

PERFORMANCE METRICS: ARE THE RISKS TOO HIGH TO BE CREATIVE?

John R McCARDLE, Adam HUSKISSON and Stephen PERRY
Loughborough Design School, UK

ABSTRACT

As students in Higher Education (HE), many highly successful design graduates exhibit the traits of being keen independent learners and sometimes even demonstrate a maverick approach to the art. The majority however are conformist. Some of the most communicative of students can be responsible for pedestrian, unsurprising design proposals lacking in daring and insightful application of technology. If students engage fully within a creative learning environment, with aims to develop both personally and professionally, should educators witness more widespread adventurous and experimental work as the norm? This paper explores one of the fundamental reasons offered by students in response to questions about their design outcomes, that of risk. Currently there appears to be a very limited understanding of the factors that constitute risk from the perspective of undergraduate students engaging in design programmes. Through a questionnaire and a series of focus groups with undergraduate students in different year cohorts, the work here identifies several distinct perceptions and motivations that could lead to such behaviour. Overall the study suggests that students are generally acting in a risk-averse manner with it being more acute in their final year of study. Commonly this behaviour was motivated by the aim to achieve the best possible grade through strategically using marking schemes and aligning with tutor advice. Extrinsic motivation dominated many students through the attainment of a desired degree classification. Students further reported feelings of anxiety and insecurity within the assessment process due to a range of external variables.

Keywords: Industrial and Product Design, Performance metrics, Risk-aversion, Student Experience

1 INTRODUCTION

Seeking high institutional reputation has played a key defining role in the political agenda of university management. Universities in the UK are coming under growing pressure to ensure their attractiveness to perspective students in an ever-increasing competitive landscape of higher education. Universities continue to work within the requirements of the Quality Assurance Agency for Higher Education in the UK (QAA), and to deliver consistency in module specifications, modes of delivery and methods of assessment, sometimes irrespective of subject specificity. With generic approaches to performance metrics, is there a cost to academic achievement and personal growth in the field of Design Education? And is programme development being bounded to the point that students are losing the opportunity to be creative?

By conducting a student focussed approach, the aim of this study was to identify determinants that may dissuade undergraduate Industrial Design students from being adventurous. Gaining insight into the level of risk students were willing to take drove the key objective of ascertaining the effect prescriptive practices in teaching and assessment may have had on student work ethic.

2 EDUCATED RISK

The concept of risk relating to resource investment in projects, tangible and financial, is an area that has been extensively explored in industry. Risk analysis is deep seated in investment forecasting. It often involves complex and interdependent processes necessitating equally complex analysis of decision making. The fundamental experiential basis of undergraduate decision making, formed during a design education process however, is an area that has received limited attention. Understanding student perceptions of learning environments and positive experiences of trying to innovate with risk, is not well documented.

2.1 Aspects of Risk

Definitions of risk vary, based upon the context they are applied [1]. Nevertheless, theories around the concept of risk are known to include the perception of *uncertainty*, *expectations* and a sense of *loss* [2], and as such have many degrees of freedom and variability between individuals. All design tasks are made and informed by personal interpretation, together with an evaluation of the risks involved within any given circumstance [3]. Processes of product development are inherently risky endeavours and influential decisions must be made in times of uncertainty [4]. Moreover, “*No project is risk free. Risk can be managed, minimised, shared, transferred or accepted; it cannot be ignored*” [5].

The definition used here is of risk being an “uncertain factor – positive or negative – that can significantly affect achievable performance” [6]. The aversion of risk can be defined as an attempt to avoid or circumvent such uncertainties.

Decision making at a personal level then, is about resolving uncertainty and weighing up a sense of loss set against one’s own expectations. When taken in the context of design education, it is also set against the perception of the expectations of others. Design outcomes are always the subject of open critique, whether that of peers, or that of examiners delivering formative and summative assessment.

2.2 Student related Risk in Design Education

In 2001, Clement & Walsh linked an absence of innovative design with *risk aversion*. The results of a five-year study of undergraduate industrial design students at Swansea University, UK concluded with a number of observed factors affecting innovation, both positive and negative. An aspect of note was, “A fear of jeopardising their grades by taking a risk”. This was perceived as a cultural phenomenon that necessitated changes to the programme regulations and module specifications to include, “encouragement of risk amongst undergraduates resulting in projects which challenge barriers and lead to an innovative mindset” [7].

