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How Can We Nurture and Develop Creativity in First Year Design Students

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How can we nurture and develop creativity in first year design students

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M.A. in Higher Education **2011**

Declaration

I hereby declare that this thesis is my own work and effort and that it has not been submitted anywhere for any award. Where other sources of information have been used, they have been acknowledged

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Abstract

This research paper investigates the perceptions of first year third level design students regarding their creative thinking and use of creative strategies, while studying a first year design based curriculum in an Institute of Technology in Dublin. The research was conducted in a three-phase, sequential project. The first phase, questioned twenty seven students by issuing anonymous questionnaires to gather data on their methods of incubating design ideas, if they experienced any levels of anxiety when doing so, and their satisfaction levels in their design and creative abilities. Literature was reviewed to discover the attributes of those we perceive as creative and if those attributes can be nurtured. Further literature was researched on whether or not creativity can be measured and what are the barriers to creativity. Finally the literature review addressed what might be the correct creative environment for students. The purpose of the investigation of the literature and the questionnaire data gathering was to create a format for the second phase of the project, a one day creativity workshop that addressed issues on creativity raised by the literature and the student cohort. A Creativity Games Day workshop was designed and conducted with a volunteer group of ten. It was hoped the workshop would enhance student's belief in their creative abilities. The third phase of the project involved collecting further data by issuing a second questionnaire at the end of the workshop. A comparison of the data from both questionnaires is discussed to ascertain whether or not the participant's perception of their creativity levels had changed. This small pilot study, while acknowledging the limitations placed on the results due to the narrow experience and small sample size of the research, does suggest that creativity can be nurtured in a student cohort.

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Introduction

This dissertation investigates the perceptions of first year third level students in the Dublin Institute of Technology, regarding their creative thinking and use of creative strategies, while studying a design based curriculum. The question of how can we nurture and develop creativity in first year design students was investigated in a three-phase, sequential project, an initial questionnaire to gather data, a creative workshop based on those data findings, and a second questionnaire on completion of the workshop to compare data. The initial voluntary questionnaire was issued to twenty seven students, the cohort consisted of;

- eleven first interior design and furniture students studying a four year honours degree
- four mature advanced entry second year students studying for an interior design and furniture honours degree
- three access to education mature students taking a module in Colour and Perception run by the facilitator
- nine first year visual merchandising and display students undertaking a three year degree.

This questionnaire surveyed students on how they perceived their creativity levels (Appendix 1) and gathered both quantitative and qualitative data. The available literature on creativity was reviewed; and from this it became apparent there are various elements, both psychological and physiological, that need to be considered to create the correct emotional and physical environment that will assist students of design to develop their creative skills.

It was originally intended to conduct small weekly creative exercises during normal class hours; however it was found that due to time constraints a one day workshop would better serve the research. Data collected from the initial questionnaire (Appendix 2) was the main factor in designing a Creativity Games Day workshop (Appendix 3). The results of the data were analysed and further research was conducted on the best format for the workshop to create a constructive alignment between the findings, the needs of the participants and the value of the games. The Creativity Games Day workshop took place

on March 10th 2011, the sample size of participants was kept to ten, the reasons for this were twofold, firstly, as it was the facilitators first time to direct the activities it was envisioned that a small group would be easier to manage, and secondly to create interaction among the volunteers in a small group setting. The student sample that took part in the day consisted of;

- three students from first year interior design and furniture
- four mature advanced entry second year interior design and furniture students
- three access to education mature students taking a module in Colour and Perception run by the facilitator.

A second questionnaire (Appendix 4) gathering both qualitative and quantitative was designed to gather information from the participants at the end of the Creativity Games Day, any changes in data from the initial questionnaire was explored and discussed. Participants of the workshop were asked to regard the questionnaire as a critical analysis, and were informed that it would remain anonymous. The findings of the study were such that from the participant's point of view the Creativity Games Day was a rewarding, positive and beneficial experience, which enhanced their perception of their creativity (Appendix 5). Hermann (1989) believed the main thing that hinders creative thinking is our belief that we are not creative. One hundred per cent of the students who participated in the workshop felt the creativity games day enhanced their belief in their creative abilities. The experience of being given time to allow themselves to focus their attention and awareness on creative activities will also help the students as they move forward in their creative thinking.

Why do we need good designers?

Erlinger (2009) believed whoever designs a part of the world — cannot disregard the repercussions their design has on the world, and he agreed with Aicher, who argued, the designer is a kind of moralist, a judge, whose work is comprised of judgments. Many professions require creativity as a core skill, the word 'creativity' has been used as if it is a tangible commodity that must be developed in a time of economic recession. *"The future of Ireland lies in creativity",* Professor Declan McGonagle the Director of NCAD

stated on the 6 o'clock RTE News on April 10th 2011. The elusive commodity of creativity and creative thinking has been heralded as the panacea to rescue us from the grip of the recession.

What defines creativity? What are common traits? Can we nurture them? Creativity and creative teaching are popular topics, particularly due to the rapid growth of competition in business and industry. In a world of increasing change and competition, generating new ideas and bringing them to the table is essential for those wishing for a career in industry. Successful businesses are looked upon as the ones that instill creativity throughout the organisation. The future prosperity of developed and developing countries will increasingly depend on their capacity to innovate, develop ideas into new products and services, develop new technologies and new methods of production, and to sell those products and services to new markets.

Students must be encouraged to develop and be confident in their creative abilities, a knowledge based economy needs workers and enterprises that are highly adaptable, and can respond effectively to changes in technologies or product markets. Dublin City Enterprise Board, a local government authority, are in the process of staging 'Idea Generation' workshops, '*this workshop not only shows you what ideas are good ideas but also introduces you to the concepts of thinking laterally'* (Dublin Regional Authority, 2011). The Science Gallery in Trinity College, Dublin has held a series of events called Connector Brainstorm. *"Einstein once said 'We can't solve problems by using the same kind of thinking we used when we created them.' Age old policies need new age"* (Lynch, 2010).

Background to the study

The reasoning for undertaking this research was as a lecturer in design it is hoped to provide first year design students with paths to enhance and nurture their creativity and assist them in their transition from previous education into a design based programme where creativity will be measured According to Jackson (2006, p.9); "*Higher education is full of intelligent, creative people and the professional act of teaching, with the*

significant autonomy attached to this role, provides fertile conditions for people to be creative in order to promote students' learning." Jackson believed many teachers do not take advantage of this opportunity, and that all too often they prefer to replicate well tried methods and designs rather than experiment with more imaginative but riskier, less comfortable ways of doing things. He stated the constant pressure for greater efficiency, cost effectiveness, increasing levels of personal accountability and peer review systems that favour conservatism, alongside resistance of colleagues to anything that involves doing things differently, are just a few of the things that can inhibit our individual and collective creativity.

Robinson (2009) believed education to date has been a linear process, starting with primary school, and leading to college which then led to a permanent job and a good life. However, during this process there may have been little personal fulfillment and he argued people are being educated out of their natural creativity, and all children, initially, have full confidence in their own creative abilities. Robinson argued education is dominated by systems of measurement, and imagination and creativity can be eroded by the pressure of obtaining grades. It has been personally observed that many first year design students lack confidence in their design abilities, therefore it was hoped to achieve a format to enable creativity thinking strategies that would address their fears and allay their anxieties. By using these strategies, students will develop confidence they can reach a creative solution to a design problem. In the literature review, among others, we look at Rogers' (1962) belief that creativity is a natural product of healthy development, but it may be blocked by a person's need for psychological defenses, however, teachers and others hoping to promote human growth can establish the conditions of psychological safety that allow individuals to develop. Students should be offered the safety that is associated with the three processes, acceptance of the individual, lack of external evaluation, and empathetic understanding.

Teaching design

It may be argued that it is impossible to teach creativity, that it is considered an innate quality or a natural talent. In their years of study to gain a degree qualification in the

Institute of Technology, design students are presented with various problem–based-learning design briefs, building up from simple design tasks in first year to undertaking a major design project in their final year. Simon (1996) defined design problems as 'wicked' problems, for which finding appropriate solutions is very difficult and with each solution to a problem creating new problems that need to be solved. The sequence of activities that students learn to work through is called a design process and necessitates considering the aesthetic, functional, and economic perspectives of both the design object and the process. This process involves considerable research, thought, modeling, interactive adjustment, and re-design (Simon, 1996). This dissertation will focus on the thought processes that designers must develop. According to Mougenot (2010, p86) most designers stimulate their creativity by "*collecting images of precedents, i.e. existing artifacts, however visual inspiration from remote sectors allowed designers to provide more creative design solutions than inspiration from their own sector"*. There has been an increasing interest in design cognition and design thinking. It is now widely recognized that designing is a unique human activity and scientific study of design not only helps to support design practice and education but also brings about human abilities such as creativity, visual reasoning, perception, and emotion (Mougenot, 2010).

Teachers of design must engage the students by reflecting the creativity of the subject in the curriculum. "*The creative teacher plays an important role in designing creative teaching strategies*" (Fisher and Williams, 2004) (as cited in Lau, Ng, & Lee, 2009, p71-84). There has been extensive research regarding the different types of learning and how students learn, Kolb & Fry (1975), Dunn & Dunn (1978), Honey & Mumford (1982), Gregorc (1984), Hawk & Shah (2007), this research question will specifically address how to develop and nurture creative thinking in first year design students.. *"It is generally accepted that design is a creative occupation and that good designers are themselves creative people, and certainly we often describe their work as creative" (*Lawson, 1997, p. 106).

Context

The rationale behind the research was to investigate practices that encourage and nurture creative and conceptual thinking in students, particularly those in their first year of study in the Dublin Institute of Technology. The students surveyed were studying on four year B.A. (hons) Interior Design and Furniture, a three year B.A. Visual Merchandising and Display and an access to education programmes. For the cohorts the creativity of their work is paramount. Students need a creative atmosphere in the classroom to assist them in letting go of preconceived ideas of methods to approach creative tasks. Students may feel that they are not as talented or creative as their peers and may be inhibited in showing their work and discussing their ideas. Robinson (2009) believed that creativity is a practical process that can be taught. The first step is to do something, and using the core disciplines and theories, experiment and try innovative ways to problem solve. Finally, we must not be afraid to make mistakes, as this is a natural process of any learning curve, therefore the emotional environment of the classroom needs to be nurturing and to value every students input equally. The curriculum needs to be inspirational and reflect the creativeness that is required from the students.

Aim of the research

The aim of the research was how to best nurture and develop creative thinking in a tertiary design curriculum. Initial data was gathered from students who were in their first year of design study in the Dublin Institute of Technology, the aim of this data was discover the student's perception of their creativity levels and if they had anxieties. The relevant literature was investigated to discover the qualities displayed by people that we perceive to be creative, the emotional atmosphere that needs to be inherent in the design studio and whether or not the student's perceptions of themselves as creative people can be enhanced in a programme of activities. On analysis of the questionnaire data and the literature, a Creativity Games Day workshop was designed. The workshop aim was to engage the students in creative activities and to assist them in developing creative thinking strategies.

On completion of the Creativity Games Day workshop a further questionnaire was issued to compare the original data with data collected on completion of the workshop. The aim of the data comparison was to ascertain whether or not the cohort believed the Creativity Games Day workshop was beneficial to the nurturing and development of their creative thinking skills. It is believed this study will lead to a review of the creativeness of design modules taught by the author and whether or not the activities of the Creativity Games Day workshop should be incorporated into the day to day curriculum. Perhaps a one day workshop should take place during first year design students induction into the Dublin Institute of Technology? The researcher aimed to ascertain if there is a gap in our knowledge of how first year design students perceive their creativity and if they are in need of assistance in developing creative thinking strategies. In the following chapter a review of literature on creativity was undertaken to determine the definition of creativity, the common traits displayed by those perceived as being creative and how those traits may possibly be nurtured. What defines creativity? What are common traits? And can we nurture them?

Literature Review

Introduction

While researching the literature on creativity it emerged that there are many books and journals dedicated to the subjects of creativity and creative teaching, but as the purpose of this research is to discover how can we nurture and develop creativity in first year design students, this review has set out to limit the research to that which is relevant to the defining, nurturing and development of creativity in students. Firstly, the definition of creativity had to be explored, another emerging theme that needed investigating, was the traits of creative people and can they be nurtured? Measuring creativity in an art and design context seems to be a sore point for all, however it is a necessary evil; and useful suggestions abound to help teachers of design facilitate the marking of students work. It was helpful to discover the barriers to creativity, which may be inadvertently put up. Methods of nurturing creativity were investigated and how these methods can be used in teaching. Finally the importance of the correct physical environment is addressed.

Defining creativity

It is difficult to explain what creativity is, however many thinkers have attempted to define types of creativity from observations of its attributes (Barron, 1969, Dacey, 1989; Isaksen, 1987; MacKinnon, 1978; Torrance, 1962). Gardner (1989) suggested creativity; *"is best described as the human capacity to regularly solve problems or to fashion products in a domain, in a way that is initially novel but ultimately acceptable in a culture*" (p. 14). The Oxford English Dictionary defined creativity as involving the use of the imagination or original ideas in order to create something. Wycoff (1991) defined creativity "*as new and useful. Creativity is the act of seeing things that everyone around us sees while making connections that no on else has made"* (p. 22) The definition of creativity offered by Csikszentmihalyi (1997, p. 27) was "*someone whose thoughts or actions change a domain, or establish a new one."* Otto Rank, (as cited in Karpf, 1953), defined creativity, as an assumptions-breaking process. According to Treffinger (1996a), creativity has no single, universally accepted definition but has always been an elusive concept; and he stated more than 100 definitions of creativity or creative thinking can be documented. Torrance (1987) defined creativity as, sensitivity to and an awareness of problems;

> *gaps in knowledge, missing elements, disharmonies, and so on; bringing together available information; defining the difficulty of identifying the missing element ; searching for solutions, making hypotheses, and modifying and retesting them; and finally communicating the results*. (p.22)

Creative traits

MacKinnon (1965) found creative people displayed originality, although he continued to point out that this is not always to be associated with fluency of thought. Some of those who came up with original ideas had many ideas, while some people had many ideas that were not very good, and others had a few high quality ideas. MacKinnon listed independence, intuition, curiosity, receptiveness, willingness to learn, and a strong sense of destiny and courage, and suggested the successful creative individual had an ongoing belief in the worth of their creative efforts. MacKinnons (1978) study from the 1950's to the 1970's, involved a study of architects. This longitudinal study included intellectual

and personality tests, self-assessments, and observations. He found the more creative of the subjects preferred to use their intuition to find deeper meanings and hidden possibilities in situations, and used their senses to become aware of their surroundings, which was in direct opposition to the general population. MacKinnon found although 25% of the general populous preferred intuitive perception, it was preferred by 90% of creative writers, 92% of mathematicians, 93% of research scientists, and 100% of architects. Contrary to popular stereotyping, intuition was associated with creativity across all of the disciplines.

Gardner (1993), studied biographical and personality factors which may be associated with creativity, by looking at the lives and work of seven great creators. These were Freud, Einstein, Picasso, Stravinsky, Eliot, Graham, and Gandhi, whom Gardner asserted consisted of a fair and relevant representation of the seven intelligences. Similarities between those selected included, "*rapid growth, once they had committed themselves to a domain'* (p.364), and "*the amalgamation of the childlike and the adult like"* (p.365). Social-psychological similarities included that the household where each of the creators spent their childhood was quite strict and that "*ultimately, each of the creators rebelled against control"* (p.367), each of the creators also had a sense of being on the margins of society to the extent that "*whenever they risked becoming members of "the establishment" they would again shift course to attain ay least intellectual marginality"* (p.368).

Eisner (1972) (as cited in Visser, 2005) identified four main ways in which people display creative traits:

- 'Boundary Pushing', which consists of extending or re-defining the limit of common objectives.
- 'Inventing', the process of employing the known to create an essentially new object or class of objects.
- 'Boundary Breaking', were there is a rejection or reversal of accepted assumptions and the making of the 'given' problematic.

• ‘Aesthetic Organizing’, the conferring of order and unity, coherence and harmony which could be evidenced in a work of art or piece of architecture.

The paradox of creativity

Csíkszentmihályi (1996) believed that the complex and potentially contradictory personality traits of creative individuals are a hallmark of creativity. Between 1991 and 1995, Csíkszentmihályi conducted interviews with 91 exceptionally creative individuals across varied fields. The criteria used for selecting the interviewees included; the individual must have made a difference to a major domain of culture, they still had to be actively involved in that domain; and they had to be at least 60 years old. Csíkszentmihályi identified personality and biographical characteristics sometimes similar to and at other times divergent from those found by Gardner (1993). For example, whereas Gardner’s creators often sacrificed personal relationships, most of Csikszentmihalyi’s participants had stable and satisfying relationships.

The most marked of Csikszentmihalyi’s findings was the existence of contrast or paradox. Creative individuals experienced early years that were nurturing or precarious, supportive or marginal. He identified paradoxical traits in his sample of mature creative’s, including the capacities to be playful and disciplined, logical and naive, humble and proud, reality-bound and fantastical, introverted and extroverted, and masculine and feminine. Csíkszentmihályi argued that creative people can adapt to almost any situation and use whatever is at hand to reach their goals. In summing up what makes their personalities different from others, the word he would use is complexity (1996). He and other researchers argued that the paradoxes found in the creative person appear to support adaptability, in thought and behaviour, as an attribute of creative performance (Brophey, 2001; Csikszentmihalyi, 1996; Guastello, Shissler, Driscoll, & Hyde, 1998; Herrmann, 1989; Mackinnon, 1962, 1970; Sternberg & Lubart, 1995, 1996) (as cited in Meneely, Portillo, 2005). Starko, (2010) agreed that some characteristics of creative individuals seem to contradict each other: flexible yet logical, taking risks yet committed to task, escaping entrenchment yet finding order in chaos.

Different ways to demonstrate creativity

Csíkszentmihályi (1990, 1996b) believed the major distinguishing characteristic of creative people was the capacity to experience "flow," which he described as an experience of timelessness and oneness with the activity in which one is engaged. According to Csíkszentmihályi, flow is "*the state in which people are so involved in an activity that nothing else seems to matter; the experience itself is so enjoyable that people will do it even at great cost, for the sheer sake of doing it"* (1990, p.4), they are completely focused with total immersion in the task. In a further study Csíkszentmihályi (1996a) argued that innovation has to be preceded by mastery, and that individuals or groups must master a domain before they can make any changes to it. Csíkszentmihályi (2005) stated that one needs ten years of technical knowledge in any particular field to create something that was better than what was there before. Gladwell (2008) concured and suggested, apart from factors like parentage, peers and opportunity, it takes 10,000 hours of practice to become outstanding in a field of practice. Persistence is a key attribute that should be encouraged in students who are trying to come up with an idea for a creative project.

In Gardner's work (1993), an emerging theme was that eminent creators made enormous sacrifices for their work. In many cases they sacrificed interpersonal relationships, lived a simple life, avoiding physical pleasures, by making work the preeminent force in their lives they left little room for other pastimes or people. Gardner (1993) identified a pattern that he called the 10-year rule where creative individuals in different domains tended to produce major ideas, breakthroughs, or other creative products at approximately 10-year intervals. This cycle consisted of initial breakthroughs followed by consolidation, succeeded ten years later by a subsequent breakthrough. Gardner also concludes that highly creative individuals do not fit into the conventions of a field or to have a conventional set of talents. There may be tensions between their areas of strength and weaknesses; however they do not balk at these stressors rather they thrive on them, the marginality they may have experienced at various points in their lives were tied in important ways to their creative strengths.

