Developing a pedagogical model to enhance and assess creativity in Omani graphic design education

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Developing a pedagogical model to enhance and assess creativity in Omani graphic design education

By
Salman Amur Salim Alhajri

A Doctoral Thesis
Submitted in partial fulfilment of the requirements for the award of

Doctor of Philosophy
of Loughborough University

February 2013

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CERTIFICATE OF ORIGINALITY

This is to certify that I am responsible for the work submitted in this thesis, that the original work is my own except as specified in acknowledgments or in footnotes, and that neither the thesis nor the original work contained therein has been submitted to this or any other institution for a degree.

.........  .......  (Signed)

...06...February...2013... (Date)
i. Abstract

This research investigates the position of ‘creativity’ within graphic design education in general, and within the Omani educational context specifically. It situates itself among three realms: education, design, and creativity, investigating the relationships, effectiveness, and interrogations among these three topics. Creativity is defined within this research and in relation to graphic design education as ‘problem solving’, which is explained also as a cultural activity, or a cultural production. Graphic designers can involve themselves effectively in solving communication, social, and cultural problems that are classified as ‘wicked problems’, which usually require creative solutions. It is argued that Omani graphic designers should be creative problem solvers and able to find effective solutions for these problems. Yet this is not the case in Oman, at least from an educational point of view.

The research problem is that the Omani design education system lacks a framework that recognises creativity as an important concept in education. Such a lack creates a twofold problem: 1) underestimating the importance of creativity in Omani design education; and 2) a shortage of pedagogical structured programmes that can enhance students’ creativity. It is argued that this problem is a result of the neglected situation of creativity in Arabic traditional education in general. Traditional education usually does not support creative thinking in design students, which consequently minimises their roles in social and cultural change.

Based on the above, this research aims to develop a pedagogical model that can enhance and promote creative potential within Omani graphic design students. This aim can be achieved through re-establishing the position of creativity within Omani design education and valuing creativity as integrated part of graphic design. It proposes that the pedagogical model can offer a systematic approach for lecturers, to guide them into the best practice to enhance the creative potential of their students. Therefore, this research, and the proposed model, is the first step towards improving the position of creativity in Omani design educational systems in general. The model would propose to help Omani graphic design students to develop their creative problem solving abilities, which can allow them to effectively find solutions for several social and cultural ‘wicked problems’ faced in Oman, such as the increased rate of car accidents nationally).

The model will contain some creative-thinking techniques, and some pedagogical strategies that are already used internationally in education to improve creativity. The relevant literature has been reviewed to study the techniques and strategies used internationally to improve the creative potential of graphic design students. A qualitative interpretative methodology was used to answer the research questions and fulfil the aims.
survey approach was used for this research, implementing two methods: questionnaires and interviews. The online questionnaire was conducted with 33 international participants. It investigated how creativity is defined within graphic design contexts; whether creativity can be taught or enhanced; if yes,

How, and by which techniques and strategies?

Which curriculum contents are most suitable and effective?

And how to assess creativity within graphic design education?

The same set of questions was asked in face-to-face interviews conducted with 39 design lecturers. The participants in these interviews were local lecturers who teach graphic design courses at six Omani institutions. All of the collected data were analysed by a thematic analysis method, by coding and categorising them according to different themes that had been extracted earlier from the literature.

The contribution of this research is in defining the concept of 'creativity' through scientific research; more specifically by practical research conducting an international survey and local interviews. Through this approach, this research has collected ideas, insights and trends about creativity in graphic design and how it can be developed. Also, this research has advanced knowledge of the relationships among graphic design, creativity, and education, specifically in the Arabic region. It is an attempt to emphasise this new field. Moreover, this research has given a snapshot of differing views regarding creativity in design education as perceived by international lecturers versus Omani lecturers, through conducting a cross-cultural study by asking these two groups the same questions, which was an interesting comparison.

Finally, the collected data were utilised to develop the proposed pedagogical model designed for graphic design lecturers who teach design courses within Omani design education. The pedagogical model is the main contribution of this research. It would be suggested to the Omani Ministry of Higher Education that the model should be part of the Omani undergraduate graphic design curriculum.

ii. Keywords
Creativity definition, creativity enhancement, creativity assessment, 'wicked problems', creative design process, graphic design students, design lecturers, teaching creativity, pedagogical model, problem solving.
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Chapter One: Introduction

1.1. Chapter overview

This chapter intends to provide a general background to the whole research. It gives a summary of the issues underlying the main research problem in Section 1.2. Within this background, there is a brief description of what has been done in the field of graphic design education in relation to creativity. Section 1.3 explores the conceptual and theoretical frameworks of the research, through outlining some theories that are useful in conceptualising the research on hand. This section specifies what issues should be measured, and what variables should be investigated. In Section 1.4 the research problem is stated. Section 1.5 highlights the research’s main aim and sub-objectives, followed by the research’s main question and sub-questions in Section 1.6. The author’s motivations and significance of the research is discussed in Section 1.7. Then, Section 1.8 clarifies some terms and definitions relevant to this research. This chapter concludes with Section 1.9, which outlines the structure of the thesis. The Latin abbreviation ‘ibid.’, which means “in the same place”, is used in this research very often to provide a citation or reference mentioned previously in the same sentence or paragraph.

1.2. Background of the research

Creativity is a complex phenomenon. It “is typically venerated above almost all other material properties or personal prospects” (Williams, Ostwald and Askland, 2010, p.ix). It is commonly assumed to intersect with multiple areas of knowledge: art, psychology, education, sociology, and cultural studies, to name a few. “Yet, as a society we have no common definition of creativity, we rarely articulate just how important it is and there is even less clarity in how we teach or assess it” (ibid., 2010, p.ix). Examples of the claimed effects of creativity are: being a crucial component for both the individual or for the whole society; it can help the individual to increase their productivity (DTI Economics Papers, 2005, p.21) and raise their self-confidence (Barron, 2007, p.20), and self-esteem (Banaji, Burn and Buckingham, 2006, p.14). The very basic definition of creativity, among most fields, is “the production of novel, appropriate ideas in any realm of human activity from science, to the arts, to education, to business or to everyday life” (Amabile, 1997, p.40). As a result, the concept of ‘creativity’ is a contested notion, and a “divisive topic” (Williams, Ostwald and Askland, 2010, p.ix), with definitions spanning the academic, artistic, and everyday worlds. Therefore, it is difficult to find a ‘one size fits all’ definition of creativity that suits all fields and is agreed by everyone.
Based on the above discussion, this research argues that defining creativity is a problematic issue and the current use of the word ‘creative’ is misleading because “No word in English carries a more consistently positive reference than ‘creative’” (Williams, 1961, p.19). “The very width of positive reference of 'creative' word involve 1) difficulties of meaning through a habit, 2) unthinking repetition which at times make the word seems useless” (ibid., 1961, p.19). Therefore, it is difficult, because of infinite regression or tautology, to define the word 'creativity' by using similar words such as original, creative or new. Barnard (2005, p.169) argues, “It is not uncommon to find each of these words used to define and explain the others”.

This research does not make a global claim for creativity, but argues a small and tight claim based on both theoretical and first-hand research. It is an attempt to locate the ‘creativity’ phenomenon within the graphic design education context, as a starting point to develop a ‘pedagogical model’. Therefore, creativity can be comprehended as a cultural activity that each member of a specific culture - in the case of this research, graphic design education - performs routinely as part of their everyday cultural activity (Williams, 1961, p.34). Also, it is understood here as a “… cultural production, and both graphic design and art are examples of cultural production” (Barnard, 2005, p.169). More specifically, creativity in graphic design can be defined as problem solving, more specifically solving ‘wicked problems’. ‘Wicked problems’ are quite frequently addressed in design research (e.g. Buchanan, 2010, p.16).

‘Wicked problems’ usually have a wide or even global effect. For example, “poverty is linked with education, nutrition with poverty, the economy with nutrition and so on” (Kolko, 2012, p.10). The German philosopher, Horst Rittle, was the first scholar to formalise a theory of ‘wicked problems’ in the 1960s (Buchanan, 2010, p.14). He developed this term “when design methodology was the subject of intense interest” (Buchanan, 2010, p.14). By suggesting this term, he “… sought an alternative to the linear, step-by-step model of the design process being explored by many designers and design theorists”. The design process, according to this approach, is divided into two main distinct phases: problem definition, and problem solution. The first phase is an analytical sequence “in which the designer determines all of the elements of the problem and specifies all of the requirements that a successful design solution must have” (Buchanan, 2010, p.15), whereas, “Problem solution is a synthetic sequence in which the various requirements are combined and balanced against each other, yielding a final plan to be carried into production”.

This model is weak because “the actual sequence of design thinking and decision making is not a simple linear process” (Buchanan, 2010, p.15) and also “the problems
addressed by designers do not, in actual practice, yield to any linear analysis and synthesis yet proposed” (Buchanan, 2010, p.15). The problem lies in the fact that,

The linear model of design thinking is based on determinate problems which have definite conditions. The designer’s task is to identify those conditions precisely and then calculate a solution. In contrast, the wicked-problems approach suggests that there is a fundamental indeterminacy in all but the most trivial design problems (Buchanan, 2010, p.16).

This argument works well with the definition of design as proposed by this research, which is based on the description of design as a ‘flexible activity’ or ‘liberal art’ proposed by Buchanan: “… Design continues to expand in its meanings and connections, revealing unexpected dimensions in practice as well as understanding” (Buchanan, 2010, p.5). This argument is supported by Horst Rittel’s understanding of ‘wicked problems’. According to Buchanan (2010, p.15), Rittel argues, “most of the problems addressed by designers are wicked problems”. They are a “class of social system problems which are ill-formulated, where the information is confusing, where there are many clients and decision makers with conflicting values, and where the ramifications in the whole system are thoroughly confusing” (West, 1976, p.141, cited in Buchanan, 2010, p.15).

Rittle and his colleague Melvin Webber (1973), the pioneers of ‘wicked problems’, outlined ten characteristics of ‘wicked problems’, as outlined by Kolko (2012, p.10-11) and Buchanan (2010, p.16):

1. ‘Wicked problems’ have no definitive formulation.
2. ‘Wicked problems’ have no stopping rule, or criteria upon which to determine "solving".
3. Solutions to ‘wicked problems’ are not true or false; they can only be good or bad.
4. There is no complete list of applicable "moves" for a solution to a ‘wicked problem’.
5. There is always more than one explanation for a ‘wicked problem’, with the appropriateness of the explanation depending greatly on the individual perspective of the designer.
6. Every ‘wicked problem’ is a symptom of another problem.
7. No solution for a ‘wicked problem’ has a definitive, scientific test.
8. Solving a ‘wicked problem’ is frequently a "one shot" design effort, as a significant solution changes the design space enough to minimise the opportunity for trial and error.

9. Every ‘wicked problem’ is unique.

10. A designer attempting to solve a ‘wicked problem’ must be fully responsible for their actions.

The process of design thinking can mitigate these problems, through an “intellectual approach that emphasises empathy, abductive reasoning, and rapid prototyping” (Kolko, 2012, p.10). However, “not all problems are wicked, even if the problem is incredibly difficult to solve, yet it cannot, be characterised as wicked until it has an indeterminacy of scope and scale” (ibid., 2012, p.10). Design methods and thinking can be applied to the pursuit of product development, and to the pursuit of innovative corporate strategies, specifically in the design of complicated systems and services. “These creative methods of design thinking are characterized as being divergent, abductive, playful, and extremely agile” (ibid., 2012, p.10). Therefore, graphic design education should instruct and encourage students to explore problems that have a social component.

In spite of the previous discussion, ‘wicked problems’ “remained only a description of the social reality of designing rather than the beginnings of a well-grounded theory of design” (Buchanan, 2010, p.16). Is this simply because neither Rittle nor Webber explained why design problems are wicked? Buchanan, (2010, p.16-17), tried to justified this by stating that,

Design problems are ‘indeterminate’ and ‘wicked’ because design has no special subject matter of its own apart from what a designer conceives it to be. The subject matter of design is potentially universal in scope, because design thinking may be applied to any area of human experience. But in the process of application, the designer must discover or invent a particular subject out of the problems and issues of specific circumstances. This sharply contrasts with the disciplines, laws, rules, or structures that are necessarily embodied in existing subject matters. Such subject matters are undetermined or under-determined, requiring further investigation to make them more fully determinate. But they are not radically indeterminate in a way directly comparable to that of design.

There are some beginnings of common consensus and approaches towards creativity and what it looks like in graphic design education. Studies such as Tudor (2008, p.2) and Williams, Ostwald and Askland (2010, p.4) argue that there is a common understanding between most graphic design educationalists towards some terms such as creativity
enhancement, creativity assessment, and pedagogical strategies. Based on the idea that different cultures generate or create different realities (Williams, 1961, p.34), this research intends to use this notion of creativity to claim that Arabic educational systems, in general, and the Omani graphic design educational system, specifically, have their own models of defining the ‘creative’ act. Nevertheless, the use of the word ‘creative’ in Arabic culture is “affected by the matter of cultural prestige […] and institutional significance” (Barnard, 2005, p.170).

The literature that has informed this issue is largely Western. Western within this study means European or a mix of European and American cultures. While current understanding of the importance of creativity in the Arabic context and in relation to design, innovation, and social change is limited (UNDP, 2003, p.76; Iqbal, 2011, p.376). Research that aims to focus on the state of creativity in relation to graphic design education is, relatively, found to be very scarce, especially in Arabic literature. Examples of the few studies that investigate creativity in design education are Khaleefa (1999) and Alkholy (2007). However, some relevant issues have not been covered well in the ‘Arabic’ literature, such as the location of creativity within the Arabic graphic design curriculum; how creativity is defined, assessed, and enhanced within this context; and finally the importance of creativity for graphic design students. This is in spite of creativity in most modern educational systems being an extremely important issue that should be considered and emphasised (Sharp, and Metais, 2000, p.2).

What is already known about the problem

- Creativity is important in education
- There are strong links between creativity and design
- Design is a creative activity
- Design is a source of innovation and a foundation for social and cultural change
- Creativity can be enhanced with students

Figure 1: Established facts about the problem

From the above literature, what is known about the problem (Figure 1) is that creativity is important in education (Craft, 2003, p.124); that there are strong links between creativity and design (DTI Economics Papers, 2005); and also, that “Design is considered a creative activity” (Sosa and Gero, 2005, p.229). Design is “a source of innovation and a foundation for social change” (ibid., p.229), One of the recent publications that explores the links
between design and creativity is Williams and Askland (2012), which argues for “the common definition of design as being a discipline that seeks a balance between form and function, between originality and practicality, novelty and appropriateness” (p.9). In addition, creativity can be enhanced within students (Hewett et al., 2005, p.13). Even though creativity is held to be important in (design) education, nobody knows what it is; however, there is a kind of blind faith that it can be taught and that it can have beneficial effects. “Surprisingly little educational attention is traditionally afforded to identifying, analysing and promoting teaching strategies that actively stimulate and nurture individual creativity in learners” (Tudor, 2008, p.5). This confirms the necessity for more research on teaching strategies that can be used by university lecturers to improve students’ creativity within graphic design education contexts. Some studies conducted in this area are Hsiao, Liang and Lin (2004), Harpe (2006), and Tudor (2008).

1.3. Conceptual and theoretical framework

Design lies between the unmeasured fluidity of the arts, where nothing is measured, and the rigidity of the sciences, where everything that cannot be measured is ignored. As such, design operates in the fuzzy realm of social problems and ‘wicked problems’, a place where results are valid, but generally local and difficult to reproduce universally; so, design is to do with the meaning of problem solving, and cultural production. The same case can be applied to graphic design education. Its education, operation, theory and technical strata of delivery are all strongly aligned with the cultural framework of the West. By contrast, graphic design education in non-Western developing countries is an emerging topic at all levels, from general to higher education.

Western philosophy (e.g. Williams, 1961) has provided a fundamental base, as a conceptual framework for this research that will be adapted herewith to non-western education (i.e. Omani educational system). The Western philosophy tradition begins with Aristotle and Plato, and is then taken up by Marvell (ibid., p.25). However, Williams (1961, p.25) critiques traditional ways of comprehending the ‘creative’ concept and argues that creativity is a part of everyday cultural activity, an activity that everyone performs routinely as a member of a culture. He argues,

Art is ratified, in the end, by the fact of creativity in all our living. Everything we see and do the whole structure of our relationships and institutions depend, finally on an effort of learning, description and communication, we create our human world as we have thought of art being created (Williams, 1961, p.54).
Also, this research can be linked to Williams’s conception of creativity, as stated by Rustin (2007, p.7):

Williams’s conception of the core value of ‘creativity’ included dimensions of work, learning, and decision-making. A good life would be one in which work made use of human faculties; in which education would encourage the development of a variety of capacities; and where people would share in decision making in the public sphere.

It is argued that Williams (1961) here focuses on the role of education to “encourage the development of a variety of capacities”. This describes the term of ‘enhancement’ that will be discussed within this research. In the above passage, Rustin (2007, p.7) argues that creativity can be developed, and it represents a “variety of capacities”. Therefore, this understanding works well with the concepts of this research mentioned earlier.

Moreover, each culture has distinctive models, frames and thoughts to define the ‘creative’ act. Williams (1961, p.34) argues,

There are thus, two senses in which we can speak of this activity as 'creative'. The evolution of the human brain, and then the particular interpretations carried by particular cultures, give us certain 'rules' or 'models', without which no human being can 'see' in ordinary sense, at all. In each individual, the learning of these rules, through inheritance and culture, is a kind of creation, in that the distinctively human world, the ordinary 'reality' that is culture defines, forms only as the rules are learned. Particular cultures carry particular versions of reality, which they can be said to create, in the sense that cultures carrying different rules ... create their own worlds which their bearers ordinarily experience.

This research is based on this perspective that artists and graphic designers play a vital role in society in revising the understandings of specific groups towards some terms (e.g. ‘creative’, ‘valuable’, ‘appropriate’). Williams (1961, p.45) suggests, “by returning the ideas to their place in the tradition, we can become conscious enough of them to reject them, as a part of our ordinary account of perception and communication”. Barnard (2005, p.172) argues, “graphic design is not different from art because art is creative and graphics is not”; rather, “both graphic design and art are creative in the sense that they are two of the ways in which experience is made meaningful and communicated”. Williams (1961, p.49) attempted to define the word ‘creative’ by stating, “The ‘creative’ act, of any artist, is in any case the process of making a meaning active, by communicating”. This understanding clearly agrees with the argument made within this research in terms of how educators
understand the creative act, that is, creativity in design education is an approach, process, and fundamental attribute of the learner (i.e. graphic designer).

Another argument that underpins this research is that “the individual creative description is part of the general process which creates conventions and institutions, through which the meanings that are valued by the community are shared and made active” (ibid., 1961, p.55). Therefore, it can be argued that if educators are interested in establishing a central role for creativity in universities and higher education institutions, they need to ensure that there are suitable opportunities, a supportive environment, and enthusiastic motivation for their students. This is in addition to activating innovative and imaginative experiences whilst teaching graphic design. But, more importantly, it is argued that to ensure the flourishing of graphic design education in developing countries, a deep understanding of the importance of creativity is required in the first place.

![If educators are interested in establishing a central role for creativity in universities](image)

Figure 2: Educators’ roles in establishing a central role for creativity in universities

The theoretical framework of this research is influenced by three relevant variables that can be categorised under three main fields: firstly, variables related to creativity, such as creativity definition, creativity models, creativity enhancement, and creativity assessment; secondly, variables related to graphic design, such as graphic designers, graphic design concepts, and design processes; and thirdly, variables related to education, such as graphic design education, the design curriculum, teaching strategies and creative-thinking techniques, graphics students, and graphics lecturers.
The education theory of creativity referred to in this research is the work of Lev Semenovich Vygotsky (1995) that concerns ‘productive’ versus ‘reproductive’ learning theory (cited in Banaji, Burn and Buckingham, 2006, p.38). This theory is adopted within this research because it is compatible with the understanding of creativity within this research. Vygotsky’s theory basically argues that creativity is a generative form of ‘productive’ learning of the individual who always searches for new knowledge. This is different from traditional forms of ‘reproductive’ learning, which “merely replicate established knowledge and skills” (Tudor, 2008, p.11).

1.4. The research problem

The research problem can be outlined as: the Omani graphic design education system lacks a unified framework towards the concept of creativity. One of the consequences of such a lack is a shortage of pedagogical structured programmes that can enhance creativity of Omani graphics students. It is believed that this is a result of underestimating the importance of creativity in Arabic traditional educational systems in general (Almusa, 2004, p.5), a system of which the Omani educational context is part. The location of this educational problem within the Omani (Arabic) context will also colour the take on creativity. This is a result, also, of the absence of unified conceptions of creativity in general, Barnard (2005, p.170) argues that, "We are still operating with an unexamined notion of creativity and we are likely to be stuck with the uncritical and mystifying conception of creativity".

While creativity is regarded as one of the main components of the contemporary design curriculum in developed countries, and a growing effective phenomenon, the situation in most of the current Arabic design educational systems disregards creativity (Khaleefa,
1999, p.22). Perhaps this problem arises as a result of the missing role of creative people in social and cultural change, also because Arabic educational systems depend entirely on old methods of teaching, where knowledge is passively transferred from the teachers to the students. Such a traditional educational environment does not encourage creativity, simply because “being creative in traditional classrooms is often difficult for students because they become afraid to take risks, afraid to explore new ideas, and afraid to fail” (Kawenski, 1991, p.236). “Traditional educational systems have allowed students to feel more comfortable by not being creative” (Cole, Sugioka and Yamagata-Lynch, 1999, p.8).

It is believed that this weakness in the Arabic education system in general, and in the Omani graphic design educational context in particular, is a result of the absence of unified educational objectives that graphic design departments and higher education institutions should achieve. For instance, in most higher education institutions in the Arab world, teachers usually construct their own educational aims (Alhadi, 2008, p.87), whereas in the UK, for instance, higher education authorities apply a uniform educational system for art and design called a ‘Subject Benchmark Statement’ issued by The Quality Assurance Agency for Higher Education (QAA). This system formulates the final anticipated outcome that is expected from art and design schools (QAA, 2008, p.3).

To solve this research problem, at least partly, it is hypothesised that there is an immediate need for a pedagogical model that can offer a systematic approach for graphic design lecturers in Oman to guide them on how to stimulate their students’ creativity. It is argued that such a model would be one step towards improving the state of creativity within the Omani design education system.
1.5. **Research aims**

1.5.1. **The main aim:**

The main aim of this study is: ‘**To develop a pedagogical model that can be utilised by graphic design lecturers to enhance and assess the creativity of Omani graphic design students**’. The following objectives are listed to achieve this aim.

1.5.2. **The objectives:**

1. To define creativity within the graphic design education context.
2. To investigate whether creativity can be taught to graphic design students.
3. To identify some creative-thinking techniques that Omani graphic design students can practise to enhance their creative thinking.
4. To identify some pedagogical strategies utilised by graphics lecturers that can enhance the creativity of graphic design students.
5. To identify the contents of graphic design curricula that can promote students’ creativity.
6. To evaluate the creativity assessment methods used in design education, in order to suggest the most suitable method.

**Figure 4: The causes of the research problem**

- 1. Absence of unified conception of creativity in general
- 2. Underestimation of the importance of creativity in Arabic education
- 3. The role of creative people in social and cultural change is missing
- 4. Traditional education system
- 5. Absence of unified educational objectives of design education
- 6. Omani graphic design education system lacks a unified framework of creativity
1.6. Research questions

1.6.1. The main research question:

The main research question is: ‘How to develop a pedagogical model that can be utilised by graphic design lecturers to enhance and assess the creativity of Omani graphic design students?’ (The questions below address the objectives above.)

1.6.2. The sub-questions:

1. How can creativity be defined in relation to graphic design education?
2. Can creativity be taught to graphic design students?
3. What creative-thinking techniques can Omani graphic design students practise to enhance their creative thinking?
4. What pedagogical strategies can be utilised by graphics lecturers to enhance the creativity of Omani graphic design students?
5. What should a graphic design curriculum contain to promote creativity?
6. What are the assessment methods used in design education to assess the creativity of graphic design students?

1.7. Motivation, significance, and contribution of the research

The main motivation for conducting this research was the author’s desire to gain a clear understanding of the concept of creativity, in a general sense and specifically in relation to graphic design. It is interesting research, because it is one of few studies that have investigated the links between creativity and graphic design education. Williams, Ostwald and Askland (2010, p.14) argue, “There is no established ‘study of design creativity’ that explores the particularities of creativity as it relates to design”. Based on this notion, it is reasonable to argue that the topic of this study is currently of interest to the community of design educators and lecturers. It is timely and fills a gap in current knowledge in design education. Another motivation was to contribute to improving the importance of creativity in relation to graphic design education in Oman. This can lead to increasing the standards of creative design practice in developing graphic design educational system in Oman.
This research has examined how graphic design education might be taught in new socio-cultural settings (e.g. Omani design education). This research offers several benefits to the international educational community, such as other Middle East states countries (e.g. Saudi Arabia and Kuwait). This thesis also can benefit some Far East countries, such as China, Korea, and Singapore. These countries would have the same kind of problems, that designers deal with, therefore what is proposed in this thesis may well be useful to them. Design educators, researchers and design lecturers from both developing and developed countries could reflect positively on this research. Generally, it encourages researchers from design education, design studies, psychological studies and many more fields to undertake further research in creativity enhancement and assessment, in order to establish a greater degree of accuracy in these fields. This research is one of the few studies that have examined creativity enhancement in relation to graphic design education, particularly in the Arabic region. So, it is currently of interest to the design education community, and shares new knowledge in design education. It introduces the notion of design as a process in the West versus design as an application of technology in developing countries (e.g. Oman). It gives a snapshot of differing views regarding creativity in design education as perceived by international educators versus Omani educators. This raises several interesting questions that might be of interest to international researchers. The following points outline examples of lessons that can be learned by the international community.

Firstly, it emphasises the idea that creativity is a primary component in the modern graphic design education context and should have a very important position reserved for it in current educational research. This would encourage educators to establish a dialogue between educators, designers and possibly psychologists, to find an inter-disciplinary

Figure 5: The researcher’s main motivations for doing this research

Motivation of the research

1. Gain a clear understanding of the concept of creativity
2. Investigate the links between creativity and graphic design education
3. Contribute to improve the importance of creativity in relation to graphic design education
4. Increase the standards of creative design practice in Omani design education
approach to studying the phenomenon. Such research may eventually generate theories, opinions, or perhaps new controversial discussion that can benefit graphic design education in general. This would assist design lecturers to develop new specific ways of enhancing creativity that consider design education requirements.

Secondly, this research has made some contribution to advancing the current understanding of creativity within the graphic design context, specifically in Oman. It introduces creativity as problem solving in graphic design education, which can generally be understood as a cultural production or a cultural activity that is usually performed by everyone. This understanding is new, at least from this research perspective, and may also encourage research to stand with or against this standpoint. The idea of creativity as problem solving would assist researchers interested in graphic design education to examine this definition and accordingly, develop theories and suggest pedagogical models or practical guides to enhancing creativity. It is argued that this definition is a reliable one because it is extracted from 'global' experiences (i.e. international graphic design contexts) and clarifies more precisely the nature of the creative abilities of graphic design students.

Thirdly, the international design community can also benefit from the suggested pedagogical strategies and creative-thinking techniques to enhance the creative potential of students, if cultural and social characteristics are taken into account. This is in addition to the descriptions of the content of ideal graphic design curricula that can be suggested for any graphic design education system, but again considering the descriptors, aims and philosophy of that particular system. Furthermore, this research builds a framework for developing creativity, by focusing more on the final beneficiary (i.e. students), based on the idea that creativity is nurtured by knowledge, experience and enhancement. It is argued that since this research demonstrates the idea that creativity is a crucial and integrated part of a graphic design curriculum, design educators worldwide and those responsible for structuring the curriculum should probably redesign or reconsider the status of creativity activities within their design curricula. This research also suggests several frameworks that can be used to assess the creative outcome of design students.

Fourthly, this research works well with modern educational theories (i.e. student-centred) that are agreed upon by most modern educational systems globally. Elton (2006, p.3) outlines the most important development in undergraduate curricula, which was “the move from teacher-centred to student-centred […] the expression if this move in the form of problem based and enquiry based curricula […] a move from positivist to interpretivist assessment and, in particular, assessment in general from unseen papers to portfolios”. This theory can help to teach students to be self-motivated and continuous learners. International
educators would be able to distinguish the capabilities of graphic design graduates who make a difference to their social and cultural surroundings by considering social and cultural changes. This would help to meet the current and future requirements of the design industry. Examples of these capabilities are high proficiency in various skills, building up strong portfolios, and passing successfully through work interviews.

Fifthly, the structure of the pedagogical model developed within this research outlines generally the roles of graphic design lecturers, students, the governmental sector, and society as a whole in developing the creative potential of students. The features and elements mentioned within this model can be applied to any modern design education system, yet social and cultural backgrounds should be considered. Since one of the main sources used to develop this model was international literature (Harpe, 2006, Cheow, 2008, and Tudor, 2008) and an international survey, it would be reasonable to propose this as a workable model for the international community. In its current form, it can be used as an educational guideline for design lecturers to empower graphic design students to maintain their creative energy and apply it within the design profession. This model would aid lecturers in adopting improved methods that would assist their students to foster their creative potential. Those students would then be able to shift their habitual ways of doing things into more creative ways of solving design problems. Eventually, students would engage in the creative process physically, digitally, and mentally.