When considering design curriculum matters, Arthur & Marsh have argued for the need for institutions to carefully consider the purpose of higher education in design. Keying into the well-aired debate over the difference between education and training, they highlighted how design curricula have evolved to adopt a highly vocational approach to teaching and assessment [8]. As a professional design practitioner, conducting a working approach of learning by failing, being self-critical and personally reflective, is far less prominent as for many it can lead to a financial and reputational penalty. While no doubt the increasing pressures on universities to prioritise employability rates has in part been a positive driver in aligning curriculum content with professional practice, it may be seen as a route to discourage some important aspects of experimental risk.

2.3 Links to Experimentation, Creativity and Innovation

Evidence that higher education performance metrics indiscriminately discourages risk taking appears to be more anecdotal than formal and therefore unclear in its influence. However, historically there is strong opinion supporting the case in the compulsory secondary education sector in the UK. That is through the National Curriculum and national educational quality inspections.

Benson & Lunt reported on attempts to introduce risk prompting activities in the design curriculum [9]. As an introduction to young students, risk taking and innovating as part of designerly play was explored. The main hindrance to developing and instigating such practice was the availability of time. Clearly, if individuals are expected to be free to learn through play and be reflective about making mistakes there is a need for space and time to do it. These are not only resource issues but curriculum issues, both of which relate strongly to governance. Benson and Lunt identified that while governing bodies may appear to agree with the value of promoting risk and innovation, it is contradicted by evaluating the quality of teaching on pass rate figures and national league tables (*ibid.*), drawing attention to issues that may be more widespread in processes using similar approaches.

Kimbell summed up the tension between the pressures educators are under in delivering to performance metrics and allowing students to be creative;

“This apparently contradictory idea - that you need to reward failure - forces the issue of assessment into the centre of any debate about creativity. And from our study it seemed that the biggest determinant of whether the students did (or did not) embrace the risky and the creative, was the attitude of their tutors. In their attitudes to failure in particular, these tutors determined how far students were prepared to chance their arms.” [10]. Furthermore, Kimbell draws attention to strong evidence that suggests performance metrics can lead to high levels of prescription in curriculum

content, delivery and assessment, which in turn may inhibit tutors in supporting more high-risk ventures [*ibid.*].

3 METHODOLOGY

Historically, attempting to understand an individual's cognitive decision-making process has used a form of protocol analysis. Such methods are complex, have inherent challenges in capturing relevant data, and often prove inconclusive. Comparisons between any decisions made is extremely difficult as there are many external and subconscious determinates that can influence individuals, many being predetermined prior to the decision itself [11]. For simplicity this study only focussed on student perception and opinions about their motives for engaging in design activities. The study used a mix of focus groups and on-line questionnaires.

The on-line questionnaire was delivered through Survey Monkey by invitation only, across three years of a four-year undergraduate programme in Industrial/Product Design. Year 1, Year 2 and Finalists. Year 3 students on industrial placement were excluded due to availability. Questions covered perception of risk, factors that influenced the choice of projects, opportunities to take a risk within the curriculum and opinions on tutor support.

Three focus groups were hosted consisting of ten students. Each group related to specific years of programme study with one group also including graduates. An attempt was made for gender equal numbers in the groups but was not attainable in practice. The groups were prompted with the question, 'what does *risk* mean to you with regards to your university course?' to which they were free to share comments, opinions and ideas. Conversations were audio recorded and transcribed. Participant Consent forms were completed by all contributors to meet institutional ethical policy.

