INTERNATIONAL CONFERENCE ON ENGINEERING AND PRODUCT DESIGN EDUCATION
8 & 9 SEPTEMBER 2016, AALBORG UNIVERSITY, DENMARK

STOP PLAYING IT SAFE: THE IMPORTANCE OF TAKING RISKS IN DESIGN EDUCATION

Leslie ARTHUR and Phillipa MARSH
Nottingham Trent University

ABSTRACT
The education and training of designers to meet; graduate employability and career opportunities are ever-present characteristics and central drivers in higher education today. The authors support this aim, but have reservations concerning the educational experience of the student. There is the possibility of under graduates thinking solely in terms of vocation only. This is not to criticise this approach, but to question the educational values. Today, the central point of teaching is upon specific skills and adopting a 'how-to-do-this' approach or learning to meet objectives. But, the dichotomy between training and education remains a tension, which is almost tangible. Business and higher education have deliberated upon this topic and its associated tensions for many years in polytechnics and universities in the UK, particularly in the design disciplines. Business does not always allow for risks to be taken, a template will always be used if a profit margin is guaranteed. This does not add to the process of design, at various stages of evolving an idea or concept serendipity occasionally arises. This could be due to; 'connections' made by the designer, a material behaving in a way that was not expected and the importance of chance to a designer. This paper argues that design education allows students to take risks. This work also advocates the need for students to take risks and sets out the proposition that design education is too safe. This paper contends that product design students' need to graduate from T-shaped learners to 360-degree design practitioners. Their experience from five to eighteen in their education has been dominated by set tasks and functions. This needs to be challenged and not re-enforced in universities.
The product design provision at Nottingham Trent University forms the basis of the research findings in this paper are drawn from a detailed review of these courses in 2013/14. This work highlights how students appear focused on the need to be taught design skills. However, underlying this, students often wish to extend their learning and are willing to take risks. These opportunities can develop students learning, not simply in providing a different perspective and understanding, but also to allow them to develop their own individuality, as designers. The research concludes by suggesting that this speculative and serendipitous approach to design education may be a predominant, individualistic and unique selling point for the student in the professional practice of design, as it is also the nurturing of their ability to think independently and to convert the abstract into the tangible and in so doing galvanize individual conviction to compliment the transition from the being descriptive in thought to being able to critique a design.

Keywords: Training, education, taking risks.

1 INTRODUCTION

The purpose of this paper is to advocate the development of design thinking and the facilitating of innovation in higher education. The names of Pugh (1991), Lawson, (2002) and Cross (2011) have all striven to generate and construct different ways of how to Design. All are right in their own academic and cultural context. Their processes reflect the changing shape of design practise and thinking. However, it is time to re visit the area of thinking to compliment the variations of practise. This text was triggered by the paper at the IED conference in Enshcede, Holland in 2014, by Liesbeth and Egginck [1], which referred to the philosopher in the classroom, the proposal was an example of deeper thinking towards design and innovation. This is how the subject progresses, it adds to the evolving canon of design. But, there is a need to develop design, which continues to converge between the sciences and the arts; it is the meme and history of design. Suggestions concerning change and thinking have developed within philosophy over the years.

2 THE CHANGING UNIVERSITY

The difference between education and training has always possessed a tension. Thinking and enquiry reflect the nexus of academia, practise and research. However, today the university sector continues to change. The changing character of the university is reflected in Collini's commentary- the professor of Intellectual History at Cambridge - who states that 'Societies do not educate the next generation in order for them to contribute to the economy' [2]. These are sound sentiments, but there is also a need to be realistic; especially when government guidelines and funding are followed in higher education.

A design student's comprehension and realisation of design is underpinned by: phenomenology, the study of consciousness: hermeneutics, the interpretation of something and the epistemological root of knowledge are all key to establishing being independent in thought and proficient in practise. These concepts are not new; the work of Cardinal Newman and Humboldt in Germany are evidence of this historically. Philosophy and thinking skills, as articulated by Finn [3], are needed in some areas of design education, as opposed to the ad hominem approach once used to educate the designer-thankfully, those days are past and the debate has returned in some institutes. In this area of education topics such as ethics and the values of design are discussed: it would seem sensible to place these subjects in the domain of critical studies. The discourse of design progression continues today in a wide-ranging number of areas. But, it also needs to be managed at under graduate level and in business.