To sum up, the original contribution made by this research is in developing a model that can be used by graphic design educators to assist them in improving the creative abilities of their students. As this is one of the few studies in the field that investigate this issue, it not only comes up with new knowledge, but also contributes something that can be applied in Omani higher education. Further discussion of the research contribution can be found in the Conclusion chapter.

1.8. Terminologies and definitions

It is essential to identify the terminologies used in this research to prevent any possible misinterpretation by readers. The following explanations give a constituent understanding towards the issues related to this research.

- Creativity
  The account of creativity here is based on a conception of creativity as cultural production, which has been presented by Williams (1961), Wolff (1981) and Barnard (2005). Creativity is productive of experience; it is the process in which people’s cultural values interact with things in the world to produce new interpretations and therefore meaningful
experiences of those things. Creativity may result in an experience that emerges from a specific culture according to specific ‘rules’ and which requires description and subsequent ‘communication’ to be delivered to an audience. What is explained as ‘cultural production’ is explained within the context of graphic design education as problem solving. Design problems have been presented as ‘wicked problems’, which are mostly addressed in design research (e.g. Buchanan, 2010, p.16). Problem solving may therefore be thought of finding the most appropriate shapes, lines and colours to communicate these experiences and information to specific audiences. Those audiences are made of different cultural groups, therefore the definition of what is appropriate must take account of their cultural identities and what is appropriate and creative to one culture may not be appropriate and creative to another culture. Creativity thus involves a relation to the idea of communication and to the process of problem solving in graphic design.

- **Design**

  The definition of design preferred by this research is based on a description of design as a ‘flexible activity’ or ‘liberal art’ proposed by Richard Buchanan (2010, p.5). This is a contemporary understanding of the word ‘design’ that is thought to work well with the main underpinnings of this research. Buchanan (2010, p.5) explains this understanding further by stating, “… design continues to expand in its meanings and connections, revealing unexpected dimensions in practice as well as understanding” (ibid., 2010, p.5). He further describes the development of the design concept, as “… design grows from a trade activity to a segmented profession to a field for technical research and to what now should be recognised as a new liberal art of technological culture” (ibid., 2010, p.5). This research agrees with this definition of design as a ‘liberal art’ that is “… undergoing a revolutionary transformation in twentieth-century culture, and design is one of the areas in which this transformation is strikingly evident” (ibid., 2010, p.5).

- **Graphic design**

  The very basic understanding of graphic design is a form of design that manipulates visual elements, such as pictures, type, and text, to convey and communicate a message to an audience. It “is a form of applied art that is highly influenced by internal and external factors. It is a conscious and intuitive effort to create and communicate meaningful order” (Cheow, 2008, p.17). The description and communication of experience is the creation and communication of ‘meaningful order’.

  Therefore the basic nature of graphic design is creative activity. Graphic design is communication throughout specific elements such as, shapes, lines and colors. Thus, it has an aesthetic component and meaningful component. These elements will usually mean
different things to different cultures. This is one of graphic design’s problems, which it has to solve. Graphic design therefore uses marks, words, and images to solve communication problems. Those problems involve the meanings of these marks, words and images. Different audiences or cultures often interpret them differently and the designer will need to be creative in order to solve problems of communication. Consequently, graphic design is a problem solving activity, and creativity can be defined as problem solving activity, then graphic design can be said a creative activity. This thesis argues that creativity as problem solving may be improved, that graphic design students may be taught better ways of solving problems and thus that graphic design may be improved.

- Creative artist and creative designer

The creative artist and creative designer within this research is comprehended as explained by Williams (1961, p.44):

The creative artist is an observer, whose brain works in new ways, making it possible for him to convey information to others about matters that was not a subject for communication before. It is by search for means of communication that we sharpen our powers of observation.

Williams (1961, p.42) believes that “the artist shares with other men...'creative imagination'...the capacity to find and organize new descriptions of experience”. Creative designers undertake the process that results in those new descriptions.

It is argued that, “graphic design and art are different from each other, but not in the ways that they are popularly or commonly thought to be” (Barnard, 2005, p.162). For example, one argument posits, “... the meaning of a piece of graphic design is obvious or easily understood and because the meaning of a work of art is not obvious or easily understood, the two are different kinds of thing” (ibid., 2005, p.163). An example of those who support this notion is Jones (2004), who explains this by stating that graphic design exists to communicate unambiguously and easily, so it cannot be considered to be art. It is argued here that such a position is weak, because in fact not every piece of design can be understood by everyone, which means it would be considered as a piece of art. This perspective of differentiating between art and graphic design is also weak because it, “... takes no account of cultural, class, national, gender, ethnic or indeed any other differences” (Barnard, 2005, p.163). As a result, “art cannot be distinguished from graphic design by arguing that meaning in art is ambiguous and difficult but easy and plain in graphic design” (ibid., 2005, p.163). Simply because cultural and social values are responsible for creating meanings, “what is easily understood by one group need not be easily understood by another”.
Graphic design is significant in exactly the same way as fine art, the creative designer is just as substantial as the creative artist for the society, and each one plays their role within their culture. Barnard (2005, p.167) argues, “…a persuasive case can be made for graphic design being at least as culturally significant and eloquent as art”. Barnard (2005, p.172) argues, "Both graphic design and art are ways in which experience is visually produced, described, and communicated". This is a different argument about cultural worth or value – graphic design and art are both indicators of culture, and therefore the artist cannot be distinguished from the designer on this basis. It is found that the only genuine difference is “to look at the institutional locations and social and cultural conventions surrounding them” (ibid., 2005, p.178).

- **Graphic designers**
  Graphic designers are talented people who usually produce digital and printed materials, such as publications, typography, displays and signage. They communicate the design in various forms. Pibernik, Milcic and Bota (2010, p.1) argue that the designer, “…can take responsibility for the content and context of a certain message, as well as the way in which that message will be interpreted by the audience". Graphic designers have to be creative, specialised, and competitive in producing lively visual forms that are attractive, new, appropriate, and can communicate efficiently.

- **Graphic design students**
  Graphic design students are those who study graphic design and visual-communication-related courses such as advertising, packaging design or publication design for nearly four years at undergraduate level. This research, specifically, refers to Omani graphic design students.

- **Problem solving**
  This is the process used by graphic design students to generate an effective solution to solve a particular creative problem. These processes are: analysing, identifying, and interpreting the elements that feature the context of the problem. The solution should be suitable, visually pleasing, and socially and culturally acceptable.

- **Design problems**
  “Design problems are often considered ill-defined, or ‘wicked problems’, in that there is no clear path available to arrive at a correct response” (Christensen, 2006, pp.58-59). Williams, Ostwald and Askland (2010, p.14) argue, “the common definition of design problems as ‘wicked’ or ‘ill-defined’ implies the importance of creativity to design; these problems require a particular (creative) approach in order for them to be solved".
‘Wicked problems’

According to Kolko (2012, p.10) ‘wicked problems’ are simply a form of social or cultural problems that are difficult or impossible to solve for four reasons: 1) “incomplete or contradictory knowledge” (ibid., 2012, p.10), and continuously changing requirements; 2) “the interconnected nature of these problems with other problems” (ibid., 2012, p.10); 3) “the large economic burden” (ibid., 2012, p.10); 4) “the number of people and opinions involved” (ibid., 2012, p.10). The father of ‘wicked problems’ (Horst Rittle) described them in 1972 as having, “no definitive formulation, but every formulation of a ‘wicked problem’ corresponds to the formulation of a solution” (Buchanan, 2010, p.16). In terms of solutions to ‘wicked problems’, they “cannot be true or false, only good or bad” (ibid., p.16). Also, “there is no exhaustive list of admissible operations, in solving wicked problems” (ibid., p.16). Buchanan, (2010, p.16) argues, “For every wicked problem there is always more than one possible explanation, with explanations depending” (ibid., p.16). Every ‘wicked problem’ is a “symptom of another” (ibid., p.16) and each problem is ‘unique’.

Design pedagogy

Locker (2008, p.2) argues that,

Design pedagogy or design education may be defined as the set of practices and systems for the training in the field of design; ways and methods of teaching for the acquisition of necessary knowledge and skills in order to practice the design profession.

Creative-thinking techniques

Cognitive practices suggested by psychologists to develop the creativity of people in general; they are different from pedagogical strategies that are usually applied by lecturers inside graphic design studios or classrooms.

Cognitive skills

Thinking human beings usually have reasoning abilities that are used in the process of learning and doing things, making meanings, taking decisions, and reflecting on creative ideas.

Pedagogical strategies

Pedagogical strategies are sets of educational teaching methods usually utilised by graphic design lecturers to achieve their intended results and to develop students’ creativity.

Creativity enhancement

Creativity enhancement is based on Williams’s (1961) perspective of “development of a variety of capacities” as stated by Rustin (2007, p.7):
Williams’s conception of the core value of ‘creativity’ included dimensions of work, learning, and decision-making. A good life would be one in which work made use of human faculties; in which education would encourage the development of a variety of capacities; and where people would share in decision making in the public sphere.

Similarly, creativity enhancement in Tudor’s (2008, p.3) view requires from the learner, “to learn differently from that normally expected of them in institutional contexts. Consequently, creative learning has somewhat less to do with ‘what’ specific curriculum knowledge students may be required to digest and regurgitate at any given time” (ibid., p.3). Therefore, to facilitate creativity with learners, teachers must be “creatively self-aware” (ibid., p.3) and, “learners are knowingly engaged in a proactive manner with investigating ‘potentialities’ via the production of future-oriented modes of learning” (ibid., p.3).

- **Creativity assessment**
  Creativity assessment within this research is based on Tudor’s (2008, pp.10-11) understating towards creativity. She argues,

  Issues of academic conformity and technical precision, success in assessment and standards measurement must be very carefully managed and adapted to recognise and value creativity. This is best done by accepting multiple or differentiated student achievements against a given range of qualitative criteria, rather than always feeling compelled to narrowly prescribe, moderate or standardise specific student outcomes in the name of quality assurance (Tudor, 2008, pp.10-11).

- **Criterion-referenced testing**
  This is an assessment system in which an award or student’s classification is made on the basis of the quality of the student’s performance, regardless of the performance of other students in the class.

- **Pedagogical model**
  This is a simplified representation of a process or system in an educational context. It usually illustrates: what it can offer for students; what students should do to reflect positively on the educational contents of the model; the roles of authority in this process; and the roles of moderators. It also specifies all of the required materials for the activities, as well as exercises and descriptions of learning venues.

1.9. **The organisation of the thesis**

This thesis consists of seven chapters. It starts with the Introduction, which gives an overview of the study, then the Literature Review, in two chapters (i.e. Chapters Two and Three). Chapter Two studies how creativity has been defined and studied from various
points of view, while Chapter Three studies creativity in relation to graphic design and some other issues such as teaching, enhancing, and assessing creativity with students. The fourth chapter outlines the methodology of the research and highlights the justification for the selected approach. It also includes an explanation of the research methods (i.e. questionnaires and interviews), along with a discussion of ethical issues involved in the research. The fifth chapter presents and discusses the results collected by all methods. This chapter is a reflection on the findings, where the main results are outlined. Chapter Six is the pedagogical model, which is the main contribution of the research. Finally, Chapter Seven discusses the conclusions and implications of the research, makes recommendations, and suggests further studies. Figure 6 shows the structure of the thesis.

Figure 6: The structure of the thesis
Chapter Two: The first part of the literature review
(Studying and defining creativity)

2.1. Chapter overview

This chapter and the next present an intensive review of the literature that covers all issues and topics related to the research on hand. This chapter reviews the literature that has studied and defined the concept of creativity from various perspectives. It starts with the strategy of the literature review. Section 2.2 explains how the relevant literature has been reviewed to collect the required information. Section 2.3 outlines some historical models of creativity, such as romanticism and rationalism. This section gives a brief history of the word ‘creative’ in renaissance theory within Western literature. Section 2.4 explores the theories and approaches used to study creativity, followed by Section 2.5, which explains why there are different definitions of creativity in different domains. Section 2.6 explores some socio-cultural approaches used to study the phenomenon of creativity. Section 2.7 explains the cultural account of ‘creative design’. The psychological perspective of creativity is defined in Section 2.8, followed by an explanation of creativity as problem solving in Section 2.9. After that, creativity as a process is explained in Section 2.10, followed by an explanation of how graphic design is also a set of processes in Section 2.11. Section 2.12 describes the creative designer, and Section 2.13 discusses how the word ‘creativity’ is defined and explained within the context of this research. Finally, Section 2.14 provides a summary of the chapter, highlighting the main issues covered within this chapter.

2.2. Strategy of the literature review

To understand a specific issue, identify gaps in the research, or investigate a particular topic by scientific research, a literature review is required. “A literature review is an examination of the research that has been conducted in a particular field of study” (Ferfolja and Burnett, 2002). There are different approaches in different disciplines to conducting the literature review. The most common approach used in social sciences is the “explicit” literature review (Oenzinger, 2005), which has been utilised in planning and structuring this literature review. This strategy started by reviewing theories, models, and frameworks. Then, comprehensive reading of the research-related issues has been conducted. This was followed by searching for the most repeated themes, and agreed consensuses reported by significant scholars. Such a strategy helped to highlight clearly the research problem and the research questions towards the end of this chapter. This has led to discovery of the gaps in each issue, which is raised in question form at the end of this chapter. Each section of this chapter has focused on a specific topic or issue.
To construct a valuable discussion of creativity from an interdisciplinary point of view, several fields were researched. This helped to find the most relevant information. The areas and issues covered within this research include: creativity studies, cross-cultural studies, graphic design education, psychology, sociology, communication, and art design education. To find the most relevant information, the following keywords were searched:

<table>
<thead>
<tr>
<th>Creativity</th>
<th>Design</th>
<th>Education</th>
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<td>Creativity</td>
<td>Design and creativity</td>
<td>Graphic design education</td>
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<tr>
<td>Creative abilities</td>
<td>Creative design</td>
<td>Art education and</td>
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<tr>
<td>Creativity and design</td>
<td>Design process</td>
<td>Creativity</td>
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<tr>
<td>Creative process</td>
<td>Design methods</td>
<td>Teaching graphic design</td>
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<tr>
<td>Creative thinking</td>
<td>Communication and creativity</td>
<td>Graphic design disciplines</td>
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<td>Approaches of studying creativity</td>
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<td>Graphic design history</td>
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<td>Characteristics of creative people</td>
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<td>Graphic design for</td>
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<td>Pedagogical model</td>
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<th>Research methods</th>
<th>Creativity Enhancement</th>
<th>Creativity assessment</th>
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<td>Enhance creativity</td>
<td>Measuring creativity</td>
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<tr>
<td>Methodologies of studying design</td>
<td>Develop creativity</td>
<td>Assessing creativity</td>
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<td>Qualitative methods</td>
<td>Promote creativity</td>
<td>Creativity assessment tools</td>
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<td>Quantitative methods</td>
<td>Foster creativity</td>
<td>Assessment in art and design education</td>
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<td>Survey approach</td>
<td>Maximise creativity</td>
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<td>Questionnaire</td>
<td>Flourish creativity</td>
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<td>Interviews</td>
<td>Creative thinking</td>
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<td>Strategies of enhancing</td>
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<td>creativity or Techniques</td>
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Table 1: The main keywords used to search for the relevant information of this research

To search for the relevant information, deep research was conducted through different resources such as electronic journal papers, books, conference proceedings, websites, and many other resources. Also, electronic resources provided by Loughborough University Library (e.g. MetaLib) were helpful in conducting advanced research analysis as they helped to locate the most relevant journals databases offering more research-related journals. Among these databases were: Science Direct, CSA Illumina, Loughborough University Institutional Repository and Loughborough University Library Catalogue Plus. These resources provided the most relevant studies of creativity, from different perspectives (e.g. psychological, social-cultural studies). Through these resources, some theories and models of creativity in general, and in relation to graphic design education, were investigated. This review was very beneficial in highlighting the most relevant themes, areas, and topics that should be considered. As a result the research questions and aims were constructed more precisely.
2.3. **Brief history of the word ‘creativity’**

The term ‘creativity’ is not an old term. Two of the main sources that studied the historical perspectives of creativity are Williams (1961) and Williams, Ostwald and Askland (2010). They will be repeated here frequently as they support most of the ideas claimed by this research. Williams’s book *the Long Revolution, published in* 1961, is one of the key, founding texts of cultural studies. It provides the most critical and concise conceptual analysis and history of ‘creativity’ yet to be published.

Creativity dates from the 16th century in English as there was no word ‘creative’ in ancient Greece; instead they used the word ‘mimesis’ which meant “doing what another has done”, or “making something like something else” (Williams, 1961, p.20). However, Williams (1961, p.ix) reminds us of the French philosopher Jacques Ranciere’s observation that in “ancient Greece, the development of new knowledge was typically established through a process of crossing boundaries” (Ranciere, quoted in Williams, 1961, p.ix). In that time the traditional meaning of art was merely a ‘skill’. The word ‘creative’ as “used by Plato and Aristotle was the very different ‘imitation’” (Williams, 1961, p.26) or as ‘divine inspiration’ (Williams, Ostwald and Askland, 2010, p.4). In this period, the belief was that “creativity bubbles up from an irrational unconscious, and that rational deliberation interferes with the creative process” (ibid., 2010, p.3) is common. Williams (1961, p.26) claims that, “Plato, similarly, “described the artist as an ‘imitator’ of pre-existing reality”. In general, the ancient Greeks had ‘mimesis’ - human imitation - and creativity for humans comes in with Humanism (Williams, 1961, p.20).

Williams (1961, p.20) further argues, “God was the creator of things, workmen the artificers of things, and artists the imitators of things”. So, it is obvious that the idea of inspiration influenced the meaning of word ‘creative’ at this time. For example, Plato “describes the poet as divinely inspired” (ibid., 1961, p.26). Plato’s “famous discussion in the Republic, proposing the censorship of poets, emphasises the dangers of the influence of these ‘mere imitators’ on the weaker parts of the mind” (ibid., 1961, p.20).

Later, Plato’s student Aristotle (384-322 BCE) recognised the word ‘creative’ from a more ‘rational’ approach, which “maintains that creativity is ‘generated by the conscious, deliberating, intelligent, rational mind” (Williams, Ostwald and Askland, 2010, p.4). He perceived “imitation as part of the normal learning process” (Williams, 1961, p.20). Based on rationalism, being creative required “conscious work, rationality and deliberation” (Williams, Ostwald and Askland, 2010, p.4). It is obvious from Aristotle’s view that the term ‘creative’ had slightly developed: “creativity was potentially more commonplace and it included the creation of uncomplicated or predictable objects as acts of creation” (ibid., 2010, p.4). In
comparison with the ‘romantic’ perspective, rationalism emphasised “reason, knowledge, training and education as essential elements of creativity” (ibid., 2010, p.4).

Later, according to Williams (1961, p.24), “a critical stage in art and thought has been reached” when Sidney asserts in one of his scripts that “a purely human creativity, the powers of the emergent mind, when imitation, the learning of reality, becomes creation, man making new reality” (Williams, 1961, p.24). However, all this effort to define the word ‘creative’ “fluctuates between imitative and creative ideas of perception, seeming to reserve real creation to secondary association, and it tends towards a denial of general human creativity, and its special reservation to the poet” (Williams, 1961, p.27).

In the Roman period, visual artists and poets shared imagination and inspiration, but there was no mention of creativity. In medieval Christianity there was a widespread belief that humans are not creating in any activities; any creation is ‘God’s act’. In the 16th century, Tasso used the word ‘creativity’ when describing that, “Nature is God’s creation; art is man’s creation. ‘There are two creators,’ […] ‘God and the poet’” (Williams, 1961, p.22). It was not until the 17th century that Polish poet Maciej Kazimierz Sarbiewski used the word ‘creation’ more explicitly; however, the word “creation” was still restricted to poetry. For the next century and a half, the idea of human creativity was met with resistance because the expression ‘creation’ was reserved for divine creation ‘from nothing” (Lai, 2007, p.9). Later on, in the twentieth century, creativity was recognised in science and nature. Williams (1961, p.28) described this period:

The belief in artistic creation as the medium of a superior reality seems most likely to be held in a period of transition from a primarily religious to a primarily humanist culture, for it embodies elements of both ways of thinking: that there is a reality beyond ordinary human vision, and yet that man has supreme creative powers.

In the mid-twentieth century, research and focus on the word ‘creativity’ began after J.P. Guilford’s Presidential Address in 1950 to the American Psychological Association (APA) (Kobnithkulwong, 2007, p.22). In this speech, Guilford encouraged research into ‘creativity’ and pointed out the lack of research in this area, specifically in the field of psychology. Williams, Ostwald and Askland (2010, p.6) argue, “Only a small number of professional articles and books were devoted to the question of creativity”. Petrowski (2000, p.305) argues that, “As evidence of need, Guilford pointed to the fact that only 0.2 per cent of the entries in Psychological Abstracts between 1920 and 1950 dealt with creativity”. Further, Petrowski (2000, p.305) argues,
Many attribute the neglect of creativity to: the Platonic notion that creativity is a mystical phenomenon (the Muse imparts divine inspiration to the artist); the persistent belief that creativity – like love – is a spiritual process that does not lend itself to scholarly scrutiny; the fact that early twentieth-century schools of psychology (structuralism, functionalism, behaviourism) ignored creativity; and the proliferation of “pragmatists” (evangelists who popularize and promote creative thinking without testing the validity of their ideas).

However, interest in studying creativity increased dramatically until the latter half of the twentieth century, “when increased scientific interest in the phenomenon saw the emergence of what has been labelled ‘creativity studies’” (Williams, Ostwald and Askland, 2010, p.6). As a result, intensive research and various theories and approaches to studying creativity have emerged.

To conclude this section, it is argued that all of the above ‘romantic and mystical’ or ‘individualistic based’ notions of creativity confront this research’s account of creativity as ‘problem solving’, which can also be explained as ‘cultural production’. Such a view of creativity emerged from reviewing works by Williams (1961) and Wolff (1981). Wolff comprehended ‘Art’ as a social product, rather than a unique creation of ‘genius’, transcending existence, society and time. Creativity is not beyond the range of mere mortals. Wolff (1981, p.9) explained this by stating that,

All action, including creative or innovative action, arises in the complex conjunction of numerous structural determinants and conditions. Any concept of ‘creativity’, which denies this, is metaphysical, and cannot be sustained. But the corollary of this line of argument is not that human agents are simply programmed robots or that we need not take account of their biographical, existential or motivational aspects.

This account of creativity will be explained further in the following sections.

2.4. Theories and approaches to studying ‘creativity’

Creativity is a very well researched topic, but also, paradoxically, it is still quite an uncertain phenomenon. It is a highly subjective experience and no universal method of studying creativity has been found yet, at least within the scope of this study. “There is no consensus as to whether creativity is located in a person, a product, or a process. There is agreement, however, that creative work is both novel and valuable” (Petrowski, 2000, p.305). The problem is how to study the existence of a phenomenon that some would argue is entirely socially constructed, but others would class as a biological function. “Creativity may manifest itself on many levels including the personal (P-Creativity), the historic/societal (H-
Creativity), and even the organizational (O-Creativity) [...] Such a complex phenomenon has generated a wide variety of research approaches" (Petrowski, 2000, p.305). Several theories explain what creativity requires in order to exist (Horn and Salvendy, 2006, p.157). The first major type of theory is the implicit theory. This believes that the creative person usually holds a set of cognitive and personality constructs that help in creative production (ibid., 2006, p.157). This approach “emphasise[s] personal judgements of creativity and study creative thinking and creative personalities” (Saunders, 2002, p.6). Horn and Salvendy (2006, p.157) argue that, “depending on the type of field or activity, variations occur with the constructs selected to judge creativity”.

The second major type of theory is system theory, which usually involves a specific set of environmental and social aspects in order for creativity to exist. Two of the main scholars who discuss this theory intensively are Amabile (1982) and Csikszentmihalyi (1996). Horn and Salvendy (2006, p.157) argue that Amabile (1982) believes that “... task, motivation, domain relevant knowledge, abilities, and creativity-relevant skills link with stages in creative problem solving". Csikszentmihalyi (1996, p.3), who fundamentally developed system theory, argues that creativity exists as a result of the interactions among three elements: the individual, the field (society or judges of creativity), and the domain (i.e. culture or environment). According to this theory, it is impossible for creativity to exist without the combination of these three elements. Csikszentmihalyi (1996) and Sternberg (2006) argue that creativity is a trait that is not associated with a few individuals; rather it is an ‘embodied talent’ within everyone which should be treated as an essential personal skill. For people to be creative, a number of aspects are generally required, for example, freedom, safety, time, knowledge, and experience. Cole, Sugioka and Yamagata-Lynch (1999, p.3) added the dimensions of experience and knowledge to this perspective.

The most recent theory in the field of creativity is investment theory, which “compares creativity to an investment strategy, where an individual or group uses the strategy to buy low (hold onto an unknown idea with potential) and sell high (persist until the idea becomes accepted, then goes to another idea)” (Horn and Salvendy, 2006, p.157). This theory “underlines that the creative act should involve certain risk-taking similar to the stock market; the individual has to sell high in order to obtain profits” (Lau, 2009, p.158). Welch (2006, p.97) argues that, “Risk-taking, with some understanding of the consequences, is essential for creative work”. As a result, the creative act implies that the individual uses all available resources, such as “the intellectual abilities, knowledge, and styles of thinking, personality, motivation, and environment to select and invest in appropriate ideas” (Horn and Salvendy, 2006, p.157).
From all of these theories, this research emphasises that “the social and cultural probe the production” account in defining the ‘creative’ act. Amabile (1982) argues, “… task, motivation, domain relevant knowledge, abilities, and creativity-relevant skills link with stages in creative problem solving” (Horn and Salvendy, 2006, p.157). Also, this reflects on investment theory, as it values the roles of environment, knowledge, motivations, and style of thinking: all these aspects will outline the account in this research of creativity in graphic design as ‘problem solving’. Studying creativity through a quantitative approach has thrown up some problems: alternatively this research studies creativity through qualitative approaches. The justification for using the qualitative approach and its problems are explained further in the methodology chapter.

2.5. Different definitions of creativity in different domains

Creativity is involved in several contemporary discussions including those about culture, society, and human learning experiences (Williams, 1961, p.3). It has various descriptions that have emerged from diverse perspectives, which have resulted in it being explained differently in various domains. A basic definition of creativity in most domains is the ability to produce work, ideas, or processes that are both ‘new’ and ‘appropriate’ for the intended purpose (Saunders, 2002, p.3). However, it is argued here that this type of description is not valuable for the research on hand, as it is a type of tautology and a circular approach. Instead, this research argues, any creative product should be an appropriate product or solution for a problem on hand, which is accepted by the society where it has been created. The justification for this is explained briefly in the first section of the introduction chapter. The following paragraphs intend to give an overview of some perspectives on the meanings of creativity and how it is understood from various viewpoints. The purpose of doing this is to give a general sense about the position of ‘creativity’ as a definition within some relevant fields.

The problem with everyday definitions of creativity is the interpretations of words that explain it. For example, the meaning of ‘appropriate’ cannot always be comprehended as a creative solution. There are various interpretations of what is appropriate within various cultures. So, if anyone wants to define the ‘creative’ act as ‘new’ or ‘appropriate’, for example, it is essential then to define these terms and clarify their meanings in relation to creativity. However, more generally, to be original means to come up with unusual or unique ideas that would solve an existing problem. Johnson (2007, p.4) argues that, “Original means it is not habitual and not routine; creative implies unconventional and intrinsically motivated, intentional actions—not actions governed by conventions or extrinsic rewards or blind luck”. Also, the term ‘novel’ can be understood as finding a solution for a problem that
nobody else had found before. Most people are familiar with advertising, where writers of clichéd, commercial, stereotyped toothpaste and dog-food advertisements are called ‘creative’. Nevertheless, Sawyer (2006 cited in Muirhead, 2007, p.1) argues,

All creativity includes elements of imitation and tradition. There is no such thing as a completely novel work. To explain creativity, we have to examine the balance of imitation and innovation, and the key role played by convention and tradition.

Muirhead, (2007, p.1) argues, “writers do not want to undermine or diminish the positive aspects that are often associated with the word ‘creative’”. Therefore, the term ‘creativity’ can be elusive. However, some researchers (e.g. Harris, 1998, p.1) have deeply considered the qualities of this term and give different perspectives on defining creativity. Harris’s definition contains four aspects: 1) the “ability to imagine or invent something new” (ibid., p.1); 2) “the ability to accept change and newness” (ibid., p.1); 3) “it is a process” (ibid., p.1); and 4) “continually to improve ideas and solutions, by making gradual alterations and refinements to their works” (ibid., p.1). However, Harris’s attempt to define creativity again may evoke some personality-related views more than other elements. Barnard (2005, p.170) argues that it is erroneous to attach individuality to the creative person, or show ‘the self-expression’, or provide descriptions such as the most ‘artistic’ designer. Also, this view is expressed by Tudor (2008, p.15) who argues that, “Creativity is not merely a happy accident of birth or random cluster of personality traits or habits to be mimicked”.

From a different perspective, Mich, Franch and Berry (2006, p.2) argue that any definition of creativity mentioned in the literature would be categorised into one of four “groups according to the entity, (1) product, (2) process, (3) person, or (4) group, to which the definition regards creativity as linked”. This is further explained in the statement, “… creativity refers to innovations in products or services […] and individuals or groups require a process which lead[s] to more and improved creative idea generation” (ibid., 2006, p.2). According to this viewpoint, there are different degrees of creativity within different individuals and different groups. The group’s creativity can be affected by the dynamics of the group; this also requires specific ways to evaluate “… the effectiveness of idea generation processes” that would generate a creative idea (ibid., 2006, p.2).

