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Undergraduate design students' experience of risk-taking in an open-ended design project

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Abstract

In this article we investigate the student experience of risk-taking in an open-ended design project that appeared to be ideally suited to encourage risk-taking. The article is informed by a phenomenological case study documenting student experience of risk-taking during a concentrated, week-long design project. The data revealed multiple instances where students had taken risks and how they had experienced risk-taking. Three significant aspects of risk-taking in design education were identified in the data and explored. The first aspect considers how the students' experience correlated with a theoretical educational approach that encourages risk-taking. The second provides a broad overview of the students' experience of risk-taking during the project. The third draws out common student experiences that highlight that risk-taking is often prompted by the undefined and unexpected elements of a project and gaps in student knowledge, experience and skills.

Keywords

risk-taking

design education

open-ended projects

creativity

fabrication

learning environments

Introduction

There is a rising awareness of the significance of creativity as an essential skill for graduates who will function in an increasingly complex world of work characterized by rapidly changing technological, social, environmental, economic and political environments. When identifying the skill set that future graduates will require, the World Economic Forum (2016) highlights the importance of creativity across all disciplines. The benefit of including creativity in education appears in the literature on both higher education and school-level courses and across different disciplines; see Hargreaves (2008) and Kleiman (2008). This article, although positioned in design higher education, aims to contribute towards a greater understanding of the educational conditions that will encourage risk-taking, which is seen as an essential component of creativity.

Risk-taking and creativity in education

Risk-taking is often linked to creativity, where it may be considered a personality trait of creative people (Tyagi et al. 2017), an element of creativity (Robinson 2001, as cited in Donnelly and Barrett 2008) or part of design models that describe the design process (Hultén et al. 2016). Studies of creativity, risk-taking and the assessment of school level drama and theatre subjects (Carrol and Dodds 2016), the risk aversion of students in university-level three-dimensional design programmes (Blakey and McFadyen 2015) and creative risk-taking for students and teachers in school-level design and technology (Davies 1999) outline the varied challenges of incorporating risk-taking in education.

Although the relationship between risk-taking and creativity has yet to be empirically established (Tyagi et al. 2017), the literature on creative thinking and higher education connects the words innovation, exploration and experimentation to the term risk-taking (Turpin et al.

2015; Visser et al. 2017). In design thinking, risk-taking can be viewed as an integral component of creative problem-solving (Rutland 2009) as design inherently uses abductive reasoning to posit ‘what might be’ (Dong 2015: 39). Encouraging student risk-taking and improvisation is seen to equip design students with a core skill (Rolfe 2010) that improves innovative thinking. A willingness to take risks is especially useful when new ground-breaking ideas are sought to tackle the complex and wicked problems (Rittel and Webber 1973) so often found in technology, design and social innovation. As Perry and Karpova (2017: 82) assert, ‘it is important to further investigate the relationship between risk-taking and creativity’. The knowledge generated by such research could inform educational practices aimed at cultivating creativity by encouraging students to experiment with taking risks. This article and the findings discussed add to the discussion of risk-taking in education programmes and have relevance for a broader community of educators who wish to understand risk-taking and how it might be applied to enhance creative skills.

The design project

In this article we analyse the risk-taking experiences of undergraduate design students who participated in an open-ended design project that runs on four Inscape campuses. Inscape was founded in 1981 as a private, for-profit, higher educational institution offering interior, fashion, graphic, marketing, ideation, audio-visual and jewellery design qualifications (Inscape 2018a). With common first-year and shared second- and third-year subjects across the different design disciplines, the breaking down of disciplinary silos is stressed, as is the inclusion of industry relevant briefs (Inscape 2018b).

The design project that is the focus of this case study was initiated in 2014 and for the past three years has been supported by the African flooring manufacturer Belgotex as an industry

partner (Inscape 2018c). For the project, student groups of four to six peers from different design fields collaborate in conceptualizing and producing design solutions for real-world problems. In 2018, when this study was conducted, the project took on an individual, personal and conceptual focus, with a charitable rather than commercial outcome. As part of the project, each student was allocated randomly a used chair that could be reconsidered, recreated and revived to communicate the student's personal life-story. The project aimed to generate 1000 chairs to be auctioned and the proceeds would be donated to a charity initiative titled *Thru the Chair* (Inscape 2018c). Students were, therefore, engaged in creating a product that would have broader significance and positive social impact.