4 RESULTS

4.1 On-Line Questionnaires

Forty-two students responded to the questionnaire with 9 (21.5%) from year 1, 12 (28.5%) from year 2, and 21 (50%) from the final year of study. From free-text responses category coding was used (NVivo) to produce the thematic top ten responses in Figure 1. In answer to the question, 'What factors determine how great a risk you take?', 'Peer/Tutor Feedback' and 'Grades' were the most popular answers with 40% participants mentioning these factors equally, with 'Creative Freedom' and 'Module Weighting' being the second most popular answers with 13% each. Consideration of resources including the availability of time and technology at 12% and 7%, followed by deliberations on the amount of work and feasibility at 5%, although these elements were not further defined. Finally, self-perception of personal skill-sets (ability) and emotions (current state of mind and 'being in the zone') was mentioned by only one or two students.

4.2 Focus Groups

Year specific focus groups were hosted to generate discussion on topics that dominate that year of study. It is however important to note that some of the comments may have been exaggerated or influenced due to the group dynamic, a common disadvantage of peer group discussion sessions. Tables 1-3 summarise the principle issues, shared comments and topics of conversation.

5 DISCUSSION

From this study, first year students were far less concerned with risk taking. Second year students were seemingly very strategic in their attitudes towards work and finalists not only strategic but more conscious of their actions and perceived potential impact on marks and final degree classification.

Many of the students believed certain modules encouraged risk through low credit weighting; short time span and open briefs, which most believed depicted an accurate reflection of design beyond education. Conversely some modules were perceived as less creative. Physical science, more didactic subjects such as Mechanics and Manufacturing were perceived as prescriptive and as such offering fewer opportunities to take risks.

Although participants believed risk taking was a trait needed to become a successful designer, many did not consider that this was practiced in their own degree. The main factor contributing to student perception of risk is in the interpretation of the grading criteria. Students focused on degree classification rather than taking a holistic view of personal and professional development.

Furthermore, with the perception that many uncertainties within the process influenced their degree outcome, many had insecurities about their own abilities.

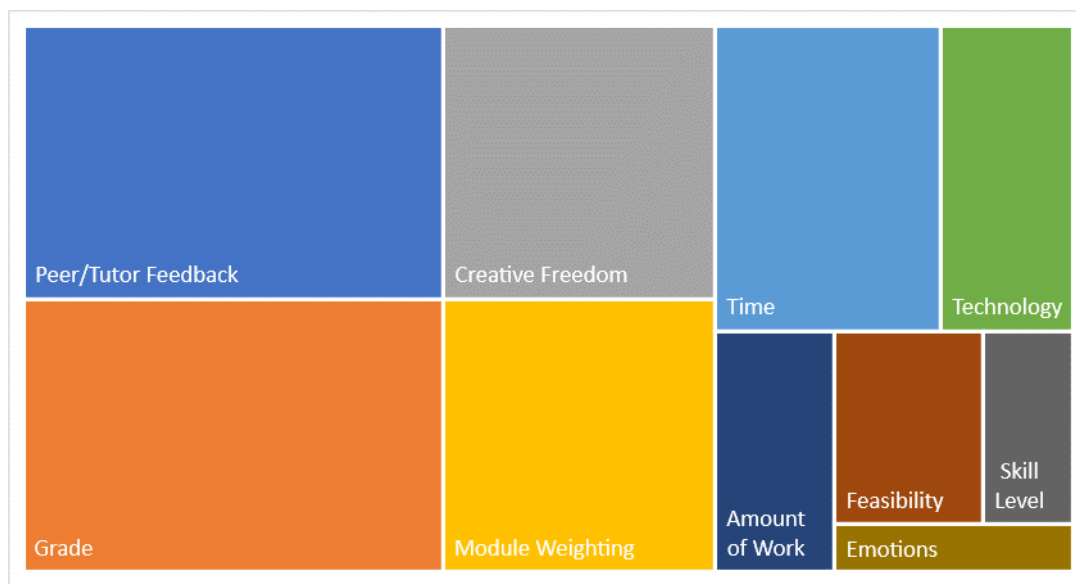


Figure 1. Top 10 Considerations of Student Risk

Table 1. Year 1 Focus Group Comments

| | |
|-------------------------------|--|
| Attitudes (work ethic) | <ul style="list-style-type: none"> • Greater independence than school • "It's about making the most of everything. We've heard from previous years this is the only time you will get to live a regular student lifestyle" • This year did not count to their final degree classification they could socialise more |
| Risk | <ul style="list-style-type: none"> • "Some students want to do their best whilst others wanted to just do the required amount needed to pass." • No need to risk anything, just do what's asked. |