The Creative Mind by Boden (1999) is a valuable resource for studying creativity, as it defines creativity from various perspectives. In her account of creativity, Boden (1999) distinguishes three main types of creativity: combinational, exploratory, and transformational creativity; and discusses computer models of creativity, ways in which science can explain it, and how intuition is important in creativity. In addition, Boden (1999) explains the idea of conceptual spaces and ways of transforming them into creative outcomes using
computational concepts drawn from artificial intelligence. This book confirms, at least partly, the same ideas outlined earlier around Williams’ (1961, p.44) ‘new ways’ of defining the creative act. Boden (1990, p.xi) sees the human mind as able to surpass itself: “we can appreciate the richness of creative thought better than ever before” (Boden, 1999, p.1).

The most interesting insight found in Boden’s account of creativity is the idea that it is something that seems to be impossible but happens regardless: “creativity enters into virtually every aspect of our life” (ibid., 1999, p.1). This account works well with the definition of creativity as cultural activity:

It is not a special faculty but an aspect of human intelligence in general: in other words, it's grounded in everyday abilities such as conceptual thinking, perception, memory, and reflective self-criticism. So it isn't confined to a tiny elite: every one of us is creative, to a degree (ibid., 1999, p.1).

Boden (1999, p.1) argues that creativity “can happen in three main ways, which correspond to the three sorts of surprise”: 1) “making unfamiliar combinations of familiar ideas”; 2) "conceptual spaces are structured styles of thought"; and 3) “transforming the space” (ibid., 1999, p.1).

Boden (1999, p.43) points out a distinction between ‘personal’, ‘historical’ and ‘psychological’ creativity. The first, ‘personal’, creativity is “when a person creates something that they’ve never created before” (ibid. p.43), while the second, ‘historical’, creativity means here a form of a product that has been created by an individual that has not been created before. The final type of creativity represents genuinely unique insights that occur to the first-ever individual in history known to have the insight. Similarly, Craft, Jeffery and Leibling (2001) introduced the concepts of ‘big C’ and ‘little c’ in defining creativity. Big C creativity means the outstanding accomplishments of geniuses, for example, discoveries or inventions created by well-known inventors, artists, and scientists. These achievements are extraordinary and represent novelty and excellence in specific fields, usually recognised and validated by their social and cultural context. On the other hand, little c creativity (LCC) means personal everyday creativity, not for the extraordinary few. It is the ability to find novel and effective solutions for everyday problems. Craft, Jeffery and Leibling (2001) argue that “LCC is based on ‘possibility thinking, described as refusing to be stumped by circumstances but being imaginative in order to find a way around the problem”.

To sum up, the previous paragraphs discussed several perspectives in defining creativity. For example, creativity is defined as the ability to produce work, ideas, or processes that should be both new and appropriate (e.g. Saunders, 2002, p.3). Other
scholars (e.g. Harris, 1998) link creativity and imagination in which someone can invent new products or ideas through accepting ‘newness’. Other viewpoints (e.g. Mich, Franch and Berry, 2006, p.2) value four main aspects of creativity (i.e. entity, person, process, and group) as conditions to define ‘creativity’. It is argued here that the previous perspectives in defining ‘creativity’ are circular and involve some tautological problems, which give them some limitations. Sosa and Gero (2005, p.230) think that this problem is caused by the common approach of studying creativity “based on an individualistic premise under which creativity is assumed to be an extraordinary capacity, trait, or generative process” (ibid., p.230), defining any created idea as valuable; yet the term ‘valuable’ tends to be more subjective. However, in spite of these limitations, there are some workable aspects within these definitions (e.g. motivation, knowledge, experience, and the role of the environment). These aspects will be involved in the account of creativity in this research.

This research provokes the idea that creative problem solving is an entirely contextual activity, where the ‘wicked problem’ is under investigation. So, creativity is problem solving and can be explained as ‘cultural production’. Each member of a specific culture performs it routinely as part of everyday cultural activity. Barnard (2005, p.171) clarifies this standpoint by describing it as a “perception and our ordinary experience are human creation’s, then, and their sources are the brain and the interpretations produced by different cultures”.

2.6. Creativity from socio-cultural perspectives

Creativity has been understood differently from culture to culture. Different cultures have different perspectives on what is ‘creative’. Therefore, the value of creativity is culture-relative. This is where the idea comes in that creativity as cultural production and problem solving is common to all cultures, but that what counts is problem solving; the content is different in each culture. However, most cultures have understood the concept of creativity to mean to make or bring into existence something new. Based on this notion, a cross-cultural study has been conducted in this research to clarify the concept of creativity from both Arabic and Western perspectives. The purpose here is to investigate how each culture perceives the value of creativity and what both cultures understand by teaching creativity in graphic design education. Berry (1980, cited in Khalefa, 1999, p.21) explains cross-cultural research as a “… scientific study of the ways in which social and cultural forces shape human behaviour”. Khaleefa (1999, p.21) suggests in his study that there is a “need for both indigenous and cross-cultural studies of creativity, […] which can lead to the development of global understanding” (Khaleefa, 1999, p.21). Also, Al-sulaiman (2009, p.3) assumes that “studying cultural environmental factors is essential to understand the associated expressions of creativity and the effect of culture on creative thinking development”.

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Therefore, to clarify this further, a comparison between ‘Eastern’ and ‘Western’ perspectives towards creativity is outlined in the following paragraphs.

Some scholars argue that the form of creativity is also diverse in different cultures. An example is Lubart (1990, p.56), who claims that ‘Western’ creativity is different from ‘Eastern’ creativity. He clarifies this: “The predominant 'Western' definition of creativity as a product-oriented, originality-based phenomenon can be contrasted with the 'Eastern' view of creativity as a self-growth process” (ibid., p.56). Lau (2009, p.160) explains this: “individuals who are from the societies of 'freedom', namely America and Europe, are more creative than people in China and religious India due to the openness of the social environment”. The justification of this is, “The eastern definition of creativity has historically focused on social and ethical appropriateness rather than on the expression of individual ‘originality’” (Nui and Sternberg, 2002, cited in Dineen and Collins, 2004, p.1). Lubart (1990, p.41) argues, “The Oriental definition of creativity, however, does not seem to focus primarily on innovative products. Instead, it is argued here that the creativity is only different, culturally in the contents, but not the form. The Oriental and Western perspectives on creativity have a fundamental difference in orientation”. Dineen and Collins (2004, p.1) explain this by stating, “Chinese society has traditionally valued the collective and conformity over the individual and the novel”. Sternberg and Lubart (1999, p.340) argue, “Creativity involves a state of personal fulfilment in some Eastern views”. However, despite the argument that Eastern peoples are less truly creative than Westerners, it is difficult to identify different ways of being creative among nations; and, indeed, it is also hard to assess and compare the creativity of different individuals. So it is important to consider the contextual and cultural factors in defining creativity. The creativity of a specific society cannot be understood without understanding the culture that surrounds this ‘creative’ activity. McIntyre (2008, p.41) defines creativity from a socio-cultural point of view as:

An activity whereby products, processes or ideas are generated from antecedent conditions through the agency of someone, whose knowledge to do so comes from somewhere and the resultant unique variation is seen as a valued addition to the store of knowledge in at least one social setting.

The previous cultural comparison has highlighted how the cultural and social elements affect both the definition of creativity and the practice of graphic design in Western and non-Western communities. As a result, it is found that there is a shared understanding of creativity agreed by both communities. Design in the West is process, and it is an application of technology in developing countries. According to Barnard (2005, p.171), Williams (1961, p.46) viewed it as 'perception', which is not "simply the passive reception of material. Rather,
it is active". "The active part of perception is the interpretation of sense information according to ‘human rules’ (ibid., 2005, p.171). So each culture has a sense of certain different rules.

Therefore, the Western account of creativity differs from the Eastern only in terms of content, but not form. Yet the main focus of this study would be on how to perceive the word ‘creative’ in relation to the Omani graphic design cultural-education context. It was argued earlier that each educational context conveys a different meaning of creativity according to the society’s needs, based on cultural acceptance. In this regard, Wolff (1981, p.9) argues, “Practical activity and creativity are in a mutual relation of interdependence with social structures”. Similarly, Williams (1961, p.3) thinks that the term ‘creativity’ would be involved in the contemporary discussion of culture, society, and human learning experiences.

Based on this understanding of creativity, this research accepts the Western perspective of creativity as cultural activity as a fundamental step to investigating how creativity is defined in non-Western design industries. It concentrates on (or uses) the Western conception, which expresses creativity as problem solving. More specifically, creativity in relation to graphic design would be defined as ‘problem solving’, which is sometimes explained as ‘cultural production’. Barnard (2005, p.169) argues that, “… creativity is more appropriately thought of as cultural production and that both graphic design and art are examples of cultural production”. Both graphic design and art are ways in which experience is visually produced, reproduced, challenged, and communicated. As a result, the Western versions of creativity differ only from non-Western versions in terms of content, not form.

Accordingly, creativity within graphic design and ‘wicked problems’, or design problems, are all contextual concepts, which is to say seated in and defined by the social domain they inhabit (i.e. Oman). This makes a useful basis and supporting argument for this research, simply because it is a local and contextual approach. It is not arguing for anything outside the local, so it allows for definitions to arise from these local contexts.

2.7. The cultural account of ‘creative design’

It has been argued earlier that the Western notion of creativity is not different from non-Western perspectives: it is different in the content but not the form. For example, the technological and business contexts do not affect the definition of what creativity is; rather they may affect the content of creative (i.e. problem solving) activities. The Eastern and Western cultures are just at different positions of economic, cultural and pedagogical development. An example of this is the fact that the absence of qualified design graduates from the Omani design industry has reflected negatively on the understanding of creativity.
This was a result of the Omani private, industrial and governmental sectors depending on unqualified artists to design logos, advertising campaigns, and national event publications. Those graphic designers in the market were not Omani; mostly they were expatriates from Eastern and Middle Eastern countries (e.g. India, Jordan, or Egypt). They were trained to deal with various machines and printers only. Therefore, 'creative design' was interpreted differently, and mostly misconceptualised. The use of 'creative' in the Omani design industry is "affected by the matter of cultural prestige [...] and institutional significance" (Barnard, 2005, p.170). "We are still operating with an unexamined notion of creativity and we are likely to be stuck with the uncritical and mystifying conception of creativity" (ibid., p.170).

However, graphic design is highly linked to creativity and it is a profoundly 'creative' act. Jungpyo Sukyoung and Dongmin (2007, p.2) argue, "A design is an act of a model creation, which allows it to be the epitome of creativity". Williams, Ostwald and Askland (2010, p.14) also think that design is associated with creativity anyway. Graphic designers endeavour to find a 'creative' production or activity “that can contribute to technological advancement and cultural enhancement; that is, design is often defined as the production of ideas and outcomes (not simply the re-production of such) and the generation of solutions to wicked problems previously unsolved” (ibid., 2010, p.14). Based on this, it is argued here, creativity in graphic design can be defined as 'problem solving', which can be described as cultural production. Therefore, the Western notion of creativity is not different from non-Western perspectives. It is different in the content but not the form.

To understand the term ‘wicked problems’ this research has reviewed one of the most recent publications discussing the issue of ‘wicked problems’ from an interdisciplinary and contemporary perspective. It is a book entitled Tackling wicked problems through the transdisciplinary imagination edited by Brown, Harris and Russell (2010). This book suggests a transdisciplinary method and a more open approach for those involved in solving ‘wicked problems’, including designers. ‘Wicked problems’ are defined here as “complex and interconnected social and environmental problems that span disciplines, knowledge bases and value systems” (ibid., 2010). This book argues that, ‘transdisciplinary imagination’ plays a vital role in addressing the “shift to sustainable futures” (ibid., 2010). Various enquiries and cases outlined in this book can propose a framework for solving ‘wicked problems’ creatively, and allow those who are interested “to work collaboratively towards long-term solutions” (ibid., 2010).

The ideas of this book work well with the thoughts and suggestions outlined in this research. For example, Brown, Harris and Russell (2010, p.xix) argue that “everyone has a vital role” in solving ‘wicked problems’; similarly, this research argues that all graphic
designers should be involved in solving social, cultural and environmental design problems within their societies. Brown, Harris and Russell (2010, p.xix) suggest ways in which professionals can reconfigure social discourse “in making decisions on complex issues”. Similarly, it was argued earlier that thinking creatively and imaginatively could assist designers to contribute creative solutions to the ‘wicked problems’ they may face in their cultural contexts. Brown, Harris and Russell (2010, p.xix) agree with this, arguing, “this defining human capacity has been exercised by the book’s contributors to stimulate our imagination, so that together we might conceive of effective approaches to solving the complex survival problems that we face as a species”. More interestingly, this book pays specific attention to artists and designers, or, as Brown, Harris and Russell (2010, p.xix) describe them, ‘Artist colleagues’, who, because they are “familiar with the importance of wonder, aware of the power of intuition, and skills in the aesthetic visualization of ideas and feelings, will find that Tackling Wicked Problems will complement their practice with the power of words” (ibid., 2010, p.xix).

2.8. Creativity from psychological perspectives

Psychological research into creativity was started and encouraged by the psychologist Guilford in the 1950s. Guilford (1979) developed tools to identify and assess “creative thinking abilities” (Dahlberg, 2007, p.2). Guilford mainly talked about convergent and divergent thinking and defined the term ‘creativity’ as individuals generating new or original things. This definition is argued also by other psychologists (e.g. Torrance, 1962; Rosenman and Gero, 1993; Partridge and Rowe, 1994; Boden, 1999). Paul Torrance, also a psychologist and pioneer of creativity, defined it as,

The process of sensing problems or gaps in information, forming ideas of hypotheses, testing, and modifying these hypotheses, and communicating the results. This process may lead to any one of many kinds of products verbal and nonverbal, concrete and abstract (Stouffer, Russell and Oliva, 2004, p.1).

Even though psychologists investigated creativity from neurological and cognitive perspectives, most psychologists investigated creativity as an individual level phenomenon throughout, focusing more on personality traits. However, it is worth investigating creativity from psychological perspectives, to explore the phenomenon from all perspectives and find out how this can reflect positively on this research. For this reason, the following paragraphs will explore the characteristics of creative people, in order to comprehend how to distinguish the ‘creative design students’ from all other students. Also, it is worth exploring these attributes within this research, as it is important to cover most of the relevant issues that relate directly or indirectly to the term ‘creativity’.
Some psychologists (e.g. Amabile, 1983; Guilford, 1988; Gardner, 1993; Sternberg, 2006) have defined creativity in terms of the characteristic qualities of creative individuals or their mentality. Petrowski (2000, p.306) argues, “Psychometricians have also studied the personality traits of creative individuals and found interesting patterns. Positive traits include curiosity, high levels of personal energy, being attracted to complexity and novelty, tolerance for ambiguity, open-mindedness, and persistence in the face of adversity”. Cheow (2008, p.5) argues that several personality characteristics are associated with creative people. Most of these scholars argue that creative people can usually generate a large number of ideas, and a wide range of thoughts. Creative thinkers usually do or see the issues differently, and even think about them differently. They also use insight and intuition to find creative solutions. Several studies (e.g. Fletcher, 2001; Mason, 2007; Cheow, 2008) list the characteristics and attributes of creative people as follows:

- Challenging assumptions
- Being responsive to new ideas
- Recognising similarities and differences
- Making unlikely connections
- Taking risks
- Intelligent
- Capable of sustaining hard work
- Seek changes and adventure
- Impulsive
- Non-conformist
- Undisciplined
- Building on ideas to make better ideas
- Looking at things in ‘new ways’ (Williams, 1961, p.44)
- Taking advantage of the unexpected
- Taking chances
- The ability to adapt to special circumstances
- Recognising opportunities and possibilities
• Finding order in chaos
• Bridging broad categories
• Coping with new information
• Going beyond boundaries
• Innovative thinking
• Originality
• Entrepreneurship
• Problem solving ability
• Initiative
• Sophistication
• Engagement
• Motivation
• Continues learning
• Ability to analyse critically

Adams (2005, p.5) argues that Amabile (1997) “has provided the field with one of the most simple and yet comprehensive frameworks” for the characteristics of creativity. Amabile thinks that creativity arises from three main components: 1) knowledge, which is expertise; 2) creative-thinking skills, which are how people usually approach problems; and 3) motivation, which is the passion within the individual to do or change something. In this regard, Adams (2005, p.5) believes that most theories that hypothesise the source of creativity can be categorised under Amabile’s model. According to this model, expertise is very important as it forms a foundation for all creative work, while ‘creative-thinking techniques’ with some of the above characteristics can nurture a creative person to the shortest paths to solutions.

According to the DTI Economics Papers (2005, p.5), Amabile (1997) in this theory suggests that anyone can learn certain useful techniques to be ‘creative’, for example, “make the familiar strange”, “try something counter-intuitive” (DTI Economics Papers, 2005, p.5). “Task motivation is intrinsic self-motivation derived from the pleasure of doing the job and is the best motivator for creativity. External motivating factors can encourage one to greater heights, e.g. reward and recognition, but too clearly defined goals and too much external control can hinder creativity” (DTI Economics Papers, 2005, p.5).

Nevertheless, the previous approaches are engaged in looking at the personal characteristics of creative people. Such approaches moved away from the sort of
environmental modifications that might help students become more creative. For example, if creative people are inherently impulsive, non-conformist and undisciplined, then it would be impossible for educators to find ways to develop students’ creativity. As a result, it is argued that not all characteristics can be applied to all creative people.

To sum up, the above description of the characteristics of creative people are valuable for this study, even though they may be activity discouraged by some cultures. However, it is erroneous to depend on them for understanding creativity as a phenomenon. This study would be more interested in Amabile’s model in terms of how it comprehends creativity as ‘skill’ that can be improved. Williams (1961, cited in Barnard, 2005, p.171) argues, “The activity of description is performed by artists, and by scientists and philosophers … but also, and necessarily by everyone”. Based on Amabile’s theory, a graphic design lecturer would provide the creative graphic designer with the required knowledge to identify the most crucial elements that would be useful to solve creative design problems. Therefore, Amabile’s three elements of creativity can help the ‘creative graphic designer’ to become more effective in communicating “everyday experience of reality” (Barnard, 2005, p.171), based on the notion that “art and design may now both be explained as parts of a general human creativity” (ibid., 2005, p.171). So, creativity is problem solving, which can also be explained as cultural production.

2.9. Creativity as problem solving

Several scholars from different fields (e.g. Paul Torrance and Sidney Parnes in psychology; Alex Osborn in business and education) have addressed creativity as problem solving (Dahlberg, 2007, p.2). Also, Sawahata (1999) and Hanna (2001) perceived “creativity as problem solving using effective methods, informed by an understanding of social, cultural, historical, and technical aspects of communication to achieve a desired goal” (Cheow, 2008, p.24). The problem solving process here should be applied in order to identify the creative strengths of students. An example of this is Albert Einstein, who “had a tremendous work ethic”, which enabled him to have “diligence and patience to use problem solving techniques to reach a solution” (Howe, 2001 cited in Muirhead, 2007, p.1).

Negus and Pickering (2000) argue that this approach to defining creativity “can be found in numerous locations where the term is used more generally to refer to a task executed with considerable skill, a problem solved with imagination and panache” (Negus and Pickering, 2000, pp.266-267). Mich, Franch and Berry (2006, p.2) argue that the definition of “creativity to which the community seems to have converged sees creativity as problem solving, encompassing also problem finding and solution thinking. Creativity is thus the generation of innovative rather than conventional solutions to the problem at hand".
According to this definition, each problem requires a unique solution and every solution requires an original approach in dealing with a multitude of factors that may work for or against it (Sawahata, 1999).

To conclude, the previous perspectives described creativity as a form of problem solving. This view of creativity is compatible with the view of Barnard (2005, p.169), who argues that graphic design is creative and it is problem solving in the same way as art, because art is also problem solving, not because they are both ‘creative’ in the ‘irruptive’, ‘special’ or ‘mystical’ sense of creativity. Barnard (2005, p.170) argued further, “problem solving is itself a creative activity, that finding a solution to a communication problem is itself an example of creative activity”. This means graphic design is also creative. Therefore, defining creativity as problem solving, in which it may be explained as a form of cultural production process, is a valid argument, at least within the context of this research, and specifically in relation to the graphic design education context.

2.10. Creativity is also a process

Some psychologists (e.g. Osborn, 1952; Torrance, 1963) perceive creativity as a process and each process has particular components. It is an “... act of the human brain, manifested as a process which allows us to think and solve our problems - in a way that is commonly considered to be creative” (Santagata, 2004, p.6). Villalba (2008, p.7) argues, “Studies on cognitive psychology have tried to understand the process of creative thinking”. Cheow (2008, p.24) argues, “If ideas are better structured, central, and accessible, creative innovations are likely to happen”. Also, Lau (2009, p.161) believes that “Creative thinking is a process; it is more than simply having an idea pop up suddenly from nowhere”.

One of the oldest studies that classified creativity as a process is Wallas (1926). Based on this theory, Osborn (1952) developed “one of the most influential” models of the creative process (i.e. ‘Creative Problem solving’ (CPS)) (Lau, 2009, p.162). According to this model, the process is fourfold: firstly, Preparation, which is the first distinct stage that identifies the problem and its related data; secondly, Incubation, which is an important phase in the creativity process, in which the creative person sinks into their unconscious mind; thirdly, Illumination, which is the stage of Insights, the bright ideas and solutions that emerge suddenly in this stage; and fourthly Verification, where the individual usually considers the possibilities of executing their insights to a doable solution (Lau, 2009, p.162). The book Creativity, written by Torrance (1963), is extremely valuable in describing the process of creativity. Torrance states that the essential stages in the creative process include “sensing, testing, modifying, and communicating” (Stouffer, Russell and Oliva, 2004, p.2).
There are some shortcomings in the above account of creativity as a process, especially in relation to the context of this research. It is argued that not all forms of creativity can be seen as processes, basically because some creativity may not be the result of a process (e.g. intuition, or serendipity). Serendipity comes into play as the result of a process of habitual preparation. Also, creativity as a process involves some aspects of romanticism (e.g. incubation, illumination) which conflict with this research's account of creativity as ‘cultural activity’ performed by everyone. But creativity can be approached as a process in relation to a student’s creative development. Lau (2009, p.164) argues, “... the conscious design and arrangement of creative learning activities within design education is crucial in helping students to release their creative potential”.

2.11. Graphic design is also a process

It has been argued earlier that graphic design is a ‘creative’ practice and creativity is a problem solving process. Some literature has explained what is meant when describing a design as ‘creative’. Among these studies is Bessant, Whyte and Neely (2005, p.2) who argue that design is “the purposive application of creativity to all the activities necessary to bring ideas into use either as product (service) or process innovations”.

There are complex processes at work during design problem solving. Graphic design practice is no exception, and the diverse problem-solving contexts of the field are addressed through the use of a particular design language, centred historically on type and image and inflected by an increasingly broad research palette (Meggs, 1992; Noble and Bestley, 2005; Resnick, 2003, cited in Tan and Melles, 2010, p.462).

The designer plays a vital role in communicating ‘experiences’ (Barnard, 2005, p.172). So, communicating ideas is part of the creative process of design anyway. Barnard, (2005, p.172) argues, “One cannot argue that problem solving is itself a creative activity in the sense that ‘creativity’ has hitherto been understood, as irruptive or expressive”. Similarly, Sevak (2003, p.1) argues that the main objective of graphic design is to communicate “Graphic design aids in communicating our ideas, concepts, and information through visual form”. So, ”Graphic design is a process of problem solving in its very basic terms [...] it automatically requires production of new ideas as well as giving the necessary information within some limits” (Erdurak, 2002, p.11). Erdurak (2002, p.11) thinks that, ”problem solving is the common aspect in creative process and also it is the very basics of design”. Therefore, it would be valid to argue that the design process can identify common structures that can guide students to solve design problems in more systematic ways. In this regard, Bandyopadhyay (2008, p.60) asserts, “... the process of graphic design is one of globalising
the world’s most powerful tools to construct sustainable social identities within the modern condition of change that is constant”. Kolodner and Wills (1993, p.95) argue that,

Creative design also often includes a process of generating and considering several alternatives, weighing their advantages and disadvantages, and sometimes incorporating pieces of one into another. It involves using well-known design pieces in unusual ways or modifying well-known designs in unusual ways.

As argued earlier, creative design is judged upon its contribution within a specific society and particular culture. Colvin (2007, p.8) argues that,

The designer’s role is changing, from designer of things to designer of processes and ultimately becoming the facilitator of innovation itself. Designers are evolving from being individual authors of objects, to being facilitators of change among large groups of people.

Therefore, it is important for this research to consider the cultural context in which the ‘problem solving’ definition exists. Wuttke (2000, p.2) suggested this as a workable framework to solve ‘ill-defined’ design problems. This research agreed on a ‘creative design process’ in which defining the problem is a key step to solving it. Such a process can help graphic designers to solve creative design problems that are classified as ‘ill-defined’ or ‘wicked’ more efficiently. So, the design process is a constructional step that can assist students to find various solutions for an existing problem in a specific context. These steps are outlined in the following bullet points:

- **Pre-production stage** (which includes a design brief, stating the main aims and goals of design).
- **Analysis stage** (a deep discussion of the current design goals).
- **Research stage** (previous similar design solutions in the domain or related area are analysed).
- **Specification stage** (outlining all needs with suggested design proposals for a product or services).
- **Problem solving stage** (documenting and conceptualising design solutions).
- **Continued development (implementing the solutions and assess them)**

Nickerson (1999, p.258) argues that “… judging the ‘goodness’ of a response, that is, the extent to which an answer or solution is fitting or appropriate to the problem or situation,
is a creativity measure”. Finding innovative solutions is more important than utilising existing conventional ones, yet the proposed solution should be realistic and applicable.

One of the relevant studies that have examined creativity in the design process is Dorst (2001), who identified aspects of creativity in design related to the formulation of the design problem and to the concept of originality. It has been argued earlier that every solution is necessarily a creative one. “Studying creative design is seen as problematic because there can be no guarantee that a creative ‘event’ will occur during a design process, and because of the difficulty of identifying a solution idea as ‘creative’. However, in every design project creativity can be found” (ibid., 2001, p.426). Dorst (2001, p.431) emphasises the importance of stating the design problem as a step towards achieving a creative result. “Defining and framing the design problem is therefore a key aspect of creativity” (ibid., 2001, p.431).

This study shows “that the ‘problem solving’ aspect of design can be described usefully in terms of Maher’s model of the co-evolution of problem and solution spaces, and that the ‘creative’ aspect of design can be described by introducing the notions of ‘default’ and ‘surprise’ problem/solution spaces” (Dorst, 2001, p.436). Demirkan (2012, p.262) argues that, “creativity as a natural component of design process has often been characterised by the ‘creative leap’ that occurs between problem and solution space”.

Dorst’s (2001) paper is interesting because it mentions and explains the notion of ‘surprise’ used by Schon in his theory of creative design, “where it has the pivotal role of being the impetus that leads to framing and reframing. Surprise is what keeps a designer from routine behavior. The ‘surprising’ parts of a problem or solution drive the originality streak in a design project” (ibid., 2001, p.436). The word ‘surprise’ is equivalent to ‘enlightenment’, which is the third step in the stages of creativity mentioned earlier. Nevertheless, Dorst’s paper does not have much potential for reflection in the present study, as it studies the creative design process from an industrial engineering perspective, evaluating it quantitatively.

To sum up, creativity can be defined as problem solving and it may be explained as a form of cultural production. The types of problems that design usually deals with are ‘wicked problems’. Cultural production is the production of objects and images as meaningful to and in a culture, where that production is also understood to produce the identity of the (cultural) group. Indeed, different cultures can have different definitions of creativity; however, they can mostly be incorrect definitions (i.e. definitions that do not work, that do not describe what is happening) and they can also actually be producing themselves as cultural groups and producing the phenomenon they are describing as creative. The thing they are describing as
creative can have the meaning 'creative' for them because of the way they construct it, whether they understand this process or not.

2.12. The creative designer

Williams (1961, cited in Barnard, 2005, p.171) understood the ‘creative’ act as 'perception', which is not "simply the passive reception of material. Rather, it is active" (Barnard, 2005, p.171). The explanation of this is, “The active part of perception is the interpretation of sense information according to "human rules"” (ibid., 2005, p.171). So each culture has a sense of certain different rules. In this case, the communicator of such experience is the artist and the designer. Wolff (1981, p.19) emphasised the role of the graphic designer within the social and cultural context. Therefore, it is argued here that the graphic designer plays a role as a cultural and social specialist and that graphic design is a form of representation of cultural values. Based on this argument, this research recognises the position of cultural and social factors that surround creative people (i.e. graphic designers), which affect their creative outcome. Therefore, creativity should be identified in relation to the graphic design context, referencing cultural and social factors.

Creative designers frequently engage in the cross-domain transfer of abstract design ideas. They also often recognise alternative uses or functions for common design. Sawahata (1999, cited in Cheow, 2008, p.9) argues, “Creative designers respond to new stimulus, introduce the elements of surprise, and solve specific problem to reach targeted goals. They enthusiastically grow and gain energy as the process moves them forward”. Therefore, “the goal of creativity in graphic design is not to find the right answer, but to explore the range of possibilities” (Pibernik, Milcic and Bota, 2010, p.1). Antonenko and Thompson (2009, p.10) argue, “Being creative is seeing the world … through different perspectives, not narrow-minded, one-way alley […] viewing situations, objects though different people’s perspectives”. Based on this argument, it is argued here that, "Creativity in graphic design, or any visual communications discipline, is not measured in terms of right and wrong, but rather by the degree of success demonstrated in problem solving, applying visual skills, and expressing personal interpretations” (Landa, 2001, p.13).