3 MANAGEMENT OF RISK

In management theory the names of: Drucker, on development, Maslow on hierarchal needs, the Belbin plant or Goleman's EQ all are concerned with thinking, maturity and the measuring of intellectual development [4] Kurzeweil, The Google director of Engineering refers to this concerning the creating of a mind [5]. The emphasis today must be upon students thinking differently so they can consider the unpredictable in design. For instance the concepts of: chance, serendipity and probability in the process of their work during the early stages. These concepts encourage the student to make connections, surely that is one key aim of education. In Kingdom's work [6] claims are made that suggest that serendipity unlocks the imagination in large business organisations as it battles against the 'corporation machine'. This argument is extended to by the director and Fellow of one of the most imaginative Design Company's, FROG, where William [7] explains that the independent approach to design is essential. He goes so far to suggest that 'we should design a disruptive hypothesis' and encourages people to 'look where nobody else is looking' [7]. He is not alone in wishing to encourage innovation as McDonald [8] suggests that the innovative quotient needs to be considered because business is naturally risk aversive. Intellectually, the concept of risk and serendipity are supported by such heavyweights as the American philosopher D. Donnet in the design of tools for thinking innovatively to nurture and facilitate serendipity [9]. This work was recognised and preceded by the concept of democratising innovation by Hippel, the Professor of management innovation and entrepreneurship at MIT [10].

We wish students to be innovative, this requires the individual to think differently, the key areas to underpin this are: reflection, an understanding of theory and practise and ideally how they link and apply themselves to design problems. The question has been raised in business concerns the tactics should be used to challenge a fixed mind-set [11]. Some of the problems relating to design exist within management structures and people who do not understand the process itself. The risk-aversive accusation, in business, is articulated by Hands [12], who states managers are not being equipped to innovate. The importance of risk management is also explained by Best [13] arguing for more of a part in the design process, and by Chuck [14] who links this to sustainable change. This suggests that academics may need to re visit the approach, content and how we teach from the didactic to enabling discourse on the areas of design that are difficult to measure, but are indispensable to the student. The area of the design curriculum that was revisited to resolve the conundrum at NTU was critical studies.

4 RESEARCH

4.1 Design and Methods

This paper suggests that engaging with critical theory can enhance the student experience in higher education. The primary focus of the work was to develop a different approach to how critical theory

has delivered to a mixed group of undergraduate design students representing science and arts disciplines. The methodology of the research reflects the student body at Nottingham Trent University, product design school. A random sample of this student population was used; which comprises of level 4, level 5 and level 6 students. Responses consists of level 6= 11, level 5= 52 and level 4 =67, combined to produce a total of 130 for all three years from a possible 283.[1] Data gathering was via a two-page questionnaire, which followed the tunnel format designed to collect information. The academic component – apart from writing reports – is often perceived as being a separate function. The analysis is descriptive and contextual. The nominal numbers identify the participants; the ordinal numbers define the order and the interval numbers to establish statistical data.

The questionnaire framework consisted of three headers: interest in critical theory, relevance of critical theory, the delivery and content of critical theory. Questions were therefore designed to have specific intentions – to determine specific information about an area. Question 2 considered students' perceived level of knowledge on the area before starting university. Question 6 reviewed to what extent students' considered themselves to be well informed academically. Question 11 reviewed to what extent students' considered staff were supportive to their learning A major part of the questionnaire was based on the Lickert Scale [14] with the criterion for questions to be based upon students' reflection. These responses were recorded on a 1-10: 1 = poor and 10 = excellent, and conformed to the funnel format. The numerical data is concentrated in. The mean, mode, median, standard deviation, Pearson correlation co-efficient and two scattergrams were then correlated.