Table 2. Year 2 Focus Group Comments

| | |
|--------------------------------------|--|
| Module Weighting/Credit Value | <ul style="list-style-type: none"> • "Some modules are worth more than others." • Take fewer risks and spend more time on modules are higher credited in the hope this result in safe but strong final submissions • "tick all the boxes and get a good grade" |
| Drive and Motivation | <ul style="list-style-type: none"> • "How will this affect my mark? What does this mean to my final degree classification?" • "I don't want to do anything unnecessarily stupid"*** • Personal motivation wanting to create a good design portfolio for a good placement. |
| Inspiration and Individuality | <ul style="list-style-type: none"> • "Everyone looks at the mark schemes as guidelines. Resulting in work that one student described as different versions of the same thing". |

Table 3. Finalist Focus Group Comments

| | |
|------------------------------------|---|
| Time Management | <ul style="list-style-type: none"> • "You can save yourself a lot of time by looking at what others have done in the past, looking at the mark schemes and doing something safe." • More time spent on higher weighted modules. |
| Tutor Feedback/Interactions | <ul style="list-style-type: none"> • "It's often difficult to know what the tutor wants." * • "Proposals get changed, not to meet marking criteria but because of the tutor's opinion "it would look better if..." • "Tutors tell us all the time we aren't reinventing the wheel. Adapt what is already out there...which I think is an obvious example of them discouraging risk" • "I don't feel like I fully own my idea as my tutor has had such a huge influence on it." ** |
| Attitude (work ethic) | <ul style="list-style-type: none"> • "You do what you have to do to get through" • "Design within education is far more restrictive than in the real world" • "Creativity is best when it isn't forced" • "There is no point doing something risky when you can be generic and still get a good mark" |
| Design beyond School | <ul style="list-style-type: none"> • Perceptions that in the professional world, financial rewards combined with constant client feedback and interaction promotes more risk taking than at university. |
| Academic Results | <ul style="list-style-type: none"> • All participants expressed a desire to achieve at least a 2:1 for their final degree classification. |

Clearly then, the dominant issues for students was to gain a good degree, although secondary factors such as developing a competitive portfolio to seek advantage in gaining a placement or for future employment was also significant. Perhaps surprisingly, financial matters were rarely mentioned. The expectation of a quality tangible outcome, e.g. a prototype with which to evaluate the progressions and outcome of a design process, or any 'in-module expenses' created little concern, neither did any issues with the perceived value of tuition fees.

There is an indication here that the majority of the undergraduate students who took part in the study were consciously acting in a risk-averse manner. When it came to making decisions about project proposals and design development, it seems to be principally driven by competitive self-advancement. The key to this was seen as falling in line with tutor expectations. Overall, the comments from students tended to align with senses of *uncertainty* (e.g. how do I do this? * Table 3), *expectations* (e.g. I want to succeed, what do you want me to do to demonstrate success? ** Table 3) and *loss* (e.g. sense of failure *** Table 2) [2]. The latter issue is exceptionally important and already known to induce high levels of anxiety. Fear of Negative Evaluation (FNE) [12] is linked to Test Anxiety and known to be a driver of a number of primary anxiety disorders.

The question remains as to what may be driving risk aversion in design students. It is clearly a convoluted situation. It may be that tutors are partly responsible in their approaches, however tutors themselves are controlled, if not hamstrung, by ensuring students deliver consistent success, where success is not necessarily viewed as encountering experimental failure. Marking schemes that negate connoisseurship and healthy debate allow strategic paths for students to succeed without pushing boundaries.

There is no doubt that HE performance metrics have a place in ensuring QA in academic practices, but for tutors and students alike, "*Feeling in control encourages risk taking*" [13], and the way universities respond to imposed performance metrics may be responsible, at least in part, for generalising modes of delivery and assessment methods that may inhibit the exploratory nature of learning.