There are some factors that would reflect positively on the development of Omani 'creative' designers. Examples of these factors are the surrounding environment, knowledge, and technology. Cheow (2008, p.7) believes that, “when creativity is combined with knowledge, technical capacity, and experience, designers and artists can stimulate and support free play, manipulation of objects, and ideas to produce tangible products that display ingenuity in creativity". Also, the modern developments in the graphic design field not only facilitate new production methods, such as computer rendering and modelling, but also
expand designers’ abilities to create, see, express and compose a design. Computers have various features, which assist designers and artists in creating practical solutions to design problems. For example, designers who use computers have a better ability to produce a large number of ideas that lead to various solutions. Nevertheless, computers only make the design process quicker, but do not increase the ‘creative’ act.

The characteristics of ‘creative graphic designers’ most relevant to this research are those mentioned by Erdurak (2002, p.10) in her Master’s thesis. She emphasised the ability of designers in developing ‘novel’ concepts, and argues that they “… must be open to experience and observation”. Artists and designers usually “… develop forms in different media in order to articulate their inner experiences in response to their observation of the world or to certain ideas of the world” (ibid., 2002, p.10). Therefore, it is important for creative graphic designers to develop visual awareness, gather data, learn how to acquire knowledge, and how to develop their own creativity (Erdurak, 2002, p.18). Based on this, the artist and designer play a vital role in redefining and revisiting the meanings of creativity within society.

It has been argued that both creativity and graphic design are highly linked to specific socio-cultural contexts. If the ‘creative graphic process’ is defined as problem solving, then the cultural elements should be taken into account. The designer’s creativity is explained in design studies as a capacity to read and analyse specific design contexts that would help to solve problems through making unusual connections and thinking literally. Art and graphic design are examples of cultural productions that are a highly creative practice (Barnard, 2005, p.196). Yet, such production is classified as ‘creative’ only within a specific culture and particular context. The same situation is applied within the Omani creative industry. The account of creativity here in relation to cultural context within this research is perceived as ‘problem solving’ that can be explained sometimes as cultural production.

This research has reviewed some recent research (e.g. Pope, 2005) that pays more attention to defining the creativity phenomenon from various viewpoints. Rob Pope (2005), in his book, *Creativity: Theory, History, Practice* unpacked several issues related to creativity to “[offer] important new perspectives on creativity in the light of contemporary critical theory and cultural history” (ibid., 2005, p.II). It has been mentioned that creativity was identified from the Romantic stereotype of the creator as individual genius. The meaning of ‘create’ taken from religious ideas was a divine creation from nothing (Williams, 1961; Williams, Ostwald and Askland, 2010). Pope (2005) builds up his discussion based on a set of literature that has contributed to developing the most recent meanings of creativity and explains how little has changed from 1961 when Williams defined creativity as a cultural
activity that is usually done by everyone in everyday life. Examples of these works are Chomsky (1972), Stenberg (1999), Howe (2001), Burk, Crowley and Alan (2000), and Steiner (2001).

Pope (2005, p.52) defines creativity theoretically as: “Creativity is extra/ordinary, original and fitting, full-filling, in(ter)ventive, co-operative, un/conscious, fe/male, re … creation”. To understand this definition, it is important to look at “the stretch and void […] in ’re…creation’, a framing for which learning and doing happen inter/(intra)textually and inter/(intra) subjectively, involving a dotting of the voids of silence and meaning, as the learner-reader makes their own sense of text and situations” (Ezepue, 2011, p.7).

This definition seeks to encompass what creativity does, its social constituents regarding who creates, where and how it is done, its historical view as to what it has meant, its import for radical educational development, the mental operations that underpin it, its foundations in language, its capacity to generate deep structures (as of deep learning), and its gendered and social dimensions (Ezepue, 2011, p.5).

As a result, “Creativity is provisionally defined as ‘the capacity to make, do or become something fresh and valuable with respect to others as well as ourselves’” (Pope, 2005, p.xvi). He explains the main words mentioned in this definition as: 1) “capacity; is a ‘potentiality’ or ‘possibility’ and may or may not be realised in fact, as an act or an achieved state”; 2) “Make, do, or become; creativity can be realised through an object (made), an action (done) or an on-going process (of becoming); it is therefore not strictly an ‘it’ or ‘thing’ at all”; 3) “fresh; presupposes novelty, which implies the ability to make the unfamiliar familiar”; and 4) “valuable; with respect to others and ourselves presupposes an exchange process moored to a system of personal, social, aesthetic and ethical values” (ibid., 2005, p.xvi).

Pope (2005) discusses the central etymological and epistemological foundations of creativity. These two aspects are intertwined. He values the language of creativity that defines its meaning, yet it is itself wide-ranging. We thus learn that there is “no creation from nothing” (ex nihilo) as there is always something “before the beginning” and “after the end” and, indeed, everything is “all middle” (Pope, 2005, p.xv). Deleuze (1995, p.161) also supports this perspective, stating, “… things and thoughts advance or grow from the middle, and … that’s where everything unfolds”. Creativity, therefore, is a ‘middling’, fluid sort of ‘continuing’ to ‘initiate things’ or ‘complete them’, a never-ending process of becoming.

It is argued that this new perspective on creativity is packed with several different meanings which can generate new connections. However, this understanding agrees with
the perspective proposed within this research, as creativity can be activated in different areas and can be practised and developed by everyone. Examples of these areas are: “creative writing; critical reading and sense making; crafting genuine originality into research; producing management knowledge through creative (qualitative) research and practice […] understanding creativity and management”, “creative problem solving and scenario analysis, leading organizations; managing change and innovation; enacting vital networks of relations; creativity in arts and social sciences as opposed to physical sciences; creativity in particular disciplines e.g. history, statistics, engineering, philosophy, health, ad infinitum” (Ezepue, 2011, p.5). According to this view, creativity according to Pope’s explanation intertwines with most aspects of our life.

Based on Deleuze and Guattari (1991, p.vii), Pope (2005, p.4) outlines characteristics of creativity that can explore its epistemological foundations. Deleuze and Guattari argue that creativity and creation cannot occur without the intersection of the following planes of existence: 1) philosophy, as it primarily creates concepts (“abstract systems of virtual worlds”); 2) literature, as it primarily creates impacts (“sensory embodiments of possible worlds”); 3) science, as it primarily creates percepts (“sensory embodiments of functional worlds”) (Deleuze and Guattari, 1991, p.163, cited in Pope, 2005, p.5).

Williams and Askland, (2012, p.6) define creativity as a phenomenon that is embedded in personal experience and subjective practice. It is “a personal concept that reflects past experiences, knowledge, familiarity, ideas, values, practices and attitudes. It is also emotional - suggesting an effective response or transcendent reaction to something, whether or not this ‘something’ is singularly connected to the self or can be experienced by others- and it is contextual; that is, it is, as any affective reaction, placed within a framework of particular social, cultural and historical circumstances”. So, creative experiences include personal, emotional, and contextual elements, which make creativity more complex.

To sum up, creativity in Pope’s (2005) understanding concerns itself much with “sense experiences, concepts, affects and precepts” generate “meanings, emotions, and functions as core constituents of being” (Ezepue, 2011, p.5). All of these aspects should be considered when we try to understand the phenomenon of creativity. It exists within every aspect of human life, from education to medical technology, to art, social sciences, to any human endeavours. Thus, Pope (2005) argues against the idea that creativity is something ‘extraordinary’ or ‘the prerogative of genius’. He argues that most educationists and psychologists “support the ordinary case and hold that the mental processes that geniuses depend upon are not qualitatively distinct from those used by ordinary individual” (cited in Ezepue, 2011, p.7). This notion is supported by Amabile (1997) and Csikszentmihalyi (1999),
who share the idea that all people have a potential for creativity. Pope (2005, p.54) includes this idea as stated by the UK National Advisory Committee on Creative and Cultural Education (Department for Education and Employment, 1996, p. 6) that “all people have creative abilities and we all have them differently”. However, any creative activity is “multidimensional, multisensory, varied and complex, so that a reconfigured conception of creativity involves many fields: chaos, complexity and emergence; cosmology, ‘parallel universes’ and ‘multiverse’; evolutionary biology and genetics; and infinite potential for change and transformation” (Ezepue, 2011, p.7).

2.13. Reconciliation in defining creativity

Previous discussion confirmed the idea that there are several differences between psychological and socio-cultural accounts of creativity. This is because various fields have various viewpoints to explain the phenomenon. For instance, psychological definitions tend to identify creativity as a property of people, products, or process. Such studies tend to focus on individual differences in people’s creativity “or on the distinctive characteristics of creative people” (Mayer, 1999, p.450), whereas socio-cultural definitions of creativity describe the phenomenon, taking into account the social and cultural aspects. For instance, Csikszentmihalyi (1999, p.450) believes that “creativity involves producing something new and useful with respect to the social or cultural environment”. In other words, it is “the ability to add something new to the culture” (ibid., 1999, p.450). So, any creation by creative people should be “sanctioned by some group entitled to make decisions as to what should or should not be included in the domain” (ibid., 1999, p.450).

This research should consider both viewpoints to come up with an appropriate reconciliation between psychological perspectives as ‘person-centred’ and the cultural perspective as ‘environment-centred’. Simply, because “Personality and cognitive skill paradigms have been the most common approaches to studying creativity […] Both have had their successes and both have had their critics” (James and Asmus, 2001, p.149). Therefore, this reconciliation is essential for comprehending the meaning of creativity within the context of this research. Creativity as ‘problem solving’ does not require producing anything ‘new’ to be classified as creative. If creativity solves the problem, then it is creative. For example, an illustration solves the problem of illustration; then it does not need to be new in any mystical sense.

To sum up, cross-culture study revealed that there was not any difference between Eastern (e.g. Omani) and non-Eastern definitions of creativity. They only differ in terms of content, but not the form. However, further investigation was required to investigate this issue. The collected data finds out how creativity is understood within the international
graphics industries, how graphic designers themselves describe it, and more specifically how lecturers define it within the Omani context. For example, problem solving within the Arabic graphics context is similar to problem solving in Western graphics contexts. Yet, it is argued here that the content (or what counts as a solution to the problem) only differs. Thus, creativity is comprehended within the context of this research as a ‘cultural activity’ that each member of given society performs routinely as part of their everyday activity. It is problem solving, in a sense that is explained as a form of cultural production. Art and design are examples of this cultural production (Barnard, 2005, p.169). Based on this understanding, developing a definition of creativity within the context of this research would be a reasonable aim.

### 2.14. Chapter summary

A variety of perspectives are involved in defining creativity in relation to design education, which is seen to be both a highly professional and an everyday activity: this is based on the important association among art and design and creativity that has given rise to much debate. Hickman (2008, p.71) argues, “Creativity can exist in all forms of learning, but is particularly developed within and through the arts”. Stamm (2008, p.5) argues, “Innovation, design and creativity are disciplines that span boundaries, and need to be understood in an integrated manner”. Stamm (2008, p.6) added, “Innovation, design and creativity have to do with curiosity, a taste for experimentation, dissatisfaction with the status quo, and the desire to continuously improve things”. Sawahata (1999) argues that, “the possibilities are endless with the notion of creativity but for every functional path a student takes, the solution posed has to be accepted not just by the student, it must also be approved and realistically producible”. So, it is a necessity in this situation, especially when the problem itself is complex and difficult to be defined (i.e. ‘wicked problems’).

Nevertheless, it is difficult to find one definition of creativity that fits all, especially in relation to graphic design education. This is because there are differences between graphic design students themselves, which caused by various cognitive, personal, social, and environmental factors. However, creativity is comprehended within this research as problem solving abilities, which can also be explained as ‘cultural production’. Such abilities can be developed by students and used by them to find solutions to creative graphic problems, in which computers can assist this process. It can be explained as cultural production in the form of objects that are produced by a specific culture and classified as ‘creative’ by the same culture.
Chapter Three: The second part of the literature review (Creativity in graphic design education)

3.1. Chapter overview

This chapter and the previous chapter are an intensive review of the literature that covers all issues and topics related to the research on hand. The previous chapter reviews the literature that has studied creativity from various perspectives. The purpose of this chapter is to study the situation of creativity in relation to graphic design education in general and to the Omani graphic design educational system specifically. Section 3.2 investigates how creativity is comprehended within graphic design education. Section 3.3 explores how creativity is understood within Omani graphic design education. Section 3.4 describes the traditional Omani design educational system, followed by Section 3.5, which describes the computerised Omani design education system. Section 3.6 explains the importance of both the traditional and computerised educational systems in developing the creative potential of students. Section 3.7 discusses the issue of teaching creativity for graphic design students. Similarly, Section 3.8 discusses creativity enhancement for graphic design students. Section 3.9 explains how pedagogical research relates to graphic design. Then, Section 3.10 answers the question ‘what is the pedagogical model?’. Section 3.11 outlines some strategies suggested by the literature to foster creativity. In Section 3.12 the issues of creativity assessment are investigated, with a focus on the assessment of creative outcomes. Section 3.13 gives a general view of assessment practice in design research. Section 3.14 outlines some examples of assessment practice and pedagogy in graphic design. Section 3.15 addresses the question of whether criterion-referenced tests can assess the creativity of Omani graphic design students. Section 3.16 gives a summary of the whole chapter.

3.2. Creativity in graphic design education

The importance of creativity in education is much argued. For example, Robinson (2006) claims, “Creativity now is as important issue in education as literacy and should be treated with the same status”. “Creativity forms part of design, design processes, and design education” (Williams and Askland, 2012, p.4). Creativity has this position in education because it can develop students’ abilities in expressing themselves and utilising their imaginations in solving graphic design problems by creating original and valued solutions. Some scholars (e.g. Harpe, 2006) approach creativity in relation to graphic design education from a psychological perspective. Other scholars’ approach (e.g. Williams Ostwald and Askland, 2010) is from a socio-cultural perspective and argues that the environment is the main reason for a decrease or increase in the creativity of students. However, most scholars
in design education value the position of creative thinking for graphic design students. Studies such as Tudor (2008) have placed much emphasis on learning and teaching approaches in developing creativity.

Reviewing the literature confirms, “that both art and graphic design are creative in the sense that they are two of the ways in which experience is made meaningful and communicated” (Barnard 2005, p.172). Also, there are a variety of understandings among educators towards issues such as ‘creativity enhancement’, ‘assessing creativity’ and ‘pedagogical strategies’, as well as many more issues. As argued previously, graphic designers, students, and lecturers share the same culture that is responsible for creating different realities (Williams, 1961, p.34). Therefore, it is rational to argue that the ‘Omani graphic educational context’ has its own model to define the ‘creative’ act. Bear in mind that the use of the word ‘creative’ in Arabic culture is “affected by the matter of cultural prestige […] and institutional significance” (Barnard, 2005, p.170). Therefore, this research:

Moves beyond the cognitive preoccupation with ‘creative thinking’ and procedural ‘problem solving’ processes. Instead it correlates previously unrelated research in search of deeper philosophical, physiological, psychological and sociological insights into what it means and feels like to knowingly ‘be creative’ and to actively teach for creativity in professional design and arts education (Tudor, 2008, p.2).

To sum up, creativity in relation to graphic design education can be defined as problem solving, which can also be explained as a type of cultural production. Graphic design follows specific creative processes that are ideally beneficial for graphic design students. The proposed pedagogical model contains techniques and strategies that can be used by graphic design lecturers to enhance students’ creativity. It is argued here that if graphic design students are motivated and practise some of these creative-thinking techniques, with help from their lecturers, then their creativity can be improved.

3.3. Creativity in Omani graphic design education

There was found to be a lack in the literature of studies of creativity within Arabic or Omani design educational contexts. This is because of a general undervaluing of the importance of creativity for Arabic graphic design students and because of a neglect of the role of creative people in social and cultural change. It is argued that there are cultural reasons for the undervaluing of creativity. UK schools value creativity but Arabic schools in general and Omani ones specifically do not. For this reason, there were not enough documents that explain the status of creativity in relation to Omani graphic design curricula. Only very few studies (e.g. Khaleefa, 1999; Alkholy, 2007; Abu-Awad, 2008) investigated
creativity in an Arabic context. They argue that the Arabic traditional education system has negatively affected the status of both graphic design as a discipline and creativity as an integrated part of this discipline. These studies mostly investigated creativity from a psychological perspective but did not cover all research-related issues, such as the importance of creativity for graphic design students, creativity enhancement and creativity assessment. However, these factors are local curriculum issues, which surely do not affect the notion of creativity as ‘problem solving’ or ‘cultural production’. So it is argued that, even though Eastern culture differs from Western culture, the process of cultural production itself is the same.

Because of the lack of literature that discusses the history of graphic design education in Arabic education in general and the Omani context in particular, there were not enough resources to understand exactly the role of the Omani educational curriculum in enhancing the ‘creative abilities’ of graphics students. The reason behind this is the fact that the graphic design discipline in Arabic education has had a very short history in this region. It started in the late 1990s when the availability of computers and the Internet reflected positively on the development of the graphics industry within art and design institutions (Abu-Awad, 2008). Then, between 2000 and 2006, many newly graduated graphic design graduates returned to Oman holding degrees in graphic design from foreign universities. Other newly graduated students from departments of art education contributed positively to this development. Some of them established their own businesses to sustain the development of the graphic design discipline within Omani society. These roles are ones that would be typically defined as ‘art worker’ roles in the West. More recently, graphic design programmes have been integrated into the Omani higher educational system. They were established first in some private institutions such as The Scientific College of Design in 2004.

Based on the above discussion, the importance of creativity in the Omani traditional educational system suffers from a lack of a framework for creativity. For example, there is no unified educational vision or set of objectives that graphic design institutions must achieve. The evidence of this is the absence of any art and design benchmarking system similar to the ‘Benchmark statement: Art and design 2008’ developed in the UK by QAA (2008). This caused a shortage of structured pedagogical models, which can enhance students’ creativity. The following paragraphs describe the situation of the traditional educational system.

The graphic design field has flourished intensively in recent years, as a result of “the vast array for new possibilities offered to educational technology” (Pereira, 2001, p.5). We believe that interacting with technology is not a complementary tool for the modern graphic design education; rather it is a necessity for recent graphic design students. Based on this
idea, the proposed model is part of the process towards the development of creativity within Omani design education. Tudor (2008) argues that in order to develop a pedagogical model, it is important to understand “how creativity is made teachable in design education”. Tudor (2008, p.3) thinks that to promote creativity within education would:

- Involve people in learning how to learn differently from that normally expected of them in institutional context. Consequently, creative learning has somewhat less to do with ‘what’ specific curriculum knowledge students may be required to digest and regurgitate at any given time.

Beal and Lee (2005, p.5) argue,

To achieve this goal, we need to consider a teaching strategy, which takes both cognition and motivation. Providing students with opportunities of experiencing successes through effort enables them to have high self-efficacy … The skilled human teacher has a wide range of tasks, strategies, and approaches that can be used to engage and instruct the student

In the same context, Tudor (2008, p.3) argues that,

The cultivation of creative self-confidence in heart, body and mind through targeted teaching strategies requires development of multidimensional, highly interactive and participatory educational approaches in which the teacher actively engages in creative exchanges with learners.

3.4. Traditional Omani graphic design education

The traditional environment means here the conventional system of teaching graphic design, such as manual cut and paste. In other words, it is all about being ‘hands on’ in producing a piece of design. Such a system usually focuses on the study of materials and mediums of basic design such as understanding colour, form, shape, texture, light, and composition. It trains students to draw and paint, and teaches them colour theories, colour circles, 2D and 3D shapes and forms, space, background and texture, poster illustration and the execution of the complete design through manually using poster colour or Gouache colour. Even though the basic tools used in this type of education can develop certain skills and intellectual abilities amongst graphic design students, its role in fostering students’ creativity requires further investigation.

In the traditional design educational environment, graphic design teachers use very basic tools such as pencils, sketches, paper, brushes, and rulers for teaching graphic skills. This type of education is explained by Heller (2004a, p.42), who clarifies how graphics
students usually study typography via traditional methods: “many of them teach traditional methods, such as setting type by hand and printing by letterpress” (ibid., 2004, p.42). However, such traditional methods can develop certain qualities in students, for example, sketching techniques with early graphic design students. Sevak (2003, p.3) argues that it can “train mind and hand coordination skill”. Interaction with the medium, which is part of the creative process, redefines established solutions and promotes the development of imagination. Kelly (2002a, p.154) argues,

Visual values are best learned through traditional hand-generated theoretical exercises. This applies directly to basic design, drawing, colour and letterform. I also believe hand skills must precede computer skills. In hand generated work, the student is working directly with tools and media; manipulation and results are immediate; the student feels as well as sees which facilitates understanding.

As a graphic design lecturer, it is believed that traditional methods are very valuable in terms of training students to understand, comprehend, and follow the creative design process. This is because traditional graphic design teachers prioritise technical skill over design thinking (Sevak, 2003, p.1). Teaching graphic design within a traditional environment, educators have been able to challenge students to be more questioning about their use of new technologies. Lecturers within Omani educational culture usually prefer students who “are courteous and considerate of others, punctual, energetic and industrious, popular with their peers, well rounded, receptive to other people’s ideas, and obedient” (Cropley, 1992, p.19).

To sum up, successful systems of teaching graphic design may require the use of advanced technologies alongside certain traditional educational methods. Kelly (2002a, p.153) asserts that the “computer provides the student with endless options of size, arrangement, choices and colours. Each option is an opportunity to make a decision”. It is argued here that the only thing worse than a solely digital design education, is a solely analogue one. Therefore, traditional design education should take its place along with computerised learning, especially in the early years of any graphic design study plan. This would help students to explore their skills, particularly those who do not have much background in art and design. Mastering some graphic software does not make one a designer (Sevak, 2003, p.2). The software is used in place of tools and makes the process easier, but it does not train the mind and hand. Also, “it is necessary to teach the design basics first, with the customary tools and media, leaving computers for more advanced work” (Alkholy, 2007, p.74).
3.5. The computerised Omani design education

Most Omani governmental and private institutions apply both analogue and computerised environments in teaching graphic design to undergraduate students. The computerised design education means here, the availability of advanced computers and devices that would help graphic design students to produce a piece of design more quickly, but not necessarily better, more appropriately or more creatively. A computerised environment provides a high level of digital facilities by offering a wider variety of solutions for most design problems. Therefore, it is argued that a computerised environment can promote creative thinking and stimulate students' behaviour. Lubart (2005, p.365) argues, “Computers may facilitate the management of creative work, communication between individuals collaborating on creative projects, the use of creativity enhancement techniques, and enhance the creative act through integrated human–computer cooperation during idea production”.

It is argued here that the graphic design student in such a computerised environment becomes more active, enthusiastic, and creative. Kelly (2002a, p.151) argues, “computers became the significant factor in graphic design that they are today. The assimilation is so complete that it is now impractical to conceive of teaching graphic design without computers”. As a result, analogue and digital technologies affect the definition of creativity, and in terms of digital technologies can foster the process of problem solving, by providing advanced devices that offer multiple solutions for a single problem. Yet, the problem solving process remains the same in both the analogue and digital environments. The purpose of comparison between these two environments is to investigate the integrated roles of the two.

3.6. The importance of traditional and computerised systems

It is important to use both analogue and digital education systems in enhancing students’ creative problem solving. This is because teaching graphic design in a computerised environment plays a very important role in producing quicker solutions to design problems. Also, computers can enhance creative-thinking skills and develop the artistic abilities of graphic design students (Kelly, 2002a; Sevak, 2003). However, the use of computers only affects the speed at which a solution is produced; it does not ensure the correctness.

It is rational to argue that designers can work more efficiently to increase production with computers, but would that necessarily mean that creativity is enhanced accordingly? Kelly (2002a, p.152) argues, “The designer’s current fascination with the computer is easy to understand. With the computer it is possible to do easily and quickly those things that it was
difficult and time-consuming to do in the past”. Cheow (2006, p.15) argues, “Educators need to define what roles graphic designers should be aware of in their human-computer interactivity and what skills need to be nurtured”. Therefore, it is strongly recommended to use both computer tools and traditional tools and media equally. However, further investigation is required here.

There are disadvantages of using computers in graphic design, as stated by Cheow, (2006, p.22): “Although the computer is known for expediency, precision and rendering abilities, it falls short in imitating the quirky and raw qualities of hand crafted letterforms”. Physical intersections can also be used interchangeably along with digital design. It is important that students focus on learning about design, rather than how to design. Sevak, (2003, p.1) argues, “In teaching design students must be encouraged to delve into their own creativity instead of relying on computers to do so, and should learn when and how to use computers”. Therefore, computers and devices should be used as a tool for students to develop their ideas. This argument is also supported by Sevak (2003, p.1) who argues, “Computers are nothing more than a calculator, a machine, and if operated on properly yield quick results. Computers are not designers”. Alkholy (2007, p.74) argues also that,

The Computer is a great tool that has made both academic research and creative art and design easier, faster, further accurate, and more interesting, but there is enormous misunderstanding about its role in graphic design. Its tools will not work properly without a good experienced and a practiced hand to control. Most students assume that computer is the goal, the more you know the better designer you are.

It is worth noting that some sort of digital working is now a cultural and economic default (e.g. the means of ideation (CAD) are digitally but not physically proximate to the means of production (CAM)). Any other approach is more difficult to enact, is therefore going to be less common and so needs to be addressed in an educational context less frequently. So underplaying the digital is just not going to happen in graphic design education. At the same time, nobody argues that computers can make creative designers. This research is not testing this notion anyway; it is covered in this section only to see how local (i.e. Omani) lecturers value using both computerised and analogue education environments.

To sum up, teaching graphic design in a computerised environment is central, simply because, “graphic design education is now being shaped by technology” (Kelly, 2002b, p.40). However, through a deep investigation of the existing literature, it has been discovered that there are fewer studies discussing the importance of both the analogue and computerised environments in enhancing the creativity of graphics students. This can be regarded as a gap in the literature; therefore, the research on hand intends to fill this gap.
Further investigation is required through collecting empirical data by means of a questionnaire and interviews. Interview methods of this study have investigated the situation of creativity in the Omani graphic design educational context, and confirmed the importance of both the analogue and computerised environments in enhancing creativity of graphics students.

3.7. Teaching or encouraging creativity within students

Several studies have addressed the question ‘Can creativity be enhanced or taught?’. The answer comes from Nickerson's (1999) article, “Enhancing creativity" (cited in Kaufman and Sternberg, 2010) which confirms that enhancing creativity is possible in all means (Adams, 2005, p.15). Cropley (1992) and Nickerson (1999) are two of the most important scholars who have studied creativity enhancement and development techniques. Also, Edwards (2000, p.2) asserts that people can learn to become more creative. There is a wide consensus that, by providing the right work environment and atmosphere, creativity, as problem solving, can be fostered further within individuals. Several other educational studies (e.g. Torrance, 1974; Gardner, 1993; Harpe, 2006; Mich, Franch and Berry, 2006) have confirmed that creativity can be taught.

On the other hand, there is a widespread belief that creativity is something that cannot be enhanced. Creativity is comprehended as an exceptional talent or 'a rare gift' that cannot be enhanced or developed. For example, Fryer, (1996) conducted research in 1989 on 1028 teachers and lecturers and argued that creativity is a unique trait owned by only certain people. Based on this view, creativity is identified as an 'innate' capability more than a skill that can be learned through particular processes.

The research on hand argues against the second viewpoint. It is rational to argue that graphic design lecturers can facilitate creativity within their students. Such a claim is discussed by (Mich, Franch and Berry, 2006, p.2), who argue, “… both individuals and groups can learn to be more creative than they were". Nevertheless, this research will investigate further the possibility of teaching creativity for graphic design students, in order to reach a clear conclusion on this matter(in spite of the fact that some of the literature confirms that there is a blind faith in creativity as innate), believing that creativity can be both taught and enhanced. As discussed earlier in the Introduction (Section 1.8), Williams (1961) suggests some ways in which the creativity of human beings can be enhanced, for example, work, learning, decision-making, ‘use of human faculties’, ‘education encourage[ing] the development of a variety of capacities’, and ‘democratic practice’ (Williams, 1961, p.34). Setting up pedagogical strategies that regard creativity as a 'problem solving skill' would help Omani design students to produce ‘cultural’ objects that are defined as ‘creative’ within
Omani culture. The following section will propose some ways to enhance the creativity of students.

3.8. **Enhancing the creativity of graphic design students**

Graphic design is one of the important disciplines in education that can develop the creative potential of students. Several studies (e.g. Craft, 2001) have recognised graphic design as an ideal discipline to practise and enhance creative design problem solving. The modern design methodologies that should facilitate creativity should "stress the importance of thinking skills, technical abilities, positive attitudes, and relevant prescriptive values" (Cheow, 2006, p.15). One example of graphic design is web design, which is "viewed as an important method that teachers can use to link content knowledge with the construction of a tangible product and allow students to contextualise and amplify their creativity" (Antonenko and Thompson, 2009, p.18). It is argued here that to establish a central role for creativity in the graphic design context, it is important that lecturers should ensure there is a supportive environment and suitable opportunities. Also, lecturers should activate innovative and imaginative experiences in teaching graphic design, and stimulate students’ motivation.