Figure 1: The *Thru the Chair* project original chairs on the left and the final chairs on the right. Inscape Campus, Pretoria, South Africa. Copyright: Inscape Education Group, 2018.

The project followed a specific structure and timeline on all campuses as outlined in Figure 2. Groups of lecturers were available on campus for consultation throughout the project.

Day	Students	Activities
Day 1 am	All first- and second-year students, Degree and Diploma	Overview of brief Workshops on reflection, personality type, strategies for team work, storytelling, workshop training and safety
Day 1 pm	Groups of four to six across disciplines	Brainstorm common experience, shared interest or story
Day 2 am	Groups of four to six across disciplines	Two-minute student presentation of theme
Day 2 pm	Individual students	Students allocated a chair Students focus on their individual chair design, conceptualisation and how it will fit into the larger group theme
Day 3 am		Student presents their concept for re-imagining chair
Day 3 pm	All/groups	Workshop orientation and training on equipment
Day 4	Individual students	Construction of chair both on and off campus
Day 5	Individual students	Hand in 08:00 and exhibition

Figure 2: Project schedule for *Thru the Chair* 2018.

Since its inception, the project has provided a unique educational opportunity with a number of valuable learning outcomes. As a collaborative project, students develop interpersonal skills as they must interact, build relationships, rely on and support each other whilst working towards a common goal. Such opportunities are critical in addressing calls for the transformation of higher education in post-apartheid South Africa (Department of Education of South Africa 2008) and a changing student demographic at Inscape. The project exposes students to real-world industry clients and to the pressures of designing within a very limited time frame. Such projects in which the design education studio experience mimic the industry environment (Logan 2006) are effective in improving the students' understanding of the design profession (Tovey 2015). In addition, the project aims to foster generic skills such as

communication, listening, empathy, managing conflict and applying managerial approaches. These skills are becoming increasingly important in the rapidly changing and uncertain contexts in which designers' function as part of interdisciplinary teams whilst addressing highly complex problems (Augsten and Gekeler 2017).

The authors, who had experience of the project, three as coordinators, two as lecturers and two as observers, identified the project as a good example of an open-ended brief that caters for 'the unexpected and unique solutions that students are encouraged to achieve' in creative projects (Giloi 2013). In a creative project, students have greater power and autonomy (Dineen and Collins 2005) over defining the problem, solution, process and product. Space is created for students to gain 'satisfaction, wellbeing, happiness and self-identity, as well as enhanced potential for professional development' (Donnelly and Barrett 2008: 117). The structure and parameters of the project and the environment that students worked in demonstrated many elements that encourage creativity. Danvers (2003: 52) describes this type of environment as one in which students can interact; move between discussion, debate, thinking, making, reflection, play, dreaming and problem-solving; are guided by lecturers; and work independently in a safe space where they can take risks and fail.

Given the objectives for the project and the environment that was created, the authors felt that students had an ideal opportunity for risk-taking. What interested us as a group was the student's experience of risk-taking rather than our observation and interpretation of their risk-taking practices. Our approach is supported by Oliveira and Marco (2016), who indicate that there is little research that explores student experience of non-prescriptive or open-ended briefs. The focus on the students' experience of risk-taking guided our choice of research

methods in using phenomenological interviews to collect data from those who have direct experience of a phenomenon (Creswell 2013).

Methodology

This study adopts an interpretivist paradigm as the aim is to uncover the design students' experience of risk-taking when completing an open-ended design project. Although this is a single-representative case study (Yin 2014: 9) and, therefore, has limited explanatory power, our long-term objective is to extend the research to multiple cases by including additional campuses and complete a longitudinal study each year on the same project. The current case study provides insight into students' experience of risk-taking on one Inscape campus.