According to Maslow (1976, pp.86-92) "*creativity is found in everyone, but it is most significantly developed in the self-actualised personality*." The definition he offers of self-actualisation is that it occurs when a person realises what their full potential is and fulfills that potential. Maslow described this as a desire to express our individual talents and fulfill our potential. In order to reach a clear understanding of this level of need one must first not only achieve the previous needs in Maslow's Hierarchy of Needs, such as physiological, safety, love, and esteem, but these needs must also be fulfilled (Maslow, 1954, pp.91-93). Maslow identified fifteen traits of a self-actualized person, which included highly valued traits such as self-acceptance, spontaneity, independence, tolerance, altruism, ethics, and capability of loving others.

Measuring creativity

Can creativity be measured? Does it change over time? Is creativity associated with intelligence? Kogan (1973) argued that as creativity is tied directly to one's output in his or her career, it is best measured in adulthood. Studies of creative output by Lehman (1953) and Dennis (1968) seemed to contradict each other; Lehman found that people in his study (ages 25 to 64), exhibited noticeable and decreasing productive contributions at the uppermost age levels. His study consisted of statesmen, college presidents, heads of large corporations and judges. However, Lehman stated that age cannot be regarded as the cause of decreasing creative productivity but; "*a decrement in physical vigour and sensory capacity, more illness, glandular changes, more preoccupation with practical concerns etc…"* (p.103). Dennis's study focused on three groups; scholars, scientists, and artists, the subjects were not of equal status, however all had produced a creative product. For almost all of the groups, the period between ages 40 and 49 was either the most productive or just slightly below their peak. For scholars, the 70s were as productive as the 40s.

McKinnon (1965) found that creativity and intelligence are interdependent only up to a certain threshold, beyond which they become independent. Although the subjects surveyed by MacKinnon were clearly reasonably intelligent having undertaken the

education necessary for professional careers. He found the individuals involved displayed a willingness to try, take a risk, and see what might work,

> [they] *make up for what they lack in verbal intellectual giftedness with a high level of energy, with a kind of cognitive flexibility which enables them to keep coming at a problem using a variety of techniques from a variety of angles; and, being confident of their ultimate success, these people persevere until they arrive at a creative solution* (MacKinnon, 1978, p.124).

MacKinnon's findings that the correlation between intelligence and creativity is low were also in the previous findings of psychologist Lewis Terman in 1921. Terman (1925) conducted the earliest study of superior mental abilities at Stanford University, showing children with very high IQs do well in life, but after a certain point IQ does not seem to be correlated any longer with superior performance in real life. Further research on this threshold was completed by Runco and Albert (1986) and set as an intelligence quotient of 120. Terman believed it might be difficult to do creative work with a lower IQ, but an IQ beyond 120 does not necessarily imply higher creativity. IQ tests measure only convergent thinking, and involve solving well-defined, rational problems that have only one correct answer. However, divergent thinking leads to a not previously agreed-upon solution. Csíkszentmihályi believed divergent thinking involves fluency, or the ability to generate a great quantity of ideas; flexibility, such as the ability to switch from one perspective to another; and originality in picking unusual associations of ideas. These are the dimensions of thinking that most creativity tests measure and that most workshops try to enhance rather than the level of IQ. People who bring about an acceptable novelty in a domain seem able to use both opposite ways of thinking: convergent divergent (Csíkszentmihályi, 1996

Meneely and Portillo (2005) argued that creativity is not localised in a particular thinking style, they found a connection between creativity and how flexible design students were in using four thinking styles equally. They used the Herrmann Brain Dominance Instrument (HBDI) as a measure. In his brain dominance model, Herrmann (1989) identified four different ways of thinking: analytical, sequential, interpersonal and imaginative. Students who were less established in a specific style of thinking measured higher creativity using Domino's Creativity Scale (ACL-Cr). Meneely and Portillo found

training the students in thinking styles associated by Herrmann as right hemisphere did not necessarily improve creativity, but training in thinking styles that measured less strongly in the instrument produced greater creativity (Meneely, Portillo, 2005).

Marking creativity

Edwards, McGoldrick and Oliver (2006) found that students' creative work may be underestimated or dismissed within a domain because of the lecturers' unrealistic expectations of developing creativity. They argued that typically the creative expression of an undergraduate is different from that of more experienced practitioners, also that creative work can challenge fixed conceptions of the discipline that may partly derive from the academics having invested intellectual capital within a domain and an unwillingness to concede to new ideas. Balchin (2004) undertook a research study to design creativity assessment tools for the field of design and technology with 14 London secondary schools heads of departments. Seven criteria were developed in total to use in marking in a design and technology context. Four of these criteria were used in marking the creative concept, or idea, they were uniqueness, associations' of ideas, risk-taking and potential. Three criteria were used to judge the quality of the build, operability, is it well-crafted and attractiveness. The panel was each asked to use the criteria to produce an individual and then a consensual mark for ten products. They were given aspects of creativity to consider in relation to the design/product in front of them;

- *What kind of unity can you see in it?*
- *What sense of rightness do you get from this product?*
- *To what extent does it give an understated or economical solution?*
- *Is it a coherent whole?*
- *What kind of aesthetic sense of organisation can you see in it?*
- *How far does it go in resolving a discord?* (p.181).

The panel showed a high degree of consensus over each score, in particular the four criteria used to judge the concept were all marked very closely to each other. The last three criteria concerning the quality of the build had more disparity in the marking, when asked about this the panel stated that the product was difficult to judge in terms of operability because there were differing opinions over the intentions of the students who

made it? This factor was unforeseen; and highlighted some of the problems of assessment without being aware of the student task. However the panel was able to agree on the scores that they gave to the concepts, which indicated that creativity can be reliably recognised and measured. Although this research was from a small sample it illustrated a process for developing and refining judgments' about creativity that seemed to work. The panel agreed that they see that a product or design which may score badly in terms of being well crafted, operability and attractiveness may still score very well in terms uniqueness, association of ideas, risk–taking and potential. The panel believed marking under these criteria would encourage more creative thought during designing stages and also give some sort of feedback and recognition to creative 'failure' (Balchin, 2006).

Runco (2007, p356) stated, "*Competition can inhibit creativity because it is extrinsic. It can, in this sense, distract the potential creator".* Collins and Amabile (1999) believed competition for awards for the 'best' product has a damaging effect on creativity, possibly because the vigorous activity and engagement necessary to produce novel ideas takes a great deal of effort, which extrinsically motivated individuals are unlikely to expend. This research will discuss the planning, delivery and analysis of one day of activities, where students are invited to join in playing games, in a non judgmental relaxed atmosphere, therefore It is important that the activities are intrinsically motivated and that the students do not feel that there are any competitive issues.

Barriers to creativity

Established perceptions such as values, beliefs and processes may form barriers to learning; they can filter and block student's abilities to transform their understanding of the world in which they live. In order to learn, students must critically examine their constructs and be prepared to set them aside and look at things a new perspective. Bohm and Peat observed creativity arises out of a spirit of friendship characterised by dialogue rather than debate. "*A key difference between a dialogue and an ordinary discussion is that, within the latter people usually hold relatively fixed positions and argue in favour of their views as they try to convince others to change. At best, this may produce agreement or compromise, but it does not give rise to anything creative"* (1987, p. 241). Mezirow

observed, *"approved ways of seeing and understanding, shaped by our language, culture, and personal experience, collaborate to set limits to our future learning"* (1991,p.1) and pointed out, there is a tendency for individuals to filter new experiences through existing structures and in order to 'avoid anxiety' or conform to peer expectations. It is the choice of the individual to risk the possibility of change or not to risk change which is central to their capacity to learn (Martin, 2001). Pollard stated that *"only particular kinds of achievement are valued and they [students] learn to assess themselves and adjust their expectations accordingly"* (Pollard et al., cited in Broadfoot, 1996, p.5)

In the context of tertiary design students' for many the fear of failure, such as the inability to conceptualise a design, is paramount. This fear can compound in the student not trying hard enough in the secondary stage of a design project where using their initial research they must solve a problem. Therefore a non judgmental environment must be developed by the teacher, where they are a facilitator to enable the student overcome design obstacles.

Nurturing creativity

What can be done in educational settings to enhance the positive characteristics of students for creativity? The psychological climate in which we are working or studying has an overwhelming influence on the success of our creativity. Creativity does not occur in a vacuum; it needs a sympathetic environment. A positive learning environment is influential in learner achievement (Goh, 1994; Fisher, Henderson and Fraser, 1995; Wubbels and Levy, 1997). Individuals need to build a climate to protect their own creativity from the indifference or hostility of a larger climate (Mauzy and Harriman 2003). Positive affect leads to greater creativity (Greene and Noice 1988), better problem solving (Isen, Daubman, and Nowicki 1987), and greater risk taking (Kahn and Isen 1993). Research by Greene and Noice (1998) found that the act of complementing students on their clothing, hair and/or jewelry will improve their performance on creativity tests. While their sample sizes were small, surprising differences were apparent. Creativity is somehow related to the emotional state of the creator (Ferguson, 1990) (as cited in Walonick 2010).

Rogers' (1962) believed that creativity is a natural product of healthy development, but also believed that it may be blocked by a person's need for psychological defenses. Teachers and others hoping to promote human growth can establish the conditions of psychological safety that allow individuals to develop. Psychological safety is associated with three processes: acceptance of the individual, lack of external evaluation, and empathetic understanding. Any act sending the psychological message that students are important, valuable, and full of potential builds a foundation of psychological safety. Perhaps the most obvious type of acceptance is the teacher's willingness to examine student ideas, even when they initially appear strange or inappropriate. Csíkszentmihályi (1996) found in his study of highly creative individuals that college or university represented a high point of life. It was where they found their voice, identified their vocation, and were exposed to teachers who recognised their unique strengths.

In Gardner's (1993), case studies on 19th century creators, one of the themes that emerged was the network of support that surrounded the creators during the times of their creative activities. In periods of intense creativity, cognitive support was needed in the form of someone in whom they could share their new found ideas and also affective support from someone whose friendship was unfailing; both of these roles could be met by the same person or by two individuals. Collins and Amabile (1999) believed the best way to help people to maximize their creative potential is to allow them to do something they love; creative achievers love their work and are identified with what they do. Amabile (1983) stated that success in any aspect of education is linked to student motivation. Research indicated that intrinsic motivation enhances creativity while extrinsic motivation generally undermines it. Amabile (1996, p. 115) provided the following definition:

> *We define as intrinsic any motivation that arises from the individual's positive reaction to qualities of the task itself: this reaction can be experienced as interest, involvement, curiosity, satisfaction, or positive challenge. We define as extrinsic any motivation that arises from sources outside of the task itself; these sources include expected evaluation, contracted-for-reward, external directives, or any of several similar sources.*

However, both types of motivation may be effective at different stages of the creative process. While students are exploring a problem and trying to germinate ideas, they may

be intrinsically motivated. On the other hand, extrinsic rewards may encourage students to learn the skills they need to complete a task or to persist when the initial enthusiasm wears off (Collins and Amabile 1999). Research showed explicit instruction in strategies that produce creative products can help students become more creative (Runco and Sakamoto 1999). Sternberg (1988) believed that tolerance for ambiguity is an indispensable and essential condition of creative performance. Creative solutions emerge over a period that includes moments of insight and times of struggle, persistence and confusion. Therefore the creative individual must be able to live with half-formed ideas and possible solutions. They must be willing to keep trying and experimenting if even if they are not sure if they are right. Esquivel and Hodes (2003) believed this creative process may be strongly influenced by personality type.

Creative ideas are often generated when one discards preconceived assumptions and attempts a new approach or method that might seem to others unthinkable. Some see the conventional system of schooling as 'stifling' of creativity. Learners are more likely to develop their creativity in situations that provide a good degree of choice and autonomy that requires imagination, that stimulates interest and passion, and that requires hard work to master something difficult. The activity should demand focused attention and encourage people to push themselves and persevere until they achieve their goal.

Teaching /Stimulating creativity

Creative teaching is regarded as a key component of all good teaching, but it does not guarantee that the students are developing their own creative potential. Bowers (1995) believed creativity is "*one of the most overused words in the educator's vocabulary"* (p.41); however is creativity not paramount in helping the development of the student's autonomy? Creative teaching where the teacher is using creative methods is not the same as teaching to develop and nurture creativity. Teaching activities that produce an enjoyable, or even creative, outcome do not necessarily enhance the student's creativity (Starko, 2010). As Jackson has noted, "*teaching for creativity requires a pedagogic stance that is facilitative, enabling and responsive"* (Jackson, 2003, p5).

One of the first schools of design, The Bauhaus, was founded by Walter Gropius in Germany in 1919. The Bauhaus had a profound influence upon subsequent methods of teaching in art, architecture, graphic design, interior design, industrial design, and typography, "*it brought together a number of the most outstanding contemporary architects and artists and was not only an innovative training centre but also a place of production"* (Bauhaus, 2010). The ethos of the Bauhaus was such that the socially disadvantaged should be able to afford products that were designed in such a way that materials and production costs were reduced, these products, combined with good design; should improve life both in materially and aesthetically. The school laid the methodological basis for design education (Droste, 1990).

The popular conception for most people is that creativity is dependent on 'natural talent'; however, there is research that indicates that the skills involved in creativity are something that can be taught and learned. Torrance conducted several experiments during the 1970's to determine if creative thinking could be taught. His research concurs that the left hemisphere of the brain is primarily responsible for written and spoken language, abstract symbolism, number operations, linear processing, rational decision making, and deductive logic. The right hemisphere is primarily responsible for spatial skills, pattern recognition, creativity, parallel processing, intuitive decision making, and deductive logic Torrance found brief and intensive training could change thinking to include more right-brain processes. After the training, subjects were better able to apply right and left hemisphere modes in a complementary way (Ferguson, 1990). One key characteristic of creative thinking is flexibility, considering more than one point of view. Role play and simulation activities are particularly effective strategies for developing this type of thinking because they involve looking at the world through someone else's eyes (Taylor, 1987). Torrance (1975) described this process in which students solve present and future problems through a variety of dramatic techniques as 'socio-drama'.

The creative environment

While reviewing the literature on nurturing creativity, most of the available research outlined personal characteristics to look for in creative problem solvers, but how might

we create a physical environment that facilitates innovation in the student population? Although there is a domain of literature about creative thinking and techniques that can be effective in stimulating creative thinking, there is little about the spaces in which this type of thinking and learning can take place. Van der Lugt, Janssen, Kuperus and de Lange (2007) observed an increasing interest in creative spaces within organisations, resulting in many different kinds of creativity and innovation stimulating environments currently being installed in companies. In the Netherlands alone they found more than 15 dedicated spaces for creativity and innovation, "*and the number is increasing rapidly"* (p. 66).

If creative spaces are being offered in industry, how do we address this in the context of the design studios that we offer our students? McCoy and Evans (2002) published two studies that researched students on the potential role of the physical environment in fostering creativity. The determined the characteristics of the interior environment people would seek out to think creatively. They showed participants 1200 photographs of interiors, and asked them to choose which places they would want to go *"if [they] had a very special problem to solve and needed to generate a lot of new ideas*" (p. 413). They determined that, when seeking a place to think creatively, participants chose those spaces that were spatially complex and conducive to social interaction; places that were full of visual detail and ornamental objects; and places that had extended views and used more natural materials, such as wood, the reasoning behind this, they proposed, is that "*humans have such a strong biological affinity for nature, the presence of wood and wood grain may itself produce positive affect* "(McCoy & Evans, 2002, P.420). Participants also emphasised, "*the importance of the type of finish and visible construction materials*" (McCoy & Evans, 2002, p.419). The study determined that, when looking for a creative space, participants avoided interior environments that used cool colour schemes (e.g., green, blue, or blue violet spectrum), had no view, and employed predominantly manufactured or composite materials.

In their second study McCoy and Evans', tested to see if working in a creative space actually enhanced innovative thinking. They tested the creative performance of a different

set of study participants in two environments—one interesting space with visual detail, spatial complexity, windows, seating for social interaction, and natural materials/plants, and one bland space with solid walls, manufactured materials, no view, and monochromatic colours. McCoy and Evans found that participants in the creative space made collages that were more interesting and original than those participants in the bland space. They found the physical environment almost certainly affected the creativity of individuals and groups. In particular, facilities making it easier for individuals to contact one another when needed were likely to be beneficial to creativity. Yet individuals also needed facilities that offer solitude, where creative thoughts and ideas could be nurtured, and where reflections on other people's ideas could be arrived at. These two functions of providing space both for meeting others and for reflection are basic to creativity. The research found that the students preferred natural views, but even an obscured view contributed more to creativity potential than no view at all.

These findings were congruent with the speculation that views of restorative environments may foster creativity (Ulrich, 1993). The study suggested that environments high in creativity potential incorporated obvious but not exclusive use of natural materials, emphasis was on the type of finish and visibility of the materials used in the construction. The proportion of natural material to the manufactured or composite materials was quite small, but it was always obvious. Primarily the observed natural material was wood. The final dimension of the physical environment that enhances perceived creativity is the visual complexity. McCoy and Evans' study found that high levels of spatial and visual complexity enhance the creativity potential of places. This place would offer visual interest and opportunity for discovery, and a challenging setting that provides intellectual and cognitive stimulation consistent with values of the creative personality, hence fostering creative behavior (p.424).

More and more companies are realising having a creatively designed workspace helps remove barriers to creativity. Flexibility is a key role in designing a space that is creativity-driven. Examples of such flexibility include movable furniture, multiple write-on surfaces, a research library, multimedia tools, information and communications

technology for group work, and space configured for small or large group sizes. The ambition is *"to create an environment in which strategies for business growth could be developed in a fun, dynamic, rapid and novel way"* (Lewis & Moultrie, 2005, p.73).

Creativity space

The University of Brighton in the UK has developed a creativity zone which comprises of a large technology enhanced space; a seminar room for 50 people and offices for centre staff (Martin, Morris, Rogers, Martin and Kilgannon).It was launched in 2007 to enhance creativity in learning, the facilitation of learning and the creative process. Much of the focus has been on its two technologically enhanced creative spaces. The main space, 'Leonardo' is 10 x 13 metres with a capacity of 60 seated or 30 – 40 for workshops. The space is re-configurable with movable white board wall panels that can be written and drawn on, and can be easily divided into a range of smaller areas for group work. Environmental controls include temperature, coloured lighting, a sound system and a range of aromas that can be altered to help create or change mood. The space has a 5 metre stereo curved back projection screen and 3-sided cell that can create total immersion for groups or individuals. It also has seven ceiling mounted projectors controllable centrally or from individual wall sockets and Wi-Fi. A smaller space, 'Galileo', can seat 40, has 3D projection capability and the technology to observe activities in Leonardo. Technical and facilitative back-up is available in the centre to support planning and learning activities. One of the most important aspects of the creativity zone is that it has been built in conjunction with, and as part of, new design studios for 150 product design students as part of the Centre for Design Technology within the School of Engineering. Although the Zone is intended for cross-university use, it is potentially a great resource for these students' development as designers.

Conclusion

The findings of the literature on creativity are wide ranging from the various definitions on offer, to the differing traits, ways to develop and nurture creativity to the ideal emotional and physical environments. In some aspects, particularly in the area of the physical environments third level institutions still have a lot to achieve. Studies by

MacKinnon and Maslow on traits that are inherent in creative people were self-acceptance, spontaneity, independence, tolerance, altruism and ethics. MacKinnon also suggested that the successful creative individual had an ongoing belief in the worth of their creative efforts. Perhaps the most obvious type of acceptance is a willingness to examine new ideas, even when they initially appear strange or inappropriate. As was found in Csíkszentmihályi,'s study of highly creative individuals, that college or university represented a high point of life. It was where they found their voice, identified their vocation, and were exposed to teachers who recognised their unique strengths. Csíkszentmihályi, also concluded that the major distinguishing characteristic of creative people is the capacity to experience "flow," which he describes as an experience of timelessness and oneness with the activity in which one is engaged. The environment that people work in may assist them in experiencing flow, as found by McCoy and Evans participants who worked in creative spaces made collages that were more interesting and original than those participants in the bland space. The physical environment almost certainly affected the creativity of individuals and groups. McCoy and Evans mentioned facilities that make it easier for individuals to contact one another when needed, yet also facilities that offer solitude, to nurture thoughts and ideas, and space for reflection. These two functions of providing space both for meeting others and for reflection were likely to be beneficial to creativity.