Reviewing the literature helped to clarify how creativity can be enhanced in a general sense, with random people, and specifically with graphic design students. Generally, enhancing the creativity of students is possible through three methods: firstly, through the use of specific creative-thinking techniques. Lau (2009) argues, “Creative thinking skills are essential part of enhancing students’ creativity”. Some of these techniques (e.g. brainstorming, mind maps, 6W, attribute listing) are suggested by Hsiao and Lin (2004). Secondly, design lecturers can implement a set of pedagogical strategies. These strategies will be used to construct a pedagogical model that can offer a systematic approach to guide lecturers in the Omani educational system. These strategies are collected from the literature review; however, they will be investigated deeply through empirical data. Thirdly, through developing a design curriculum that values the position of creativity as a crucial component. The following paragraphs introduce the proposed model and initially suggest how to nurture, teach and develop the creativity of Omani graphic design students. Indeed, this proposal will be investigated further through conducting a survey.

3.9. **Graphic design in pedagogical research**

This research has reviewed how design and graphic design were defined and explained in relation to pedagogical research over the past three decades.

Graphic design, as a practice, has seen complex changes in its social and industrial settings over the last half century, with the result that graphic design literacy is no
longer considered solely to consist of competence in drafting or formal aesthetics, but now reflects an increased notion of professionalism (Heller, 2004b; Jabling and Crowley, 1996; Sauthoff, 2004; Swanson, 1994, cited in Tan and Melles, 2010, p.461).

Several researchers (e.g. Frascara, 1988; Swanson, 1994; Heller, 1998; Ellmers, 2006) have studied graphic design from a pedagogical perspective. For example, Heller (1998) is one of the pioneer researchers in the field of design education. He has contributed intensively to several areas related to graphic design education such as illustration, typography, design teaching and several more. He is the author and co-author of more than fifty books in these areas. Among his books is The education of a Graphic Designer, which was highly valuable for the research on hand. This book is highly beneficial as a guide for graphic design lecturers who need to keep their knowledge, skills, and understanding up to date in such a constantly changing field.

Graphic design pedagogy is a new emerging area, even if there is a tradition of design research (Ellmers, 2006, p.1). The typical design education has paid more attention to project outcomes rather than focusing on learning opportunities or the creative design process. Ellmers, (2006, p.3) has emphasised the position of the design process, stating that, “understanding the design process is an important aspect of becoming a professional graphic designer as this can provide a platform to transfer expertise to different design contexts”. Based on this, Ellmers (2006) encourages the inclusion of a reflective framework into traditional graphic design pedagogy. This idea is very dominant in current pedagogical design research.

Design in general, and graphic design specifically, has been defined as a ‘liberal art’, particularly in relation to pedagogical studies (Buchanan, 1990; Swanson, 1994, p.52). The explanation of this is that “the liberal arts are undergoing a revolutionary transformation in twentieth-century culture, and design is one of the areas in which this transformation is strikingly evident” (Buchanan, 2010, p.5). According to this understanding, liberal design should take a variety of forms, and designers must start to believe in their own rhetoric and “see design as an integrative field that bridges many subjects that deal with communication, expression, interaction, and cognition” (Swanson, 1994, p.59).

More broadly, design in the pedagogical literature (e.g. Swanson, 1994; Frascara, 1988) has been introduced as “expression and the mass dissemination of information” (Swanson, 1994, p.59); “graphic design is both a rational and artistic activity” (Frascara, 1988, p.26). This may explain the claim made earlier, that graphic design stands between art and science. It is about meanings, and how meanings are created and communicated. Frascara (1988, p.26) explained this by stating that, “the nature of the field always required a
certain degree of artistic intuition, that is, of decisions made by designers on the basis of experience that is difficult to quantify or explain rationally”. Because design can bridge diverse disciplines, and it locates itself between rational and artistic streams, educators should find ways to balance the elements of these two streams. Frascara (1988, p.26) argues that this is an educational challenge, “that calls for the development of visual sophistication and intuitive abilities to express concepts visually, along with a rational capacity for processes of analysis and synthesis”. It is clear from this discussion that most educational literature tends to instruct educators to enhance their students’ higher levels of learning objectives as outlined in Bloom’s taxonomy of learning (i.e. analysis, synthesis, and evaluation). This approach is highly regarded by this research, because it basically pushes students towards further creative development.

Design pedagogy should enhance the creative abilities of design graduates and develop their competences in the design industry; the institutions here play a vital role in delivering such curricula. Heller (1998, p.ix) argues,

In many institutions it is no longer adequate to simply have a marketable portfolio graduates must acquire bona fides through internships, apprenticeships, work studies, and anything else that bulks their résumés. They must have certificates, diplomas, degrees, awards, and scads more evidence that they are designers with a capital D rather than mere mouse-pushers.

Also, there is recent on-going research about ‘problem-based learning’, which is described as an instructional educational methodology. According to Rhem (1998, as mentioned in Ellmers, 2006, p.4) this type of learning students usually engage “with contextualised problems and look to discover meaningful solutions”. Students here work individually and in groups to solve real-world problems through discussing the possible solutions. Students have the opportunity to build on each other’s knowledge and share information, through outlining what each student knows and does not know about the problem.

A contemporary understanding of the word ‘design’ that is considered to work well with the main underpinnings of this research. Buchanan, (2010, p.5) explains this understanding further by stating, “design continues to expand in its meanings and connections, revealing unexpected dimensions in practice as well as understanding” (Buchanan, 2010, p.5). He further describes the development of the design concept as, “design grows from a trade activity to a segmented profession to a field for technical research and to what now should be recognised as a new liberal art of technological culture” (Buchanan, 2010, p.5). The present research agrees with this definition of design as a ‘liberal art’ which is “undergoing a
revolutionary transformation in twentieth-century culture, and design is one of the areas in which this transformation is strikingly evident" (Buchanan, 2010, p.5). Based on this discussion, Omani graphic designers should incorporate this understanding of design into graphic design education pedagogy.

A study conducted by Dineen (2004, p.2) about creativity in graphic design pedagogy found that specific factors have been identified in the educational literature (e.g. Shield, 1995; Hopper and Downie, 1998; Martin, 2003), which can affect the process of creativity development within learners. These factors are: cognitive; student motivation and learning style; teaching approach and methods; project/task content and outcomes; assessment methods; teacher; and learner. These factors have been considered during this research in the process of developing the pedagogical model. “Art and design by their very nature deal with speculative ideas and possibilities; diversity and divergence are essential for originality. The disciplines thus provide an ideal context for the development of creativity” (Dineen, 2004, p.3).

To sum up, most of the previous research shows the importance of continuous revaluation and reassessment of graphic design education programmes. Such evaluation should include the duration of the study. Heller, (1998, p.ix) argues, “There are not even enough days in an average undergraduate four-year graphic design program to develop the skills and foster the talents necessary to become a viable practitioner”. Also, in terms of design curriculum, the education of contemporary graphic design requires teaching more than technique and technology; it requires “conceptual, strategic, psychological, marketing, and other abstract and practical issues” (Heller, 1998, p.ix). This is because of the fact that, “as a discipline, design is at the same time guided by existing realities with particular needs, functions and requirements, and future opportunities for cultural reproduction, technological advance, innovation and intervention” (Williams and Askland, 2012, p.9).

3.10. What is the pedagogical model’?

The proposed model in this research is based on one of the newest pedagogical paradigms, called the ‘constructionist paradigm’. Pereira (2001, p.3) argues that this paradigm can offer “the best basis to deal with the present complexity and to promote deep and meaningful learning”. According to this paradigm, Pereira (2001, p.3) outlines four main elements that construct knowledge: the “knower, critical pedagogy, the socio-cultural theories, and reflective practice”. Implementing this theory would result in an effective learning style, which helps to nurture students as lifelong learners. According to the constructivist paradigm, knowledge is socially, culturally, and collaboratively constructed. As a result this theory aligns with understandings of creativity in the context of this research as
problem solving, which is explained mostly as ‘cultural production’ or ‘cultural activity’. So, it is obvious that creativity is highly linked to socio-cultural contexts where the creative production is produced. According to Barnard (2005, p.171), “the creative production of the everyday experience of reality is something that everyone necessarily does. Art and design may now both be explained as parts of a general human creativity”. Similarly, from the constructivist viewpoint, Tudor (2008, p.3) argues that,

Readily available and potentially shared between all teachers and learners working within overlapping communities of practice that value inquisitiveness, ingenuity and inventiveness as legitimate and productive ways of dealing with both simple and complex challenges, and perplexity.

This model would be a tool that could be integrated into graphic design education; it would be like including various creative techniques, strategies and processes into design courses that are taught in Omani higher design institutions. Lecturers would play a vital role in this process, by utilising these instructions to aid and support creativity in the educational context. However, Omani design lecturers should be aware of socio-cultural factors that can influence students' creativity. Also, students should make an effort to develop their own creative problem solving abilities. So, to ensure the effectiveness of this model, both lecturers and students should participate positively and play their roles efficiently. Cropley (1992, cited in Cheow, 2006, p.6) argues,

One way of encouraging creativity is to assert that every idea is a possible solution, no matter how silly or impossible they may seem especially during the process of ideation. Besides intellectual skills in solving problems, creative thinking requires diligent hard work, motivation, courage, a sense of recognition, and other similar factors.

Based on the above, this research proposes that, if this model applied to the Omani undergraduate design curriculum, where design students are fully aware of their social, cultural, and psychological roles, and resourcefully practise some techniques that can stimulate their creative thinking, then it is expected that this model would promote students’ creativity. Such success also depends upon the ways that graphic design lecturers implement this model within design education systems. If these two conditions are realised, then it is reasonable to hypothesise that creativity can be promoted further within Omani graphic design students.

As a result, any suggested pedagogical modules of creativity within this research should offer the students various chances to improve and practise their creative abilities, to
solve ‘creative design problems’ either individually or in groups. Also, the model should be linked to one of the modern educational approaches (i.e. the learner-orientated approach) that belongs to the constructivist paradigm and is based on “the principles of the socio-cultural theories and critical pedagogy, and adopts reflective practice as a methodology” (Pereira, 2001, p.3). Also, the proposed exercises of this model should be as “individual and collaborative exercises, which allow students to participate in the construction of knowledge, further developing the theoretical issues with their practical work” (Madrazo, 2006, p.75). The initial proposed strategies to foster creativity as ‘problem solving’ skills are outlined in the following sections.

3.11. Strategies suggested by the literature to foster creativity

3.11.1. Through a superior environment

The level of creativity within graphic design students is commonly affected by several surrounding environmental, cultural, and social factors. Scholars such as Moys (2004, p.28) value highly the role of the environment in decreasing or increasing the level of creativity within learners. Similarly, the educational environment is highly important in nurturing creative thinking, where the students feel secure and safe. A supportive environment usually encourages the individual to try alternative solutions and to expect failure before achieving success. An example of this is that an educational environment that has advanced technologies can usually help graphic design students to experiment using various types of fonts and also can specify the most suitable ones in a short time, which gives various solutions for a given problem.

3.11.2. Through teaching a ‘creative design process’

There is an increasing emphasis on the importance of creative design processes, as mentioned in most of the current design studies (e.g. Cheow, 2008; Tudor, 2008). They are constructional steps in which they can assist students to find various solutions for an existing problem. It is argued that teaching these processes to graphic design students would help them to explore and practise creative ways of thinking. These processes can assist students to understand the principles of graphic design, which can aid their creative design thinking.

Ideally they also may help educators to fulfil the main goal of any design course, as stated by Stultz (2006, p.11):

The goal of graphic design education, in simple terms, is to develop the ability and skill to create unique and refined graphic solutions that are beyond the capabilities of an untrained person who simply owns a computer with desktop publishing software.
This research argues that it is important for any graphic design student to understand and practise the creative design process as part of ‘creative’ design abilities, which will be produced as a final creative outcome. Teaching a creative design process to undergraduate graphic design students would contribute positively to enhancing their creativity. The characteristics of the lecturers are also important to develop the creative design processes. However, it is not necessarily the case that teaching students how to approach briefs in terms of problems to be solved, making them into many problems to be solved if necessary, would actually improve their problem solving skills and make them more ‘creative’. Alternatively, training graphics students to use design processes can positively assist them to become more ‘creative’ by following a ‘creative design process’ to solve design problems. These processes can lead to several solutions for one single problem.

Christiaans (1992, p.147) argues that, “The educational process should focus on teaching the student how to organise and manage his or her design process; that is, students should be aware of what relevant and important knowledge can be abstracted from design projects to be applied to future projects, and what methods are useful in implementing knowledge to aid design”. “In design education, creativity should be given high priority. Design aims to innovate, to add something new to what already exists. Thus, in training and assessment more attention must be paid to this aspect” (ibid., 1992, p.147).

The literature review found some helpful resources that can assist students in conducting the creative design process. An example is a book Design Diaries: creative Process in Graphic Design by Roberts and Wright (2010) that describes creative practices conducted in the graphic design industry. It is a collection of graphic designers’ diaries that shows eleven different design projects and explains how to start with the first thought, and follow this through to reaching the final product. It is a sort of practical description of the design process. Graphic design students can reflect on this kind of book positively, as it can be a helpful tool for students who want to discover how companies respond to a brief.

Graphic design teachers can pursue the following steps to teach the creative design process in graphic design classroom. These steps are: firstly, students have to define the given problem, analyse the situations, and specify goals; secondly, utilise their existing knowledge efficiently; thirdly, gather the relevant information; fourthly, suggest possible solutions; fifthly, examine subsequent effects that are related to the solution; and sixthly reveal the proposed solution. As a result, training lecturers to teach design as a series of problem solving exercises would reflect positively on the level of their students’ creative problem solving skills.
3.11.3. Through increasing the knowledge of the students

If graphic design students were trained to solve design problems creatively with a series of problem solving exercises, it would reflect positively in their level of performance. This is because knowledge is an important condition for creative people. Welch (2006, p.99) stresses that, “to be creative requires knowledge of the subject matter”. Cheow (2008, p.4) thinks that creativity is a mixture of a set of attributes: knowledge, accurate observation, good memory, logical thinking, inventiveness, enthusiasm, fantasy, inner drive, capacity for being enthused, and motivation. Alkholy (2007, p.76) suggests a strategy to increase information about the problem for students, through using the Internet to enhance students’ abilities to find information related to solutions to design problems. To apply these techniques, students can be given specific design tasks that require information to be found on the Internet. Students would then be able to outline the problem before suggesting a suitable solution. Using the Internet would train students to communicate with the world around them and share and exchange ideas within the graphic design field. Such methods of communication can definitely help students to send the right message within the right target (Alkholy, 2007, p.76). Also, increased knowledge presumably gives more perspectives on the given problem than knowledge of how other people have approached the problem in the past.

3.11.4. Through the design lecturers and their teaching style

Design lecturers should implement an effective teaching style to foster creative potential with graphics students. It is believed that by delivering graphic design fundamentals more interestingly, lecturers can move students away from acquiring skills towards acquiring knowledge, and then using the gained knowledge to solve design problems. Otherwise, if teachers are not able to discover the nature of creativity of their students in the classroom, they might kill it with their unproductive teaching style. In this regard, Cheow (2006, p.17) argues, “Promoting of conceptual and technical competence requires an evolving, adaptive and versatile educator who is a designer, communicator, and thinker”. Indeed, applying these methods in design teaching requires well-trained teachers. Sevak (2003, p.3) thinks that, “Design education must focus on delivering a life skill and balance the visual perception skills and design principles along with proficiency in advancing tools and technology”. For example, students need to be taught how to use Photoshop to help them realise the idea and find alternative solutions to the given problem, not just to acquire skills of how to operate the software itself. So, students should learn to become conceptual thinkers, not software operators. Lecturers should,
Provide ample opportunity for research, experimentation and revision and assignments should extend over a significant period of time so that students can investigate and reflect. It is important to show appreciation and approval when a student is adventurous and willing to take risks, even if the outcome is not always the intended one (Lindstrom, 2006, cited in Cheow, 2008, p.10).

Also, graphic design lecturers should teach their students ‘creative-thinking processes’ as well as basic principles of design, typography, manipulating and enhancing photos, and theories of colours. By using this model, lecturers would be able to assist their students to be creative problem solvers and conceptual thinkers. Cheow (2006, p.27) confirms, “Developing designer eyes are necessary to cultivate a strong sense of design sensibility”. Muirhead (2007, p.2) says that,

Teachers can prepare students to face and overcome obstacles by relating personal narratives on when they encountered people who were not supportive and reacted negatively to their best ideas. Instructors should have students read materials (e.g. articles and instructor lectures) that will enhance their awareness of issues associated with the creative process. Students should learn that obstacles could appear in different forms such as external issues (e.g. fearing the opinions of others) or reflect internal battles with performance anxieties.

To develop a pedagogical approach, Tudor (2008) suggests that each lecturer needs to be aware of the ‘fluid nature’ of creativity, in relation to specific characteristics of the task, followed by using the developed innovative teaching strategies. She assures that this process can lead to professional ‘experience’ and the basis of self-motivated creativity. Muirhead (2007, p.2) agrees: "…teachers can provide valuable knowledge and advice to their students that will promote enduring creativity in their lives".

So, improving the methods of teaching graphic design is not enough alone: graphic design educators must play an important role in fostering problem solving skills with students using the ‘creative’ application of creative-thinking techniques, such as mind mapping and brainstorming. Graphic design teachers should create a balance among theory, practice, skill development and work experience. Also, teachers should offer various stimulating environments by promoting discussion between students. This would encourage them to create new ways of displaying and sharing their ideas.

### 3.11.5. Through the role of graphics students themselves

Graphic design students themselves can play a vital role in fostering the level of their creativity. It is argued here that if graphic design students comprehend clearly the
characteristics of creative people, they can imitate such characteristics and can increase their willingness to be more creative. Attributes of creative people have been outlined in the previous chapter. Antonenko and Thompson (2009, p.18) specifically outlined some attributes that are required for creative graphics students. These attributes are: firstly, knowledge of the field, which is "extensive research that leads to a deeper understanding of the topic"; secondly, utilisation of some ‘higher-order thinking skills’, for example, “comprehension, analysis, synthesis, application, evaluation, and creation”; thirdly, the ability to consider “multiple perspectives to design an audience-appropriate approach”; fourthly, some information management skills; and finally the ability to edit content through ‘verbal and visual rhetoric’. Students also need to be involved collectively in the process of creativity, accepting critiques, and managing to access sets of data (Antonenko and Thompson 2009, p.18). The following Figure (7) outlines some suggested methods to enhance the creativity of graphic design students.

Figure 7: Strategies used to foster creativity as suggested by the literature

This research reviewed some studies that developed pedagogical models to enhance the creativity of students. An example of these studies is Harpe (2006, p.236), a PhD thesis titled ‘Cognitive and behavioural strategies for fostering creativity in graphic design education’. It investigated some cognitive and social-psychological strategies in order to develop “two theoretical constructs that may be implemented as part of an undergraduate graphic design curriculum to cultivate creativity in students” (ibid., p.236). She seeks to develop two outcomes:
Firstly: “a learning program in creativity studies”, which is a set of study units that aims “to provide tuition in the theoretical foundation that students need to enhance their creative ability” (ibid., p.236).

Secondly: “a range of General Guidelines that aims to provide educators with a range of didactic strategies and practices to support and stimulate creative ability in graphic design students” (ibid., p.236). Harpe (2006) has included ‘cognitive and behavioural’ strategies, which have been divided into three areas:

- **“Product-related strategies”**, “these are a range of divergent thinking techniques that could be used in graphic design education to stimulate and promote idea-generation for creative products” (ibid., p.236). This section consists of “(1) Random Association, (2) Morphological Synthesis, (3) Metaphors and Analogies, (4) Mind-mapping, (5) Idea Checklist, (6) Visual Thinking, (7) Sense Connections” (ibid., p.236).

- **“Process-related strategies”**, which are a set of strategies that “focus on the effective management of the various phases of the creative process in graphic design education” (ibid., p.236). This section consists of “(1) Clarification, (2) Inspiration, (3) Distillation, (4) perspiration, (5) Evaluation, (6) Incubation”.

- **“Person-related strategies”**, which are social-psychological strategies that may be used in graphic design education to stimulate and maintain creative ability in students (ibid., p.236). This dimension consists of “(1) intrinsic motivation, (2) Self-belief, (3) Stress, (4) Self-regulation” (ibid., p.236).

Another relevant intensive study that investigates creativity development in relation to design is a PhD thesis conducted by Christiaans (1992) entitled ‘Creativity in Design’. This thesis explores the creative activity of the industrial designer; it aims mainly to “…extend jointly the scientific base of design methodology and educational design principles within the domain of industrial design engineering” (ibid., 1992, p.ix). It also investigates the aspects that “determine, within a domain, the creativity and can one’s creativity be increased by training?” (ibid., 1992, p.17). Christiaans argues, “Within the area of research on creativity many theorists seem to be focus on a universal definition of the concept, taking as a starting point either the trait or process approach” (1992, p.16). Christiaans (1992, p.16) examines creativity from both the artistic and engineering perspectives. She argues, “in the domain of the fine arts the concept of creativity has a different meaning than in the domain of engineering”. Engineering students tend to approach creativity as a process rather than a trait. “Creativity can probably be defined and studied as a special mode of problem solving.
However, as far as artistic creativity is concerned that paradigm may perhaps be unsuitable” (ibid., 1992, p.16-17). This perspective was argued earlier in the above sections of this chapter. Generally, the research on hand reflects positively on Christiaans’ thesis, as it studies creativity enhancement with learners and in relation to design.

The link between design and creativity is also outlined by Christiaans’s thesis. Obviously, the study by Christiaans approaches design from the same perspective as the research on hand. Christiaans (1992, p.ix) argues that it is, “a field where science and art, or systematic methods and creativity, are so deeply intermingled”. One of the assumptions repeated in this thesis is that “creativity is the most salient criterion of design” (ibid., 1992, p.ix). Design has been defined as an information-processing activity. Design links to creativity by default, simply because “being novel and innovative is by definition a feature of design” (ibid., 1992, p.ix). More importantly, the thesis is interesting because it investigates ill-defined design problems. Christiaans (1992, p.2) refers to Cross (1990, p.132) when describing the abilities of designers as follows:

- Resolve ill-defined problems
- Adopt solution-focussing strategies
- Employ abductive/ productive/ appositional thinking

Christiaans (1992) also discusses the issue of creativity assessment, and states that the assessment technique based on the consensus of judges is familiar in the design domain. Christiaans (1992, p.146) argues,

Designing is, to a great extent, the integration of basic knowledge into a design solution. Moreover, the solution must add something new to the designed world because design problems are, by definition, ill-defined as creativity cannot be accomplished through existing solutions.

Christiaans (1992, p.147) explains this further by stating,

In domains where problems are structured better (i.e. where strong solution oriented methods can be taught and employed) an important characteristic in the development of expertise, to shorten problem solving search paths, is the acquisition of ‘chunks’ or ‘script’ of problem situations. Conversely the design domain is characterised by ill-structured problems, where the development of a student’s knowledge of problem situations can be adequate if he/she is offered a large variety of design tasks. Creative
designing often means a very small deviation from existing solutions, but in order to make such as small step knowledge of all kinds of similar problem situations is necessary.

To sum up, this thesis is worth investigating because it studies the relationship between cognitive activity and the creativity of the design result. However, it investigates design from engineering perspective, whilst the research on hand investigates creativity from cultural and educational perspectives. Yet, it is still valuable because it attempts “to operationally define creativity and to find a reliable measuring instrument” (ibid., 1992, p.ix). Christiaans (1992, p.16) argues that, “it may be better to forestall employing a universal definition of creativity […] the concept of creativity is only meaningful within the context of the domain at issue”. This view works well with the view towards creativity argued by this research. “Creativity can only be conceived of as a ‘relative’ concept. Firstly, the judgement of what is creative or not is culturally defined, i.e. influenced by time, by domain and by ideas of people or groups. Secondly, especially when applied to education, the view that within a domain there are different levels of creativity has to be adopted” (ibid., 1992, p.18). Nevertheless, Christiaans’ research investigates creativity quantitatively, while the current research takes a qualitative approach.

Sternberg, and Williams (1996), in their book How to Develop Student Creativity, list 26 steps that should enhance the creativity of students, as outlined by Adams (2005, pp.16-17). These steps are:

**The prerequisites**
1. Modelling creativity
2. Building self-efficacy

**Basic techniques**
3. Questioning assumptions
4. Defining and redefining problems
5. Encouraging idea generation
6. Cross-fertilizing ideas

**Tips for teaching**
7. Allowing time for creative thinking
8. Instructing and assessing creativity
9. Rewarding creative ideas and products
10. Encouraging sensible risks
11. Tolerating ambiguity
12. Allowing mistakes

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Add complex techniques
13. Identifying and surmounting obstacles

Use role models
15. Teaching self-responsibility
16. Promoting self-regulation
17. Delaying gratification

Explore the environment
18. Using profiles of creative people
19. Encouraging creative collaboration
20. Imagining other viewpoints

The long-term perspective
21. Recognizing environmental fit
22. Finding excitement
23. Seeking stimulating environments
24. Playing to strengths
25. Growing creatively
26. Proselytising for creativity

According to Petrowski (2000, p.305), Mary Murdock presented a plenary session at the International Conference on Creativity and Universities in 2000 in which she developed general guidelines that would provide an ideal climate for creativity in the classroom. These guidelines start by providing “opportunities for student choice and discovery”, then “emphasize mastery and self-development”, followed by “promote supportable beliefs about creativity”, and finally “teach techniques and strategies for creative performance” (Petrowski, 2000, p.305).

3.12. Approaches to assessing creativity

One of the most controversial issues in the field of creativity is the possibility of assessing or measuring the creative acts of people. If this is possible, how can it be done (Mayer, 1999, p.451)? Many researchers have tried to find methods to assess creativity (e.g. Guilford, 1979; Torrance, 1974). Reviewing the literature confirmed that for several studies (e.g. Mayer, 1999) studying creativity assessment took a psychological approach. During the 1970s, cognitive psychologists began new approaches for examining and measuring the creativity phenomenon. Such studies focused on measuring mental processes instead of creative personalities. The most widely examined approaches were the psychometric, the experimental, and the biographical (ibid., 1999, p.452). The psychometric approach is one of
the oldest methodologies for studying creativity, besides the experimental approach that depends on “the tried-and-true method at the heart of classic research in cognitive psychology” (ibid., 1999, p.452). These two approaches are quantitative methodologies, whereas the biographical approach usually combines both quantitative analysis and qualitative approaches. The following paragraphs discuss these approaches and investigate their advantages and shortcomings. They have been included here for two reasons: 1) they are part of the investigation of creativity assessment; and 2) to reflect on them positively and assess how they can contribute to the research on hand. Petrowski (2000, p.305) argues, “Each of the major methodologies (psychometric, experimental, biographical, biological, contextual, and computational) contributes unique insights to our understanding”.

The psychometric approach is a quantitative assessment tool that depends more on measurable outcomes than theoretical discussion. One of the main examples of the psychometric test is the Torrance Test of Creative Thinking (TTCT), developed by Paul Torrance in 1966. This test is one of the most internationally recognised tests. Hokanson (2008, p.105) states that it is “by far the most commonly used test of divergent thinking and continues to enjoy widespread international use”. Within this approach, “Creativity is viewed as a mental trait” (Mayer, 1999, p.452). This type of test “deals with the quality of the measurement of personality characteristics and interpersonal differences” (Schuler, 1998).

This test enables all applicants to be ranked on a uniform scale and, relative to other selection tools, is less affected by the different background of each applicant or other subjective factors. Sternberg and Lubart (1999, p.35) believe that using this test to assess the creative potential of humans is a challenging task. Sternberg and Lubart (1999, p.35) argue,

The psychometric approach is significantly more complex and comprehensive than its critics (and many of its proponents) would have us believe, and alternatives to the psychometric approach are wrought with many of the same difficulties posed during the direct measurement of creativity.

To sum up, it is argued here that this test would not be considered within this research, because the “Psychometricians assume that creativity is a measurable mental trait (like intelligence) and focus on developing tests which measure divergent thinking” (Petrowski, 2000, p.305). This view contradicts this research’s account of creativity as a skill or a ‘cultural activity’. “Art and design may now both be explained as parts of a general human creativity” (Barnard, 2005, p.171).
The experimental approach views creativity as a cognitive process, as the psychometric approach do, and comprehends these processes as mostly deployed in solving ‘wicked problems’. It investigates the use of creative-thinking strategies to enhance people’s creative problem solving performance. To assess creativity, this approach uses thinking methods including brainstorming and productive thinking programmes. It is argued here that this approach would be helpful for the research on hand, since it defines ‘creativity’ as problem solving.

The contextual approach “focuses on creativity in its social, cultural, or evolutionary context” (Mayer, 1999, p.458). It studies “the context of the creative people and creative production more than focusing on creative thinking in individuals” (ibid., 1999, p.458). Csikszentmihalyi, (1999, p.313) argues that, “creativity is as much a cultural and social as it is a psychological event”. Contextual approaches suggest a culture (as domain), society (as field) and the individual.

Many other approaches (i.e. biographical, biological, and computational methodologies) have been developed recently to assess creativity. Biographical approaches have been used to analyse case histories of creative people, running a qualitative description (case studies), and the biological approach depends on cognitive neuroscience assessment. Both identify creativity “as physiological changes that accompany creative problem solving” (Mayer, 1999, p.456). The computational approach “brings a level of precision that is rare in creativity research and that offers an objective test of theories of creativity through computer simulation” (ibid., 1999, p.456). These approaches do not take into account the definitions of creativity found in the research at hand: they are outlined here only to explain how creativity assessment has been comprehended from a variety of perspectives.