5.1 Limitations and Further work

The intention here was to seek insight into the views of students by reflecting on their attitudes to assessment, opinions on their design outcomes and their own general approach to their work. In doing

so we clearly acknowledge that the findings are subjective. There has been no attempt to consider gender specific issues. Furthermore, we did not attempt a validated psychometric alignment with participants nor gave consideration of cognitive styles and learning strategies. Such approaches may indeed shed further light on the influence of personality traits, but the focus here was to explore the cultural attitude towards risk taking. Of further interest would be the study of any change in student work ethic following a placement in industry. All finalists who participated in the study had completed a placement, which may have influenced their approach to academic design work.

6 CONCLUSIONS

Risk and its relation to engaging creatively with design tasks is highly subjective and perceptions dramatically differ from person to person. Overall the findings have provided evidence that students studying Industrial and Product Design can be risk averse, and progressively so; but more for strategic reasons than from a lack of desire to push boundaries. Questions remain as to whether the system within the teaching and assessment of Design in HE is expediting these strategic approaches of students; or, as may be evident in secondary education in the UK, imposed metrics are having a detrimental effect on Design Education by negating the valuable student experience of exploratory failure. Often the resources of time, curriculum content needs to be developed with opportunities, recognition and rewards for risk taking. Despite the pressures on educational institutions to deliver a high-quality rewarding student experience, beyond a very broad scope of subjective feedback from national surveys, there is little evidence of focussed and validated research methods being used to gain insights into student levels of anxiety. Perceptible levels of nervousness surrounding a fear of negative evaluation may be driven by decisions overshadowed by a sense of risk.

REFERENCES

- [1] Roeser, S. 2012. Handbook of risk theory. Dordrecht: Springer Science+Business Media B.V.
- [2] Douglas, M. 1985. Risk acceptability according to the social sciences. New York: Russell Sage Foundation.
- [3] Ert, E. and Yechiam, E. 2010. Consistent constructs in individuals' risk taking in decisions from experience. *Acta psychologica*, 134 (2), pp. 225—232.
- [4] Ferdowsi, B. 2003. Product development strategies in evolutionary acquisition, MSc Thesis, B. S. Aeronautics and Astronautics, MIT, 2001
- [5] Latham, M. 1994. Constructing the team. London: HMSO.
- [6] De Meyer, A.C.L., Loch, C.H. and Pich, M.T.. Managing project uncertainty: From variation to chaos. (2002). MIT Sloan Management Review. 43, (2), 60-67. Research Collection Lee Kong Chian School of Business. Available at: http://ink.library.smu.edu.sg/lkcsb_research/5450
- [7] Clement, M. and Walsh, I. (2001). Steps towards the development of a 'culture of innovation' amongst undergraduate industrial designers. [online] Available at: <https://dspace.lboro.ac.uk/dspace-jspui/handle/2134/1348>
- [8] Arthur, L., & Marsh, P., (2016), Stop playing it safe: The importance of taking risks in design education, E&PDE 8 & 9 Sept 2016, Aalborg University, Denmark
- [9] Benson, C. and Lunt, J., (2009). Innovation and risk-taking in primary design and technology: issues arising from the evaluation of the pilot phase of the curriculum development project 'Butterflies in My Tummy'. [online] Loughborough University Institutional repository: The Design and Technology Association. Available at: <https://dspace.lboro.ac.uk/2134/5093>
- [10] Kimbell, R. (2009). Creativity, risk and the curriculum. [online] The Journal of Design and Technology Education. Available at: <https://ojs.lboro.ac.uk/ojs/index.php/JDTE/article/download/416/393>
- [11] Chen, H., Chen, I. and Wu, H. (2014). Exploring the critical influential factors of creativity for college students: A multiple criteria decision-making approach. *Thinking Skills and Creativity*, [online] 11, pp.1–21. Available at: <http://www.sciencedirect.com/science/article/pii/S1871187113000606>
- [12] Watson, D; R Friend (1969). "Measurement of Social-evaluative Anxiety". *Journal of Consulting and Clinical Psychology*. 33 (4): 448–57. doi:10.1037/h0027806.
- [13] Drummond, H. (2001), *The Art of Decision Making*, John Wiley & Sons Ltd, Chichester, UK, ISBN 0-471-49718-5, P.129