A detailed view of how to best nurture and develop creative thinking in a tertiary design context is needed; therefore the following chapter will discuss the mixed methods approach of collecting both close-ended quantitative data and open-ended qualitative data which will be advantageous to best understand the research problem (Cresswell, 2003).

Methodology

Introduction

This chapter discusses the rationale for taking an action research approach to the research design. It discusses the validity of following Lewin's three step process and how a mixed methods approach of gathering both quantitative and qualitative data was the best methodology for the question. The design of two questionnaires is discussed, the initial questionnaire to gather data from first year design students on their perceptions of their creativity and a second questionnaire issued to the participants of the Creativity Games Day workshop. The design of the workshop is relayed in detail and the psychological and physiological well being of the participants is discussed. Finally ethical considerations are taken into account.

Research Design Method

The method is the particular procedure designed to explore a research question or test a hypothesis, the research method was led by the question, 'how to best nurture and develop creative thinking in a tertiary design curriculum', and it was believed that an action research approach best suited the problem. Crotty (2003) recognised the significance of the research question and its usefulness as a starting point for our epistemological stance: "*We typically start with a real-life issue that needs to be addressed, a problem that needs to be solved, a question that needs to be answered. We plan our research in terms of the issue or problem or question*" (p. 13). Crotty continued to explain the process of research as interplay among epistemological assumptions, theoretical perspectives, methodologies, and methods which stem from our epistemological stance and which can be traced through the choices we make in our respective responses. Crotty outlined four questions that need to be addressed: "*What methods do we propose to use? What methodology governs our choice and use of methods? What theoretical perspective lies behind the methodology in question? What epistemology informs this theoretical perspective?"* (2003, p. 2). These assumptions flow from the top down with each epistemological stance providing assumptions that guide the

researcher through theoretical perspectives, which in turn underpin the methodologies that are to be used in the research.

The criteria considered for choosing an action research approach were: the research problem, the personal experience of the researcher, and the audience(s) for whom the research will be written. A detailed view of how to best nurture and develop creative thinking in a tertiary design context was needed; the resulting research was to enable the researcher to improve their practice. This is the largest piece of research undertaken by the researcher to date and it is intended the audience will be teachers of design wishing to nurture and develop creative thinking strategies in their first year students. Action research involves research in action rather than about action. McNiff, Lomax and Whitehead (1996) described action research as "*an intervention in personal practice to bring about improvement. The action is not haphazard or routine, but driven by educational values that need to be explored or defended* (p.16).

Action research has a 'live' educational theory approach; reflective practitioners hold their teaching to account by producing explanations of their educational influences in their own learning in enquiries of the kind of 'how am I improving what I am doing?' (Whitehead, 1989). The 'live' educational theories of professional educators and other practitioner-researchers can usually explain their educational influences in the teaching and learning of their students. Whitehead continued to argue that this form of enquiry falls within the tradition of action research. It can be distinguished from other approaches in the tradition through its inclusion of 'I' as a contradiction within the presentation of a claim to educational knowledge. Whitehead describes a cycle of evaluations that the action researcher can go through

> *How do I improve this process of education here?' I experience problems when my educational values are negated in my practice. I imagine ways of overcoming my problems. I act on a chosen solution. I evaluate the outcomes of my actions. I modify my problems, ideas and actions in the light of my evaluations ... (and the cycle continues)* (p.41-52).

Three stage process

The term 'action research' is generally attributed to Kurt Lewin, (1948) who described it as a three step process for change, firstly faced with a dilemma or problem an awareness of a need to change develops, principally at this stage there is a preliminary diagnosis, gathering of data, the results are analysed and action planned. The second stage according to Lewin involves diagnoses of the situation and exploration of different models of behaviour are explored and tested. Included in this stage is action-planning activity Following this planning, steps are carried out as part of the transformation stage. During the third stage of action research the new behaviour is evaluated, and if reinforcing, it is adopted, this stage includes actual changes in behaviour (if any) resulting from corrective action steps taken following the second stage. Data is again gathered from the participants so that progress can be determined and necessary adjustments in learning activities can be made.

The action research steps taken in this particular piece of research followed a three step process. The question of how can we nurture and develop creativity in first year design students was investigated in a three-phase, sequential project. It was personally observed that first year design students lacked confidence in their design abilities, therefore it was hoped to achieve a format for a creativity developing activities that would allay their anxieties, and provide students with creative thinking skills. Students were issued with an initial questionnaire to gather data, a creative workshop based on those data findings, and a second questionnaire on completion of the workshop to compare data. The data comparison was to provide information to the researcher whether or not the creative activities provided practical tools for creative enhancement for first year students of design. Lewin (1948) argued that action research should be problem centered, client centered, and action oriented. It should involve the client system in a diagnostic, active-learning, problem-finding, and problem-solving process. He believed action research should set in motion long-range, cyclical, self-correcting mechanisms for maintaining and enhancing the effectiveness of the new system by leaving the system with practical and useful tools for self-analysis and self-renewal.

Methodology

Methodology is the set of standard and accepted methods within a particular discipline. The strategy and methods adopted in gathering relevant information are crucial to the success of any research project. The methodology is concerned with investigating the potentialities and limitations of particular techniques and procedures (Grix, 2002). A detailed view of how to best nurture and develop creative thinking in a tertiary design context is needed; therefore a mixed methods approach of collecting both close-ended quantitative data and open-ended qualitative data proved advantageous to best understand the research problem (Cresswell, 2003). Many action researchers gather data using both techniques. The use of both quantitative and qualitative methods allows 'triangulation' of results and may achieve greater robustness in the conclusions.

Qualitative data is that which is difficult to express adequately in numerical terms, perhaps because it is complex, dependent upon interpretation or context, such as the comments from participants, it contains information, implications or information that has meaning even though (for various reasons) it is not amenable to statistical analysis. Merriam (2002) believed that "*qualitative research is an umbrella term that encompasses several philosophical or theoretical orientations, the most common being interpretive, critical, and postmodern"* (p.15) he described the postmodern world as one of "*uncertainty, fragmentation, diversity, and plurality"* (p.10). Quantitative data is that which can be expressed in numerical terms, for example the results of the statistics in a survey. Cresswell (2003) discusses the qualitative, quantitative and mixed methods approaches as such techniques as such;

> *The first has been available to the social and human scientist for years, the second has emerged primarily during the last three or four decades, and the last is still new and still developing in form and substance.* (p.3)

A second questionnaire gathering quantitative and qualitative was issued at the conclusion of the activities in the Creativity Games Day workshop (Appendix 4). Questions gathering quantitative data asked the participants if their belief in their

creativity had been enhanced by partaking in the activities, if they could take inspiration from the day to develop their creativity and if any of the activities had taken them out of their comfort zone**.** Other questions asked if the participants felt as creative as everyone else in the group and if they had discovered new methods of incubating ideas. Qualitative data asked participants to sum up their experience of the Creative Games day and if they would you like any creativity enhancing games introduced into the curricular

Epistemology

Epistemology is the branch of philosophy that deals with research. According to Grix "*epistemology focuses on the knowledge-gathering process and is concerned with developing new models or theories that are better then competing models and theories"* (2002, p.177). Whitehead (1989) argued that a living educational theory of professional practice could be constructed from practitioner's enquiries of the kind, 'How do I improve my practice?', he believed the significance of 'I' exists as a living contradiction and continued to consider epistemological issues related to values, validity and generalisation. It is this epistemology that has laid the foundation for this research, as the rationale for undertaking was to improve the researchers practice as a lecturer in design and therefore to enhance the student learning experience. Whitehead examined the process of gaining academic legitimacy for a living form of theory in terms of the politics of truth within our Institutions of Higher Education. Schön (1983) developed an overall epistemology of professional practice, based on the concept of knowledge-in-action through his interest in professional knowledge and education.

Sample section

The student sample that completed the first questionnaire (Appendix 1) consisted of a total of twenty seven;

- eleven first interior design and furniture students studying a four year honours degree
- four mature advanced entry second year students studying for an interior design and furniture honours degree

- three access to education mature students taking a module in Colour and Perception run by the facilitator
- nine first year visual merchandising and display students undertaking a three year degree.

The researcher taught on both programmes and had weekly contact with both cohorts; in order to secure the consent of the participants, the researcher relayed all important details of the study, including its aim and purpose. The commonality of the programmes is they both require a level of creativity to be developed within the first year of study, and both will lead to careers where students must display confidence in their ability to conceptualise and develop ideas. The four mature advanced entry students were in the second year of the degree programme; however it was their first year of study in the Dublin Institute of Technology. Of the twenty seven participants who completed the creativity questionnaire, ten continued with the research by taking part in the Creativity Games Day workshop and completing the final questionnaire issued at the end of the day.

The sample size of the participants in the Creativity Games Day was kept to ten, the reasons for this were twofold, firstly, as it was the facilitators first time to direct the activities it was envisioned that a small group would be easier to manage, and secondly to create easier interaction among the volunteers in a small group setting. The student sample that took part in the day consisted of;

- three students from first year interior design and furniture
- four mature advanced entry second year interior design and furniture students
- three access to education mature students taking a module in Colour and Perception run by the facilitator.

Therefore the data collected from the second questionnaire was from a sample size of ten.

Research Instruments

Questionnaire designs

Johnson & Christensen (2007) described questionnaires as "*a self-report data –collection instrument that each research participant fills out as part of a study"* (p170). An initial anonymous questionnaire gathering both quantitative and qualitative data was devised to survey students on how they perceived their creativity levels (Appendix 1). Neumann (2007) stated that it is important to make questions clear and specific, therefore in the construction of the questionnaire ambiguous and vague questions were avoided. Attention was given to the order of the research questions and hypotheses. Quantitative data was gathered by asking students twenty one questions which were divided into sections such as; self perception, incubation of ideas, their perceived levels of their creativity and their levels of anxiety regarding their creativity. The answers used a Likert type scale, with answers being; strongly disagree, disagree, agree, strongly agree or don't know.

A further three questions gathered qualitative data; if you indicated you were anxious about any item listed above, what do you think are the main reasons for your anxiety?, What might your tutor do to help reduce any anxiety, in particular over your creative skills? How useful do you think having good creative thinking skills will be in your career? Finally the participants were asked if they would be interested in attending a Creativity Games Day workshop. The questionnaire took approximately fifteen minutes to complete.The method of data gathering used in the research of 'how can we nurture and develop creativity in first year design students' was conducted by purposive sampling. The questionnaires were conducted as part of a three-phase, sequential project; the first questionnaire, being exploratory, tested theories and concepts. On analysis of the data from the initial questionnaire (Appendix 2) and from the review of the available literature on creativity a Creativity Games Day was designed (Appendix 3).

The second questionnaire was issued to the ten participants of the Creativity Games Day workshop at the end of the activities (Appendix 4). It was intended that factual accounts of their learning experiences would be gained. The questionnaire took approximately ten

minutes to complete. The second questionnaire was designed to gather information from the participants at the end of the Creativity Games Day; any changes in data from the initial questionnaire were explored and discussed. Participants of the workshop were asked to regard the questionnaire as a critical analysis, and were informed that it would remain anonymous. The questionnaire gathered both qualitative and quantitative data. There were seven questions eliciting quantitative answers. The format for answering the quantitative questions was kept the same as the initial data gathering questionnaire; with the answers being strongly disagree, disagree, agree, strongly agree or don't know. Questions eight and nine also gathered quantitative data and concerned the favourite and least favourite games of the participants. A further two questions gathered qualitative data by asking participants open ended questions regarding their experiences on the Creativity Games Day and whether or not they thought it should be introduced into the curriculum.

Workshop design

The one day workshop in creativity development was decided as the best way to help students overcome some of the issues they felt they needed to address during their first year of design studies. Originally it was hoped that small creative exercises would have taken place weekly during normal college hours, however it was found that due to time constraints a one day workshop would better serve the research. Data collected from the initial questionnaire was the main factor in designing the Creativity Games Day workshop. The results were analysed and research was conducted on the best format for a one day workshop to create a constructive alignment between the findings, the needs of the participants and the value of the games. Much research was conducted to garner inspiration on how to conduct the Creativity Games Day (Appendix 3), four publications that related most directly to the needs of the participants were chosen. These included a DVD, two texts and an educational website. The DVD chosen was '100 pathways to creativity' (Porter**,** 2007), which contained exercises that took place with a group of third level students whose participation was recorded on film. The exercises were intended to connect more deeply to the individual's creativity, to the ability to handle obstacles, to create regularly and passionately during distractions, to reduce negative thinking and feelings, and to stay focused on the task at hand.

Epstein's (2000) The Big Book of Creativity Games and Michalko's (2007) Thinkertoys: A Handbook of Business Creativity, were the texts used as inspiration for the activities alongside drama games. On analysing the data from the initial questionnaire (Appendix 2), the section which questioned students on their self perception, fifteen out of the twenty seven participants agreed that they did not feel as creative as others in their class; therefore exercises were selected to assist students to discover their creativity and help open pathways.

Workshop Activities

Introductory exercises

Participants were requested to arrive at 9.45 when a brief outline of the day was given (Appendix 3). The first half an hour from 10-10.30am consisted of introductory exercises, the first of which 'Touching Hands', divided participants into two groups of five, all members of each of the group touching the others hands, they taking turns they closed their eyes and touched the others hands again to see if they could identify the others by touch alone. The rationale behind this exercise was to assist students to develop attention and fight fear of proximity. Participants were then asked to take turns to individually make the shape of the first letter of their middle name using their body, with the remainder guessing what the letter was. Following this, in two groups of five, participants were asked to make letters of the alphabet, which were called out by the researcher, using their bodies, with all five participating in the shape of the letter. Common traits that MacKinnon (1978) listed in creative people included independence, intuition, curiosity, receptiveness, willingness to learn, and a strong sense of destiny and courage. Therefore to assist in encouraging the participants to develop these traits and help combat their anxiety, an activity 'The Worst Singer' was included, this activity took the format of asking each student in turn to turn their back on the group and sing 'Happy Birthday' in their worst possible voice, reversing the competitive nature. The reasoning was to place students well out of their comfort zone and so they must combat their fear of participation, (Porter, 2007). It also communicated to participants that you do not always have to be the best to achieve something.

Drama games

Concerns over public speaking when faced with taking part in a class critique were voiced in the data collected by the initial questionnaire; therefore introductory games retrieved from the website teachingonline were incorporated into the day. These exercises involved the use of drama, particularly those which some of the students may not have experienced since primary school, it was felt they would give balance and add depth to the game playing. The drama activities were chosen to enable the students to develop confidence, both in themselves and their imagination, and to bring the students back to their childhood. The rationale behind the use of drama was to invigorate other subject areas. Taylor (1998) believed one of the key characteristics of creative thinking is flexibility, the ability to consider more than one point of view. He stated that role play and simulation activities are particularly effective strategies for nurturing and developing this type of thinking as they involve looking at the world through someone else's eyes. The participants may feel uncomfortable and self conscious at first but it is hoped that they will relax and realise that they are in a non-judgmental environment. Participants were asked to move slowly out into an area, find a space, to stretch up as high as possible, to crouch down and become as small as possible, and then to become as wide as possible. This led to individual drama activities, students were requested to mime they were taking a walk along the beach, and were asked questions such as; what do you see? What do you pick up? Show that the sand is hot. Go for a swim. Try bodysurfing in on a wave. Clear the water from your ears. Then become a mountain climber moving very carefully along a long narrow ledge. Try not to look down. Run a warm bath. Get in slowly and totally relax as the warm water covers you. Don't forget to wash your hair.

This was followed by paired activities, play a game of table tennis with a friend. Take it in turns to keep the score. Now try playing a game of tennis. Build a snowman together. Put on a hat and scarf on the snowman. Don't forget to smooth the snow. You get bored with this and it turns into a snowball fight. The snow is very cold when it goes down your neck. In pairs become a person interviewing a person for a job. If you are being interviewed, convince the interviewer that you are the right person for the job. Swap

places. Then students were asked to form a circle and as a whole group to play instruments such as trombones, drums, violin, cello and flutes. Play in a symphony orchestra with the researcher as the conductor. Now the whole group becomes a rock band performing at a huge concert. Gasper (2004) in a study with undergraduates found that sadness inhibits new ideas, in part because they were wary of making a mistake. Gasper noted that previous research supported the boost in creativity gained from being in a state of happiness. In comparisons with people in sad or neutral moods, those in happy moods found coming up with unusual word associations, moral dilemma solving, generating story endings and writing answers to divergent thinking tasks, easier. To avoid being overly cautious and stale in their work, Gasper suggested that students remember to have fun. Rogers' (1962) believed that creativity is a natural product of healthy development, but that it may be blocked by a person's need for psychological defenses.

Creativity games

In the initial questionnaire, seven of the students had stated they found incubating ideas difficult. A Harvard Medical School study from in the early 1990's asked students to imagine a problem and try to solve it as they were drifting off to sleep, half of the participants reported having dreams that addressed their problem, and a quarter were able to come up with solutions while dreaming (Barrett, 2001). One of the relevant texts The Big Book of Creativity Games (Epstein, 2000) contained an activity, 'Capturing a Daydream'; participants were asked to spend a few moments daydreaming. Epstein believed under the correct conditions, anyone can have highly imaginative daydreams and this demonstrates the enormous creative potential we all have. The researcher spoke slowly and calmly and requested participants to close their eyes, breath in and out deeply a few times, and relax. It was explained that they were being given permission to do something they've been forbidden from doing since primary school: permission to daydream. They were asked to let their minds wander freely for a few minutes, it was suggested they will visit other places, see strange images, or hear odd sounds. After ten minutes of silence, they were asked to come back to the room from their daydream and asked if they would like to share where they had gone.

For students who sometimes felt as if they had no creative ideas to contribute to a brief, 'Selling a Zork' was included, participants were asked to sell an unusual object to the group for €250,000, the ethos behind this was that unusual stimuli can help generate ideas. Epstein believed a diverse knowledge base creates interconnection which is the basis for all creative thought.

One of the other themes that emerged from the questionnaire was the problem of communicating their ideas, therefore 'The Memory Game' (Epstein, 2000) was incorporated into the day to address this, which took the format of supplying half of the participants with 'capturing tools', with the other half using their memory. The rationale behind this game is to show students that it is important to record their ideas and that these recordings can then be used as a tool to assist them in communication. Working in teams of two; participants were given ten minutes in which to devise a name for a new chewing gum. Two of the five groups were given paper and pencils to record their ideas, while the other three groups were asked to try to remember their new ideas. This was followed by a brief discussion on the importance of preserving new ideas as they occur, and possible materials and supplies that could be used to promote capturing in the workplace or at home (paper, computers, mobile phones, folders, notebooks etc…).

Another game used to demonstrate the importance of sketching or diagramming a problem, was 'Sketching Ideas', participants were asked to draw or make a diagram of something rather than listing it. This involved asking the students to quickly think about how many windows are in their house or if they were living in a flat to recall the number of windows in a house they were familiar with. They were asked what this figure was, and then they were asked to draw a sketch or diagram of the house showing the windows, this was to point out that drawing and diagramming is useful in creative thinking to recover information from memory that might otherwise be unavailable. Creative insights sometimes occur as a result of sketching or diagramming a problem, because they help us notice certain features that may be overlooked.