4.2 Results and Discussions

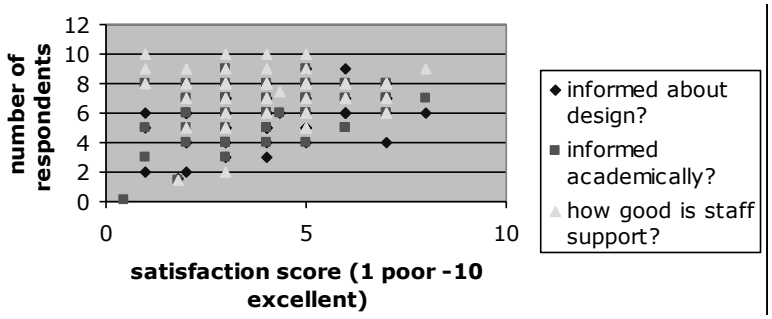

Figure 1. Scattergram showing level 4 survey responses

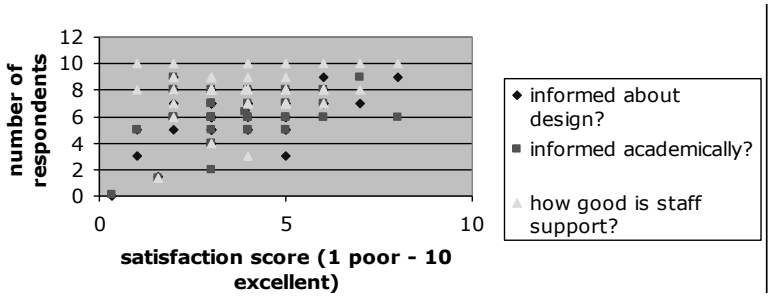

Figure 2. Scatter gram showing level 5 survey responses

4.2.1 Students' perceived knowledge of Critical Theory.

Initial questions prompted students to response specifically upon their understanding of critical theory. Results from students at level 4, showed an average score of 4.3 (4), which suggests that this student body initially lacked confidence in their understanding of the subject area. This group of students

[1] There were a small number of errors in the responses from all cohorts of students where a question may have been misread or missed completely, but this was relative low considering the numbers responding. The discrepancy concerning the minimal number of responses at level 6 was linked to the limitation and importance on their time. These students were in the process of writing dissertations, producing projects and completing reports for the degree qualification. Therefore the researchers chose not to include the level 6 results at this stage. Therefore a final 52.2% response rate was found over the remaining two levels.

returned an average of 5.9 (6) for the later question, which related to their perceived knowledge base after the year of study. As the qualitative findings showed, development in confidence can be achieved, as reflected in the following quote:

> *"I have become progressively more sure by talking to people, conducting research and discussing my findings, which has increased my confidence"* Level 4 student.

At level 5, the average score was 3.9 (4), which reflects a similarly low score; as with the students at level 4. This confidence was shown to develop, similarly to level 4, where students considered how the teaching had influenced their knowledge; scoring an averaged at 6.3 (6). However the level 5 students did exhibit some differences from level 5. Although the score pattern is similar to the prior level, level 5 students' comments articulated the differences as the following two quotes demonstrate:

> *"I have a better understanding to approaching a new task. Working with critical theory, my work has developed in more depth"* Level 5 student.
>
> *"Over the course of the past year, I have become more interested in aspects of design and started to learn more specific opinions about what actually interests me"* Level 5 student.

It is important to note these two comments as they pinpoint key areas of the curriculum and personal realisation of what is important, in terms of individual development. It is the students recognising the importance of critical theory and its links to being a good designer. There are a number of reasons for this difference. The students are a year older and they are beginning to mature. Students show reflection in a greater depth of understanding and have some experience of the subject having had one academic year of teaching previously.