The most important problem associated with the assessment of creativity is the lack of convergent validity among different methods. “Each method is purported to be measuring creativity, it is reasonable to predict that they be correlated, thus satisfying a minimum condition of convergent validity” (Hocevar, 1981, p.457). This suggests that a variety of methods should be used to assess the creativity of individuals. Sternberg (1995) states, “Assessment of such a multidimensional construct as creativity requires multiple channels of measurement such as tests and inventories”. For example, a social-personality approach to the assessment of creativity is outlined in Sternberg, Jarvin and Grigorenko (2010, p.93) in which he argues, “Developing in parallel with the cognitive approach, work in the social-personality approach has focused on personality variables, motivational variables, and the socio-cultural environment as sources of creativity”. According to Wechsler (2003, p.2),
“Societies tend to recognise their talents through prizes or awards, so one could possibly identify creativity using this criterion”. The creativity was defined by the social recognition of the subjects’ production, by means of local, state or national prizes.

To sum up, all of the approaches discussed would help a little in this research, simply because this research comprehends creativity assessment from a cultural perspective, and defined as problem solving that is explained as cultural production. The main disadvantage of previous approaches is the fact that they deal more with ‘personality traits’ and understand creativity as ‘mental computation’. Therefore, they cannot assess creativity, at least within the context of this research. Accordingly, there is a need for a specific educational approach that can assist graphic design lecturers, training them how to assess their students’ creative problem solving skills. Cole Sugioka and Yamagata-Lynch (1999, p.8) suggest that teachers must “promote the use of journals, open-ended problems, portfolios, interviews, and performance assessment. This measure allows students to discover the new rules of grading alternative assessments reward their unique contributions rather than their short-term memories". Elton, (2006, p.4) argues that the portfolio is highly significant, as it can show the level of a student’s creativity: “…it is best to submit creative work in the form of portfolio and to report on it in terms of a profile […] students may consider their portfolios more important that their degree class when job hunting”.

In order to suggest a suitable creativity assessment method that can assess the creativity of graphic design students in the Omani educational system, this research has reviewed the relevant educational literature (e.g. Tudor, 2008) and collected primary data through two methods (i.e. interview and questionnaire). The literature discussed creativity assessment specifically in graphic design education. This helped to evaluate these assessment methods. However, further investigation was required to specify a workable assessment method that would help to evaluate the ‘creative’ production of graphic design students. Therefore, a question was raised in this section about the suitable assessment method that could be used to assess the creativity of graphic design students. The result of this investigation would contribute in constructing the assessment section as a separate part of the ‘Creativity Enhancement and Assessment Model’ (i.e. Chapter Six). The proposed assessment criterion is discussed in the following section.

3.13. Assessment practice in design research

The assessment of creativity in design is one of the most contentious issues facing design education. Williams and Askland’s (2012) report is one of the valuable resources that has investigated this issue very recently. Williams and Askland (2012, p.4) argue, “There is a pattern underpinning assessment that scales the assessment support tools and the
enablers, as well as the quality principles, according to anticipated objectivity and subjectivity, and summative and formative qualities”. They have “developed a common conceptual framework for understanding creativity for which expected learning outcomes and appropriate assessment practices can be established” (ibid., 2012, p.4). They have also developed “a multi-level assessment model that can assist academics in the identification of the combination of elements that support best practice assessment in design education” (ibid., 2012, p.4).

Elton’s (2006) article is another interesting source relevant to this research, as it studies creativity assessment and its development within undergraduate curricula in different disciplines. Elton (2006, p.3) argues, “Neither creativity nor criticality can be adequately assessed in time limited examinations”. Elton (2006, p.6) states:

To form a judgment of a particular piece of work, it has to be done on the basis of a list of general criteria […] through discussion between assessors after students have presented their work; it is not possible as a rule to lay down assessment criteria in advance, as it is exactly this feature of traditional assessment, i.e. basing assessment on predetermined outcomes, which takes away from the originality, criticality and creativity of the work. For that reason such assessment has been called interpretivist (Johnston 2004), as opposed to the traditional positivist approach, in which performance is matched against previously determined performance criteria.

Prof. Bernadette Blair is another example of the few scholars who have intensively studied studio-based pedagogic practice, learning studio critique, formative feedback, Ipsative assessment, and student-centred learning. Blair (2006) was a pioneer in the learning value of the large studio critique ‘crit’. In her EdD thesis, Blair reviews the practice of critiques in UK Art and Design higher education: “The verbal feedback students receive in studio crit sessions, together with written feedback, concludes that students’ interpretation and understanding of verbal formative feedback is not always the same as their tutor” (Blair, 2010, p.11). Blair (2010, p.11) argues, “the studio crit is an established and important part of a studio-based culture, where teachers and students can discuss, experiment with and develop ideas and concepts within a ‘supportive environment’”. Reviewing Blair’s work is valuable addition to the research at hand, as it extends the dialogue and responsibility of student involvement in assessment and feedback. This review confirms that, when art and design students receive a reliable assessment and feedback, it reflects directly into their learning outcome and learning experiences.

Similarly, Christiaans (1992, p.146) has studied the effectiveness of feedback provided by lecturers to students:
One of the educational principles based on learning theories is the importance of feedback to the student. However, particularly in academic design education, there is a greater chance that the analytical aspects will receive considerably more attention by way of feedback, than the integrative.

The approach that values the participation of both lecturer and students in the assessment process was preferred and outlined by several scholars (e.g. Williams and Askland, 2012; Blair, 2010; Christiaans; 1992). Williams and Askland (2012, p.4) argue, “to avoid ambiguity and create a constructive dialogue between teachers and students, an understanding of perceptions [of creativity] as they form part of the social field is required”. Design lecturers and students feel frustrated when they judge the component of creativity in the artwork; this ambiguity diffuses into the context of design education. Therefore, Williams and Askland (2012, p.24) found that their study,

Illustrates the need to carefully consider how creativity – as a skill, tool or method guiding the design process and/or a characteristic of the final product - forms part of the assessment task and its learning objectives and the need to employ means that lead to objective, transparent, fair and equal assessment of the student's creative efforts.

Blair (2010) values the role of the environment in supporting an ideal feedback practice. Similarly, Demirkan and Afacan (2012, p.264) argue that, “In architectural design process the interaction between person, creative process and creative product inside a creative environment should be considered as a total act in assessing creativity”. “If students are learning in a supportive and what they perceive as a non-threatening environment, then motivational beliefs are likely to be higher and they are more likely to ‘make sense of the tasks in hand’” (Blair, 2010, p.12). Williams and Askland (2012, p.24) confirm that there are,

Implications for the assessment of creativity as it provide space for individual growth through reflection and subjective feedback from experts in the field. It illustrates the need to maintain a dialogue with the student about their creative processes and, subsequently, enhance their understanding and judgement of what constitutes creative design solutions in an evolving field.

Blair concludes that there is a “need to continually review the design curriculum’s modes of feedback” (Blair, 2010, p.12). She argues, “The student’s perception of their role in the crit together with their perception of self can distract the student from the task in hand and block any learning experience” (ibid., 2010, p.12). In addition, she found that, “Students
also voiced examples of subjective, negative feedback from teachers, which could block and interfere with any learning experience” (ibid., 2010, p.11).

The relationship between self-confidence and the quality of student’s creative performance is critical to the quality of the learning experience of the individual student. An under-confident individual anxious about the task is more likely to seek out more predictable, non-challenging and unimaginative solutions (Blair, 2010, p.12).

Most of the above-mentioned scholars have developed assessment models or frameworks that can be used in assessing creativity in design education contexts. For example, Williams and Askland (2012, p.24) have proposed an assessment model based on the idea that,

Creativity has to be subjected to both summative and formative assessment processes; it has to be assessed for certification and learning purposes. This requires an objective and transparent framework that simultaneously provides room for reflection, subjective feedback and critique”.

Sarkar and Chakrabarti (2011, p.348) also developed “individual methods for assessing novelty and usefulness of products, and then combine[d] these into a method for assessing creativity of products”. They argue, “A method for assessing the degree of creativity is necessary to help select the most creative product” (ibid, 2011, p.348). To develop this method, the study started by “understanding what is meant by creativity, and what its current measures are, and how adequate these are”. However, the study focuses intensively on two elements of creativity (i.e. novelty and usefulness) and neglects all other elements. “Since the core components of creativity are ‘novelty’ and ‘usefulness’, a direct measure of creativity should be in terms of measures of both product novelty and product usefulness” (ibid, 2011, p.348). It is argued that this would be a shortcoming in approaching creativity assessment: instead, the research on hand argues that creativity is not limited to novelty and usefulness. Also, Demirkan and Afacan (2012) developed “an instrument for measuring the creativity of the artifacts in design education” (Demirkan and Afacan, 2012, p.264). “This study defines design creativity as the conceptual judgement of the design instructors” (ibid., 2012, p.264). The following paragraphs outline examples of assessment practice in graphic design education reviewed and outlined from the literature.

3.14. Example of assessment practice and pedagogy in graphic design

3.14.1. Ipsative assessment

Ipsative assessment (also known as ‘developmental assessment) is a type of assessment where a person’s performance is compared with their previous performance to
determine whether any improvement has been made, or any added value has been achieved. In education, it measures the improvement that students may make from one moment in time to another. In this type of assessment there is no relation to any national or local norms; it is mainly concerned with the evaluation of personal achievement over time. It is different from norm-referenced tests, which measure the person’s performance against other people’s performances: in Ipsative assessment, the benchmark is measured against any change which might have happened in the person’s own performance only.

Specifically, in education and psychology, this type of assessment is used widely as a descriptor that can indicate a specific type of measure in which respondents compare two or more desirable options and pick that which is most preferred. The process starts by asking students to sit the same test prior to and after completing a specific unit: the teachers here should follow the student’s average percentage mark or overall grade average throughout the whole course. Ipsative assessment is also used widely in sports assessment, for example, following how an athlete’s achievement has improved in several aspects, such as time and distance. Rayment (2007, p.79) argues,

Diagnostic assessment approaches students’ work and behaviour as evidence for the analysis of their ability in a given field (it is often used to discover learning needs). It can be used constructively as a vehicle for discussion between teacher and student, where both parties consider progress, perhaps defining targets for future development. It can be a powerful motivating factor for students. Negotiated assessment in the form of constructive criticism promotes learning and a degree of student ownership in the assessment process.

This kind of assessment may be more useful for evaluating the traits of each learner, and it is useful in identifying faking and improved motivation, simply because the learner is encouraged to beat his/her previous scores. In fact, self-assessment provides teachers with insights about students’ understanding of their own improvement. Rayment (2007, p.79) argues, “developmental assessment reinforces positive qualities, comparing a student’s present performance with past performances”. It is obvious that Ipsative assessment is different from criterion-referenced assessment and norm-referenced assessment. The main advantage of this type of assessment lies in the fact that it is “intrinsically learner-centred, it is made by negotiation between teacher and taught and often takes the form of student self-assessment. This provides an opportunity for students to appraise themselves in a non-competitive climate” (ibid., 2007, p.79).
3.14.2. Formative assessment

Formative assessment is a diagnostic method of assessment where teachers usually build in many opportunities to assess the process of their students' learning and then use the collected information to change the instructions. It is a constructive type of assessment that is usually applied in most learning activity as a continuous process. The main aim of formative assessment is to allow teachers to specify exactly what students know and in which aspects they may be weak, in order to carry out responsive steps or measures during the act of teaching. In this assessment, teachers can usually conduct discussions or observations with their student, or perhaps analyse their tests and assignments. This type of assessment allows teachers to provide the required on-going feedback or instructions to their students, over the course. It is not a process of assessing the final product. Rayment (2007, p.79) argues, "Formative assessment at its best is assessment FOR learning as well as OF learning and plays an integral part in the development of projects; it encourages and guides students' work forward".

This assessment is effective in art and design, owing to the fact that “… if students do not receive regular positive feedback on their work they can quickly lose motivation and become unsure of their own assessment of success or failure" (ibid., 2007, p.79). Formative assessment is useful because it uses diagnostic feedback from the students to alter and adapt the teaching and learning process to meet students’ requirements. In fact, this is the essence of any assessment that considers all activities and actions undertaken by both teachers and students to enhance and alter teaching and learning procedures. For example, when teachers recognise how students are progressing and where they might have some problems, they can make the necessary instructional adjustments using the collected information. Teachers here can probably offer more opportunities for practice or perhaps reteach areas, or try alternative instructional approaches: all of these steps can improve the chances of students' success.

Formative assessment offers several benefits and purposes. Examples of these benefits were outlined by Ramaprasad (1983) and Sadler (1989), as criticism and continuous feedback can guide students through the actions necessary to achieve the desired goal. Such feedback assists students to identify any possible gaps between their anticipated aim and their current knowledge, skills or understanding. Therefore, formative assessment encourages teachers to provide suggestions and comments about mistakes, or feedback on tests or assignments. Firstly, such valuable feedback helps students to improve their work, and encourages them to focus their attention thoughtfully on the task itself rather than searching for the right answers. The second benefit of this assessment is the fact that,
it can help students whose achievement is low, as it places more emphasis on the idea that the level of those students can be improved further if they pay more attention and put more effort into their studies. Thirdly, “formative assessment helps support the expectation that all children can learn to high levels and counteracts the cycle in which students attribute poor performance to lack of ability and therefore become discouraged and unwilling to invest in further learning” (Ames, 1992, and Vispoel and Austin, 1995, cited in Boston, 2002).

Even though most feedback usually comes from teachers towards students, formative assessment allows students to play an important role through self-evaluation. This is another advantage of this type of assessment. Boston (2002) outlines two experimental research studies conducted by Fontana and Fernandes (1994) and Frederikson and White (1997), which showed “that students who understand the learning objectives and assessment criteria and have opportunities to reflect on their work show greater improvement than those who do not” (Boston, 2002). Teachers within formative assessment can use several pedagogical strategies, and can beneficially increase students' knowledge and enhance their understanding. An example is discussion and asking questions. Boston (2002) argues, “Teachers need to make sure to ask thoughtful, reflective questions rather than simple, factual ones and then give students adequate time to respond”. As a result, formative assessment would be an effective form of assessment in art and design education practices.

3.14.3. Formative assessment in project-based and studio-based learning

Ellmers (2006) argues that most of the present pedagogical strategies employed in modern pedagogical design systems involve project-based or studio-based learning. This strategy starts with "setting the design problem, periodic lectures, critique of student work (four distinct types: desk critique; pin-up; interim/midterm critique; and final critique), and assessment by jury" (ibid., 2006, p.1). However, these systems have some shortcomings such as over-emphasising the design project rather than teaching students the creative design process. As noted by Blumenfeld et al. (1991, p.369) project-based learning is identified as a “comprehensive approach to classroom teaching and learning that is designed to engage students in investigation of authentic problems”. This strategy of learning can be a beneficial addition to the development process of the Omani design pedagogical system. Therefore, this research outlines the advantages of project-based and studio-based learning to serve this purpose. The project-based approach works well with the main hypothesis of this research, within which solving problems creatively is encouraged.

It is argued that Omani graphic design students should marry theoretical and practical experiences. Davies (2012) in his recent book, Graphic Design Theory encourages and teaches graphics students how to evaluate design work critically. Implementing theoretical
frameworks would assist students in their studio practice-based learning to improve their creative production. As mentioned by Blumenfeld et al. (1991, in Ellmers, 2006, p.1), “By placing students in realistic, contextualised problem solving environments, project-based learning can serve to establish bridges between knowledge gained in the classroom and real-life experiences”. A generalised model of project-based learning explained in the following steps (see Figure 8).

![Figure 8: Assessment process of project-based learning](image)

Ellmers, (2006, p.1) argues that, “first, there is the articulation of a driving question from which the students then enter into the activity of designing, which is usually collaborative in nature. As the project develops, the work is formatively assessed from which the students then revise their work entering into further design activity. The students cycle through these three steps before proceeding to the final step of project presentation”.

There are four central stages in the studio-based learning assessment process as described by Kvan (2001 in Ellmers, 2006, p.2). These steps start with formulating the design problem; solutions are then explored through action-based activity; and the problem is then re-examined. The student repeats these steps continually until they reach the final stage, which is the jury examination. These stages are summarised by Figure 9.
Problem-based learning starts with problem formulation; a solution is developed through a self-directed learning approach; then the problem is re-examined and the suggested solution tested (Ellmers, 2006, p.2). Figure 10 highlights all of these steps.

3.15. Assessing creativity by criterion-referenced testing

There was a need to investigate some pedagogical tests used in education to assess the creativity of graphic design students. One of the most commonly applied tests is ‘criterion-referenced testing’, which is an assessment system in which an award or the student classification is made on the basis of the student’s performance, regardless of the
performance of other students in the class. It usually reports the performance of students in terms of acquired skills and knowledge. It does not only depend on a sample, as in the case of norm-referenced tests. The application of criterion-referenced testing requires teachers and students to agree on clear descriptions (criteria) of the performances being sought. Therefore, criterion-referenced testing is fairly reliable, as its scores can provide an indication of any improvement in learning for students.

On the other hand, the norm-referenced test is one in which students are usually placed in rank order and predetermined proportions of them are placed on various levels. This type of testing requires that the grade given to a specific student depends entirely on a comparison of that student’s performance with those of all the other individuals or groups, rather than upon their own performance.

Criterion-referenced testing has been acknowledged by several educational scholars (Davies, 2000; Lai, 2007; Harpe and Peterson, 2008) as being a practical assessment system that can assess student-learning outcomes in art and design education. Harpe and Peterson (2008, p.3) argue, “It is now widely accepted that good assessment is holistic, incorporates integrated capabilities, acknowledges the developmental and iterative nature of learning and skill development and goes beyond merely assessing recall of content knowledge”. This understanding fits well with the understanding of creativity assessment of this research as a ‘cultural activity’ that values the continuous learning and development of the creative person. Such development would lead them to solve design problems creatively.

However, there are some problems associated with the criterion-referenced test, including, “Within art and design education, the demand for an assessable product, criterion-referenced to pre-set learning outcomes, has begun to shift the emphasis from creative process to final outcome” (Dineen and Collins, 2004, p.1). This would be a problem for this research, simply because the assessment ignores the importance of the ‘creative process’ and focuses mainly on the final outcome. The creative process is a crucial part of the holistic picture of creativity as a problem solving process suggested earlier. However, this disadvantage can be overcome by adding a component to criterion-referenced testing that would assess the creative process efficiently. Mason (2007, p.61) suggests a solution for these difficulties:

Teachers appeared ill-equipped to handle criterion referenced assessment. They experienced difficulties, using written grade descriptions to assess visual images and using exemplary photographs of students’ artwork. Dialogue between teachers about how they are grading students’ artwork is crucial to avoid orthodoxy. Exemplary visual materials are no substitute for looking at real works of art and may be prescriptive.
To sum up, creativity is understood in this research as ‘problem solving’, which is used as a basis for constructing and suggesting a suitable tool to assess the creative problem solving capabilities of graphics students. Through criterion-referenced testing, “the point is not to identify students in terms of some characteristic, but to identify performances that tell us what has been learned and how well one student's result is quite independent of any other student's” (Biggs and Tang, 2007, cited in Harpe and Peterson, 2008, p.3). For the creative disciplines, this means identifying clear assessment criteria, as well as assessing all aspects of design/art making, including product, process and person, which is more important than focusing merely on the characteristics of the creative person. Such understanding is compatible with how creativity should be treated as problem solving skills within the context of this research.

3.16. Chapter summary

The conceptual framework of this research is Williams’ (1961) account of creativity as a ‘cultural activity’. This framework is compatible with Wolff’s (1981) account of creativity as ‘cultural production’. Williams (1961) criticised the Western traditions’ (e.g. Plato and Aristotle) romanticism and rationalism views towards creativity, and defined the ‘creative’ act as everyday cultural activity. Accordingly ‘creativity is in all our life’ in a form of ‘effort of learning’. It is argued that this works well with the theoretical framework of this research, which is the creativity educational theory of Lev Semenovish Vygotsky (i.e. ‘productive’ vs. ‘reproductive’ learning theory). Vygotsky argues that creativity is a generative form of ‘productive’ learning of the individual who always searches for new knowledge. This theory is different from the ‘traditional’ form of ‘reproductive’ learning, which usually replicates established knowledge and skills. Based on this theory, creativity can be seen here as a continuous improvement. Therefore, this research intends to propose a specific structure or procedure (i.e. pedagogical strategies) that can suggest ways to enhance the creativity of Omani graphics students within the educational context.

In regard to creativity assessment, reviewing the literature has shown that ‘criterion referencing testing’ would be an accepted suggestion as a creativity assessment model to assess graphic design students’ outcomes in the Omani higher education system, yet this suggestion required further empirical investigation through interviews and questionnaires. Sufficient resources are available that have studied the criterion-referenced test from a pedagogical viewpoint; however, there is still a shortage of studies on this test in relation to the art and design disciplines, and therefore this research intends to pursue this task. This is based on the fact that there is a need to investigate the possibilities of applying the criterion-referenced test in assessing the creativity of graphic design students. Such an investigation
will be conducted through questionnaire and interview methods that ask design lecturers and experts about their perspectives on this type of test.

There are some gaps: variables, themes and issues have been extracted from reviewing the literature. The main issues of the research are creativity definition, creativity in relation to graphic design education, and how to enhance and assess the creativity of students. There is also a shortage in the literature that covers the role of the graphic design lecturer in developing the creative abilities of students. Therefore, there is a need for further enquiries to investigate the nature of creativity in the graphic design context and to collect more empirical data, which can clarify the responsibilities of design lecturers in enhancing and fostering the creative problem solving skills of graphic design students. As a result, a question has been raised about this issue. The answers will be in the form of a ‘pedagogical’ model (i.e. Chapter Six) that outlines all of the techniques and strategies, curriculum contents, and assessments that could be used by graphic design lecturers in Oman as a creativity enhancement guide.

The following topics are the main issues considered by this research, followed by the constructed research questions.

- The nature of creativity in graphic design education.
- Teaching and enhancing creativity in graphic design education.
- Techniques and pedagogical strategies that can enhance creativity.
- The contents of graphic design curricula that can improve creativity.
- Creativity assessment in relation to graphic design education.
- Suitability of the criterion-referenced test to assess creativity in graphic design education.
- The process of developing a ‘Creativity Enhancement and Assessment Model’.
- Can creativity be taught to graphic design students?
- What pedagogical strategies can enhance the creativity of Omani graphic design students?
- What contents of the creative design curriculum can foster students’ creativity?
- What is the role of the graphic design lecturer in enhancing the creativity of graphic design students?
- What is the role of graphic design students in developing their own creativity?
Chapter Four: Methodology

4.1. Chapter overview

This chapter introduces the reader to the methodology of the research. Section 4.2 outlines the basics of the methodology of the research in general. Section 4.3 explains the interpretative methodology, by comparing the two main paradigms of epistemology (i.e. positivism and interpretivism). Section 4.4 introduces the inductive research approach, followed by Section 4.5, which gives a justification of using a survey as the main research approach. Section 4.6 highlights a brief revision of the research problem. Section 4.7 reminds the reader about the conceptual and theoretical context of the research. It also highlights some theoretical methods or models that were best suited to explore the research problem, for example, the cultural model, sociological method, and design theory. Section 4.8 gives an explanation of how the research was designed. This is followed by Section 4.9, which outlines the research process.

Section 4.10 discusses the research methods (i.e. semi-structured questionnaires, semi-structured interviews) employed within this research to collect the required data. The data-collection processes, such as the participant selection and pilot study, are described separately in sub-sections. Each method has contributed, to some extent, to fulfilling the research aims and answering the research questions. For example, the questionnaires helped to determine issues that related to creativity in relation to graphic design internationally, while the interviews investigated the same issues but in relation to the local Omani educational context. Section 4.11 clarifies the ethical issues of the research and this is followed by a plan in Section 4.12 that was adopted to improve the reliability and maximise the validity of the research findings. Section 4.13 introduces the thematic analysis method used to analyse the data. Finally, this chapter concludes with Section 4.14, which is a plan towards the development of the thesis in all stages of the research.

4.2. The basics of the methodology

The research methodology differs according to the type and nature of the research. Hickman (2008, p.16) defines research methodology in general: “Methodology at its most basic refers to the study of methods; it does, however, go beyond that, referring to the theoretical background to research and its implications for the particular research method employed”. Hickman (2008, p.16) gave an example, “one's methodology might be interpretive, and working within a constructivist paradigm, and one might employ particular qualitative research methods, such as interviews and focus group”. So, each methodology should be based on a particular paradigm that constructs the form of the methodology and
describes its aspects and requirements. Traditionally, there are two main types of research methodology (i.e. qualitative and quantitative). Quantitative usually deals with numbers, figures, statistics, etc., whereas qualitative research mostly deals with texts, scripts, images, etc. However, both approaches have some limitations and strengths. It was important for this research to review the literature to gain a general overview of these methodologies, and investigate the research paradigms and approaches, in order to find the relevant research methodology that suited the research on hand. Examples of the literature that has investigated this intensively are Punch (2005) and Blaxter, Hughes and Tight (2006).

Moreover, in order to specify the suitable methodology for this research, the aims and research questions were taken into account along with the relevant literature. The methodology is very important to guide the research, as its ultimate goal is to answer the research question and fulfil the aims. Accordingly, the research on hand employed an interpretive methodology that utilised a survey approach to collect the required data through two methods (i.e. questionnaire and interview). The selection of such methodology was based on a discussion of creativity, which is a controversial phenomenon interpreted differently in various fields and by different people. Such a hermeneutic methodology should deal with the meanings of creativity, as expressed by specific people using their own terms. Various interpretations were required to outline the possible numerous meanings conveyed within such interpretations. An investigation of creativity could not be a quantitative one in any case, but was rather an interpretive constructed investigation, which required a qualitative discussion. One expected interpretation of creativity is as ‘problem solving’, which is usually identified as a ‘cultural production’. This definition is argued by this research and discussed intensively in the literature. This perspective helped to limit the intended interpretations from the respondents. For all these reasons an interpretive methodology was correctly selected for this particular research. The following section explains the fundamentals of this type of methodology.

4.3. Positivism and interpretivism

The process of conducting any research should be based on a specific research philosophy (Saunders, Lewis and Thornhill, 2009). The research philosophy is a reflection of the methodology that a researcher has utilised in thinking about the development of their knowledge. Accordingly, it was important for this study to understand the philosophical issues associated with this research in order to construct a suitable research methodology. In general, there are six research philosophies (paradigms) used by researchers in social science research (Maylor and Blackmon, 2005). These paradigms are positivism, interpretivism, realism, subjectivism, constructivism, and critical realism. Collis and Hussey
focused more on only two main philosophies (i.e. positivism and interpretivism) that are used in social science research to investigate specific phenomena (Jankowicz, 2000, p.111). The philosophical paradigm was chosen for this research based on the scope of enquiry, the source of the data, the research questions, the hypotheses, the constraints, and the overall research aim (Yin, 2009). Based on this, the research on hand belongs more to the ‘interpretative’ paradigm. The following comparison, argued by Jankowicz (2000, p.111) clarifies the main differences between the positivist and interpretative paradigms.

Jankowicz (2000, p.111) argues that in positivism the phenomena are usually defined in terms of observable and repeatable experimental situations and in terms of specific variables, whereas, in interpretivism they are explained in terms of meanings of issues under investigation. The data can be collected in positivism by the allegedly (or supposedly) dispassionate outside observer, while in the interpretative paradigm the data are collected through asking the participants and observers, all of whom have different levels of participation. In positivism, researchers can usually distinguish what is true from what is false, if the evidence is given. Researchers are then enabled to agree on the given research. On the other hand, in interpretivism the truth is usually difficult to determine in any absolute way. Any researcher here is capable of utilising evidence to work towards a consensus, but should sometimes conclude that the truth is inaccessible.

The purpose of positivist enquiry is to build or develop a theory that can be applied for testing purposes, whereas the purpose of interpretative enquiry is to gain sufficient understanding that can help to anticipate future outcomes and their meanings for the participants and the observers. So, applying the theory is optional here, as the understanding is ‘theory in action’ or from action (Jankowicz, 2000, p.111). Accordingly, it is argued that positivism is a form of empiricism, so it is naïve and theoretically unsophisticated when it comes to meanings. In contrast, the research on hand is all about meanings, so it would be an interpretivist paradigm anyway, in the form of a hermeneutic discussion.

Amaratunga et al. (2002) argue that interpretivism stresses the understanding of human experiences in a specific research context. So, it would recognise the participants of this research who give meanings to the things that they do. Therefore, there are double hermeneutics here: the first is the understanding of this research of what the participants are doing; and the second is the understanding of those participants of what they are doing. The interpretation of the ‘creative’ activity conducted by those people could be inaccurate, simply, because the researcher is different from them, for example a different gender or different culture. Even the participants’ interpretations of their own ‘creative’ activities could be inaccurate because they do not know exactly what such activities mean to them.
This notion is aligned with this research’s approach of creativity as a human phenomenon that is interpreted differently in different cultures. ‘Reality’ in the interpretative view is not objective and external; it is socially constructed as the meaning is given by people (Easterby-Smith, Thorpe and Lowe, 2002, p.29). The justification for choosing this particular research philosophy for the research on hand is the fact that this research aims to conduct an in-depth study in order to comprehend the main issue (i.e. creativity) within a specific culture and particular context (i.e. graphic design education). The data collected from a specific group of people (i.e. graphic design lecturers) would help to explain the issues under investigation. This is based on the fact that the interpretative methodology can ideally deal with beliefs, different realities, attitudes and experiences within specific cultural contexts, and clarify the way in which such experiences are exchanged between people.

4.4. Research approach

Several researchers (e.g. Jankowicz, 2000; Maylor and Blackmon, 2005; Yin, 2009) argue that the selection of the research approach should be based on the research questions, and main aim and objectives of the research. The main two research approaches are deductive and inductive. The deductive approach usually intends to address questions that have been generated from the most relevant theories, or to test specific hypotheses. The researcher here usually develops a theory or hypothesis, and then designs a research strategy in order to test it. So the literature here leads the researcher to the questions and hypotheses.