In gathering and interpreting the qualitative data, we make use of a descriptive phenomenology approach that Creswell (2003: 13, citing Moustakas 1994) defines as a method that 'involves studying a small number of subjects through extensive and prolonged engagement to develop patterns and relationships of meaning'. Phenomenology, as Austerlitz (2007) points out, has been widely used in higher education research to elicit and analyse student experience.

Guided by the phenomenological approach, we interpreted how students experienced risk-taking during the project. The purposive sample consisted of eleven participants from multiple design fields, who were engaged in the first or the second year of study across different design courses. Participant selection criteria specified the successful completion of the project with a pass mark and work that was deemed successful by a panel of judges in the first round of a selection process. We acknowledge that only interviewing students who were

successful may not offer a full description of risk-taking, but as the analysis revealed, not all successful participants took risks.

The interview methodology included semi-structured interviews conducted by one of the authors three months after marks had been awarded for the project. Eight open questions were used and these were informed by the phenomenological interview approach proposed by Bevan (2014). The questions aimed to encourage students to explore their decision-making when it came to taking risks. Bevan (2014) suggests structuring questions in three stages. In the first stage, the participant explains their experience in relation to the context. The second stage questions encourage participants to provide a detailed experience of the actual phenomenon. The third stage allows for clarifying questions and what Bevan refers to as 'imaginative variation' (2014: 141), which encourages participants to consider a variation in the context and how this might influence their experience. The questions used in the study started with students providing a description of a typical day and their general experiences of the group stage of the project. They were subsequently asked to identify specific risks taken during the project, and finally participants were asked to consider and describe possible outcomes if they had not taken risks. In the case of students who did not take risks the final set of questions asked why they had not taken risks and how their project might have differed if they had taken risks.

Eleven interviews, of between ten and 25 minutes each, were recorded and transcribed by the authors. In the analysis 192 significant statements were coded and these were categorized into 21 themes informed by the literature (see Figure 3). The themes and categories were discussed in a meeting with all researchers. It was agreed that the focus would be on the individual's experience of the project when students worked on their own, rather than

including the analysis of the group work experiences. Tyagi et al. (2017) emphasize that risk-taking is a very individual experience and we wished to thoroughly explore this aspect.

Despite the small number of students interviewed, the data generated is rich and revealed a broad and diverse range of experiences.

Given the diversity of experiences and the limitations of this article, we present the student experiences in three sections. First, we identify a theoretical educational environment that encourages risk-taking and evaluate how the students' experience of the project aligns with this. Second, we provide an overview of the student experience during the project. Third, the common themes identified in the data are described in greater detail.

Creating an environment for risk-taking in design education

When considering the significance of creativity and risk-taking in education and our experience of the project, we identify approaches that could be conducive to encourage risk-taking amongst students. Davies (1999), Demirkan and Hasirci (2009) and Hargreaves (2008) provide descriptions of the educational approaches and environment that encourage risk-taking. These include the following:

- creating a safe environment
- acknowledging and rewarding success
- lecturer/teacher support
- challenging students
- removing the negative performance consequences of failure
- providing an appropriate project vehicle and
- acknowledging the individual student.

When analysing the data, we identified instances where the above criteria were reflected in the students' experience of the project.

Creating a safe environment

Students indicated that they felt safe to take risks during the conceptual and fabrication stages of the design process. However, they referred to concerns of personal safety when their concept required that they use unfamiliar equipment and materials for example, cutting wood with a band saw. Students sometimes drew in family members or professionals who were proficient with the equipment to mitigate personal safety risks.

Acknowledging and rewarding success

Students reported that they experienced success when their final artefact aligned with what they had conceptualized or when their concept was approved for the specific stage of the project. They acknowledged successful learning during the project and how this learning would better prepare them for their classes, the workplace and future critique of their design work. Smaller rewards such as the coffee provided were acknowledged.

Lecturer support

The literature consulted mentions three components that relate to student lecturer interaction consisting of trust, support and two-way communication (Davies 1999; Visser et al. 2017). Students affirmed that they felt supported by their lecturers, understood the feedback provided, trusted the lecturers' judgement and generally followed their advice.