This part of the questionnaire was concerned with the students' self-confidence related to their knowledge of design. The research findings show that level 4 and 5 cohorts lacks confidence in their own knowledge; whether this is because of naivety or a lack of familiarity about what they should be reading is not known. The apparent growth in confidence suggests that through exposure and awareness to subjects, confidence can begin to increase. It is worth noting, that there may have also been other outside influences that could have attributed some of this growth, so the suggestion would be that Critical Theory teaching might in part be influential in this confidence growth.

4.2.2 The Relevance of Critical Theory to being Academic.

Students highlighted an average of (6) in their perception of their academic knowledge base. Whilst this is an overall positive result, further results did highlight some concerns. From the qualitative data, many students highlighted their concerns, and specifically related it to writing:

> *"I have never been confident when it comes to academic work and writing essays"* Level 4 student.

The question has to be asked; why do students position themselves on the lower part of the scale when they have met academic criteria in their application to attend a University? It must be recalled that the majority of the students are school leavers and most of them will be moving away from home for the first time. Many students did respond to this in their comments, showing they recognised a distinct difference to what is required overall:

> *"It's been a challenge understanding what is required of us; it is very different from the days of coursework and A-levels"* Level 4 student.

However some students commented on how they initially felt unconfident about their academic ability, but as the year and the teaching progressed, this confidence grew:

> *"I feel more confident about my writing skills and I have a lot more knowledge about academic theory"* Level 4 student.

There are expectations held by the University and lecturers that the maturity gap is a natural transition, but for some students it has to be recognised that the journey is not always an easy one. For many the transition is as much about social orientation, as opposed to academic rigour, engagement and performance. Although the pre-conceptions and assumptions held by universities is recognised and cannot be ignored, the reverse is also the same for the student.

Again, level 5 students' scores were widespread, but there is a levelling out and a lack of extremes. Students scored an average of 6.4 (6) when asked about their perceived academic knowledge base. A small number of students appear to be forging ahead and some are beginning to move towards the middle band. The students are constantly asked about their specific interests in design; the students are requested to supply and articulate an aim and set of objectives throughout all the briefs set by staff and thoroughly refer to texts and literature as evidence. This is exemplified in the following statement:

"Better understanding of the area, however I still lack confidence in writing" Level 5 student.

"I feel more confident in my approach to analyse and cross reference. I also feel stronger in my capacity to form a coherent argument" Level 5 student.

The teaching staff consistently received feedback from the students via tutorials, lectures and seminars. This is important, as the staff need to read and act upon suggestions that are made. This means that the students can see that teaching staff was willing and able to change, which is what they were constantly being asked to do.

4.2.3 The Content and Delivery of Critical Theory.

The students on level 4 have supplied a high score for staff support on the questionnaire, shown though an average of 7.4 (7), when students were asked to measure the effectiveness of the teaching staff in informing their understanding of Critical Theory. Although, this is complimentary to the small critical theory team it is important to acknowledge, as the students are validating the working practises of the academic staff. Many students discussed the teaching team in their comments:

"I wanted to thank the staff for their support throughout the course, they have changed the way I see design and the design world for the better" Level 4 student.

"Overall I feel that the seminars are very informative, but sometimes feel the lectures bombard us with information about topics we know little about and so becomes confusing, but appropriate, as it is our job to research them further" Level 4 student.

Whilst the later response could be seen negatively, there is an element in which it can be considered as being proactive, in encouraging the independence in this student not expect to be delivered everything in teaching sessions. This highlights earlier ideals that the teaching team was looking to encourage; in that students (in part) recognised and took responsibility for their learning. The tasks the students are involved in needed to be interesting as an intellectual rationale and an end product, which is aligned to artefacts and skills, shows students the relevance of this in terms of their educational and career aspirations. Throughout the development of level one, students receive lectures, which do inform, but they also are delivered in such a way that the students feel that they can contribute to the session. The lectures are concerned with asking why rather than a 'this is it' approach.

Staff support, again scored highly at level 5, as students said they were available, approachable and generally supportive in their tone of voice to the students. Students averaged a score of 8, when asked about the effectiveness of the teaching staff in informing their understanding of Critical Theory. This is supported by comments from students as shown:

"Its broaden my mind on this subject … I need to read more openly in subjects that I really didn't think were important until now" Level 5 student.