The qualitative content analysis method would be used to analyse the data, simply because the approach of this research is inductive. Specific processes of this type of analysis are designed to condense the collected raw data into separated themes and categories based on valid inference and interpretation (Zhang and Wildemuth, 2009, p.2). This research is inductive simply because the themes and categories have emerged from the collected information. To distinguish such themes, a cautious consideration, careful examination, and constant comparison should be made by the researcher.

Inductive research is mostly based on specific topics or themes or certain inferences that are derived from the data. So, the data here are collected first and the theory is developed as a result of the inductive approach analysis. The research approach that has been taken into account within this study is inductive research, for two reasons: 1) because the reasoning used in this study is more in the realms of critical thinking than formal logic; and 2) because the collected data is used to develop the theory (Maylor and Blackmon, 2005). Research that uses the inductive approach is concerned more with the context and events to comprehensively understand the research context (Saunders, Lewis and Thornhill,
It is a process where researchers study particular phenomena, and on this basis, arrive at conclusions.

To sum up, this research employed an inductive survey approach within an interpretive methodology. It is a qualitative investigation that combines "... methods to examine specific phenomena" (Hickman, 2008, p.195). The survey approach consists of two research methods: questionnaires and interviews. They are extracted from the research methodology categorisation developed by Blaxter, Hughes and Tight (2006, p.63). In this categorisation (see Figure 11), according to Blaxter, Hughes and Tight, (2006, p.63) there are two main research families: 1) Quantitative (i.e. deskwork); and 2) Qualitative (i.e. fieldwork); and there are six main approaches and four research techniques. Research methods are a collection of techniques used to collect data. According to Blaxter, Hughes and Tight (2006, p.63), questionnaires and interviews are regarded as research techniques derived from a survey approach. The purpose of employing these two methods is to compare the generated results against each other, since both investigate a similar set of issues but from two perspectives (i.e. international and local Omani perspectives).

![Figure 11: Research methodology categorisation, approaches, and research techniques, based on Blaxter, Hughes and Tight (2006, p.63)](image)

### 4.5. Justification for using the survey approach

It was important from the beginning of this research to find a reliable approach that "can provide a lot of data relatively quickly" (Blaxter, Hughes and Tight, 2006, p.76), because of the fact that the data-collection processes were delayed. The reason for such a delay was the unsuitability of the quantitative methodology (i.e. Torrance Tests of Creative Thinking instrument) that was suggested at the beginning of the research, which was later cancelled. The reason for not implementing the quantitative approach is the imperative of the
generalisability of such a quantitative methodology. The previous methodology plan is included in Appendix 1. In fact, this research does not intend to generalise any facts or notions. Cohen, Manion and Morrison (2000, p.13) argue that pure quantitative data is usually used to generalise facts that have been discovered after systematic research. As a result, a purely quantitative approach is not sufficient in the case of this research. Therefore “what works is what is useful and should be used, regardless of any prior assumptions” (Hickman, 2008, p.192). Blaxter, Hughes and Tight, (2006, p.84) have also confirmed this by stating “Your main method may, for example, be a questionnaire survey, or a set of interviews, or a series of observations, but this is likely to be complemented, at the very least, by some documentary analysis”.

However, there are some disadvantages of the survey approach in general, for example, “the researcher is often not in the position to check first-hand the understanding of the respondents to the questions asked. Issues of truthfulness and accuracy are thereby raised” (Blaxter, Hughes and Tight, 2006, p.79). To overcome these shortcomings, a pilot study was conducted with a few participants during the process of applying both methods (i.e. questionnaire and interviews). All of the participants gave a variety of feedback about their understanding of the survey’s questions. Another disadvantage usually associated with qualitative research in general, and with the survey approach in particular, is the possibility of a subjective response that may affect the process of data analysis. Even though a qualitative set of data does not usually generalise facts, ideas, and information about the phenomenon under investigation (Keele, 2010, p.37), it usually generates "multiple realities that are continually changing with individual interpretation" (ibid., 2010, p.36). The following section explains the research problem and how it has been investigated through utilising the survey approach.

4.6. Research problem

This research is interested in dealing with particular social, cultural, educational, and interpretative issues. The main interpretative and hermeneutic issue is the definition of creativity, which is both a problematic and controversial phenomenon. It is problematic because the use of the word ‘creative’ conveys some positivist aspects that have reflected negatively in the way the word is interpreted in various socio-cultural contexts. And it is controversial because each perspective (e.g. psychological, mystical, or socio-cultural) has specific different standpoints towards the phenomenon. However, most attempts to define creativity suffer from circular and tautological matters. For example, defining the creative act, as ‘novel’ and ‘appropriate’ would require explaining what these two words mean in the first place.
Creativity is important for both the individual and the society, yet this notion exists and is institutionally implemented within Western societies, but not Eastern (e.g. Arabic or Omani). For example, the Omani educational system does not pay much attention to the role of creativity in graphic design education (Alkholy, 2007, p.25; Khaleefa, 1999, p.72). Graphic design discipline preliminary matured in Europe and the USA and now has an international appeal. Even though the discipline of graphic design gained recognition in some developed countries (e.g. Malaysia and Hong Kong) and some developing countries (e.g. Jordan, Lebanon and Oman) it is still a new field. Tan and Melles, (2010) argue, “Despite its significance, research on the nature of graphic design practice as professional practice has been limited to date”. So, it also lacks a clearly articulated pedagogic framework.

The discipline of graphic design in Arabic education has had a very short history in this region. It started in the late 1990s, when the availability of computers and the Internet reflected positively on the development of the graphics industry within art and design institutions (Abu-Awad, 2008). Then, between 2000 and 2006, many newly graduated graphic design students returned to Oman holding degrees in graphic design from foreign universities. Other newly graduated students from departments of art education contributed positively to this development. Some of them established their own businesses to sustain the development of the graphic design discipline within Omani society. These roles are ones that would be typically defined as ‘art worker’ roles in the West. More recently, graphic design programmes have been integrated into the Omani higher educational system. They were established first in some private institutions such as The Scientific College of Design in 2004.

Graphic design is a young discipline in the Omani higher education system in general. Private institutions established graphic design degrees before governmental institutions. In the academic year 2003-2004, three private institutions (Dhofar University, Al Zahra College, and the Scientific College of Design) were established as institutions within the body of Omani higher education. These institutions’ programmes included a Bachelor’s degree in graphic design. Prior to 2004, no Omani private or governmental institution offered graphic design specialisation as a comprehensive degree. Only two design-related courses (basic design and advanced design) were offered by the Department of Art Education at Sultan Qaboos University as part of its Art Education degree. These two courses were core courses among other core and elective art education courses such as painting, ceramics and handicrafts. This department prepared students to be art teachers at elementary and secondary schools. However, the graduate students did not gain a deep understanding of graphic design theories and practice, as they only undertook an elementary design foundation course.
In 2007, the six Omani Colleges of Applied Sciences, located in the main Omani cities (Muscat, Sur, Ibri, Nizwa, Rustaq, and Salalah) were established by Royal Decree and administered by the Omani Ministry of Higher Education (Al Shmeli, 2009, p.11). These colleges evolved from six educational colleges that were established in the mid-1990s. In 2007, the Ministry consulted international experts, such as the New Zealand Consortium, to launch a new role for these colleges in order to satisfy the requirements of the Omani economy and the market need for qualified professionals. In general, the six colleges offer various technological and business courses, yet only two colleges (Nizwa College of Applied Science, and Ibri College of Applied Sciences) offer graphic design as a comprehensive degree. The design curricula of these degrees were supplied by the New Zealand Consortium (Al Shmeli 2009, p.12). The following table gives a brief view of the history and institutions that currently offer Bachelor’s programmes in graphic design in Oman.

All these issues have created some educational problems such as: 1) less attention being paid in Omani design education towards educational issues such as the value of creativity for graphic design, creative curriculum, creativity enhancement, and creativity assessment; 2) there is no clear objective to develop the creative potential of Omani graphics students; 3) the importance of creativity in relation to Omani design education is neglected; and 4) a unified framework for creativity at the higher educational level is missing. All these problems have resulted in an absence of pedagogical models that should be utilised by graphics lecturers to enhance the creative problem solving skills of their students. Design studies place much emphasis on dealing with ‘wicked problems’. Therefore, this research intends to propose and develop the missing model utilising this methodology.

4.7. The conceptual and theoretical methods

Specific methods are best suited to exploring the above research problems, for example sociological methods, cultural studies and design theory. These methods, and how they approach the problem, are explained here. The cultural model highlights how and why each culture has a specific model or framework to define the ‘creative act’. To deal with this interpretative and hermeneutic problem, a socio-cultural approach would be helpful to define the essence of creativity. Such an approach was based on specific scholars’ (Williams, 1961; Wolff, 1981) accounts of creativity. Williams defines the word ‘creativity’ as a cultural activity, and “different cultures generate different realities” (Williams, 1961, p.34). Similarly, Wolff (1981) comprehended the word ‘creativity as a cultural production. Hence, creativity is defined in relation to graphic design education as problem solving, which can also be explained as ‘cultural production’. It is a ‘cultural activity’ that each member of particular society performs routinely (Williams, 1961, p.34).
The sociological method outlines the argument that both graphic design and art play a very important role in any society, specifically in revising the meaning of the word ‘creative’. This is because of the fact that creative people are more able to contribute to social and cultural changes: “both graphic design and art are creative in sense that they are two of the ways in which experience is made meaningful and communicated” (Barnard, 2005, p.172). Williams (1961, p.55) argues that, “The individual creative description is part of the general process which creates conventions and institutions, through which the meanings that are valued by the community are shared and made active”. Based on this argument, creativity would be valued and interpreted differently within the Omani cultural context, which means that relocating the position of creativity in Arabic and Omani educational systems is required.

Design theory was a helpful method to explore the above graphic design education and other relevant problems. Design theory highlights how design lies between arts and science in a ‘fuzzy’ reality of ‘social problems’ in which any design product is valid, but only within a specific local context. It is argued that ‘design is cultural activity’ (DTI Economics Papers, 2005, p.3). Data collected by an interview method based on design theory was very beneficial, as it explained the location of graphic design in relation to both creativity and to the Omani design educational context. This would reflect positively on increasing the state of creativity in the Omani graphic design educational system. Both graphic design and art are ways in which experience is visually produced, described and communicated (Barnard, 2005, p.172). Design theory confirms the importance of creativity for the graphic design student, and that creativity can be taught and enhanced through specific teaching strategies, based on the argument that there is a blind faith that creativity can be taught and it would have beneficial effects.

One of the main educational theories that outlines this research is that of productive vs. reproductive learning, developed by Lev Semonovich Vygotsky, which argues that creativity is a generative form of ‘productive’ learning of an individual who always searches for new knowledge. Williams’ (1961) account of creativity described how creativity could be enhanced. It is in the “work, learning, decision-making, and use of human faculties” (Williams, 1961, p.55).

To sum up this section, creativity in design education involves constant improvement; it is an approach to successes that builds on fundamental attributes of the learner. This central educational theory helps to specify the roles of educators and university lecturers within the graphic design education context. Examples of these roles are providing suitable opportunities and a supportive environment through enthusiastic motivation of students and through activating innovative and imaginative experience in teaching graphic design. The
above educational and design theories, extracted from the relevant literature, confirmed the immediate need for a pedagogical model, which can offer a systematic guide for lecturers to enhance creativity. To accomplish this aim, specific plans, steps and methods were laid out, which are outlined in the following paragraphs.

4.8. Research design

Research design is an initial plan for a research process, which is usually conducted before the data collection. It is “… a logical structure of the inquiry” (De Vaus, 2001, p.9). “The function of a research design is to ensure that the evidence obtained enables us to answer the initial questions as unambiguously as possible” (De Vaus, 2001, p.9). Bryman and Bell (2003, p.28) argue that the research design means the “… framework within which data is collected and analysed”. The nature of the research questions should guide the researcher to the most suitable research design. This was exactly the case with this research. Accordingly, the research problem, aims, and evidence type have influenced the decisions on the research design. For example, it was less structured in the beginning of the research process; therefore, the research questions and aims were modified several times, and even after completing the data-collection process, the aims and questions were also modified. According to Yin (2009), such acts in research are valid and acceptable.

4.9. Research process

Research, in general, is a systematic process of inquiry based on existing knowledge. Research requires continued searching for new knowledge, based on the assumption that previous research was not sufficient and there are always ways of improvement. Such improvements in knowledge require systematic enquiry, asking researchable questions and finding suitable methods that can answer these questions (Fellows and Liu, 2003). Based on this argument, it was important from the beginning of this research to construct a plan that consisted of a set of steps. These steps should be carried out in order to answer the research questions and fulfil the aims.

This research started in October 2008 by indicating the main issue (i.e. creativity) in relation to graphic design education. Then, the research problem was identified, which is, how to enhance the creativity of Omani graphic design students; this was followed by a review of the relevant literature that helped to identify the most important issues related to the research problem. This helped to discover the gaps within the literature. After that the aim and objectives of the research were outlined. This led to the researcher stating the research questions more clearly. Accordingly, these steps were helpful to select the methods that were appropriate to answer the questions and fulfil the aims. Then the questionnaire
and interview questions were outlined based on the main questions and aims. These steps ended by analysing the collected data to answer the research questions and fulfil the aims. All of these stages are summarised briefly in Figure (12).

4.10. Research methods

The two main methods employed to collect the required information were semi-structured questionnaires and semi-structured interviews. They are explained later in separate sections. Such details highlight the sampling population, proposed questions, how the questions were asked and answered, and the process of pilot study. The justification of using these two methods within this research is that the questionnaires intended to collect information from international experience, whereas the interviews were designed to collect the same information, but from a local (i.e. Omani) perspective. Therefore, the questionnaire participants answered the questions online. The second group of participants were interviewed to answer the questions in a face-to-face setting. The final outcome of both methods has contributed positively to answering the main research questions and fulfilling the research objectives. For example, the information collected from design lecturers was
helpful to highlighting the research problems and comprehending how those people approach research-related issues.

This research is interested in what the experiences of the people mean to them, based on the fact that culture is all about the meanings of things, which are constructed differently according to different realities. Therefore, the interviews were appropriate because they helped to raise some issues that were not thought of at the early stages. Even though the initial collected answers were generated from asking simple questions, they were not totally naïve. This is because the answers were collected from experts who are intensively involved in graphic design education practices. Most of them showed an ability to answer the questions directly and objectively, and avoid expressing personal beliefs or attitudes.

This research depended on the constancy of the given answers. In cases when some answers had some elements of prejudice, the measure was taken to avoid that particular answer. To ensure that the meaning of the given answers was understood, the participants were presented with the account of creativity of this research from the beginning. Also, in the case when some answers were not clear, they were asked to clarify or explain the implicit and explicit meanings of their answers. The following sub-sections give a full account of the methods used and explain why they are the most appropriate methods for this research.

4.10.1. The semi-structured questionnaires

The online questionnaire comprised four open-ended questions that generated qualitative data, and six closed-ended questions that generated semi-quantifiable information. Both types of question were asked of graphic design lecturers who facilitate graphics courses in various worldwide institutions. The open-ended questions (i.e. questions 4, 5, 6, and 7) allowed the participants to give free answers. Ideally, participants had more freedom to express their views towards the issues under investigation. Cohen, Manion and Morrison (2000, p.247) argue, “… qualitative, less structured, word-based and open-ended questionnaires may be more appropriate as they can capture the specificity of a particular situation”. So, this type of question has a “… clear structure, sequence, focus, but the format is open-ended, enable[ing] the respondent to respond in her/his own terms. The semi-structured questionnaire sets the agenda but does not presuppose the nature of the response” (ibid., 2000, p.248). However, this is a challenge with this type of question: word based usually means meaning based. Interpreting meaning is tricky, as it needs to be understood how it should be interpreted. Therefore, this research suggests that interpretation should be based on the gained experience of the researcher in relation to creativity and graphic design terms.
Also, the importance of the questions’ order was considered from the beginning. So, it is notable that the questions follow the funnel approach from general to specific, from wide to narrow. For instance, the initial questions started with interesting quantifiable questions such as “Is creativity important or real in the creative industries?” and “Can creativity be taught?” etc. Yet, the later questions are framed to limit the answer within a specific frame. The first three questions identify general issues of creativity within the graphic design educational context. The fourth, fifth, and sixth questions encourage deeper answers about creativity recognition, techniques to enhance creativity, and the best content of the graphic design curriculum. Finally, the last three questions investigate creativity assessment and whether creativity can be assessed.

The questionnaire was designed online using a service provided by ‘Bristol Online Surveys’ delivered by Loughborough University. The active online link of the survey can be found at https://www.survey.lboro.ac.uk/creativitydesign. The questionnaire opened on 21/02/2011, and closed on 21/05/2011. Three months would be enough to receive a reasonable number of responses. Defining creativity as ‘problem solving’ in relation to graphic design education was introduced within this questionnaire. Creativity was explained as ‘cultural production’, which was introduced in the first page of the questionnaire, and the problems here are ‘wicked problems’ that are usually contextualized within specific local contexts. Therefore, the participants have comprehended the account of creativity discussed within this research. The questionnaire also introduced the purpose of the questionnaire, along with giving some general instructions about how to complete the questionnaire. This was followed by a list of terminologies and concepts used in the questionnaire and their meanings. The results were gained from the participants’ answers to ten questions that were mixed between open-ended and closed-ended.

4.10.1.1. Sampling population

The total population sample that was contacted to participate in the online questionnaire was 50 graphic design experts and educators; 33 completed questionnaires were returned (including the pilot study) with a response rate of 66%. It is argued that the analysis can be performed with this response rate, as this research does not intend to generalise any result. Saturation was satisfied once the responses reached a total of 30. So it is argued here that the percentage of responses would be sufficient because the sample group was comprised of internationally recognised experts in graphic design education; therefore, it was less likely to receive a response from all of them. Also, in art and design research, the quality of the responses and the common consensus is more important than the quantity of responses. The purpose of having this variety of experts is to create a
universal sense of how specific issues (e.g. defining creativity, creativity enhancement, teaching creativity, creativity assessment) are perceived by international educational experts within the graphic design courses. The selected sample revealed useful educational strategies that are deployed in facilitating graphic design education.

The selection of participants for the questionnaire was based on the fact that most qualitative studies employ ‘non-probability’ sampling, which aims to identify those people who are similar in their characteristics or relevant to the issue being studied. The main two sampling approaches used in qualitative studies are purposive and theoretical. For this research the ‘purposive sample’ has been used because, “… the researcher believes that certain characteristics or settings are likely to impact on data collected” (Tierney, 2008, p.3). Therefore, the determining characteristic of the participants in this research is their involvement and experience in teaching graphic design disciplines for undergraduate students.

To determine the correct number of a sample for any research, it is important first to specify “the total population and work down to the sample” (Cohen, Manion and Morrison, 2000, p.92). Total population means, in the context of this research, all graphic design educators, experts, and lecturers worldwide. In fact, it is fairly difficult to estimate the total population size, as there are no statistical data for the number of graphic design educators in various international institutes in the whole world. Therefore, to determine the sample number, this research depended on the estimation that 30 responses from international graphic lecturers who teach graphic courses at undergraduate level would be enough out of 50 participants who were invited to participate. Such a number would be enough to reflect on how graphic design experts comprehend creativity in relation to graphic design, and give sufficient information about the issues under investigation.

The participants’ names and details were collected from various resources including personal websites, art and design school websites, and some academic social networks (e.g. academia.edu, LinkedIn.com). There was no intention to select particular individuals based on specific characteristics, such as personality, nationality, or gender. The proposed participants must specialise in graphic design or at least in design studies, as this research is concerned with common and individual experiences associated with creativity in relation to graphic design education.
<table>
<thead>
<tr>
<th>Continent</th>
<th>Number of participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe</td>
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</tr>
<tr>
<td>North America</td>
<td>9</td>
</tr>
<tr>
<td>South America</td>
<td>2</td>
</tr>
<tr>
<td>Asia</td>
<td>7</td>
</tr>
<tr>
<td>Africa</td>
<td>1</td>
</tr>
<tr>
<td>Australia</td>
<td>3</td>
</tr>
</tbody>
</table>

Table 2: Questionnaire participants by geography

<table>
<thead>
<tr>
<th>Gender</th>
<th>Number of participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>22</td>
</tr>
<tr>
<td>Female</td>
<td>11</td>
</tr>
</tbody>
</table>

Table 3: Questionnaire participants by gender

4.10.1.2. **The pilot study**

In the pilot study setting, five graphic design lecturers were asked to participate by filling in the online questionnaire. They were contacted by email to ask them to be part of the pilot study with the purpose of evaluating the survey. The purpose of conducting the pilot study was to ensure that there were no errors or misleading issues in the questionnaire. After acquiring the participant’s agreement and willingness to participate, the survey was sent to them by email with a note that they should complete it online within 10 days. Eventually, 3 participants out of 5 responded to this pilot study. Such responses were very helpful for modifying the questionnaire based on some valuable comments. The pilot study was completed within two weeks. Based on some valuable suggestions, the survey was redesigned.

4.10.2. **The semi-structured interviews**

The second method employed within this research to collect the required data was semi-structured interviews. Interviews were conducted with graphic design lecturers who facilitate graphic design disciplines in three Omani private design institutions and three governmental colleges. The same set of questions used in the online questionnaire was asked again in these interviews. The aim here was to investigate how lecturers define the word ‘creativity’, how they treat it, and how it could be enhanced within the design educational context. Also, this method investigated the pedagogical strategies that are useful to enhance the problem solving skills of undergraduate students. The interviews contributed
positively in answering the first research sub-question, “What is the definition of creativity in relation to graphic design education?".

Moreover, these interviews disclosed richer data through listening to the participants. The collected information allowed the identification of some common elements, themes, ideas, and perspectives shared by graphic design lecturers. Also, such information outlined how Omani educators assess their students’ creativity. However, there was one obvious shortcoming of this method, as outlined by Tierney (2008, p.2):

Semi-structured and unstructured interviews allow people to express their views more freely than in a structured questionnaire, but there is always the danger of interviewees getting side-tracked and talking about issues of little or no relevance to the area being investigated.

This indeed occurred during the interviews. However, this shortcoming was controlled and minimised through asking the participants to answer the questions within the limits of the question only, and within the available time. In the case that the answer was irrelevant, the researcher asked, kindly, for the participants to stop and move on to another question. This helped to obtain the desired answers for each question, as was planned earlier.

4.10.2.1. **Sampling population**

It has been argued in several studies (e.g. Cohen, Manion and Morrison, 2000, p.92) that it is important for any research project to study the availability of the population sample even before starting the process of data collection. For this reason, relevant information (i.e. names, nationalities, contact details, and institutions) of the proposed participants was gathered before conducting the actual interviews. All of the participants work as university lecturers and teach design courses that differ from one institution to another. Most of the lecturers graduated from various international schools. Their nationalities were varied, but mostly they were Arabic (e.g. Egyptians, Jordanian, and Lebanese) with a few Omani citizens (7 lecturers out of 40). The reason for such a small number of Omani lecturers is the lack of institutions that offer undergraduate graphic design degrees in Oman. Graphic design is one of the new disciplines that have been established recently in the Omani higher educational system; therefore, it was difficult to find enough Omani educators to interview.

The selecting criteria for the institutions were meaningful, simply because these institutions are the only institutions that offer graphic design courses in Oman. As a result, the participants were 39 graphic design lecturers (male and female). They teach in three Omani governmental colleges and three private institutions. The majority of them specialise in graphic design, communication, paintings, drawings, typography, and pictorial studies. All
of the participants have had a satisfactory background in graphic design education, and have facilitated some graphic design disciplines academically. Their graphic design background has assisted them to reflect on their teaching experience and interact positively with the researcher; they were all already experienced in dealing with graphic design students.

The process of conducting the interviews started by contacting a few participants by email and asking them to participate in the pilot study. The pilot study was important to assess the questions and to analyse the ability of the questions to provoke the required information. Also, the pilot study would reflect positively in assessing the quality of the interview procedure, in terms of time management, the settings, question types, etc. The pilot study is explained in the following sub-section.

<table>
<thead>
<tr>
<th>Institution</th>
<th>Sector</th>
<th>Number of participants</th>
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<tbody>
<tr>
<td>Sur College of Applied Sciences</td>
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<tr>
<td>Ibri College of Applied Sciences</td>
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<td>7</td>
</tr>
<tr>
<td>Nizwa College of Applied Sciences</td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>Al Zahra College For Women</td>
<td>Private</td>
<td>7</td>
</tr>
<tr>
<td>Scientific College of Design</td>
<td></td>
<td>6</td>
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<tr>
<td>Dhofar University</td>
<td></td>
<td>6</td>
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</tbody>
</table>

Table 4: Interview participants by institution

<table>
<thead>
<tr>
<th>Gender</th>
<th>Number of participants</th>
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</thead>
<tbody>
<tr>
<td>Male</td>
<td>24</td>
</tr>
<tr>
<td>Female</td>
<td>15</td>
</tr>
</tbody>
</table>

Table 5: Interview participants by gender

4.10.2.2. **The pilot study**

The pilot study for the interviews took place on 20 March 2011 at Sur College of Applied Sciences. Three lecturers who teach graphic design courses in this college participated in the pilot study. Defining ‘creativity’ as problem solving, which is usually explained as ‘cultural production’, was expressed at the initial stages of these interviews. Such problems here refer to ‘wicked problems’ that are mostly contextualised. Therefore, the first interviewee showed an understanding of the kind of creativity we were talking about. Accordingly, the following participants interacted positively with the questions and answered them within the specified time frame, and within the context of the questions. However, the
first participant gave some comments about one or two questions that probably required re-writing, as they asked for two different meanings that can cause some misleading issues. An example of these questions was: “Can creativity be taught or enhanced?”. This question asks about two issues, teaching and enhancing creativity, which could be comprehended differently by the participants. Therefore, this question was re-written to be: “Can creativity be taught to graphic design students or not?”. Another change was with sub-question 2, which required one change (i.e. from how to ‘recognise’ creativity to how to ‘define’ it).

4.10.2.3. **Conducting interviews**

The reflection on the experience of the three participants in the pilot study of the interview was very helpful for reconstructing the questions. Therefore, the actual interviews were conducted with 36 participants, after ensuring the accuracy of the interview questions. The interview process started with a plan consisting of a procedure to conduct the interviews and a timetable of the meetings with the selected participants to suit them. The interviews started in March 2011 and continued until mid-June 2011. The participants were interviewed in their work places (i.e. colleges and institutions). Most of the interviews lasted between 10 and 20 minutes. This length of time was enough to gather the required information. In order to archive the information, all interviews were recorded on an audio digital recorder in MP3 format, before being transferred to the computer.

The language of the original questions was English, as some participants have a good proficiency in using academic English language. However, the majority of interviews were conducted in the Arabic language, because of the fact that there were few participants who spoke English sufficiently. Accordingly, seven interviews were undertaken in English. Interviewing people in Arabic is a reasonable measure, simply because the study was undertaken in Oman, where the official language is Arabic. The interview questions were translated into Arabic by the researcher, with careful consideration of the meaning of terms within the questions.

After finishing all of the interviews, the information gained was transcribed in order to prepare for the translation procedure (Tierney, 2008, p.2). In total 32 interviews required translation from Arabic to English, which was conducted by the researcher. Therefore, the translation process was considered carefully, as there were several hidden meanings and a variety of cultural loaded connotations. The translation process took a long time, with much effort from the researcher to comprehend the reported information. All of the collected data from both the questionnaire and interview are outlined and reported in Chapter Five: Results and discussion.
4.11. Ethical issues of the research methodology

Some ethical issues regarding the participants were considered during the data-collection process. The British Educational Research Association Guide (BERA, 2004) has been used as a reference to help in addressing such ethical issues. One of the main principles of this guide was informing the participants about the research project from the beginning. For this reason, all participants were informed about the aims, questions, and scope of the research from the beginning. They were informed that all information collected for the project was confidential and would only be used for research purposes. Also, all data and conclusions were checked with the participants before publishing them. Privacy would have been maintained by not using their names (i.e. anonymising their responses).

Another consideration that was involved in the early stages of this research was gaining permission from Loughborough University to conduct the interview. Therefore, the Ethical Clearance Approval Form was filled in (Appendix 2). This step was crucial before meeting any participants to obtain the required data. An example of these participants is graphic design lecturers who teach in Omani institutions, which were all contacted formally through their administrative authorities to ask them to participate in the interviews. For this purpose, a letter was issued by the institution to which the researcher belongs (i.e. Sultan Qaboos University).

The second letter issued by Sultan Qaboos University has the same purpose. It states clearly that the researcher is authorised to conduct the research within selected institutions, asking the recipient to facilitate his mission. This letter was directed to deans and directors of selected institutions requesting them to provide the required assistance for the researcher. Their permission is asked to maintain the correct participant agreement. Privacy is maintained through anonymising the responses. As part of the interview procedure, the participants had the right to withdraw from the interviews at any time, and this was explained to them.

4.12. Personal and professional values

One of the familiar requirements for qualitative research is clarifying the ‘personal and professional values’ and how these have influenced the research. Bryman (2008) calls this a ‘personal bias’. The following paragraphs clarify the ‘researcher’s role’.

