts for the formulation of live projects.

National and international recognition for the programmes through exhibitions such as 'New Designers' in London (Figure 1) and competitions such as the National SolidWorks sponsored CAD prize won by a final year student in 2010 (Figure 2) as well as final year degree shows were voiced by students in the research as vital to improving recognition for the programmes and they saw a direct connection between this raised profile and their future employability.

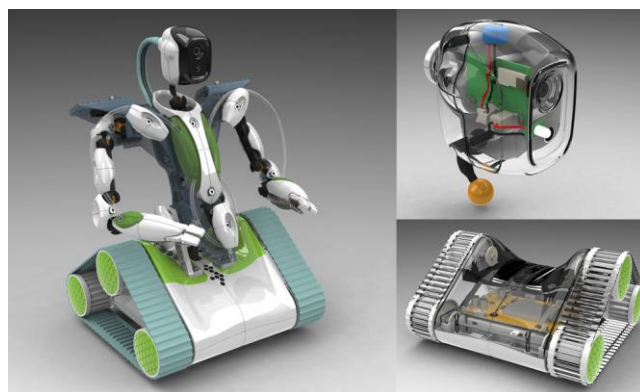


Figure 2. Complex CAD assembly by a final year student. Winner of a national CAD competition sponsored by SolidWorks in 2010.

An increased awareness of the importance of sustainability issues within product design was highlighted by employers, but also somewhat surprisingly by current students. Sustainable design has been on the agenda for some time at Derby, with a BSc Product Design, innovation and EcoDesign programme running at the University for a number of years before being dropped due to low recruitment. The fact that sustainable design has been highlighted by employers and students alike is timely as it is in line with UK government initiatives to include sustainability within design programmes but also in that the programme development teams' experience of the failure of the separate EcoDesign programme had already led them to believe sustainability should

be integrated into the mainstream of the programmes.

An alarming factor that came out of the research was that very few of the current students on the existing programmes placed any importance on taking a placement year out. The development team highlighted this as a key area that needed addressing as conversely it was a key factor that prospective employers highlighted as a benchmark that they used to rate graduates during selection for employment.

RESULTING PROGRAMME PHILOSOPHY

Successful development of an undergraduate design programme involves a delicate balance of design content, pedagogic delivery as well as academic guidelines and the standards laid down in the United Kingdom by Universities, the Quality Assurance Agency for Higher Education and of course any accrediting bodies such as the Institution of Engineering Designers (IED). The courses should provide the students with the opportunity to become design innovators and autonomous problem solvers, combining their practical skills with a perception of aesthetics, practical operation and function. They will gain the ability to look for requirements and opportunities and respond to them by developing a range of ideas and designing innovative products and systems. (Rogers, 2010)

In order to effectively nurture the diverse skill set required of a modern day product designer, taught sessions must range from straightforward lectures, to studio, CAD laboratory, workshop and face to face tutorials covering everything from Bauhaus design history through to the latest cradle to cradle and life cycle analysis environmental concerns for product design. It is widely regarded that there are almost fifty different theories regarding learning and teaching styles (Leahy, 2009) but it could be argued that by the very nature of the diversity of the skill set of a product designer, a broad selection of learning and teaching styles are going to be experienced by an undergraduate student, and equally that there are as many good approaches to design as there are outstanding designers (Loewy, 2008).

The working environment that an undergraduate industrial product design student is exposed to also has an impact on the quality of the learning experience. The idea of having a special 'creative space' in which to work and be creative is not new. Since early Renaissance times, artists have had their 'studio' as a place in which to develop ideas (Martin, 2007). The University of Derby, in parallel to the development of the product design programmes invested heavily in a state-of-the-art facility that offers the students not only a great working environment, but also access to industry standard workshops including CNC, rapid manufacturing and 3D scanning equipment. These technology based tools will of course evolve and change over time, but if we are to assume that it is the aim of higher education to encourage and support students to be creative, for example, take risks, push boundaries, tolerate ambiguity, make mistakes and move on from them, reflect on and refine their work, we should also assume that Universities have a responsibility to provide the necessary resources and facilities (Rogers, 2009). This not only means keeping pace with the relevant technological tools, but also hanging on to tried and tested working practices that can be resource intensive. The studio culture of the programmes is seen by staff, students and industry consultants alike as a vital element to a creative environment, with the programmes external examiner stating that he believes strongly that a studio culture feeds ambition and will result in higher achievement from students. However justification of space allocation in a modern University, where programmes are charged for the spaces they use, results in an ongoing battle between academics and resource managers.

Students must be encouraged to take placements between their second and third year to help them gain valuable industrial experience (Reddy, 2007). In order to encourage this, students will now gain a University Diploma in Professional Practice qualification which is recognised by industry. In the past they undertook the year out simply for the experience and the knowledge they would hopefully gain from it.

To strengthen the programmes for the future, the development team sees strong connections with graduates as the key to success. This can often lead to them reengaging with the programme they studied further down the line and enriching the student experience. Recent live projects have come from BabaBing Ltd - who design and manufacture baby equipment for John Lewis - Boots and Mothercare and Reef One Ltd, manufacturers of the Bi-Orb tropical fish tank.

Both of these companies are owned and run by successful graduates of the programme who see Derby as a key springboard to their success in the design industry. Through these graduates and other industry connections, we must endeavor to make as many of our projects' briefs as possible 'live' projects set by design firms so that our students feel a strong connection with what is actually going on out there in the real world.

CONCLUSION

The main aims and objectives of providing students with a commercial and vocationally oriented programme of study concerned with new product design for mass market products remain firmly embedded within the new programmes. In addition to this, there is far greater clarity shown in the pathways of the industrial design focussed BA and the engineering focus of the BSc programme in line with the needs of industry.

The new programmes will instill in our students a passion for design and an ability to question existing thinking or the accepted norm as well as provide them with a broad skill set that is in line with the requirements of the diverse product design positions our students undertake after graduation.

The pedagogic delivery of the programme content offers as broad a range of teaching styles and environments as is conceivably possible at present due in part to the diverse array of skills required as well as answering the needs of the University and governing bodies with regard to inclusive programme design.

The five yearly revalidation process used for the development of undergraduate degrees is a particularly strong practice for industrial/product design programmes. Industrial product design is by its very nature a constantly evolving discipline reacting to consumer trends, government legislation, materials and manufacturing developments, economic highs and lows, technological developments and our understanding of psychology and perception, to name just a few of the factors that challenge designers daily. Universities would be foolhardy to prevent their programmes from having the tools to react and keep pace.

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