Challenging students

That the project challenged students was confirmed by their comments of experiencing stress and feeling overwhelmed and confused at times. Students mentioned that they were often

uncertain of: what was being asked of them; and how they would respond to the varied challenges presented. In certain cases, uncertainty was created by the student choosing a path that they were unsure of, or by unexpected and unplanned for challenges. They revealed that at times they doubted that they could achieve certain outcomes and had exceeded even their own expectations. Danvers (2003: 53) proposes that ‘instability and uncertainty are often seen as positive states of mind within art and design’ and the project had created that potential for students.

Removing the negative performance consequences of failure

As the design products resulting from the project were graded, and students were required to pass the project to complete the year, risk-taking had the potential to negatively influence a student’s performance. Students did refer to marks and mentioned that achieving high marks was one of their objectives in taking certain risks. However, the project’s assessment structure included a range of criteria such as collaboration and support of the group, story-telling, endurance and perseverance and therefore emphasized person and process rather than the final product. Person, process and product are acknowledged in design education and assessment (De la Harpe et al. 2009). The design process is considered a key learning stage in design education (Gulwadi 2009) and the assessment of process rather than product may encourage greater risk-taking in students (Ehmann 2005).

Providing an appropriate project

Educational projects that are loosely constrained, voluntary, provide a large amount of freedom and have broader significance encourage risk-taking (Davies 1999). The outcomes of the project were seen by some students as open-ended, while one student who did not take risks perceived the project as constrained. Although the project was not voluntary, students indicated that they had a fair amount of freedom and agency in choosing their own direction

for the project. They acknowledged that the charitable objectives of the project gave it relevance. The environment created was also instrumental in students making new, on-campus friends from diverse cultures and backgrounds. This was prompted by the necessary sharing and collaboration centred around the design brief based on personal life-stories.

Acknowledging the student as an individual

As the project required each student to tell their own personal story, there was a focus on the individual and their life experiences. Students recognized the differences between the group and individual stages of the project and felt that they had the freedom as individuals to explore and experiment, whereas within the group they sometimes had to compromise.

As indicated above, the project that we selected aligned fairly well with the literature on creative education including the type of project, environment and approach that encourages risk-taking.

Overview of student experience of risk-taking

When we considered the analysis of the data, themes were grouped into three broad categories describing enjoyment, skills and student characteristics. These were again related to risk-taking amongst students as described by Davies (1999), Demirkan and Hasirci (2009) and Hargreaves (2008). In the data, the themes and categories are presented as Figure 3, which illustrates the alignment between the literature and data in these three areas.

Student focus for risk-taking based on Davies (1999), Hargreaves, (2008) and Demirkan and Hasirci (2009)	Experience of students
Enjoyment pride, discovery, recognition, surprise, achievement, success, mastering something difficult, satisfaction	The emotional enjoyment of the project was recognised by students who referred to their experience using words such as fun, enjoy, proud, achievement, satisfaction and surprise
Skills Needed flexibility, language and communication, decision making	Students experienced a gap in their knowledge and skills at all stages of the design process which challenged them to take risks
Student Characteristics confident/courageous, manages stress, frustration, unexpected challenges and outcomes, and negative emotions, communicative, responsible, sees the broader value of design, not afraid to fail	Students indicated that they felt confident to take risks, took ownership of the project and their decisions, were determined, stressed, overwhelmed, confused, scared

Figure 3: An academic approach to risk-taking and student experience.

In the skills section of Figure 3, the data indicated that gaps in the students' knowledge, experience and skills meant that they were challenged to take certain risks. This aspect, which seemed contrary to our understanding of preparing students for design projects, is further explored in the following section.

Common risk-taking experiences

From the data, and guided by Hobson and Titchen (2005), who suggest identifying shared meanings amongst participants, we detected certain experiences that were described in a number of interviews. The common experiences tended to be clustered in the fabrication phase where the students worked on physically transforming the chair, as opposed to the

initial concept generation phase. We grouped the dominant experiences of risk-taking into the following three categories:

- decisions that were made because of ‘chance’ opportunities
- decisions made because of gaps in existing knowledge, experience or skills and
- justification for taking risks.