The next game was the 'Random Doodles Game'. Participants were given sheets of paper and pencils, and were asked to draw various items, three of which were real and three were imaginary. The items were to be drawn in 30 seconds; they consisted of a tree, a 'nid', a girl, a 'kif', a table and a 'mip'. They were asked to place the sheets of paper under their chairs. The next game took place followed by 45 minutes for lunch and it was approximately one hour and fifteen minutes later that this game was resumed. The students were given clean sheets of paper and the previous items were called out again in a different order for the students to sketch once again. When this was done students were asked to hold up both their drawings of the same items to ascertain whether or not their sketches of their imaginary items had remained the same. It is important to record the new ideas that surge through our heads throughout the day, some may have huge potential.

According to Epstein people are rich sources of stimuli and to enhance creativity we should surround ourselves with diverse and interesting people, therefore to bring this home to the students 'The Audience Game' was included in the workshop, participants were asked to come up with names for new hairstyles, half of the participants facing the audience and others looking at a blank wall. A student was asked to volunteer to be the 'score keeper' and all remaining participants names were written down on a flip chart. The group was divided into two, four members of the group were put sitting viewing a wall, while the remaining five were put into a circle facing each other. Participants were given paper and pencils and asked to list as many new hairstyles as they possibly could, in ten minutes. It was mentioned that everyone has heard of hairstyles such as 'crew cut', 'shag', and 'afro'. How many new hairstyles can they invent? For each hairstyle, they should write a name for that style, along with a brief description or a sketch. They were asked to raise their hands every time they added a new style to their list so the score keeper could put a tick against their name. When the time was up, a comparison of the total count was made to see who had the highest scores.

'The Tell-Me-A-Story-Game' followed, which encouraged participants to generate story endings by applying unusual stimuli to conceptual thinking. Participants were given five

minutes to compose a story that was suggested by a large three dimensional paper star that had an interesting pattern. The star was put on a chair in the studio and the students were given notepads and pencils to write. Participants were asked if they would like to read out their stories. It was suggested perhaps they could apply the concept of unusual stimuli in their college design projects. The next activity was 'The Odd Couple Game', students were put into new pairings and each pair was given five yellow folded pieces of paper with each one having a different product written on it, they were also given five white folded pieces of paper with a topic written on it. At random the groups were asked to pick a piece of folded yellow paper and a piece of folded white paper and based on the pairing, try to improve existing products or to invent new ones. This was to be continued until all pieces of paper had been chosen. The yellow paper contained products such as hairspray, computer monitors, hats, breath mints, earrings and crisps. Topics included World War 2, insects, earwax, Elvis, the North Pole and witches.

The final activity saw the participants divided into three groups of three as one of the participants had to leave for a prior appointment. In this game the students were given twenty minutes to write the 'Worst TV Programme Ever'. Participants were told they worked for a television production company that had been given the 'graveyard' midnight slot on a well known television channel. They were a young and upcoming company and have decided they need to create a cult following by making the worst television programme ever. However on deciding the format, they had to write a script which they were going to act out. When this time was up each group was given five minutes to perform a segment of their show. The main premise behind the development of the workshop was to assist students in their future creative thinking, however it was also paramount that the participants had fun during this day, felt nurtured and that the games took place in a positive learning environment. A positive learning environment is influential in learner achievement (Goh, 1994; Fisher, Henderson and Fraser, 1995; Wubbels and Levy, 1997).

Measuring creativity

Secondary research in the literature review discussed the issue that student's creative work may be dismissed as their lecturers may have unrealistic expectations of their creative development. The data collected from the students was anonymous, therefore removing any bias the students may perceive the lecturer may have to their creativity levels in the design studio. The students were being queried on their perceived levels of their creativity, it was important to make them aware that their answers would not affect the marking of their class work or their relationship with the researcher. The Creativity Games Day workshop was a mark free zone, with there being no winners or losers only participants.

Psychological safety

Psychological safety is associated with three processes: acceptance of the individual, lack of external evaluation, and empathetic understanding. Any act sending the psychological message that students are important, valuable, and full of potential builds a foundation of psychological safety. During the three processes, gathering the initial data, the Creativity Games Day workshop and the final questionnaire the participants were informed at all times of the aims of the research. They were kept aware the purpose of the research was to bring about a 'live' change to the researchers practice. Individuals need to build a climate to protect their own creativity from the indifference or hostility of a larger climate (Mauzy, Harriman 2003). Positive affect leads to greater creativity (Greene and Noice 1988), better problem solving (Isen, Daubman, and Nowicki 1987), and greater risk taking (Kahn and Isen 1993).

The creative environment

The emotional environment in which the Creativity Games Day workshop set out to emulate Rogers' (1962) beliefs that creativity may be blocked by a person's need for psychological defenses. Rogers's believed teachers and others hoping to promote human growth can establish the conditions of psychological safety that allow individuals to develop. He stated that psychological safety is associated with three processes: acceptance of the individual, lack of external evaluation, and empathetic understanding.

Awareness of developing the correct ambience for nurturing creativity was an important factor of the day. Providing participants with a safe environment encouraged risk-taking as there is no threat of personal failure or feelings of discomfort (Pecaski-McLennan & Smith, 2007).

Creativity space

The venue for the workshop was a large studio space that is generally used for the teaching of window design and display. One of the reasons for choosing this space was it has only one entrance which on entering does not allow a full view of the studio, it was thought that this would help the participants feel more relaxed when playing the games, having the knowledge that they couldn't be viewed by non participants who may accidently enter during the day. The room faced south which allowed in natural daylight and was not overlooked. The ambient lighting was soft in the form of window spotlights which allowed the overhead harsh white fluorescent lighting to be turned off. To further create ambience a compilation of 'chill-out' music was put together and played at a low volume from an iPod and speakers. A flip chart was used to write down the name of each game and this was uncovered to give the students the title of each game before it began. There was also a laptop and a projector which showed a compilation of slides on how to break down barriers to creativity. Tea, coffee and biscuits were provided for breaks, after consulting with the participants for their choices, pizza was ordered for lunch. Participants were asked to arrive between 9.45 and 10am., when a brief outline of the day and what it entailed was given, the students were aware that it was the first time that such a workshop was run by the facilitator.. A detailed schedule of events for the day had been devised (Appendix 3) and all the different activities had been previously practiced. The day concluded at approximately 4pm when the participants were thanked for their participation and enthusiasm and asked to complete an anonymous questionnaire

Data collection and analysis methods

Data was collected by two questionnaires. The initial questionnaire (Appendix 1) was analysed (Appendix 2) and the quantitative data was collated into tables, percentages of the answers were calculated. The qualitative data was investigated for emerging themes.

The data and themes led to the design of the Creativity Games Day workshop (Appendix 3). The second questionnaire (Appendix 4) collected quantitative data from the participants of the workshop and this was also collated into tables which include a calculation of percentages (Appendix 5). The qualitative data was perused for themes. The data and themes from both questionnaires was analysed and compared. The information collected led to the discussion of whether or not the hypothesis has been tested.

Ethical considerations

Ethical issues that were considered in the research process included consent and confidentiality. The confidentiality of the participants was ensured by keeping the questionnaires anonymous. Participants were asked to code the survey, to allow a comparison of individual data if taking part in the Creativity Games Day workshop and completing the second questionnaire. It was suggested the code could be their mother's maiden name, a name of a pet, but would not be known to the researcher. Only relevant details that helped in answering the research questions were included. Ethnicity, gender or age was not a factor.

Analysis and findings

The following chapter analyses the data and themes that emerged from the questionnaires. The findings of the Creativity Games Day workshop are relayed, and the participant's reactions to the activities during The Creativity Games Day workshop are discussed. The second questionnaire containing quantitative and qualitative is analysed and there is a comparison of data from four randomly selected students.

Findings

Introduction

The findings of the quantitative and qualitative data from the first survey are analysed and divided into the same sections as the questionnaire (Appendix 1). How the participants related to the activities during The Creativity Games Day workshop is discussed. The second questionnaire (Appendix 4) contained quantitative and qualitative analysis on the opinions of the students regarding the workshop, and this is also divided into relevant sections. Finally, four students' initial and second questionnaires were randomly selected, for a comparison of data, to ascertain whether or not the workshop changed their perceptions of their levels of creativity and if they believed they have discovered new methods to assist them in their creative thinking.

Creativity questionnaire findings

Self perception

The first section of the initial questionnaire regarded the students self perception, an average of 88% agreed they considered they were creative, were satisfied with their creative abilities and had confidence in their design ideas (Appendix 2, section A, questions 1-7). When queried on how they rated their creativity, 55% agreed with the statement that 'I don't feel as creative as other people in my class' (Appendix 2, section A, question 5).

Incubation of ideas

The next section quizzed students on incubation of ideas the average majority of students, 81%, enjoyed spending time researching, brainstorming and exploring new ideas, and ways to do things differently (Appendix 2, section B, questions 8-12). 26% felt they could not always come up with creative ideas (Appendix 2, section B, question 12).

Creativity satisfaction levels

The third section questioned the students on their levels of satisfaction regarding their creativity, an average of 76% believed they had contributed as many creative ideas to

briefs as others and had opportunities to express their creativity while at college (Appendix 2, section C, questions 13-16)**.** Just under half of students surveyed, 47.5%, felt they either had not reached or did not know if they reached their creative potential at college (Appendix 2, section C, question 15). 37% stated they sometimes felt as if they had no creative ideas to contribute to a brief (Appendix 2, section C, question16).

Levels of anxiety

The fourth and final section of quantitative data concerned the levels of anxiety that the students may experience (Appendix 2, section D, questions 17-21). 48% experienced anxiety when given a new design brief (Appendix 2, section D, question17). 49% also worried whether they will have the creative skills to conceptualise a good idea (Appendix 2, section D, question 18). The majority of students, 71%, were anxious presenting work to the class (Appendix 2, section D, question 19). After this point one of the participants did not complete the questionnaire therefore the following qualitative data is from a cohort of twenty two.

Reasons for experiencing anxiety

Qualitative data (Appendix 2, section D, questions 22-30), was gathered by asking students to comment on what they felt their main reasons for experiencing anxiety were, comments merged into themes such as, time management, making presentations, lack of confidence in their idea or being unable to communicate their idea. One student commented on both the amount of time available to complete work, and making presentations as causes of anxiety (Appendix 2, section D, question 22); *"the lack of time and not being able to develop a better idea. Presenting work in class makes me anxious because I don't like standing in front of a class"* (anon), another mentioned time and conceptual thinking; "*won't get it done in time. Not able to do it. Unable to think of idea"* (anon). Making presentations of their work also caused anxiety among students, some citing nerves; "*Nerves speaking in front of people"* (anon)*, "Nervousness – bad at public speaking"* (anon) and *"I am a nervous person, when it comes to public speaking and confrontation"* (anon). Other comments on their feelings of anxiety when making class presentations included, "*presenting work in front of the class or others"* (anon)*,* however

one student while accepting their nervousness felt they were becoming more confidence "*I get nervous when doing presentations. But I am learning to be more outspoken when talking about my design"* (anon).

A student commented on a lack of confidence in their belief in their creative ability as a cause for anxiety; "*Sometimes when I get an idea, I'm not sure that it is a good idea for everyone. Maybe somebody else feels that it is a very common idea. Maybe the tutor feel* [sic] *nothing special"* (anon). Further comments were "*just anxious if my ideas are not right*" (anon) and "*Because of the high level of creativity in my class it makes me anxious I will not be as good as everyone"* (anon). Not being able to communicate their design idea was also a source of anxiety for some students *"I suppose its not being fully confident in my design ideas. Sometimes people don't fully understand your design idea, and you can't fully communicate your message"* (anon) and *"Can see it in my head, get frustrated when I can't draw it"* (anon).

Other singular comments that did not fall into any of the aforementioned themes were; *"I wouldn't be anxious, I just feel my confidence isn't that high regard my ability"* and *"Got a lot of negative feedback from my fashion tutor last year. But my teachers this year are restoring my new found confidence"* (anon).

Reducing anxiety

Participants were questioned (Appendix 2, section D, question 23), on what might their tutor might do to help reduce any anxiety, in particular over their creative skills. An emerging theme was in regard to encouragement, with participants stating that tutors could offer *"constructive criticism and constant feedback"* (anon), *"give positive encouragement"* (anon), *"encourage every student that all minds are equal and capable of a high standard. Gather a connection with students"* (anon) and *"Keep doing what he/she is doing. Encourage me and push me"* (anon). The final theme when asked how could tutors help students reduce their anxiety over their creativity was to offer assistance; *"Help me practice"* (anon), *"Help with drawing"* (anon) and *"Talk about other options. Help me understand better"* (anon).

Creative skills development

Students were questioned on their future creative skills development, one of the remaining twenty six students did not answer this section (Appendix 2, section E, questions 24-26). Twenty two students (Appendix 2, section E, question 24), believed their creative skills would improve, twelve agreeing strongly, two students strongly agreed their creative skills would not improve and one was unsure. However, when questioned (Appendix 2, section E, question 25), on whether or not they could develop creative skills further on their course all twenty five agreed that they could, ten agreeing strongly. When quizzed (Appendix 2, section E, question 26), whether or not it was the responsibility of the tutor to help them develop their creativity, fourteen agreed it was and nine agreed it was not, two were undecided. Twenty one students (Appendix 2, section E, question 27), believed having creative skills would be very useful in their career with one believing it would be somewhat useful.

Qualitative data was gathered by asking students for their reasoning behind this belief. Themes such as the need to come up with new ideas and also the need for those ideas to be creative emerged; *"Ability to think of new ideas is essential"* (anon), "*As an interior designer is constantly looking for new ideas"* (anon), *"It means that I can come up with original ideas"* (anon) and *"Always be able to think out of box new ideas etc…*" (anon). Regarding those ideas being creative students stated; *"I think you need to have innovative and different ideas to keep things interesting and make your ideas stand out"* (anon), *"Creative is to make something new. We are live* [sic] *in a world which be designed already. The buildings, rooms, even the pencils. We have to find something fresh. So we need creative skill"* (anon) and "*Interior and furniture design is based on creativity and having ideas. Creative skills will allow you to have new and interesting ideas"* (anon).

Creativity workshop

In the final section of the questionnaire students were asked if they would be interested in attending a one day workshop to help them enhance their creativity skills, eleven students said they were very interested in attending, ten were somewhat interested, two were not very interested, one was not all interested and two were unsure (Appendix 2, section F,

question 28). When asked if topics related to creativity should be included in a follow up workshop, ten students felt there should be and two felt there should not. Only one student outlined what that subject should be, *"basic drawing skills"* (anon). Students were asked if there were any other comments they would like to make regarding creativity and how the Dublin Institute of Technology might help support student creativity (within their programmes), comments included; *"Improve our 'creative' environment. Make it less like a college, and more like a creative home"* (anon), *"Mature students should have proper times on timetable in art room, not just fitted in and always later class"* (anon) and *"Encourage entry into competitions"* (anon).

Creativity Games Day findings

Introductory exercises

The volunteers were requested to arrive between 9.45am and 10am, when a brief outline of the workshop was given; students were made aware it was the first time such a workshop was run by the facilitator. A detailed schedule of events for the day had been devised (Appendix 3) and all the activities had been previously practiced. Feedback had been given during the practice sessions and adjustments had been made. The introductory exercises discussed in the methodology chapter took place, the first of these 'Touching Hands', caused slight embarrassment at first, however the participants seemed to relax once their initial embarrassment was over, and there was some hilarity when people guessed the wrong person. The researcher then demonstrated how to make shape of the first letter of their middle name using their body and participants were asked to take turns to follow with the remainder guessed firstly the letter and then the name. This was surprisingly difficult, but all the letters were guessed, the names proving more difficult.

Following this, in two groups of five, participants were asked to make letters of the alphabet using their bodies, however all five had to participate in the shape of the letter. This happened very quickly, with approximately 30 seconds to make each letter. Letters A, F, M, K and S were called out by the researcher. The students needed to work together very quickly and very closely, this was a physically demanding exercise, and it helped students get to know each other and further relax. During this activity the

participants asked if they could lie on floor to make the letter, which they all promptly did.

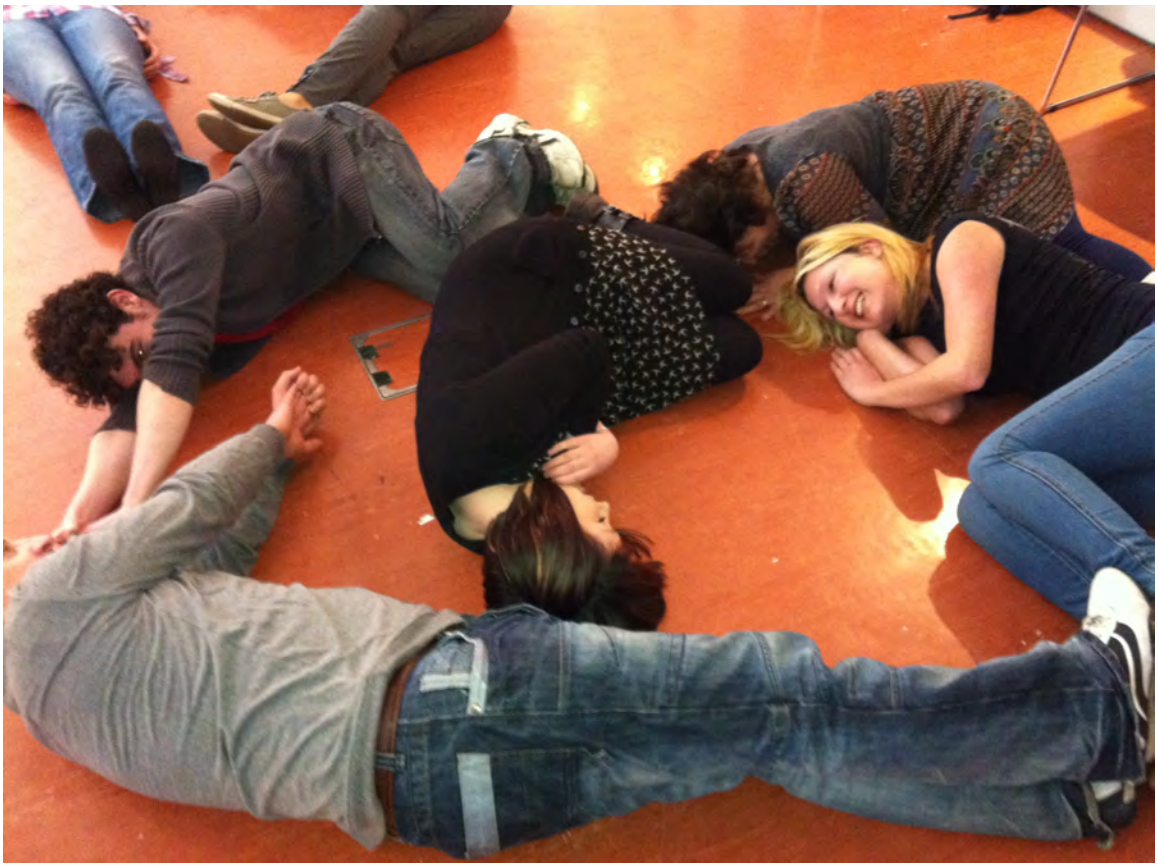

Figure1.Students making letters

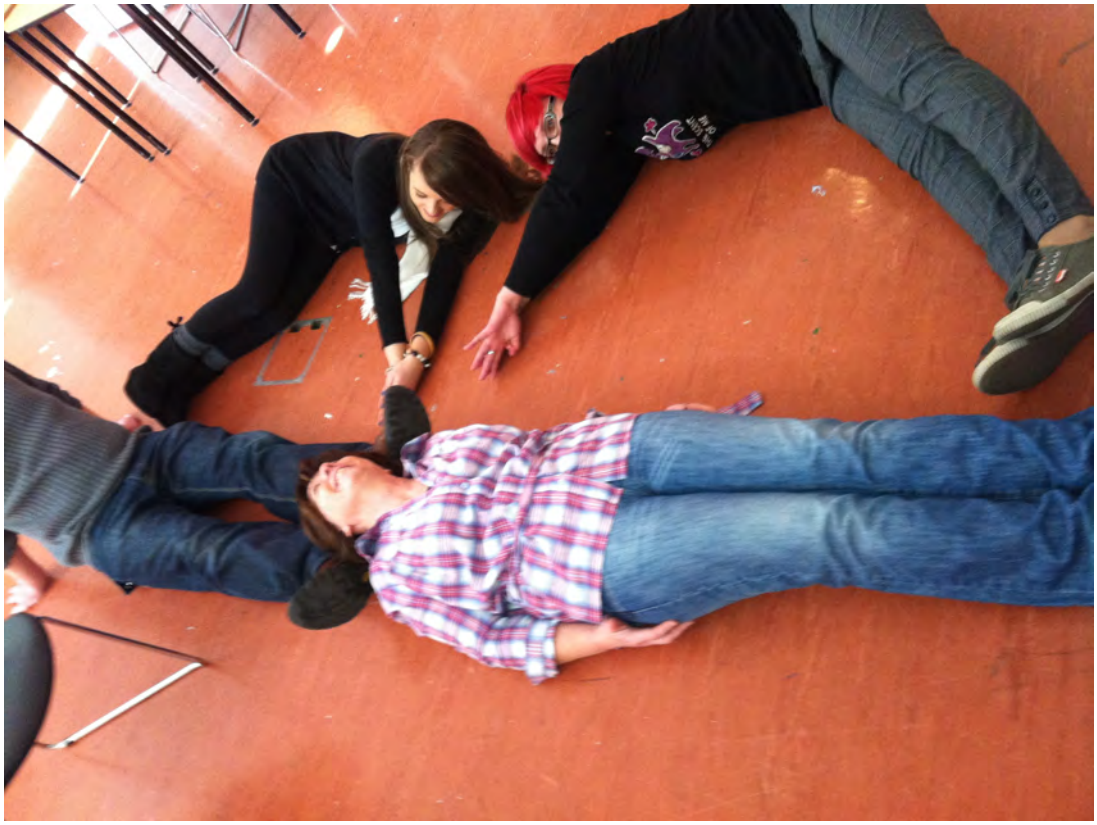

Figure2.Students making letters

The next exercise was 'The Worst Singer'; each participant turned their back to the group and sang 'Happy Birthday' in their worst possible voice. The researcher encouraged the participants to sing like Mickey Mouse or as if they had a mouth full of helium. Most of the participants needed some persuading as this exercise took most out of them out of their comfort zone. The researcher sang first and all the students took part, as this exercise was quite demanding on their confidence, there was a strong sense of achievement from the students when this task was completed.