Students commonly discuss that they had developed in confidence and awareness, and that teaching sessions had *"opened my eyes"* to this. However sessions did not simply provide praise to students' ability and development, but as earlier comments have shown, teaching demonstrates future opportunities to learn more. The key to the success of the critical theory module is crystallised in the word enthusiasm. Overall, the team encouraged students to progress from naivety into maturity, as young designers who are confident at presenting ideas and to industry or concepts to research panels.

5 CONCLUSIONS

These research findings appear to show that the relevance of this subject area was not simply shown by students as being relevant to their design work, but interestingly, many students also commented on how the subject area had a wider relevance to them. Several students showed a strong understanding of the relevance of critical theory to them personally. This was exhibited through many qualitative comments made at both levels:

"Studying Critical Theory over the past 6 months has changed me a lot. I have developed a new set of values and ambitions in my life and design" Level 4 student.

"It is now an area of design that I would like to work in after graduation" Level 5 student.

As these comments show, a small number of students discussed how the subject had left a long-lasting impression on them for the future where students commonly commented on in positive influence this area has had upon them. This suggests that for some students, critical theory has become a key driver in thinking about their practice, even when this is not related direct to future ambitions. These findings offer good opportunities for universities, as well as employers, as many of the postgraduate and research studies centre of key foundations of critical thinking and theory. If a student has an ambition

to continue in this area, they may be open to postgraduate work, therefore this maybe a good potential grounding for future studies as well as employment.
Unusually, this paper acts as a prompt to all of us involved in Design education to evoke the spirit of the names of: Peter Behrens, Reyner Banham and Thomas Heatherwick and to replicate their acts of being innovative in practise. This is not an idealist point of view, it is not a sentimental return to untroubled days, it is a prompt to re -launch the aim and meaning in design. The authors make no apology for proselytising the importance of design education. It is supportive of academics, students and design research. This paper requests that colleagues ensure that the importance of taking risks, being explorative and experimental to guarantee that the most essential aspects of design and innovation are safeguarded in a stoic manner in the best way they are able.

REFERENCES

[1] Liesbeth, S. Eggink, W. 2014 *Why Designers and Philosophers should meet in school*, 16th International conference of Engineering and Product Design Education, The IED and The Design Society.
[2] Collini, S., 2012, *What are universities for?* Penguin Books, Clays Ltd, St Ives.
[3] Finn, D. Case, C. Underwood , B and Zuck, J.,2012,*Philosophical Skills*, Continum, Newgen Imaging, pve, Ltd. Chinnai, India.
[4] McGrath, J. Bates B ,2013,*Big Management Theories*, Pearson, Ashford Colour Press Ltd GB.
[5] Kurzweil, 2012, *How to create a Mind*, Duckworth Overlook, CPI Group (UK) Ltd.
[6] Kingdon, M. 2012, *The Science of Serendipity*, John Wiley & Sons, Italy, Trentro.
[7] William, L., 2011, *Disrupt- spark Innovation,* Pearson Education, USA.
[8] McDonald, K, 2013,*Innovation,* Kogan Page, Ashford Colour Press.
[9] Dennet, C.D., 2013, *Intuition Pumps*, Penguin, Clays, Ltd St Ives Plc.
[10] Hippel V. E, 2006, *Democratising Innovation*, MIT,USA.
[11] Collins, H. 2010, *Creative Research,* AVA publishing SA, AVA, Book Production pte, Ltd, Singapore.
[12] Hands, D, 2009, *Vision and Values Design Management,* AVA publishing SAAVA, Book Production pte, Ltd, Singapore.
[13] Best, K, 2006, *Design Management,* AVA publishing SA,AVA, Book Production pte, Ltd, Singapore.
[14] Chuck, A. Micklethwaite, 2011, *Design for Sustainable Change*, AVA publishing SAAVA, Book Production pte, Ltd, Singapore.