Opportunistic risk-taking

Students described how new opportunities presented themselves during the fabrication process. During the process, they would evaluate a potential risk and make a decision to proceed on a different path or not. Cross (2006: 87) refers to this part of the design activity as ‘the “opportunistic” pursuit of issues or partial solutions that catch the designer’s attention’. In the data we identified opportunities that could be considered ‘inspirational’ risks that were experienced as positive since they would lead to a better final product. Students referred to these as a new insight, one thing leading to another, a new idea, being led by one experience to consider something else.

If a new idea popped up along the way and it seemed to me like this is the harder thing to do, or the more risky thing to do, I went with that because that's what gave me my end result at the end of the day. (Transcript D7)

I think that when you actually start physically, you have this concept in your head and you actually start working on it, you get these little, these slight changes or things that you see that you can improve on because now you are physically working on it.

(Transcript D8)

Negative prompts that resulted in students taking risks were often practical challenges that they encountered during the fabrication process. These ranged from running out of time, not planning sufficiently or accurately, not having the necessary knowledge, materials, tools or skills or not having the financial means to buy what they felt was needed. These challenges could cause students to take risks that had negative consequences. One student described how he had to use a brick to support his final design as he had not considered the slippery floor that the final product would be displayed on. This risk had negative consequences as the brick support did not match the visual style of the product.

I think that brought my marks down a bit, because it was just this brick painted, that's sitting there, but it did have a purpose there. So yeah that was a bit last minute thinking, that was basically a morning just quickly figuring out, because I completely forgot about the smooth surfaces here. (Transcript D9)

Risk because of gaps in knowledge, experience or skills

Many of the practical challenges emerged from a gap in the student's experience, knowledge or skills and taking a risk became an opportunity to learn something new. Students evaluated the risk of having to learn a new skill against a number of possible positive and negative outcomes such as the benefit of achieving their envisaged outcome, making something beautiful or 'not boring', receiving recognition and approval by the panel. The risk of learning something new was weighed against the potential negative impact of the time and effort that it would take, the financial cost and safety risks.

'With my chair, and with my seven hundred and fifty pompoms I made for the chair, I was obviously, I was quite scared that I was not going to be able to finish it (Transcript D2).'

Certain decisions meant that students had to quickly learn new skills. This included learning to work with their hands, measure and estimate and use unfamiliar materials, tools, techniques and styles. Similarly, learning to communicate their concepts to the panel of lecturers, or others they chose to include in the production process, for instance family members, were also seen as risks. Students experienced a great deal of uncertainty as they often did not know whether such risks would work out well, or not. Yet they felt motivated to proceed despite their doubts.

‘When I started with my project, I would have never thought that I was going to, um, do a piece of like, paint on my chair, or make it a piece of art and put it on my chair, because I’m not really that skilled um, as an artist with painting detail or portraits or anything in that line (Transcript D7).’

Students identified both immediate benefits and long-term benefits in taking the risk to learn something new. Achievement built a sense of confidence that they felt would carry through into their classes, where they indicated that they would do things differently and take more risks in the future.

‘I think coming from that [the previous project] it was kind of the mentality of go big or go home, so you know coz I always have these crazy ideas and then most of the time I feel as if I’m not able to execute them. (Transcript D3, emphasis added).’

Based on their experience and success, students felt that they would manage their time more effectively, cope better with stressful situations, plan better, be more productive and bring a more personal slant to their design work. Confidence meant that they saw lecturer criticism in

a different light and felt that they would be less upset by negative feedback in the future. Some had experienced success despite ignoring the lecturer's feedback.

‘I was just like deciding, shall I listen to her, shall I do my own thing and I stuck with my own thing and it seems like I did pretty well (Transcript D6).’

When there was a positive outcome for risk-taking and the student had learnt something new, they felt a sense of achievement. They stated how surprised and proud they were with what they had achieved, especially if they had initially been doubtful of their ability to succeed.