Drama games

During the warm-up games, participants were asked to move slowly out into an area, find a space, to stretch up as high as possible, to crouch down and become as small as possible and then spread as wide as possible, it was pointed out to the participants they may not have done this since primary school. The individual drama activities followed, with students miming various scenarios; then pairing up to mime out further drama activities.

Both the individual and the paired activities were performed with much enthusiasm. Students were then asked to form a circle and take part in the group activity playing musical instruments, firstly in a symphony orchestra with the researcher as the conductor and then as a rock band performing at a huge concert. These activities were physically tiring; however there was much laughter during these exercises and a huge effort put in by the participants.

Creativity games

After the physicality of the previous exercises, students were asked to find a comfortable position on a chair and take some time to daydream. Speaking slowly and calmly the researcher requested participants to close their eyes, breath in and out deeply a few times, and relax. It was explained that they were being given permission to do something they've been forbidden from doing since childhood: permission to daydream. They were asked to let their minds wander freely for a few minutes, it was suggested they will visit other places, see strange images, or hear odd sounds. The room became very quiet and the ambience was very calm. After ten minutes of silence, they were requested to return to the room from their daydream and asked if they would like to share where they had gone. Many of the students had gone somewhere warm, to a memory of a holiday or a favourite place; all shared their experience and all were surprised at how vivid their daydream had been.

The next activity was 'Selling a Zork', this involved participants selling a strange object for €250,000 to the group.

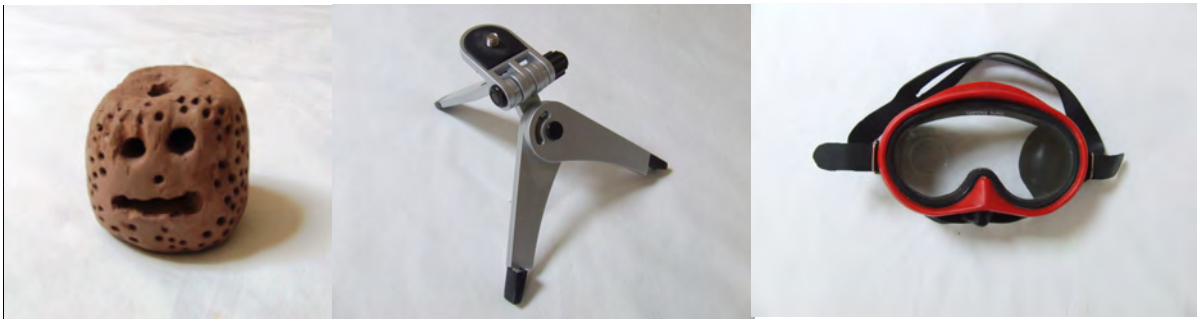

Figure 3. 'Selling a zork' items

The objects chosen were a small hand made sculpture, a small fold up tripod and a large pair of swimming goggles. The students were asked to very quickly come up with uses for the object they were given. Among many interesting ideas, these objects became a priceless early sculpture by Picasso, the blades worn by Johnny Depp in Edward Scissorhands and a pair of x-ray goggles. The students really engaged with this activity and all were surprised at the quality of the ideas generated. After this exercise it was time for students to have a break and tea/coffee and biscuits were provided. At this time a list of preferences for lunch was taken, this was provided by the researcher. The reasoning for the keeping of the tea breaks and lunch within the confines of the room was to not break the 'spell' of camaraderie that had developed among the group. At this stage, the group, most of whom did not previously know each other, had bonded and there was a relaxed and congenial atmosphere.

The first exercise after the break was **'**The Memory Game', working in teams of two; everyone was given 10 minutes in which to name a new chewing gum. Both sets of groups came up with good original ideas for naming the chewing gum; however the groups that were able to record their ideas with pens and paper produced a lot more ideas. This was a simple, yet informative, exercise and participants were surprised at the difference in the amounts of the ideas. This was followed by a brief discussion on the importance of preserving new ideas as they occur.

The second game included to demonstrate the importance of sketching or diagramming a problem, involved asking the students to quickly think about how many windows are in their house or if they were living in a flat to recall the number of windows in a house they were familiar with. They verbally stated how many, but were then asked to draw a sketch of the house showing the windows. There had to be quite a bit of effort put into remembering. All of the students had underestimated the amount of windows in their memory, however by sketching it they had a much more accurate version of the house and the sketch allowed them to inspect and count the windows. The discrepancy in the numbers of windows, of what they had thought and the actual amount, was discussed, and

it was suggested that drawing and diagramming is useful in creative thinking to recover information from memory that might otherwise be unavailable.

For the 'Random Doodles Game', all the participants were given sheets of paper and pencils to record their sketches, and were asked to draw various items, three of which were real and three were imaginary. The items were to be drawn in 30 seconds; they consisted of a tree, a 'nid', a girl, a 'kif', a table and a 'mip'. Some questions were asked, 'what is a nid?' and so on, however they were told it was anything they wanted it to be. They were asked to place the sheets of paper under their chairs. The next game took place followed by 45 minutes for lunch and it was approximately one hour and fifteen minutes later that this game was resumed. The students were given clean sheets of paper and the previous items were called out again in a different order for the students to sketch once again. When this was done students were asked to hold up both their drawings of the same items. The interesting thing was drawings of the familiar items, the tree, the girl and the table were in all cases nearly exactly the same as the previous drawing, however the unfamiliar imaginary items varied, some by a great deal, one student stated he had absolutely no recall on what his previous 'nid' had been. There followed a discussion regarding the recording of new ideas that surge through our heads throughout the day, it was suggested to the students that some have value and some do not, however unless we capture those ideas, we'll never be able to assess their value.

The last game before the lunch break was the 'The Audience Game'. One student was asked to volunteer to be the 'score keeper' and he wrote the other participants names on a flip chart. The remaining group was divided into two, four members of the group were put sitting viewing walls, while the remaining five were put into a circle facing each other. Participants were given paper and pencils and asked to list as many new hairstyles as they possibly could, in ten minutes. How many new hairstyles can they invent? For each hairstyle, they should write a name for that style, along with a brief description or a sketch. They were asked to raise their hands every time they added a new style to their list so the score keeper could put a tick against their name. When the time was up, a comparison of the total count was made to see who had the highest scores. The students

who were arranged in the circle facing each other had higher scores than those facing the wall. It was believed it was easier for them to invent new hairstyles as they had a variety of hairstyles to examine. In other words, new ideas came more easily as they had access to diverse, relevant stimuli and it was suggested to enhance creativity, they should surround themselves with interesting and diverse physical and social stimuli, including people.

In 'The Tell-Me-A-Story-Game', participants were given five minutes to compose a story that was suggested by a large three dimensional paper star that had an interesting pattern.

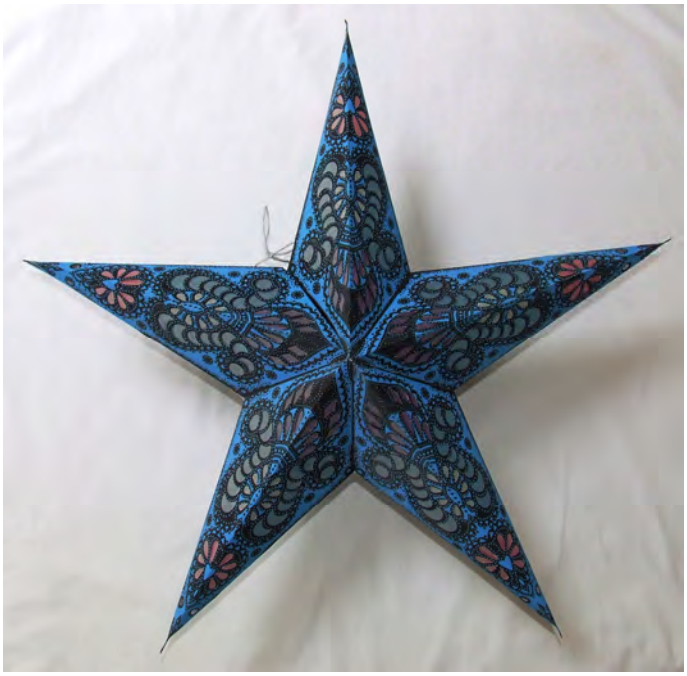

Figure 4. 'Tell-me-a-story'

The star was put on a chair in the studio and the students were given notepads and pencils to write. Participants were asked if they would like to read out their stories, one of the students wrote a nursery story involving a star, another wrote about intergalactic travel and another wrote a poetic passage of prose which surprised us all. Two of the four males taking part admitted that they found this activity quite difficult. Most were surprised at the content of their story and the effect that the star had on their creativity. It was suggested perhaps they could apply the concept of unusual stimuli in their college design projects.

The next activity was the 'The Odd Couple Game', students were put into new pairings with each pair given five yellow folded pieces of paper containing products, and five white folded pieces of paper with a topic written on it. The pairs were asked to randomly select a piece of folded yellow paper and a piece of folded white paper and based on the pairing, try to improve existing products or to invent new ones. The teams were then asked to present their products; the teams found some pairings were much easier than others. The researcher showed an image of a 'butter stick', and one of the participants suggested the image should have been shown prior to the exercise for inspiration. General questions were asked such as how was your thinking affected when you paired a product (like hats) with an unlikely topic (like earwax). Do you routinely think about odd topics when you're working on a problem or trying to think of something new? What value might this have? If you increased your knowledge in areas well outside your current areas of expertise, how might this help you be creative? (Epstein, 2000).

Figure 5. Worst TV programme ever

The final activity saw the participants divided into three groups of three as one of the participants had to leave for a prior appointment. In this game the students were given twenty minutes to write the 'Worst TV Programme Ever'. Participants were told they worked for a television production company that had been given the 'graveyard'

midnight slot on a well known television channel. They were a young and upcoming company and have decided they need to create a cult following by making the worst television programme ever. However on deciding the format, they had to write a script which they were going to act out. After twenty minutes the groups asked for more time and were given ten more minutes. When this time was up each group was given five minutes to perform a segment of their show, one of the groups had created a games show called 'never gonna get it', where a quiz master asked inane questions of phone-in callers who were never going to get the correct answers, the second group did a version of the Rocky Horror Show which involved breaking into song and dance. The third group did a news reel with incredibly inept reporters. Each of the sketches caused much hilarity for the onlookers. At the conclusion of all the activities in the Creativity Games Day the participants were thanked for their participation and enthusiasm and asked to complete a questionnaire (Appendix 4).

Creativity Games Day findings

Both the initial creativity questionnaire (Appendix 1) and the creativity workshop questionnaire (Appendix 4) were anonymous, however the participants coded the back of both of their questionnaires with a keyword known only to them, this facilitated the researcher to compare the results of their original questionnaires with the results of their questionnaires completed after the Creativity Games Day workshop. Four students were selected at random for individual comparisons. These students will be addressed as Students A, B, C and D and the findings will be discussed in detail in the individual comparisons section.

Nurturing creativity

Quantitative questions (Appendix 5, questions 1-9) asked the participants if their belief in their creativity had been enhanced by partaking in the activities; 100% of participants agreed it had (Appendix 5, question1). 100% of students felt they could take inspiration from the day to help them develop their creativity, with 70% of students strongly agreeing (Appendix 5, question 2). When questioned if they felt inspired by the day, 100% of students agreed (Appendix 5, question 3). Regarding their participation in the

tasks, 80% of participants agreed they were happy to take part, one participant didn't know and the tenth participant disagreed with the statement "*I felt happy to take part in all the tasks"* (anon) (Appendix 5, question 4).. The same student also agreed the tasks took them "*out of their comfort zone"* (anon) (Appendix 5, question 5), however the other ninety percent of participants felt comfortable with the tasks. 80% of students felt they were as creative as everyone else in the group, one of the students strongly felt they were not as creative and this was also the participant who had felt uncomfortable (Appendix 5, question 6). The tenth participant didn't know. 90% of students felt they had learned new methods of incubating ideas; 40% felt strongly about this, the tenth person didn't know (Appendix 5, question 7).

Views of activities

Quantitative data (Appendix 5, question 8), was gathered by asking participants if they had a favourite game, forty percent participants liked them all, sixty per cent of students said yes and cited their favourite games as Touching Hands, Making Letters, Selling a Zork, How many windows, and Random Doodles, three people liked the Hair Styles game the most, and two preferred the Worst TV Show, one of whom described it as fun and inspirational. When asked if they had a least favourite game fifty percent of the students indicated they did, some indicated more than one; these included Making Letters indicated by one person, the Worst Singer which was two participants least favourite game, one of the students explained "[I] *had to get up in front of people"* (anon), this student also felt that the Drama Games were another least favourite game. Another student disliked the Tell-me-a-story game and another student expressed the wish that an inspiring image shown on PowerPoint for The Odd Couple game had been shown earlier "*I think the image showing the butter stick should have been shown first to inspire – direction"* (Student D). Another person's least favourite game was the Worst TV Show.

Confidence building

The first question gathering qualitative data asked participants to sum up their experience of the Creative Games day in one or two sentences. When reviewing their comments

several themes emerged, one of these was how the day affected the participants confidence; comments included;

"Very positive, definitely made me more confident. I still can't believe I stood up and sang Happy Birthday! I think it was a great team building day as I didn't know most of the others in the beginning…" (Student A).

"Really enjoyed day, took me out of my comfort zone. I was really embarrassed about the singing but so glad I did it, made me feel I could push myself" (anon).

Generation of ideas

Another theme that emerged was the generating of ideas, two of the students commented;

"Made me think twice about my creativity. Made me want to further develop my creativity by expanding ideas and taking more risk" (anon).

"I found it very good. It was good to interact with people I did not know – but mainly all different types of ways of generating ideas was very beneficial to me" (Student C).

"I think it would open your mind to different elements of creativity. It helps people be more comfortable and feel more creative" (anon).

"Meeting new people helped me with spontaneous ideas and thinking on the spot" (anon).

"I really think these types of games help people with regards ways of thinking and help validate your individual ideas" (anon).

"Yes because idea generation is a very important part of the design process" (anon).

Workings of creativity

The issue of how students viewed the workings of their creativity came up;

"It was a brilliant day. I learned a lot about myself and how my creativity flows" (anon), and how the workshop made them think differently;

"*Today was an interesting day, fun filled with games and laughter. Helped with opening and widening your creative mind and met new people, which is always good!"* (anon).

"I really enjoyed the day. Made me think outside the box" (anon).

"Relax in front of people I don't know. New way of thinking" (anon).

Non competitive

A few of the students mentioned meeting people during the day as an asset;

"I loved it. Great day. Would really recommend it. Nice meeting new people too" (Student B).

"Great. Full of openness" (Student D).

Some of the games included in the day required the participants to do their worst rather than their best, the rationale behind this was to show the participants that you don't always have to be the best to achieve something.

"I feel it broke the ice, got us laughing at each other, and helped me know the other students. It also made me think outside the box" (anon).

There was no competitive edge to the day, there being no evaluation of their participation or their levels of creativity, this brings to mind Runco (2007) and his statement on competition being a distraction to the potential creator. The participants viewed being part of a group as an asset. Collins and Amabile (1999) also believed competition for awards for the 'best' product has a damaging effect on creativity. Further qualitative data was gathered by asking participants if they would you like any creativity enhancing games introduced into the curricular, all of the participants answered yes.

Part of the curriculum

Among the themes that emerged from their answers were; the confidence building aspect of the day; for many creative people (experienced and beginners), it often can be a lack of confidence that prevents them from reaching their full potential. *"Yes, I think a day like this would be really beneficial on a curriculum as it gives you confidence to be creative around others* [students emphasis] *even if you don't know them which can be really hard otherwise"* (Student A).

Other participants in the survey mentioned overcoming restrictions to creativity as a reason to introduce the Creativity Games Day to the curriculum;

"I think all of us aspiring to work or learn design need creative understanding and how to overcome restrictions" (Student B).

"Some people don't develop their ideas enough; if there were classes there'd be more successful students/projects" (anon).

Another participant thought the day would be *"useful for everyone"* (anon), and finally there was a comment on the activities that emphasised the role of recording ideas, *"creativity is in mind and soul. Ideas in mind have to appear on paper*" (anon).

Individual comparisons

In the initial questionnaire regarding their self perception, student A agreed they were a creative person, were able to complete tasks as well as other people in the class and had confidence in their design ideas. When questioned about incubation of new ideas they also agreed they brainstormed, wrote or sketched in a notebook and felt they could always come up with new ideas. In the section entitled, level of satisfaction they answered 'don't know' if they had contributed as many creative ideas to briefs as everyone else. However, they felt they had reached their creative potential and had creative ideas to contribute to a brief. When asked about their levels of anxiety they agreed they felt anxious when given a new brief and strongly felt presenting their work to the class made them anxious. When asked to indicate the main reasons for their anxiety, they stated; *"In one of my electives I know the teacher doesn't 'get' my work. I worry that his assessment of my ability will be negative and that this will affect my application. Also he is very much into arts and crafts and I am not really. This all makes me a bit anxious! But it might be positive too as I should have total confidence in my ideas"* (Student A).

Nevertheless they did not feel anxiety when discussing their ideas with a tutor and did not worry they lacked the creative skills to conceptualise good ideas. Student A did not complete question 23 which asked how their tutor may reduce their anxiety. When asked about their future skills development they believed their creativity skills would improve. They strongly agreed they could develop their creativity skills on their course and agreed it was the responsibility of the tutor to help them develop their creativity. They felt good creative thinking skills would be useful in their career staring; *"I think good creative thinking skills are a huge asset as they bring good ideas and productivity"* (Student A). They were very interested in attending a creative skills development workshop.

On completion of attendance at the Creativity Games Day workshop, Student A filled in the second questionnaire, they strongly agreed the day had enhanced their belief in their creative abilities and could take inspiration from the activities to help their creativity. They felt they got much inspiration from the day and agreed they were happy to take part in all the tasks; however they also felt some of the activities took them out of their comfort zone. They had discovered new methods of incubating ideas and liked all the games. When asked to write one or sentences summing up their experience of the Creative Games Day, they stated; *"Very positive, definitely made me more confident. I still can't believe I stood up and sang Happy Birthday! I think it was a great team building day as I didn't know most of the others in the beginning. Do more days like this, it was brilliant"* (Student A). They would like to see the creativity enhancing games introduced into the curricular, explaining*; "Yes, I think a day like this would be really beneficial on a curriculum as it gives you confidence to be creative around others even if you don't know them which can be really hard otherwise"* (Student A).. When previously asked about their levels of anxiety they had felt anxious when presenting their work to the class, one of the objectives of the workshop was to alleviate student anxiety when making presentations and this seems to have been addressed by increasing their confidence. *"Very positive, definitely made me more confident"* (Student A)*,* this positive affect leads to greater creativity (Greene and Noice 1988), better problem solving (Isen, Daubman, and Nowicki 1987), and greater risk taking (Kahn and Isen 1993).

In the self perception section Student B agreed they considered themselves to be creative, but felt they did not have a positive attitude towards themselves. They strongly agreed they were able to do things as well as most people and possessed a number of good qualities. They felt they were not as creative as others in their class, but were satisfied with themselves as a creative person, and strongly agreed they had confidence in their design ideas. When incubating ideas they did not enjoy spending time researching for inspiration and did not always explore new ideas and ways to do things differently, and were not always able to come up with new ideas. However, they brainstormed and either sketched or wrote down ideas in a notebook. Regarding their level of satisfaction they felt they had contributed as many ideas as everyone else and strongly agreed they had many

opportunities to express their creativity at college. They felt they had reached their creative potential at college, but agreed sometimes felt they had no creative ideas to contribute to a brief. Student B felt anxious when given a new design brief, but was not concerned they lacked the creative skills to conceptualise a good idea. Presenting their work to the class made them feel anxious and they strongly agreed feedback from the class helped them develop their ideas better, however discussing their ideas with their tutor made them anxious. Student B did not indicate any reasons for their anxiety or any ways their tutor may help alleviate it. They did not complete the future skills development section, but thought good creative skills would be very useful in their career and a short reason given was "*design=creation, creation=new"* (Student B). They indicated they would be very interested in a Creative Skills development workshop.

On completion of the workshop they agreed they could take inspiration from the activities and that their belief in their creative abilities had been enhanced. They felt they had gained much inspiration from the day; however were not happy taking part in all the tasks, strongly agreeing some of the activities had taken them out of their comfort zone. In the first questionnaire they had stated they were not always able to come up with new ideas, however on completion of the workshop they felt as creative as others taking part and also that they had discovered new methods of incubating ideas. They liked all the games and did not have a favourite. Asked to sum up their experience of the day they stated; *"I loved it. Great day. Would really recommend it. Nice meeting new people too"* (Student B). They agreed creativity enhancing games should be introduced into the curricular; *"I think all of us aspiring to work or learn design; need creative understanding and how to overcome restrictions"*. Mezirow (1991) argued there is a tendency for individuals to filter new experiences through existing structures and in order to 'avoid anxiety' or conform to peer group expectations, merely reinforce existing constructs. He argued it is the choice of the individual to risk the possibility of change or not to risk change which is central to their capacity to learn. By participating in the Creativity Games Day, the two students were removed from their existing structures, with Student B strongly agreeing they felt they were taken out of their comfort zone by some of the activities, the risk of change has enhanced their perception of their confidence.

In the initial questionnaire regarding their self perception Student C considered they were a creative person with a positive attitude. They strongly agreed they were able to complete tasks as well as most people and had a number of good qualities. They agreed they did not feel as creative as most people in their class, but were satisfied with themselves as a creative person; however did not have confidence in their design ideas. They enjoyed spending time researching for inspiration when incubating new ideas, but did not use brainstorming techniques. They kept an ideas notebook, explored new ways to do things differently and felt they could always come up with new ideas. Regarding their level of satisfaction they did not contribute as many creative ideas to briefs as everyone else and had not been provided with opportunities to express their creativity while at college.

Student C also felt they had not reached their creative potential and were anxious they would not have creative ideas to contribute to a brief. When answering the section regarding their level of anxiety, they experienced anxiety when given a design brief and worried over their skills to conceptualise a good idea. They strongly agreed presenting their work to the class made them anxious. When asked to indicate reasons they stated; *"Speaking in front of a class about something that is new to me makes me anxious. Main reasons; lack of knowledge and not speaking clearly"* (Student C). When questioned on how their tutor may relieve their anxiety they said; *"Maybe some examples of creativity"* (Student C). . Feedback from the class helped them develop their idea and they were not anxious discussing their idea with their tutor. In Gardner's (1993, 1994) case studies on 19th century creators one of the themes that emerged was the network of support that surrounded the creators at the times of their creative activities. During periods of intense creativity, cognitive support was needed in the form of someone in whom they could share their new found ideas and also affective support from someone whose friendship was unfailing. They felt creative thinking skills would be very useful in their future career and were very interested in attending the creative skills workshop.

On completion of the workshop Student C strongly agreed the Creativity Games Day had enhanced their belief in their creative abilities and they could take inspiration from the day. They were very happy to take part in all the tasks although some of them had taken

them out of their comfort zone. They felt as creative as others taking part which contrasts with their previous statement they did not contribute as many creative ideas to briefs as everyone else. They also agreed they discovered new methods of incubating ideas, which should address their creative potential attainment and anxiety over their creative ideas when presented with a new brief. They had a favourite game, Hair Styles and their least favourite game was the Worst TV Show. Summing up their experience they said; *"I found it very good. It was good to interact with people I did not know – but mainly all different types of ways of generating ideas was very beneficial to me"* (Student C). They believed creativity enhancing games should be introduced into the curricular; *"Yes because idea generation is a very important part of the design process"* (Student C).

Student D, when questioned on their self perception agreed they considered themselves a creative person had a positive attitude and were able to do things as well as most people. They perceived themselves as being as creative as others in their class, were satisfied with themselves as a creative person and had confidence in their design abilities. Regarding incubation of ideas they agreed they enjoyed research, that they brainstormed ideas, kept an ideas notebook and explored ways to do things differently. Student D did not know if they had contributed as many creative ideas to briefs as others, but felt they had been provided with many opportunities to express their creativity at college and agreed they had creative ideas to contribute to a brief. They experienced anxiety when given a brief and worried over their conceptual skills. They were not anxious presenting to a class and felt class feedback enabled them to develop ideas. They were not anxious discussing their ideas with their tutor. They felt creative thinking skills would be very useful in their career believing *"the tools and know how are needed for any job"* (Student D). Student D was very interested in attending a creative skills development workshop.

On completion of the workshop they strongly agreed their belief in their creative abilities was enhanced and they could take inspiration from the day, which addressed their anxieties when given a brief and worries over their conceptual skills. They were happy to take part in all the tasks and none of the activities took them out of their comfort zone. They believed they were as creative as others taking part and had found new methods of incubating ideas. They had a favourite game, Selling a Zork and a least favourite game

was Making Letters. A summary of their experience was; "*Great. Full of openness. Put together great"* (Student D). They believed the activities should be introduced into the curricular stating; *"Creativity is in mind and soul. Ideas in mind have to appear on paper"* (Student D).

The following chapter will discuss the findings and whether or not the hypothesis has been tested. Observations of the participants in the Creativity Games Day workshop are relayed. A comparison of the general data from both questionnaires is discussed to ascertain whether or not the students have discovered new methods to incubate new ideas, and whether or not their anxiety levels have been addressed.

Discussion

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Introduction to discussion

The nature of the action research was to test the hypothesis 'How can we nurture and develop creativity in first year design students'. This chapter will discuss whether or not that has been achieved. Literature was investigated on the definitions of creativity, the traits inherent in creative people, the barriers to creativity and whether or not it can be measured. Further literature was reviewed on the nurturing of creativity and the environmental factors that are conducive to creative thinking. Traits that people who are perceived as having been creative were investigated, such as "*the amalgamation of the childlike and the adult like",* which Gardner (1993, p.365) associated with creativity. MacKinnon (1978) also listed common traits inherent in creative people, these included independence, intuition, curiosity, receptiveness, willingness to learn, and a strong sense of destiny and courage.

Activities nurturing traits found in those that are perceived as being creative were researched to assist in designing a one day workshop, alongside activities that addressed the needs and anxieties of the students that became apparent from the Creativity questionnaire. An initial questionnaire was devised to determine the thoughts of first year design students on their beliefs of their creativity levels. The students were also questioned over their future creative skills development and were asked if they were interested in taking part in a one day workshop, twenty seven students took part in the initial investigation. Further literature was reviewed to find activities that would nurture creativity to assist in the design of a one day Creative Games workshop**.** Once the Creativity Games Day was designed and planned, trials were carried out to gather information on the use of the activities. Students who had completed the first questionnaire were asked to volunteer to take part in the day. The sample size participating in the workshop was ten. On completion of the Creativity Games Day workshop a second questionnaire was issued to determine the participant's evaluation of the workshop and whether or not it had caused any changes in student's perceptions of their creativity levels or helped them develop creative thinking tools.

Observations of Creativity Games Day volunteers

Although the workshop was offered to two design disciplines, none of the Visual Merchandising degree students were available to participate, two students cancelling the evening before, citing work or family difficulties. Seven participants from the B.A. (Hons) Interior Design and Furniture degree took part; they consisted of three first year students and four mature second year students who were included as this was their first year in DIT, having been accepted by direct entry into second year due to prior qualifications. The remaining three participants were mature back to education students, who were in DIT to take part in a college access programme; these students were studying one of the modules in first year interior and furniture design taught by the researcher. All the seven mature students had expressed a strong wish that they be included in the workshop. As the Creativity Games Day was scheduled for review week, many of the full time students were returning home for the week and expressed disappointment that they were unable to take part.

The researcher's previous observations of the ten volunteers in the capacity as their lecturer was, two of the first year students appeared to have low levels of confidence in their creative abilities while engaged in studio design work, one of these students was a direct from school entrant and the second was repeating the first year due to personal circumstances. The third first year student was very capable with strong willingness to learn and displayed a reasonable level of confidence in their creativity. Three mature students were part of the access to education programme and were partaking in a module taught by the researcher. They were all unsure of their ability to produce creative work; the most mature of them lacked confidence in their creativity ability and expressed anxiety on whether or not they would be able to complete the full time curriculum. However they were all very keen to learn. Of the four advanced entry students in second year, one of the three mature students appeared to be quite confident in their abilities and displayed a strong willingness to improve, two of them were moderately confident and the fourth non mature student lacked confidence, giving an aura of feeling 'out of their depth' among students who had been through the first year.

Discussion

The first questionnaire was devised to attain data from design students on their self – perception, how they incubate new ideas, their levels of satisfaction with their creativity and their levels of anxiety. In the self perception section, surprising information was contained, although 88 percent were satisfied in their creative abilities and had confidence in their design ideas; 55 percent didn't feel as creative as others in their class. Student comments regarding this included; "*Just anxious if my ideas are not right"* (anon) and *"because of the high level of creativity in my class it makes me anxious I will not be as good as everyone"* (anon). This highlights the dilemma of teaching design, as it is subjective there should not be a comparison of student's work; however the students compare and rate themselves. *"Sometimes when I get an idea, I'm not sure that it is a good idea for everyone. Maybe somebody else feels that it is a very common idea. Maybe the tutors feel nothing special"* (anon) and *"I suppose it's not being fully confident in my design ideas. Sometimes people don't fully understand your design idea, and you can't fully communicate your message"* (anon).

Amabile (1998) believed competition with peers was an extrinsic factor which decreased creativity. In a studio setting, the environment that nobody is more talented than anybody else should be created and the students work should be regarded as creativity in process. Positive or negative evaluation can bring creativity to a superficial level. It is hoped that the issue of comparison was addressed in the Creativity Games Day workshop by considering creativity to be more than just cognition, attention was paid to the socio-emotional, psychological and physiological environment (Littleton & Miell, 2004). This finding concurs with the literature reviewed that argued a positive learning environment is influential in learner achievement (Goh, 1994; Fisher, Henderson and Fraser, 1995; Wubbels and Levy, 1997). Individuals need to build a climate to protect their own creativity from the indifference or hostility of a larger climate (Mauzy, Harriman 2003). Creativity is somehow related to the emotional state of the creator (Ferguson, 1990) (as cited in Walonick 2010). From the analysis of the data the emotional environment of the design studio needs to be carefully monitored to address the fact that 55 percent of students did not feel as creative as others in their class. The methods of creating the

correct psychological and physiological environments used in the workshop should be looked at and emulated in the design studio, such as the psychological factor of equality and safety, and the physiological factor of relaxing background music to create ambience.

The second section of the initial questionnaire quizzed students on incubation of new ideas, the majority of students, 81 percent enjoying spending time researching, brainstorming ideas, exploring new ideas, and ways to do things differently, nevertheless twenty six percent surveyed felt they could not always come up with creative ideas with one student commenting; *"not able to do it. Unable to think of ideas"* (anon). Activities used in the Creativity Games Day workshop seemed to address this, with 90 per cent of the participants agreeing they had developed new ways of incubating ideas, student comments included; *"all different types of ways of generating ideas was very beneficial to me"* (anon) and *"new way of thinking"* (anon) . It would be worthwhile considering installing some of the creative development activities such as 'Capturing a Daydream', 'Selling a Zork' and the 'Memory Game' into the general curriculum. This would also address the issues raised in the third section of quantitative data which questioned students on their satisfaction regarding their of creativity level, with thirty seven per cent of students stating they sometimes felt as if they had no creative ideas to contribute to a brief. On completion of the Creativity Games Day workshop 100 percent of the participants agreed or strongly agreed with the statements 'the creativity games day has enhanced my belief in my creative abilities' and 'I believe I can take inspiration from today's activities to help my creativity'.

The fourth and final section of quantitative data gathered in the initial questionnaire addressed the levels of anxiety the students experienced. Forty eight percent experienced anxiety when given a design brief with forty nine percent worried whether they have the creative skills to conceptualise a good idea. Most of the students, 71 percent, were anxious presenting work to the class, student comments included; "*presenting work in class makes me anxious because I don't like standing in front of a class"* (anon). In an effort to assuage the anxiety experienced by the students drama activities were included

in the Creativity Games Day workshop to assist the students to develop confidence in front of their peers. The 'Worst Singer' activity was a particular demanding activity for those who experienced anxiety when speaking in front of other people and one of the participants cited it as their least favourite activity. However 80 percent of participants agreed that they were happy to take part in the tasks, comments included, *"Very positive, definitely made me more confident. I still can't believe I stood up and sang Happy Birthday!"* (anon) and *"I was really embarrassed about the singing but so glad I did it, made me feel I could push myself"* (anon). Ninety percent of the participants agreed that some of the activities took them out of their 'comfort zone', however this was not necessarily perceived as being a bad thing with one student commenting *"really enjoyed day, took me out of my comfort zone"* (anon) *and* another commented *"made me want to further develop my creativity by expanding ideas and taking more risks"* (anon).

The feedback from the students reinforces Jacksons (2006, p.9) insight; *"Higher education is full of intelligent, creative people and the professional act of teaching, with the significant autonomy attached to this role, provides fertile conditions for people to be creative in order to promote students' learning."* He believed rather than replicate well tried methods teachers should experiment with imaginative but riskier, perhaps less comfortable ways of doing things. The entire student cohort surveyed (Appendix 5, Question 11) endorsed the suggestion that creativity enhancing games should be introduced into the curricular. The workshop set out to address the levels of anxieties experienced by the students regarding their creative abilities. Forty eight percent of the student cohort surveyed in the initial questionnaire had expressed concerns over their creative skills to conceptualise a good design idea, and 57 percent sometimes felt as if they had no creative ideas to contribute to a brief, however after the Creativity Games Day, 90 percent of the participants agreed that they had discovered new methods of incubating ideas. One hundred percent of the students felt the Creativity Games Day enhanced their belief in their creative abilities.

Summary

According to the findings and discussion, the hypothesis, 'How can we nurture and develop creativity in first year design students' has been tested by the research. The initial

questionnaire disclosed the issues the students felt stemmed their creativity level. These issues were addresses by the workshop, which came about as a result of a combination of research of literature and a review of the data garnered by the questionnaire. The respondents who took part have overwhelmingly endorsed a Creativity Games Day workshop as a means of helping students develop the attributes necessary for success in a creative field.

Conclusion and recommendations

Delimitations and Outline of the timescales

The problems faced by this research were how to measure how new students perceive themselves regarding their creativity, how to design teaching methods and material that will nurture creativity and how to determine whether or not these teaching methods and materials have improved the students thinking. The students were originally to be assessed and given creativity development tools on an ongoing basis throughout their first academic year, however due to time constraints the assessment took place in two stages and the development of tools for creativity enhancement took place in one day. The limitations of this research are that it is a small study; however it is often better to test a new hypothesis in a small number of subjects first. Once the study is completed and the data is analysed a reflective approach will be taken of the model of research used. The researcher will self examine one's learning, design, and teaching, as well as student self-examination of one's learning, engagement, and performance.

This small pilot study, while acknowledging the limitations placed on the results due to the narrow experience and small sample size of the research, does suggest that creativity can be nurtured. There are various elements, psychological and physiological, that both need to be considered to create the correct emotional and physical environment that will assist students of design to develop creativity. In the literature review we looked at Rogers' (1962) belief that creativity is a natural product of healthy development, but that it may be blocked by a person's need for psychological defenses, however teachers and others hoping to promote human growth can establish the conditions of psychological safety that allow individuals to develop. Students should be offered the safety that is associated with the three processes, acceptance of the individual, lack of external evaluation, and empathetic understanding. The common traits, listed by MacKinnon (1978), displayed by creative people such as independence, intuition, curiosity, receptiveness, willingness to learn, and a strong sense of destiny and courage, should be encouraged. Was the Creativity Games Day a small step on the right direction to assist and enable design students to develop their creative skills? The findings of the study were

such that from a student's point of view the Creativity Games Day was a rewarding, positive and beneficial experience. Hermann (1989) believed "*the main thing that hinders creative thinking is our belief that we are not creative"*. All of the students who participated in the workshop felt the creativity games day enhanced their belief in their creative abilities; it is this self belief that will help the students develop and nurture their creative talents. The experience of being given time to allow themselves to focus their attention and awareness on creative activities will also help the students as they move forward in their creative thinking. Time is an important ingredient of creativity.