It was my first time working with wood and stuff and machinery and stuff, so I came away from it having managed to do that and I felt really proud. So, I just you know just had a reaffirmation that if I put my mind to something I could do it. (Transcript D3)

Justification for risk-taking

When students explicitly evaluated a risk, they would consider the benefit and justified the decision. In other words, taking the risk was considered in relation to how it would help them achieve an outcome. Students sometimes had a very clear vision of what they wanted to produce, and they would do whatever was necessary to achieve this, even if it was more difficult.

‘When the idea came to mind, I thought I *have to* do this, [...] I can't do anything else, nothing else is going to be on the same level (Transcript D2, emphasis added).’

They justified the risk against success in terms of marks, aesthetics, clarity of concept, alignment with concept and being judged as successful by the panel.

Figure 4: A sample chair and its transformation. Inscape, Pretoria, South Africa. Copyright: Inscape Education Group, 2018.

Students stated that they preferred to make decisions on their own as they were prepared to take responsibility for failure and success. On their own they had the freedom to experiment, could focus, make the project personal and maintain control. Conversely when they evaluated a risk and decided that someone else needed to be part of the fabrication process they had to learn to trust them.

I wanted to use tools by myself, but I took a step back and said you know, I am not going to be hard headed or, this is my project and I will do it by myself when I actually know it would be beneficial to have someone use the sewing machine, cut it for me rather than me just saying I will, because this is mine. [...] Just giving that trust to someone else, making

sure that they have your measurements and that they are just cutting it correctly.

(Transcript D8)

Out of the eleven students interviewed only one student stated that they had not taken risks.

This student describes the project as:

‘... this year it was a bit more boxed in, can I say? So, it gave me boundaries to work with

(Transcript D10).’

The student above, therefore, experienced the project as quite prescriptive, while the majority of the students who took risks experienced the project as open-ended, felt that they had freedom, could do ‘anything’ and could make the project personal. This highlights the individualistic nature of risk-taking even if an ‘ideal’ project vehicle is created.

Discussion

From the data we established that the project and environment were well suited to facilitating risk-taking in student decision-making during the fabrication stage. There was, however, little evidence of students considering the potential for risk-taking during the conceptual stage.

That risk-taking was predominantly described in the fabrication stage of the project may relate to the structure of the project where concepts were preapproved, before students embarked on fabricating the final product.

In a phenomenological study, where experiences must be articulated by participants, students may have had difficulty describing the conceptual stage. We considered that students’ understanding of risk-taking might be tied to the physical activity of making the design

product and that they did not consider that risks could be taken during the conceptualization stage.

Hanney (2012: 108) proposes that ‘if we, as educators, want to engage with “risk” as a pedagogic strategy then we need to construct a learning space that celebrates crisis’.

Although students felt confused, challenged and unsure at times during the project, most proved to have the confidence to take risks, especially if they felt that the risk would assist them to achieve their objectives. These objectives could be a very clear personal vision of the final product, or the achievement of high marks. These two motivations and the more opportunistic strategies that students implemented when prompted by challenges to their knowledge, experience and skills provide intriguing possibilities for constructing learning opportunities.

Conclusion

Encouraging students in higher education to adopt creative approaches, including taking risks, is a consideration for a range of disciplines that prepare graduates for working in changing, complex and unpredictable environments. Higher education, therefore, has to consider how curricula, pedagogy and assessment might provide the opportunities, environments and support needed to encourage students to take risks and be creative.

Our findings suggest that even if an encouraging environment and open-ended project are provided, not all students will take risks. For design students, risk-taking may be initiated by gaps in knowledge, experience and skills and this seems to be particularly evident in the fabrication stage of a design project. The findings further suggest that challenging students with the unfamiliar prompts risk-taking and learning. Further research to include students

who are not successful in such projects and that focuses more explicitly on the conceptual stage is called for. However, from this study, certain guidelines for creating an educational environment that encourages risk-taking can be drawn, whilst highlighting that each individual may experience risk-taking differently. The educational approach, therefore, needs to subtly balance freedom with support, safety with experimentation, discomfort with confidence, and knowledge, experience and skills with the opportunity to explore the unknown.

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