Was a one day workshop the correct method of enhancing the student's belief in their creativity? Due to time constraints in the normal curricular, the decision was made to hold the workshop in a one day time frame during review week. The benefits of this were; the students had a whole day to invest in creative nurturing activities without having to consider the possibly distracting factors that normally take place during the course of a normal academic day. The venue was free for the entire day due to suspension of normal classroom activities due to it being review week. Nevertheless, due to the Creativity Games Day being held as a one day workshop during review week, many students who had expressed interest were unable to attend as they were returning home.

Would the activities have as much impact if held in small segments during class over the course of the academic year? It is believed that the ambience created by setting the correct psychological and physiological factors for the one day workshop would be harder to achieve in a normal class setting. The participants needed to be aware that their psychological well being was being looked after and that they were in a relaxed non judgmental environment. The awareness of delivering the workshop in the correct physical setting was also paramount to enable students to relax and as the activities were arranged in a sequential manner that enabled a flow from one activity to the next, it is believed the one day workshop had more impact due to the amalgamation of these factors and if used individually the creativity games could have less effect.

Did the particular cohort of volunteers affect the results of the second questionnaire? Originally it was believed the attendees of the Creativity Games Day would be first year design students, however only three of the first year student group of the BA Interior Design and Furniture students attended and non of the BA Visual Merchandising and Display Students. The remaining seven participants were mature advanced entry students and access to education students. One of the reasons for this, as mentioned previously, was due to time constraints the Creativity Games Day was held during review week when many students returned home. The volunteer students were aware the format of the day was a creativity enhancing workshop and therefore were willing to participate. The volunteer cohort of first year students attended as they did have a wish to increase their creativity levels. The mature students who attended came for the same reason as did the access to education students. All participants had expressed a strong interest in attending with the majority willing to partake in the activities. It would be interesting to analyse the data from a different cohort to determine whether or not the feedback would be as positive.

Should a one day workshop play an inherent role for all design students? The results of the survey suggest that all design students should be encouraged to take part; all of the participants agreed that a creativity enhancing games day should be introduced into the curricular. Some of the participants mentioned the confidence building aspect of the day; for many creative people (experienced and beginners), it often can be a lack of confidence that prevents them from reaching their full potential. When and in what semester would this day take place? Perhaps the workshop should be considered as part of the induction during the first week of college entry. The psychological factors conducive to holding the Creativity Games Day may be more difficult to recreate as the workshop took place in the second semester when some students had already built up relationships with others taking part. The researcher was also familiar with the participants; this familiarity meant knowing all their names which added to the informality of the workshop.

A critical approach should be ubiquitous in research (Bassey, 1999). This study, in order to substantiate the findings, would be required to be developed in a number of ways: a much larger study would eliminate any small sample bias. It should include students from a wider number of institutions to exclude any institutional bias and also from a wider spectrum of programmes, particularly other design based degree programmes, to eliminate any bias related to the interior design and furniture and visual merchandising programmes. Further improvements could be made by collating more data regarding the cohort sample, such as age at commencement of the programme of study. A larger study should be conducted on a much longer basis, perhaps interviewing the same group of graduates over their period of their four years of study. This would ascertain if the graduate's perception of their levels of creativity changes as their experience of design increases. It would also be helpful to be able to measure the value of a Creativity Games Day on these students from their various lecturers' perspectives. Examining the different inputs provided by the lecturers would allow a review to establish if the benefits detected by the students are singularly related to the Creativity Games Day, or are part of their integration within the college and the curriculum. Overall this would enable an evaluation to be made of the real benefits to programmes that include creativity workshops against more traditional programmes. The results could provide a basis for potential incorporation into the curricular of a Creativity Games Day. The colleges can then evaluate whether such workshops truly enhance the student's creativity and whether the resources employed in this type of programme are justified.

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Appendices

Appendix 1: Creativity Questionnaire

Introduction

This is an anonymous survey which will be conducted by two questionnaires. It is for students are in their first year of study in the Dublin Institute of Technology who are studying on programmes that are related to design, the four year B.A. (Hons) Interior Design and Furniture programme and the B.A. Visual Merchandising and Display programme. Both programmes require a level of creativity to be developed within the first year of study and both programmes will lead to careers where confidence in your abilities to conceptualise and develop ideas must be displayed. It is hoped that an equal number of both groups will complete the survey; ethnicity, gender or age will not be a factor. A creativity day is in the process of being designed, the creativity day will take place during review week in March 2011and it is hoped that a number of the students partaking in the survey will attend. The students will be asked to use a personal code on the questionnaire as a follow up questionnaire will be issued at the end of the creativity activities. They will be asked to use the same code on the second questionnaire and therefore the researcher can compare the views of the student, while the student remains anonymous. An interesting part of the research will be a comparison of the student's own views on their confidence in their ability to be creative and whether or not there have been any changes.

Completing the questionnaire

The questionnaire explores different aspects of your creativity. Please go through the questionnaire indicating your degree of agreement or disagreement with each item using the following scale; (1) strongly disagree. (2) disagree. (3) agree or (4) strongly agree. There are no right or wrong answers.

Creativity Questionnaire

(Please circle only one response for each item).

A. Self -perception

	Strongly Disagree	Disagree	Agree	Strongly Agree	Don't Know
1. I consider myself a creative person.	1	2	3	4	5
2. I take a positive attitude towards myself.	1	2	3	4	5
3. I am able to do things as well as most other people.	1	2	3	4	5
4. I feel that I have a number of good qualities.	1	2	3	4	5
5. I don't feel as creative as other people in my class.	1	2	3	4	5
6. On the whole I am satisfied with myself as a creative person.	1	2	3	4	5
7. I have confidence in my design ideas.	1	2	3	4	5

B. Incubation of new ideas.

8. I enjoy spending time researching for inspiration.	1	2	3	4	5
9. When given a design brief I brainstorm ideas.	1	2	3	4	5
10. I either sketch or write down all my design ideas in a notebook.	1	2	3	4	5
11. I am always exploring new ideas and ways to do things differently.	1	2	3	4	5
12. I can always come up with creative ideas.	1	2	3	4	5

C. Level of satisfaction

	Strongly Disagree	Disagree	Agree	Strongly Agree	Don't Know
13. Generally, I have contributed as many creative ideas to briefs as everyone else.	1	2	3	4	5
14. Many opportunities have been provided for me to express my creativity while at college.	1	2	3	4	5
15. I don't feel that I have reached my creative potential at college.	1	2	3	4	5
16. I sometimes feel as if I have no creative ideas to contribute to a brief.	1	2	3	4	5

D. Level of anxiety

	Strongly Disagree	Disagree	Agree	Strongly Agree	Don't Know
17. I generally feel anxious when given a new design brief.	1	2	3	4	5
18. I worry whether I will have the creative skills to conceptualise a good idea.	1	2	3	4	5
19. Presenting my work to the class makes me anxious	1	2	3	4	5
20. Feedback from the class helps me to develop my ideas better	1	2	3	4	5
21. Discussing my creative ideas with my tutor makes me anxious	1	2	3	4	5

22. If you indicated you were anxious about any item listed above, what do you think are the main reasons for your anxiety?

23. What might your tutor do to help reduce any anxiety, in particular over your creative skills?

E. Future creative skills development

	Strongly Disagree	Disagree	Agree	Strongly Agree	Don't Know
24. I don't believe that my creative skills will improve any further.	1	2	3	4	5
25. I believe that I can develop my creativity further on this course	1	2	3	4	5
26. It is the responsibility of the tutor to help me to develop my creativity	1	2	3	4	5

27. How useful do you think having good creative thinking skills will be in your career?

☐ Very useful ☐ Somewhat useful ☐ Not very useful ☐ Not at all useful

☐ Don't know

Please give a short reason for your response.

F. DIT creative skills development workshops

A one day workshop is being organized to take place during the review week in March…that will help you enhance your creativity skills. Spaces in the workshop are limited.

28. Would you be interested in attending a Creative Skills development workshop.

☐ Very interested ☐ Somewhat interested ☐ Not very interested ☐ Not at all interested

☐ Don't know

If a follow up workshop was to be held in the future are there any topics related to creativity that you feel should be covered included? Yes ___ No___ If Yes please outline here.

Any other comments you would like to make regarding creativity and how the DIT might help support student creativity (within their programmes).

THANK YOU FOR COMPLETING THIS QUESTIONNAIRE!

Appendix 2: Creativity Questionnaire Results

A. Self -Perception

Question 1		
I consider myself a creative person		
Strongly disagree	1	3.5%
Disagree	1	3.5%
Agree	13	63%
Strongly agree	8	30%
Don't know	-	-

Question 2		
I take a positive attitude towards myself		
Strongly disagree	-	-
Disagree	5	19%
Agree	18	66%
Strongly agree	4	15%
Don't know	-	

Question 3		
I am able to do things as well as most other people		
Strongly disagree	-	-
Disagree	1	4%
Agree	19	70%
Strongly agree	6	22%
Don't know	1	4%

Question 4		
I feel that I have a number of good qualities		
Strongly disagree	-	-
Disagree	-	-
Agree	15	55%
Strongly agree	12	45%
Don't know	-	-

Question 5		
I don't feel as creative as other people in my class		
Strongly disagree	4	15%
Disagree	8	30%
Agree	11	40%
Strongly agree	4	15%
Don't know	-	-

Question 6		
On the whole I am satisfied with myself as a creative person		
Strongly disagree	-	-
Disagree	2	7%
Agree	19	71%
Strongly agree	5	19%
Don't know	1	3%

Question 7		
I have confidence in my design ideas		
Strongly disagree	-	-
Disagree	7	26%
Agree	13	48%
Strongly agree	6	22%
Don't know	1	4%

B. Incubation of new ideas.

Question 8		
I enjoy spending time researching for inspiration		
Strongly disagree	1	3%
Disagree	6	22%
Agree	15	56%
Strongly agree	5	19%
Don't know	-	-

Question 9		
When given a design brief I brainstorm ideas		
Strongly disagree	1	4%
Disagree	3	11%
Agree	16	59%
Strongly agree	6	22%
Don't know	1	4%

Question 10		
I either sketch or write down all my design ideas in a notebook		
Strongly disagree	2	7%
Disagree	3	11%
Agree	15	56%
Strongly agree	7	26%
Don't know	-	-

Question 11		
I am always exploring new ideas and ways to do things differently.		
Strongly disagree	-	-
Disagree	4	14%
Agree	15	56%
Strongly agree	8	30%
Don't know	-	-

Question 12		
I can always come up with creative ideas		
Strongly disagree	-	-
Disagree	7	26%
Agree	10	37%
Strongly agree	8	30%
Don't know	2	7%

C. Level of satisfaction

Question 13		
Generally, I have contributed as many creative ideas to briefs as everyone else.		
Strongly disagree	1	4%
Disagree	4	15%
Agree	12	44%
Strongly agree	7	26%
Don't know	3	11%

Question 14		
Many opportunities have been provided for me to express my creativity while at college.		
Strongly disagree	-	-
Disagree	4	15%
Agree	15	56%
Strongly agree	7	26%
Don't know	1	3%

Question 15		
I don't feel that I have reached my creative potential at college.		
Strongly disagree	3	10.5%
Disagree	11	42%
Agree	6	22%
Strongly agree	4	15%
Don't know	3	10.5%

Question 16		
I sometimes feel as if I have no creative ideas to contribute to a brief.		
Strongly disagree	2	7.3%
Disagree	13	48%
Agree	8	30%
Strongly agree	2	7.3%
Don't know	2	7.3%

D. Level of anxiety

Question 17		
I generally feel anxious when given a new design brief.		
Strongly disagree	-	-
Disagree	13	48%
Agree	10	37%
Strongly agree	3	11%
Don't know	1	4%

Question 18		
I worry whether I will have the creative skills to conceptualise a good idea		
Strongly disagree	2	7%
Disagree	11	41%
Agree	8	30%
Strongly agree	5	19%
Don't know	1	3%

Question 19		
Presenting my work to the class makes me anxious.		
Strongly disagree	1	3%
Disagree	7	26%
Agree	8	30%
Strongly agree	11	41%
Don't know	-	-

Question 20		
Feedback from the class helps me to develop my ideas better		
Strongly disagree	2	7%
Disagree	4	15%
Agree	9	33%
Strongly agree	11	41%
Don't know	1	4%

Question 21		
Discussing my creative ideas with my tutor makes me anxious		
Strongly disagree	1	4%
Disagree	15	56%
Agree	7	26%
Strongly agree	2	7%
Don't know	2	7%

Question 22. If you indicated you were anxious about any item listed above, what do you think are the main reasons for your anxiety?

"Just anxious if my ideas are not right".

"Because of the high level of creativity in my class it makes me anxious I will not be as good as everyone".

"Shy, bad public speaker".

"Lack of confidence."

"Sometimes when I get an idea, I'm not sure that it is a good idea for everyone. Maybe somebody else feels that it is a very common idea. Maybe the tutor feel nothing special".

"I get nervous when doing presentations. But I am learning to be more outspoken when talking about my design".

"The lack of time and not being able to develop a better idea. Presenting work in class makes me anxious because I don't like standing in front of a class".

"I wouldn't be anxious I just feel my confidence isn't that high regard my ability".

"Go through your difficulties and discuss them, make suggestions for solutions and make you feel at ease".

"Won't get it done in time. Not able to do it. Unable to think of ideas".

"I suppose its not being fully confident in my design ideas. Sometimes people don't fully understand your design idea, and you can't fully communicate your message".

"Nerves speaking in front of people".

"Very self conscience when in front of people".

"Nervousness of presenting, that ideas are good enough".

"Nervousness – bad at public speaking".

"Can see it in my head; get frustrated when I can't draw it".

"Got a lot of negative feedback from my fashion tutor last year. But my teachers this year are restoring my new found confidence".

"I am a nervous person, when it comes to public speaking and confrontation".

"Presenting work in front of the class or others".

"In one of my electives I know the teacher doesn't 'get' my work. I worry that his assessment of my ability will be negative and that this will affect my application. Also he is very much into arts and crafts and I am not really. This all makes me a bit anxious! But it might be positive too as I should have total confidence in my ideas".

"Speaking in front of a class about something that is new to me makes me anxious. Main reasons; lack of knowledge and not speaking clearly".

Question 23. What might your tutor do to help reduce any anxiety, in particular over your creative skills?

"Constructive criticism and constant feedback".

"Practice more".

"Nothing, its something you have to get over yourself".

"I think I have to overcome it myself".

"Keep doing what she/he doing. Encourage me and push me".

"Talk about other options. Help me understand better".

"Have a relaxed attitude; try to understand the foundations of student's creativity".

"Encourage class mated to give their opinion".

"Not really much that can be done".

"Give positive encouragement".

"Help me practice".

"Help with drawing".

"Nothing. Everything is really good".

"Encourage every student that all minds are equal and capable of high standard. Gather a connection with students".

"Nothing I don't think".

"Nothing".

"Maybe some examples of creativity".

E. Future creative skills development

Question 24		
I don't believe that my creative skills will improve any further.		
Strongly disagree	12	50%
Disagree	10	40%
Agree	-	-
Strongly agree	2	8%
Don't know	1	2%

Question 25		
I believe that I can develop my creativity further on this course		
Strongly disagree	-	-
Disagree	-	-
Agree	12	48%
Strongly agree	13	52%
Don't know	-	-

Question 26		
It is the responsibility of the tutor to help me to develop my creativity		
Strongly disagree	1	4%
Disagree	8	32%
Agree	13	52%
Strongly agree	1	4%
Don't know	2	8%

Question 27		
How useful do you think having good creative thinking skills will be in your career?		
Very useful	25	99.5%
Somewhat useful	1	5%
Not very useful	-	-
Not at all useful	-	-
Don't know	-	-

Please give a short reason for your response:

"I think you need to have innovative and different ideas to keep things interesting and make your ideas stand out".

"As an interior designer is constantly looking for new ideas".

"Because all the time you have to design".

"Creative is to make something new. We are live in a world which be designed already. The buildings, rooms, even the pencils. We have to find something fresh. So we need creative skill".

"You need to be creative to create".

"It means that I can come up with original ideas".

"We need to come up with original idea".

“Interior and furniture design is based on creativity and having ideas. Creative skills will allow you to have new and interesting ideas”.

“Always be able to think out of box new ideas etc…”.

“Ability to think of new ideas is essential”.

“Hoping to pursue a career in design without creativity I wouldn’t be very successful”.

“Good designs, getting for and being professional”.

“If you are working in a creative field it is mandatory”.

“Come up with ideas”.

“It will help you find a really good job that you will love and you can express your creativity”.

“If you’re not good at creative thinking then most work would be quiet and boring”.

“Creative thinking in all walks of life. Personal and professional”.

“I think good creative thinking skills are a huge asset as thry bring good ideas ans productivity”.

“The tools and know how are needed for any job”.

“Design=creation, creation=new”.

F. DIT creative skills development workshops

Question 28		
Would you be interested in attending a Creative Skills development workshop		
Very interested	11	44%
Somewhat interested	10	39%
Not very interested	2	7%
Not at all interested	1	3%
Don't know	2	7%

If a follow up workshop was to be held in the future are there any topics related to creativity that you feel should be covered or included? Yes **2** No **10.**

If Yes please outline here.

"Basic drawing skills".

Any other comments you would like to make regarding creativity and how the DIT might help support student creativity (within their programmes).

"Improve our 'creative' environment. Make it less like a college, and more like a creative home."

"Mature students should have proper times on timetable in art room, not just fitted in and always later class".

"Encourage entry into competitions".

Appendix 3: Creativity Games Day.

8.00-9.30: Setting up of venue.

What's needed; laptop, projector, extension lead, flipchart on an easel, markers, chair for each participant, 4 small tables, A4 sheets (20 pre-folded into thirds), pencils, new idea or memory pads, masking tape, 10 matching sheets, 10 red dice, 10 black dice, 3 unusual 'Zork' objects, picnic rugs, lunch provided..

9.45-10: Participants arrive

10-10.10: Brief intro to the day.

Explain to participants what the day will entail. Set the mood for the day. Ask them have they any questions.

10.10-10.30: Intro Exercises

Touching Hands

Participants divide into groups of 5 and each of them will touch each others hands, then they take it in turns to close their eyes and touch the others hands again to see if they can identify them.

Rationale; This exercise will help them develop attention and fight their fear of proximity; bring them from the known to the unknown. It may cause some embarrassment, but will also help them to relax once the initial embarrassment is over.

Making Letters

Individually participants make the first letter of your middle name with your body. Can others guess what the letter is?

The groups of 5 are asked to make letters of the alphabet using their bodies, all 5 must participate. This happens very quickly, approximately 30 seconds to make each letter. 5 or 6 letters will be called out.

Rationale; this is quite a physically demanding exercise and will help students get to know each other and relax.

The Worst Singer

The participants will participate individually. Each will take a turn to turn their back to the group and sing 'Happy Birthday' in their worst possible voice. The facilitator will also participate, taking everyone out of their comfort zone!

Rationale; The competitive nature is reversed showing participants you don't always have to be the best to achieve something.

10.30-10.45: Drama

Drama (and movement and mime) gives balance and adds depth to game playing as well as being a creative activity in its own right.

Activities for Developing Confidence: WARM-UPS

Move slowly out into the area and find a space. You will know it is your space because you won't be able to touch anyone else. Stretch up as high as you can. Crouch down and make yourself as small as you can. Become as wide as you can.

Individual Activities

Take a walk along the beach. What do you see? What do you pick up? Show that the sand is hot. Go for a swim. Try bodysurfing in on a wave. Clear the water from your ears.

Become a mountain climber moving very carefully along a long narrow ledge. Try not to look down.

Run a warm bath. Get in slowly and totally relax as the warm water covers you. Don't forget to wash your hair.

Rationale; these types of activities may not have been partaken in since primary school. However they should help build up participants confidence in themselves and their imagination

Paired Activities

Play a game of table tennis with a friend. Take it in turns to keep the score. Now try playing a game of tennis.

Build a snowman with a friend. Put on a hat and scarf on the snowman. Don't forget to smooth the snow. You get bored with this and it turns into a snowball fight. The snow is very cold when it goes down your neck.

In pairs become a person interviewing a person for a job. If you are being interviewed, convince the interviewer that you are the right person for the job. Swap places

Group Activities

Play a trombone, drums, violin, cello, flute. Play in a symphony orchestra. Now the whole group becomes a rock band performing at a huge concert

10.45-11.00: Capturing a daydream

Participants are asked to daydream for a few minutes and then to relate to the group the contents of their daydreams.

5-10 minutes

Participants learn that (a) under the right conditions, every one of us has highly imaginative daydreams, and (b) the daydream demonstrates the enormous creative potential we all have.

No materials are needed.

Explain that you are going to give participants permission to do something they've been forbidden from doing since primary school: permission to *daydream.*

Ask participants to sit in a relaxed position. Have them close their eyes, take a deep breath, and let the breath out slowly. Speak slowly and calmly, and encourage them to relax. Then ask them to let their minds wander freely for a few minutes-perhaps they'll visit other places, see strange images, or hear odd sounds. Perform the exercise with them. Relax and have a day dream.

After 2 or 3 minutes-longer, if the setting permits-ask people to open their eyes and return to reality. Then call on people and ask where they went and what they experienced. How many of them left the room? Did any of them see bizarre images or have impossible experiences? Share your own daydream with the group if it was interesting in some way.

Questions
1 Where did you go? What did you experience? Did you experience anything odd of fantastic or beautiful in your daydream?
2 Did you have difficulty with this exercise? If so, why? Could the present conditions be a problem? Under what conditions might you be able to perform better than you did here?
3 Where you surprised by how far your daydreams took you? How so?
4 Do you think daydreaming might have any practical value? In what way?
5 How might an artist or designer use the daydream deliberately for creative purposes? How might you do the same?
6 What stops us from daydreaming more than we do?

If appropriate, as soon as you have the participants open their eyes, have them jot something down about what they just experienced. Daydreams, like night dreams disappear quickly from memory.

11.00-11.15: Selling a 'Zork'

Participants are asked to sell a strange object to the group.

15 minutes.

Unusual stimuli generate unusual ideas.

The sky is the limit. The 'Zork' can be almost anything, as long as it's unusual. You should have three objects, or drawings, or photos, ready for each of the volunteer salespeople in the game. The items should be places out of sight in front of the room before the game begins. If you're using a photo or drawing, you can put it on a projector.

Ask a volunteer come to the front of the room and face the audience. Explain that you will be showing him a 'Zork' and that they will then have 3 minutes to sell the 'Zork' to the group for €250,000.

Show the 'Zork' to the volunteer, and time the performance.

As time allows, repeat the procedure with other volunteers and other Zorks from your collection. With a suitable selection of objects, everyone should have great fun.

Questions
1 How is it that we're able to sell Zorks even though we've never seen them before?
2 Is Zork-selling creative? Why or why not?
3 If you are able to sell a Zork, what else might you be able to do that you're not doing now?
4 How, if at all, might Zork-selling be relevant to creativity in your college life?

The more provocative and interesting the selection of Zorks, the more successful this game will be.

11.15-11.30: Tea/coffee Break

11.30-11.45: The Memory Game

Some people try to remember their new ideas, while others write them down.

Approx 15 minutes.

Supplying people with 'capturing tools'- tools for recording their new ideas as they occur- can vastly increase creative output

Writing materials for half the participants- preferably including paper or a pad that's marked 'Memory Pad' or 'New Ideas'. A flipchart and a timer.

This is a deceptively simple, yet informative, exercise. Working individually or in small teams, everyone is given 10 minutes in which to name a new chewing gum. But half the group is allowed to record their ideas on paper, while the other half must try to remember their new ideas.

Lead a brief discussion about (a) the importance of preserving new ideas as they occur, (b) materials and supplies that could be used to promote capturing in the workplace or at home (paper, computers, mobile phones, folders, notebooks etc…)

Questions
1 Who presented more ideas, those who recorded their ideas or those who tried to remember their ideas?
2 How big a difference was their in the creative output of these two groups/
3 Why is it important to have the right materials at hand when you're generating new ideas?

11.45-12.00: Sketching ideas

Participants are asked to draw or make a diagram of something rather than listing it.

5-10 minutes.

Drawing and diagramming is useful in creative thinking to recover information from memory that might otherwise be unavailable.

Ask the students to quickly think about how many windows are in their house. Then ask them to draw a sketch or a diagram of the house.

Drawing the house allows them to inspect and count the windows. Creative insights sometimes occur as a result of sketching or diagramming a problem, because they help us notice certain features that may be overlooked.

12.00-12.15: The random doodles game

Participants generate random doodles and then try to remember them.

15 minutes

A standard large pad (the flipchart type) mounted on an easel, some markers, and some masking tape, also some kind of timer. In a small group, sheets of paper will suffice. Before you begin the game, draw lines on each sheet into equal thirds.

Remind the participants that new ideas surge through our heads throughout the day. Some have value and some do not, but unless we capture those ideas, we'll never be able to assess their value.

Select two volunteers. Two easels should be set up in the front of the room, and both volunteers should draw at the same time (The following instructions will assume that two people are drawing. With enough easels you can have as many artists as you like. You can even do the exercise with a lone volunteer.)

Ask the volunteer/s to draw some items, some of which will be imaginary. When you announce the name of each item, have the volunteer write that name in the top and bottom thirds of the sheet of paper. Then have the volunteer draw that item in the *top third* of the paper.

After a drawing is complete, fold the paper upwards as shown, and tape the sheet closed, so that only the bottom third of the paper is showing. Now give the volunteers another item to draw. Give six words in all-three real and three imaginary. If you like, select from the following list:

Real	**Imaginary**
Tree	Jork Jub
House	Zil Nid
Car	Gak Eef
Dog	Yug Kif
Girl	Veb Mip
Table	Orz Ilm

When all the drawings have been completed and covered, arrange for a delay in the proceedings-perhaps to take a bathroom break or to have a discussion about creativity in the news.

After a delay of 5-10 minutes, recall the volunteers to the easels and ask them to draw the objects again, as you repeat the object names in a new order. The volunteers should make their new drawing in the bottom third of each piece of paper-the portion that remained showing after the paper was folded and taped.

Finally, when all the drawings are complete, remove the tape, and compare the old and new drawings.

For real objects, the old and new drawings will usually be similar. For imaginary objects, you will probably find little or no correspondence between the old and new drawings.
New ideas are especially hard to remember, which is why it's so important that we capture them as soon as they occur.

Questions
1 Why do you think novel ideas are so difficult to remember?
2 Can you think of a time when a great idea occurred to you and then disappeared, never to return? (It's interesting that we can remember this incident but not the idea.)
3 What did you learn from this game?
4. How might you improve the odds that you'll be able to capture new ideas when they occur to you during the day? How might you preserve ideas that occur to you at night?

This game can be done in many different ways. You can make the same point by having everyone in the group draw a doodle, cover it, and then some time later, try to draw it again.

Remember, novel ideas are like rabbits they move swiftly, and before you know it, they're gone. Not every new idea has value, but if you ant to produce more genuinely creative material, it helps to start with a large pool of novel ideas. So preserve first, and evaluate later.

12.15-12.30: The audience game

Some volunteers perform a naming task while facing the audience, and others perform the same task while facing away from the audience.

15 minutes.

People are rich sources of stimuli. T o enhance your creativity, you should surround yourself with interesting and diverse physical and social stimuli-and that includes people.

You'll need six chairs that you can move around in front of the room, as well as writing materials for your volunteers.

Select six volunteers and seat three of them so that they face the audience and the other three so that they face away from the audience. I f space allows, place

the latter three people so that they can't see other, either. Give writing materials to all of the volunteers.

Now ask all of the volunteers to list as many new hairstyles as they possibly can in 10 minutes. Everyone has heard of hairstyles such as 'crew cut', 'shag', 'afro'. How many new hairstyles can people invent? For each hairstyle, people should write a name for that style, along with a brief description or a sketch. Have the volunteers raise their hands for a moment every time they add a new style to their list.

For added drama, have a scorekeeper keep a simple tally on a flipchart. The tally should show the number of times people raise their hands in each of the two groups- Audience and No-Audience.
When the time is up, inform the audience of the total count in each of the two groups, elicit some examples of new names from each group and lead a discussion about the results. The Audience group will normally produce more new names than the No-Audience group, because it is easier to invent new hairstyles when you have a variety of hairstyles to examine. In other words, new ideas come more easily when you have access to diverse, relevant stimuli.

Questions
1. Did the two groups produce different results? What were the results, and how did they differ?
2. Did the individuals in the two groups behave in a noticeably different way during the task? If so, how?
3. Social stimuli would normally inhibit performance on a task like this. Why?
4. In a group or team situation in which everyone can participate, social stimuli are often inhibiting. Why would that not be the case in the task we just completed?

You might try increasing the work period to 15 minutes. Longer time periods should accentuate the difference between the groups.

12.30-13.15: Picnic lunch on rugs on floor, provided by the facilitator

13.15-13.30:The tell -me -a-story -game

Participants have 5 minutes to compose a story that's suggested by an interesting design, given by the group leader.

10 minutes

The power that unusual stimuli have for the creative process.

Writing materials for all participants, a projector and the design.

Show the participants the design. Next inform them they have 5 minutes to compose the most interesting story they can, suggested by the design.

After the five minutes are up, call on a few people to share their stories.

Questions
1 What was your story about?
2 Were you surprised at the contents of your story?
3 What effect did the design have on your creativity?
4 How could you apply the concept of unusual stimuli in your college projects?

13.30-14.30: The odd couple game

Dice are used to help people pair up different products and odd topics. Based on the pairing, people try to improve existing products or to invent new ones.

40-60 minutes.

Pairing a current task with a topic that's very different from the task helps people think in new ways.

Writing materials for all participants, as well as one copy of a Matching Sheet for each team. Also a pair of dice for each team, ideally the dice in each pair should be of different colours, with one colour for 'product' the other for 'topic'. Also a timer.

Divide the group into small teams and give each team a Matching Sheet and a pair of dice. Have them roll the dice to pair a product with a topic. Then, based on that pairing give them 5 minutes to improve that product or to invent an entirely new one.

When the time is up, have the teams roll the dice again to create another product-topic to work on (this might take several rolls).

Continue this process until all of the pairs have been exhausted Then have representatives from each team present some of the new product ideas, and lead a discussion about the importance of broad training for creativity.

Questions
1 How was your thinking affected when you paired a product (like hats) with an unlikely topic (like earwax)?
2 Do you routinely think about odd topics when you're working on a problem or trying to think of something new? What value might this have?

3 If you increased your knowledge in areas well outside your current areas of expertise, how might this help you be creative?

Product	**Topic**
Hairspray	World War 2
Computer Monitors	Insects
Hats	Earwax
Breathmints	Elvis
Earrings	The North Pole
Crisps	Witches

Instructions: Roll the pair of dice to tell you which product to pair with which topic. Then draw a line connecting that product with that topic. Continue rolling until you've identified five pairs. The sixth one is the pair that's left over.

14.30-15.30: Design challenge – the 'worst TV programme'

In this game the participants are divided into groups of four or five and given twenty to thirty minutes to write the 'Worst TV Programme Ever'. Participants are told they work for a television production company that has been given the 'graveyard' midnight slot on a well known television channel. They are a young and upcoming company and have decided they need to create a cult following by making the worst television programme ever. On deciding the format, they then need to write a script which they are going to act out. Each group will be given five minutes to perform a segment of their show,

Participants design and carry out their own TV programme to demonstrate that we all have enormous creative potential.

Allow 40-60 minutes. If you want to have a discussion after the game is complete, plan on about 90 minutes.

The materials will vary with the task that the group designs. Have basic writing materials, a flipchart, and some odd objects on hand. Things from the attic, toy store etc…the odder the better.

The participant's task is to design and implement a new 'TV show' that shows that we all have enormous potential.

SUMMARY

These games should demonstrate one or more of the following lessons: (a) we all have new ideas throughout the day, (b) many of our thoughts and images are very strange-perhaps even conceptual, (c) we ignore many of the new ideas that occur during the day, (d) we all experience dreams, daydreams, and the semi-awake state-all potentially enormous sources of creative ideas, (e) in the right setting people can 'switch on' a very high degree of creativity, (f) creative thinking can be facilitated throughout the day, (g) anyone can write poetry, compose music, paint a picture, or design something, even if they have never done it before.

After the games have been played, lead a brief discussion about what the games may have taught the students.

Appendix 4: Creativity Games Day Questionnaire

Introduction

This is an anonymous survey which will be conducted by two questionnaires. It is for students are in their first year of study in the Dublin Institute of Technology who are studying on programmes that are related to design, the four year B.A. (Hons) Interior Design and Furniture programme and the B.A. Visual Merchandising and Display programme. Both programmes require a level of creativity to be developed within the first year of study and both programmes will lead to careers where confidence in your abilities to conceptualise and develop ideas must be displayed. It is hoped that an equal number of both groups will complete the survey; ethnicity, gender or age will not be a factor. The second questionnaire will be given out at the end of the creativity day in March 2011. The students will be asked to use a personal code on the questionnaire as a follow up questionnaire will be issued at the end of the creativity activities. They will be asked to use the same code on the second questionnaire and therefore the researcher can compare the views of the student, while the student remains anonymous. An interesting part of the research will be a comparison of the student's own views on their confidence in their ability to be creative and whether or not there have been any changes.

Completing the questionnaire

The questionnaire explores your thoughts on the creativity games day. Please go through the questionnaire indicating your degree of agreement or disagreement with each item using the following scale; (1) strongly disagree. (2) disagree. (3) agree or (4) strongly agree.

There are no right or wrong answers.

Creativity Day Questionnaire

(Please circle only one response for each item).

	Strongly Disagree	Disagree	Agree	Strongly Agree	Don't Know
1. The creativity games day has enhanced my belief in my creative abilities.	1	2	3	4	5
2. I believe I can take inspiration from today's activities to help my creativity.	1	2	3	4	5
3. I didn't gain much inspiration from today.	1	2	3	4	5
4. I felt happy to take part in all the tasks.	1	2	3	4	5
5. Some of the activities took me out of my 'comfort zone'.	1	2	3	4	5
6. I didn't feel as creative as other people taking part.	1	2	3	4	5
7 I have discovered new methods of incubating ideas after today,	1	2	3	4	5

8. Did you have a favourite game? YES NO liked them all

If so, what was it?

- Touching hands
- Making Letters
- Worst Singer
- Drama Games
- Daydream
- Selling a Zork
- The Memory Game (Chewing Gum)
- How many windows
- Random Doodles
- Hair Styles
- Tell-me-a-story
- The Odd Couple
- Worst TV Show

9. Did you have a least favourite game? YES NO disliked them all

If so, what was it?

- Touching hands
- Making Letters
- Worst Singer
- Drama Games
- Daydream
- Selling a Zork
- The Memory Game (Chewing Gum)
- How many windows
- Random Doodles
- Hair Styles
- Tell-me-a-story
- The Odd Couple
- Worst TV Show

10. Can you please write one or two sentences summing up your experience of the Creative Games day?

11. Would you like to see any creativity enhancing games introduced into the curricular?

YES NO DON'T KNOW

Please explain your answer in one or two sentences.

THANK YOU FOR COMPLETING THIS QUESTIONNAIRE!

Appendix 5: Creativity Day Questionnaire Results

Question 1		
The creativity games day has enhanced my belief in my creative abilities		
Strongly disagree	-	-
Disagree	-	-
Agree	4	40%
Strongly agree	6	60%
Don't know	-	-

Question 2		
I believe I can take inspiration from today's activities to help my creativity.		
Strongly disagree	-	-
Disagree	-	-
Agree	3	30%
Strongly agree	7	70%
Don't know	-	-

Question 3		
I didn't gain much inspiration from today. .		
Strongly disagree	7	70%
Disagree	3	30%
Agree	-	-
Strongly agree	-	-
Don't know	-	-

Question 4		
I felt happy to take part in all the tasks.		
Strongly disagree	-	-
Disagree	1	10%
Agree	4	40%
Strongly agree	4	40%
Don't know	1	10%

Question 5		
Some of the activities took me out of my 'comfort zone'.		
Strongly disagree	-	-
Disagree	1	10%
Agree	3	30%
Strongly agree	6	60%
Don't know	-	-

Question 6		
I didn't feel as creative as other people taking part.		
Strongly disagree	2	20%
Disagree	6	60%
Agree	-	-
Strongly agree	1	10%
Don't know	1	10%

Question 7		
I have discovered new methods of incubating ideas after today.		
Strongly disagree	-	-
Disagree	-	-
Agree	5	50%
Strongly agree	4	40%
Don't know	1	10%

Question 8		
Did you have a favourite game?		
No	Yes	Liked them all
-	6	4
If so what was it?[some ticked more than one]		
Touching hands	1	10%
Making Letters	1	10%
Worst Singer	-	-
Drama Games	-	-
Daydream	-	-
Selling a Zork	1	10%
The memory Game	-	-
How many windows	1	10%
Random Doodles	1	10%
Hair Styles	3	30%
Tell-me-a-story	-	-
The Odd Couple	-	-
Worst TV Show	2	20%

Question 9		
Did you have a least favourite game?		
No	Yes	Disliked them all
5	5	-
If so what was it?[some ticked more than one]		
Touching hands	-	-
Making Letters	1	10%
Worst Singer	2	20%
Drama Games	1	10%
Daydream	-	-
Selling a Zork	-	-
The memory Game	-	-
How many windows	-	-
Random Doodles	-	-
Hair Styles	-	-
Tell-me-a-story	1	10%
The Odd Couple	1	10%
Worst TV Show	1	10%

Question 10. Can you please write one or two sentences summing up your experience of the Creative Games day?

"Very positive, definitely made me more confident. I still can't believe I stood up and sang Happy Birthday! I think it was a great team building day as I didn't know most of the others in the beginning. Do more days like this, it was brilliant".

"It was a brilliant day. I learned a lot about myself and how my creativity flows".

"Today was an interesting day, fun filled with games and laughter. Helped with opening and widening your creative mind and met new people which is always good!"

"I really enjoyed the day. Made me think outside the box."

"I loved it. Great day. Would really recommend it. Nice meeting new people too".

"Relax in front of people I don't know. New way of thinking."

"Made me think twice about my creativity. Made me want to further develop my creativity by expanding ideas and taking more risks".

"Great. Full of openness. Put together great".

"I found it very good. It was good to interact with people I did not know – but mainly all different types of ways of generating ideas was very beneficial to me".

"Really enjoyed day, took me out of my comfort zone. I was really embarrassed about the singing but so glad I did it, made me feel I could push myself".

Question 11. Would you like to see any creativity enhancing games introduced into the curricular?

YES **10** NO DON'T KNOW

Please explain your answer in one or two sentences.

"Yes, I think a day like this would be really beneficial on a curriculum as it gives you confidence to be creative around others even if you don't know them which can be really hard otherwise".

"I think it would open your mind to different elements of creativity. It helps people be more comfortable and feel more creative".

"Meeting new people helped me with spontaneous ideas and thinking on the spot".

"I really think these types of games help people with regards ways of thinking and help validate your individual ideas".

"I think all of us aspiring to work or learn design need creative understanding and how to overcome restrictions".

"Useful for everyone".

"Some people don't develop their ideas enough, if there were classes there'd be more successful students/projects".

"Creativity is in mind and soul. Ideas in mind have to appear on paper".

"Yes because idea generation is a very important part of the design process".

"I feel it broke the ice, got us laughing at each other, and helped me know the other students. It also made me think outside the box".