Personal bias was minimised by explaining the researcher’s personal and professional values at the beginning of the research (see Chapter 1, Section 1.7). One example of these values is that the researcher wanted to develop the status of graphic design education within the Omani educational system, as part of his commitments as a researcher and design
It is considered that this can lead to an increase in the standards of creative design practice in the developing educational system in Oman. Also, to minimise personal bias, the researcher acts explicitly as a representative of an ‘insider’ position, which enables an understanding of the Omani cultural context and reveals the real picture of the field. Being an insider helped the researcher to reconsider the whole picture, rather than parts of it.

Moreover, the thematic analysis method helps to minimise the ‘personal bias’ of this research, as it employs objectivity and is systematic. Objectivity here means “‘freedom of bias’ referring to dependable knowledge, checked, controlled and undistorted by personal bias and prejudice” (Kvale, 1996, cited in Roberts, 2002). The procedure of conducting the methods was specified from the beginning and, to maintain objectivity, transparency was retained in the process of both the data collection and the data analysis, “so that the analyst’s personal biases intrude as little as possible in the process” (Bryman, 2008, p.289). Being objective means a determination ‘to see through the eyes’ of the people being studied. This has also helped to maximise the internal validity of the research.

The process of data analysis and interpretation also helped to minimise personal bias. These processes started by making sense out of the text, and preparing the data for analysis, “conducting different analysis, moving deeper and deeper into understanding the data” (Creswell, 2003, p.183). In the middle of this process, the data are represented, “making an interpretation of the larger meaning of the data” (ibid., 2003, p.183). The thematic analysis method also helps to maintain the accuracy of the information, which consequently minimises the personal bias. These steps consist of several activities, starting by: 1) gathering the raw data; 2) organising and preparing them for the analysis; 3) reading through all data; 4) coding them to yield themes and description; and 5) interpreting the meanings of themes/descriptions (ibid., 2003, p.185). Interviews helped to eliminate the scope of personal bias in the research: all participants were asked the same questions, in the same way, without any intervention from the researcher. As a result, personal bias was controlled and minimised so as not to influence the research, through maintaining the process of analysis: therefore, the “results are not an extension of the analyst and his or her personal biases” (Bryman, 2008, p.289).

4.13. Reliability and validity

It was important for this research to consider reliability and validity issues that relate directly to the employed methods and expected data. Therefore, a set of steps was used to maximise the validity and improve the reliability of the results of the research. This was important because gaining a high level of reliability and validity can give the research more trustworthiness. Gipps (1994, p.67) defines reliability as “the extent to which an assessment
would produce the same, or similar, score on two occasions or if given by two assessors”. Gipps (1994, p.58) summarises validity as “the extent to which an assessment measures what it purports to measure. If an assessment does not measure what it is designed to measure then its use is misleading”. However, Gipps (1994, p.58) argues that validity is more important than reliability: “a highly reliable test is of little use if it is not valid”. But in any case, the test will not be valid if it does not have a minimum level of reliability.

Based on this argument, both methods for this study intend to generate qualitative data; then, qualitative approaches that belong to this paradigm can increase the potential trustworthiness and rigour of the research because multiple sources of data are used (Robson, 2002; Cohen, Manion and Morrison, 2000 in Mason, 2007, p.57). However, because of the fact that this research concerns the creative abilities of graphic design students, there is an expected problem of subjectivity that might be involved to some extent in the final results. Mason (2007, p.54) argues that if the research is concerned more about the behaviour of the selected participants, it can be inherently subjective. Also, Robson (2002, cited in Mason, 2007, p.54) believes that “subjectivity in research can affect the trustworthiness (validity and reliability) of the findings”. Therefore, Mason suggests there should be a way of maximising the trustworthiness through specific strategies. The strategy planned for use with this research involves utilising some quantitative methods that generate objective data, such as closed-ended questions.

This strategy is supported by the qualitative data obtained from “studies that take place in the participant’s natural setting and techniques such as open-ended questioning or freedom to complete tasks in their own way and in their own time are applied” (Robson, 2002, in Mason, 2007, p.55). Based on this assumption, the methods of this research have been designed to fit with this notion. For example, the participants of the main interviews had more freedom in responding to the open-ended questions, as these interviews took place in their own ‘natural environment’. Therefore, the reliability of the collected data would be high.

### 4.14. The thematic analysis method

The analysis stage comes after collecting the required data. As there are several methods used to collect the qualitative data, there are also several approaches to data analysis used in qualitative studies. Most of these approaches share a predominant concern with textual analysis, whether in terms of verbal or writing materials (Myers, 1997). The possible challenge appearing here is the profusion of qualitative data, which makes the researcher feel swamped by the volume (Remenyi, 1998, pp.112-114). Therefore, it is important for the researcher to follow a particular qualitative analysis procedure. Such a procedure will give the reader an idea about how the data have been analysed. The reader
would then be able to evaluate, synthesise or compare the study with other studies in the same area (Braun and Clarke, 2006).

Several studies of graphic design education among other qualitative-based researches have used thematic analysis approaches in which traditional ways of analysing the qualitative data are used. Examples of these methods are thematising meanings, investigated by Holloway and Todres (2003, p.347) or using thematic coding, by Ryan and Bernard (2000, pp.769-802). Thematic analysis is an approach used commonly with qualitative studies to identify, extract, analyse, and report patterns (themes) out of textual based data, in order to find ways to organise these themes into more detailed descriptions (Braun and Clarke, 2006). Based on this, it is argued here that most of the analysis methods used in qualitative studies are thematic-based anyway. Braun and Clarke (2006) argue that they are regarded as something else or are not identified as any particular method at all. Based on this, thematic analysis in general is the platform for qualitative analysis.

4.14.1. Justification for utilising this method

The justification for employing this type of analysis with this research is because it “goes beyond merely counting words or extracting objective content from texts to examine meanings, themes and patterns that may be manifest or latent in a particular text” (Zhang and Wildemuth, 2009, p.1). This is exactly what is needed for the research on hand, as there are several hidden meanings in the texts that cannot be easily gained by computerised software such as Nvivo. In the case of this research, there are several culturally loaded phrases within the collected data that require careful interpretation by a specialised researcher. Accordingly, the researcher conducted the analysis manually. One of the advantages of this method is the fact that, “it allows researchers to understand social reality in a subjective but scientific manner” (ibid., 2009, p.1). This supported by the fact that this research is contextual research.

The other justification is that, since much of the data is collected through interviews, it is more suitable to use thematic analysis, as it “is most often used to analyse interview transcripts in order to reveal or model people’s information related behaviours and thoughts” (ibid., 2009, p.3). Thematic analysis is a flexible approach as an independent method that can be employed with several theoretical approaches (e.g. surveys).

Based on the above reasoning, thematic analysis was used to analyse the collected data of this study. Also, the thematic analysis focuses more on certain concealed themes, which may outline several meanings related to the phenomenon under investigation (i.e. creativity).
4.14.2. The procedure of thematic analysis

A specific six-step procedure was followed with this research to conduct the thematic analysis, which is provided by Braun and Clarke (2006, p.87).

<table>
<thead>
<tr>
<th>No</th>
<th>Step</th>
<th>Action description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The collected data is familiarised by the researcher</td>
<td>Reading the questionnaire results&lt;br&gt;Reading the data again when transcribing the data&lt;br&gt;Summarising the primary notions</td>
</tr>
<tr>
<td>2</td>
<td>The primary codes are gathered</td>
<td>Coding the most relevant ideas out of the data&lt;br&gt;Gathering data related to each code</td>
</tr>
<tr>
<td>3</td>
<td>Careful search for themes is conducted</td>
<td>Linking the gathered codes to potential themes&lt;br&gt;Gathering all data relevant to each potential theme</td>
</tr>
<tr>
<td>4</td>
<td>The themes are reviewed again</td>
<td>Checking that the themes are linked to all relevant codes&lt;br&gt;Developing a thematic map of the analysis</td>
</tr>
<tr>
<td>5</td>
<td>The themes are defined and named</td>
<td>Refining the specifics of each theme and the overall story the analysis tells&lt;br&gt;Naming each theme and suggesting definition for each theme</td>
</tr>
<tr>
<td>6</td>
<td>The analyses are produced</td>
<td>The analysis is checked for the last time&lt;br&gt;Selecting compelling and vivid extracts or examples&lt;br&gt;Checking the links among the analysis, the research questions and the literature&lt;br&gt;Producing a reliable report of qualitative analysis</td>
</tr>
</tbody>
</table>

Table 6: Six steps followed by the researcher to conduct the thematic analysis as suggested by Braun and Clarke (2006, p.87)


The following Table 7 shows the “Plan for the development of the thesis 2008-2012”, which is a concise way to show the research development. This research followed this plan from the beginning of the research in 2008. The first year was the reading year, in which the research proposal was developed and the research problem, aims, questions and potential methodology were proposed. In the last few months of 2008, the first-year report was produced. In the second year, the researcher focused on developing his research skills and was involved in some academic activities, for example, attending a conference in the USA and publishing a paper. Several methodologies were tested in this year as well. The third year was the data-collection year, and several amendments were made to restructure the thesis: the initial results were also written up during this year. Finally, the fourth year was the ‘writing up’ year, as most parts of the thesis were written during this year. The following table gives more details of all activities conducted between 2008 and 2012.
<table>
<thead>
<tr>
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<th>October</th>
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<tr>
<td></td>
<td>Re-reading the research proposal and outlining the research problem</td>
<td>Reviewing the relevant literature and proposing the research questions, main aim and objectives</td>
<td>Proposing the research methodology</td>
<td>Submitting one conference paper and writing the first year report</td>
<td>The first year panel</td>
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<tr>
<td></td>
<td>Proposing the TTCT to be the measurement tool</td>
<td>Publishing a conference paper</td>
<td>Attending a conference in the USA: 4th International Conference in Design</td>
<td>Testing various methodologies</td>
<td>Updating the literature review and research methodology</td>
<td>Writing the second year report</td>
<td>The second year panel</td>
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<td>Conducting the questionnaire</td>
<td>Conducting the interviews Transcribing data into MS Word documents</td>
<td>Writing the preliminary findings</td>
<td>Submitting the 3rd year report for a panel to be assessed and drafts of Literature review, Methodology and Findings</td>
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<td>Writing up the discussion chapter</td>
<td>Working on the conclusion and introduction chapters and the 1st draft</td>
<td>Submitting the first draft of the thesis to the internal reviewer</td>
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<td>Final Viva and Finish the PhD degree</td>
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Table 7: Plan for the development of the thesis (2008-2012)
Chapter Five: Results and discussion

5.1. Chapter overview

The literature review chapters (One to Three) provided a theoretical background about creativity within graphic design education. Chapter Four discussed the methodology that has been used to answer the research questions and fulfil the aims. This chapter picks up the concerns and issues of the previous four chapters and intends to present, analyse, and discuss the collected data. It analyses the relationships between all of the observed facts and presents the principles and generalisations shown by the results. It discusses the findings towards developing the promised pedagogical model (in the next chapter), which would be the major contribution of this research.

Section 5.2 of this chapter is the Introduction, which gives the reader an overview of the Omani higher education system, followed by the general research problem, the hypothesis, the context, the purpose of study, and the type of investigation undertaken to study the research problem. It also explores the participants of the research, and briefly explores how the data were collected and analysed. The process that was followed to answer the research questions and fulfil the aims is explored within this section also. So, Section 5.2 section provides some general background. Section 5.3 highlights the statements of the results. In this section the findings are interpreted, evaluated, and discussed with reference to the literature review. This section states all of the central findings and how they relate to the initial hypotheses under investigation. The findings are structured according to the order of the questions as they were asked in the survey through the questionnaires and interviews. Section 5.4 draws out the possible implications and applications of all of the previous findings, while Section 5.5 discusses the limitations of the whole study, which helps to highlight future directions for study. Section 5.6 is a chapter summary that brings us back to the main topics of the study and the inferences extracted from the findings.

5.2. Introduction

- Overview of Omani higher education

In order to clarify the research problem, it is important to describe, briefly, the higher education system in Oman and its current status. In fact, it is a relatively young system compared to other countries in the region, simply because Oman is one of the developing countries and started its modern development in the 1970s. The first public university (i.e. Sultan Qaboos University (SQU)) was founded in 1986. Prior to this, the Omani government sent some students to complete their studies in Arab countries such as Egypt, Jordan and
Kuwait, as well as some developed countries such as the USA and the UK. SQU is self-administered and has nine colleges and about 15,000 Bachelor's, Master's, and PhD students. In the 1980s and 1990s, some public colleges of education were founded that are responsible for graduating schoolteachers. These colleges are administrated directly by Oman's Ministry of Higher Education, and located in the main Omani cities (Ibri, Nizwa, Salalah, Sohar, Sur, and Rustaq). In 2005 these colleges were transformed into colleges of applied sciences in order to satisfy the growing Omani labour market requirements in fields such as engineering, IT, international business administration, communication and graphic design. Additionally, there are seven colleges of technology, operated by Oman's Ministry of Manpower, located in Muscat, Al-Mussana, Ibra, Ibri, Nizwa, Salalah, and Shinas. The Ministry of Health operates a number of health institutes to prepare assisting medical staff such as nurses, pharmacists and paramedics. Many other ministries sanction specialised institutes and colleges.

In the last two decades, the government pushed the private sector to invest more in higher education; therefore, many other private institutions were established during this period. Now there are seven private universities, and 22 private colleges. Most of these institutions focus on areas needed in the employment market such as business administration, engineering, and computer sciences. These colleges are not branches of any foreign universities, but are affiliated with European, Australian, or American institutions. The language of teaching and instruction in most of these institutions is mainly English. In 2005 only a quarter of secondary-school students could find places in universities, but now the picture is different: the government has started to invest more in higher education and to combine different colleges under one university. Currently the variety of courses offered by various institutions in several fields is much higher than before. Therefore, the opportunities for Omani students have been doubled: about two-thirds of those students who finish secondary school now have a chance to complete their higher education, either inside or outside Oman.

Graphic design is a young discipline in the Omani higher education system in general. Private institutions established graphic design degrees before governmental institutions. In the academic year 2003-2004, three private institutions (Dhofar University, Al Zahra College, and the Scientific College of Design) were established as institutions within the body of Omani higher education. These institutions' programmes included a Bachelor's degree in graphic design. Prior to 2004, no Omani private or governmental institution offered graphic design specialisation as a comprehensive degree. Only two design-related courses (basic design and advanced design) were offered by the Department of Art Education at Sultan
Qaboos University as part of its Art Education degree. These two courses were core courses among other core and elective art education courses such as painting, ceramics, and handicrafts. This department prepared students to be art teachers at elementary and secondary schools. However, the graduate students did not gain a deep understanding of graphic design theories and practice, as they only undertook an elementary design foundation course.

In 2007, the six Omani Colleges of Applied Sciences, located in the main Omani cities (Muscat, Sur, Ibr, Nizwa, Rustaq, and Salalah) were established by Royal Decree and administered by the Omani Ministry of Higher Education (Al Shmeli 2009, p.11). These colleges evolved from six educational colleges that were established in the mid-1990s. In 2007, the Ministry consulted international experts such as the New Zealand Consortium to launch a new role for these colleges in order to satisfy the requirements of the Omani economy and the market need for qualified professionals. In general, the six colleges offer various technological and business courses, yet only two colleges (Nizwa College of Applied Science, and Ibr College of Applied Sciences) offer graphic design as a comprehensive degree. The design curricula of these degrees was supplied by the New Zealand Consortium (Al Shmeli, 2009, p.12). The following table gives a brief view of the history and institutions that currently offer Bachelor’s programmes in graphic design in Oman.

<table>
<thead>
<tr>
<th>Sector/ Period</th>
<th>Private institutions</th>
<th>Governmental institutions</th>
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<tbody>
<tr>
<td>Before 2004</td>
<td>No graphic design programmes in Oman</td>
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<tr>
<td>2004 until present</td>
<td>Dhofar University</td>
<td>Nizwa College of Applied Sciences</td>
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<td></td>
<td>Al Zahra College</td>
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<td></td>
<td>Scientific College of Design</td>
<td>Ibri College of Applied Sciences</td>
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Table 8: Omani private and governmental Institutions that offer graphic design courses

The research problem is that the Omani design education system lacks a framework of creativity as an important concept in education. Such a lack creates two problems: 1) underestimating the importance of creativity in Omani design education; and 2) a lack of pedagogical structures within programmes that can enhance students’ creativity. The literature shows that this problem is a result of the neglected situation of creativity in the Arabic traditional educational curriculum in general (Almusa, 2004, p.5), which does not support creative thinking in students, and is a result of neglecting the role of creative people.
The hypothesis is the immediate need for a pedagogical model that can offer a systematic approach for lecturers to guide them into the best practice to enhance the creative potential of students to solve such problems. This would be the first step towards improving the state of creativity in the Omani design education system. Purposefully, that would help Omani students to develop their creative problem solving abilities as successful graphic designers.

There was not enough literature explaining the status of creativity in relation to Omani graphic design education. However, a few studies (e.g. Khaleefa, 1999; Alkholy, 2007) have investigated creativity in Arabic context. These argue that the Arabic traditional education system has negatively affected the status of both graphic design as a discipline and creativity as an integrated part of this discipline.

The context of this research is Omani graphic design education, where this research takes place. It has investigated whether creativity is described as problem solving by graphics lecturers. This research defined creativity as problem solving, which is explained sometimes as a cultural activity that each member of a specific culture - in the case of this research, graphic design education - performs routinely as part of everyday cultural activity (Williams, 1961, p.34). Also, cultural-related materials (Wolff, 1981) were invaluable in conceiving the word ‘creativity’ as cultural production. This research defines the phenomenon in a design educational context only. The design education literature showed that creativity is the problem solving abilities of graphic designers to solve social and cultural (i.e. ‘wicked problems’) within specific contexts. Based on this, the outcome of this research would be valuable for both the Omani and Arabic contexts.

The purpose of this study is to develop a pedagogical model that can be utilised by graphic design lecturers to enhance and assess the creative acts of their graphics students. The type of investigation undertaken to explore the research problem and to address this purpose was a comparative cross-cultural study of the phenomenon of creativity and how it is defined in both Eastern and Western cultural contexts. Such an investigation confirmed the importance of creativity for Omani graphics students in the modern educational system. Initially, the literature review was conducted to explore this issue, and then an interpretive qualitative methodology was helpful to specify the required contents of the pedagogical model that would help to foster the creative potential of students.

The data have been collected through employing semi-structured questionnaires and semi-structured interviews as part of a survey approach. The online questionnaire targeted international lecturers, while the interviews were conducted with graphics lecturers who
teach design courses within Omani higher institutions. The collected data were analysed by a thematic analysis method, where the results were first coded and then categorised according to different themes, which were extracted from the literature review and based on the research aims and questions.

At the same time, this research criticises myths associated with definitions of creativity. Examples of such myths are that people are born either creative or uncreative (Plucker, Beghetto and Dow, 2004, p.85). This is not a valid argument, because creativity is not preserved by a few gifted people or associated only with the arts. Plucker Beghetto and Dow (2004, p.83) argue, “The root cause of these stereotypes is the lack of adequate precision in the definition of creativity”. Therefore, this research changes the conception of creativity. Loveless (2002, p.3) argues,

There has been an acknowledgement of the creative potential of all individuals in different knowledge domains, or subjects not confined to traditional definitions of the ‘arts’ or ‘sciences’ […] peer groups or the wider society and considered as an essential element in participating in and contributing to the life and culture of society.

Other concerns of this research were about whether creativity can be taught or not. It has been found that several educational theories provided much evidence confirming that creativity is something that can be enhanced and assessed through structured curricula. Therefore, the issue of creativity assessment was one of the main concerns of this study.

All of these concerns were picked up by proposing the process that can lead to answering the research questions and fulfilling the aims. To satisfy this purpose, this research went through a procedure that started with defining creativity as ‘problem solving’, then reviewing the literature to distinguish the main concerns relevant to creativity in relation to graphic design students. Accordingly, a set of questions was developed and answered by a qualitative interpretive survey approach. This chapter outlines the answers to those questions along with the main agreements and differences that emerged from the various opinions. This forms a base for the next chapter, where the final inferences are used to develop the proposed pedagogical model.

The participants in this research were made up of two groups: the first group included 33 international graphic design lecturers who participated in the online questionnaire. This group was selected by the researcher to reflect international experiences in teaching graphic design and enhancing students’ creativity. Selecting such a variety of respondents aimed at comparing how different cultures perceive creativity. The criterion to select those participants was searching for academic design lecturers from art and design schools around the world,
and then selecting two or three design lecturers from each school. Fortunately, their thoughts provoked various themes and issues that were beneficial for this study. The second group was 39 graphic design lecturers who teach design courses in six Omani higher education institutions. The number of participants assisted the researcher to distinguish the most repeated inferences of answers and the most repeated differences. The type of analysis undertaken for this study was thematic analysis, as outlined by Braun and Clarke (2006, p.123). This type of analysis usually codes and categorises the information manually to obtain the inferences. An intensive overview of the data analysis method used with this study is explained in the Methodology chapter (Section 4.14).

5.3. Statement of the results

The questionnaire consists of six semi-closed-ended questions and four open-ended questions. Three of the closed-ended questions were asked at the beginning of the questionnaire and the other three at the end. These questions are closed-ended because there were only three possible answers (i.e. ‘Yes’, ‘No’, and ‘Other’). The results of these questions provoked some consensus and variations about the issues under investigation. In order to reveal more data, the fourth, fifth, sixth, and seventh questions were open-ended questions that encouraged the participants to express their ideas more freely. The results of the questionnaire were transformed from a web-based format to the text format. The results of the interviews were transcribed first from audio format to text format, and then translated from Arabic to English. The same sets of questions were asked in both the questionnaires and the interviews. The results of both types of questions are explained in the following paragraphs as investigated by both the questionnaires and interviews. The following survey questions and main issues are presented along with the results’ statements. These questions and issues are based on the structure of the research aims and questions.

5.3.1. Creativity in graphic design education

Question 1: Do you think creativity exists in graphic design education?

Of the 33 questionnaire participants, 28 answered this question ‘Yes’, with only 1 participant saying ‘No’. However, 4 participants selected ‘Other’, where other opinions were expressed: an example is Participant 16 who explained by saying, “Sometimes”. Similarly, the majority of interview participants (i.e. 38 out of 39) answered it with ‘Yes’, with only 1 participant saying ‘No’. None of the interview participants selected ‘Other’ to answer this question.

The answers to this question indicate that the majority of international and local (i.e. Omani) design lecturers recognised the importance of creativity in graphic design education.
Yet a few participants expressed uncertainty about the existence of creativity, as problem solving, within graphic design education. Reviewing the literature has confirmed the strong relationships between creativity and graphic design education. Examples of prior studies that have noted the importance of creativity in design education are Khaleefa (1999) and Tudor (2008).

As a result both the literature and the primary sources of data confirmed the importance of creativity as a crucial component in contemporary design education. However, very little information was found in the literature on the question of how creativity is defined in the Arabic educational context in general and in design education in particular. An example of these studies is that of Robinson (2006), who said, “Creativity now is as important an issue in education as literacy and should be treated with the same status”. So, this research states that creativity is an integrated component of cutting edge graphic design education; it is highly linked to graphics practices by default.

5.3.2. Teaching and encouraging creativity

Question 2: If the answer to the previous question was 'Yes' do you believe that creativity can be encouraged or taught?

Of the 33 questionnaire participants, 30 answered this question with ‘Yes’, with only 2 participants answering ‘No’. The only one who selected ‘Other’ was Participant 22 who stated, “Can definitely be taught”. Similarly, the majority of interview participants (31 out of 39) answered this question with ‘Yes’, with only 2 participants answering ‘No’. However, six participants selected ‘Other’, including Participant 23, who stated, “Depends on the person himself/herself”, and Participant 15 who said, “Creativity is to be developed not to be taught”. Four participants mostly shared the same comments, for example Participant 7 stated, “Creativity can be motivated with talented people”, Participant 28 said, “The core of creativity is inherited with the person, but it can be polished”, and Participant 11 said, “The base of creativity is talent, to be developed it must exist with the designer first”, and Participant 9 argued, “It is talent but can be taught”.

The second sub-question of the research enquired about teaching and encouraging creativity with students. This question confused the participants as it asked about two things at the same time (i.e. teaching creativity and encouraging creativity). However, the positive responses from the lecturers helped to provoke another important finding and overcome this shortcoming. Most of the lecturers agreed that it is possible to teach creativity for design students and to encourage it within them further. This notion has already been argued intensively by several creativity studies in various fields including design education studies.

Reviewing the literature confirmed that there is a blind faith and belief, which argues that creativity, can be taught and this would have beneficial effects. Raymond Williams (1961) suggests some ways in which the creativity of human beings can be enhanced. Examples of these are: work, learning, decision-making, ‘use of human faculties’, ‘education encourages the development of a variety of capacities’, and finally ‘democratic practice’ (Williams, 1961, p.34). This is in addition to set of pedagogical strategies that regard creativity as a ‘problem solving skill’ developed with students to produce ‘cultural’ objects that are defined as ‘creative’ within a specific context. However, there are still some lecturers who believe that creativity is a talent that exists with a few students but not all.

Is creativity the same as genius or talent? In fact, they are not the same, at least from this research perspective. Creativity is a cultural activity or a cultural production, whereas a talent can be defined as a specific attribute, aptitude or skill that exists within an individual in one or more areas. It is argued that regarding creativity as a talent is a mythical approach, which usually accompanies a view of creativity as an individual and spiritual entity. This view has been very widespread throughout history. For example, the Romantic era embraced the idea of creative genius, which developed in the Enlightenment to include the ability to analyse and order. This view continued even into the eighteenth century as a quality mystically possessed by gifted individuals. According to Massey (2005, p.18), this view still exists within contemporary studies, as “…innovative design is explained in terms of design problem and design solution by the innately talented individual(s)” (ibid., 2005, p.18). However, the most dominant understanding of creativity at the present time is the idea that everyone is potentially creative in some way. Massey (2005, p.18) explains this: “[the] prevalent contemporary approach is to assume that everyone is innately creative and it just needs the right environment, teaching or approach to unleash this creative potential for the benefit of the individual, organization or nation”.

Talent involves a better intuition about a certain area, yet, to achieve the best result for any talent, it should be matched with the correct task, within the right environment suitable for the appointed task(s). A talented person usually performs above average in that particular task compared to his/her peers, especially those of the same age. Talent is not necessarily linked to the artistic area of expression: it can lie in any area of endeavour (e.g. sports, music, or mathematics). It implies some natural ability based on a specific area of strength. A talent emphasises one’s “personality and the types of opportunities available in the environment over a period of time play a large role in the development of a talent” (Bloom,
1985; Sosniak, 1997). Some recent studies (e.g. Rondhuis, 2005) revisit this concept from a philosophical perspective. Rondhuis (2005, p.4) argues,

Talent is no longer viewed as just a matter of rather stable individual differences in potential or performance. Instead, developmental changes in talents are currently examined in close relation to changing contextual support, changing constraints, and changing tasks. Talent is supposed to result from the acquisition of a sequence of skills, facilitated by changes in the individual’s environment.

To sum up, a talented person can perform exceptionally well in a specific area of interest, while a creative person shows remarkable performance in a consistent way in several tasks in which they engage. However, a talented person needs practice and continuous persistence, in order to develop their talent. Therefore, creativity necessarily depends on ‘talent’.

5.3.3. Creativity enhancement

Question 3: Can creativity be enhanced?

Of the 33 questionnaire participants, 32 answered this question with ‘Yes’, with no one saying ‘No’. The only respondent who selected ‘Other’ was Participant 12, who actually confirmed that creativity could be enhanced by stating “100% – much evidence to say so too”. In the interviews, 36 out of 39 participants answered this question with ‘Yes’, with only two participants answering ‘No’. The only respondent who selected ‘Other’ was Participant 37, who stated that creativity could be enhanced, “but not encouraged”.

Creativity enhancement is different from creativity encouragement, as in the enhancement process the creative student has a role in his/her creativity enhancement, whereas the encouragement usually comes from the lecturer towards the student. There was some confusion for some participants in answering this question. This can be regarded as a limitation of this question, which will be discussed further in the limitation section in the Conclusion chapter. However, the largest number of participants agreed that creativity could be enhanced for graphics students using specific methods. This consensus was also argued earlier by the literature. For example, Craft (2003, p.124) identified the graphic design discipline as a perfect field in which to practise and enhance students’ general creative-thinking and creative problem solving skills (DTI Economics Papers, 2005, p.3), “Design is considered a creative activity. It is also considered a source of innovation and a foundation for social change” (Sosa and Gero, 2005, p.229): and creativity can be enhanced within students (Hewett et al., 2005, p.13).
To sum up, this research states that the majority of graphics lecturers believe that creativity is a problem solving skill that can be enhanced within graphic design students. The main player in creativity enhancement is the lecturer, yet the graphic design student has a role in developing his/her own creativity, through self-motivation and other techniques explored by the following questions.

5.3.4. Defining creativity within graphic design education

**Question 4: How do you define creativity within graphic design education?**

This question investigated how international and local graphic design lecturers define and perceive creativity specifically in relation to the graphic design education context. There were varied responses to this question were various. Therefore, it has generated a large number of codes and themes. All of the answers to this question were coded first, then categorised into ten different themes as shown in Appendix 3. The question was asking various graphic designers what they thought, so the researcher was not responsible for their answers or for reconciling any contradictions.

The most dominant definition of creativity was to explain it as the problem solving ability of graphic design students who usually involve themselves creatively in solving ‘wicked problems’ that they might encounter in their own social group. The lecturers here believe that when a student is able to find a suitable solution for a given ‘wicked problem’, that would be a creative activity. The only condition here is the fact that the solution must be accepted within the socio-cultural perspectives. Participants here described the solution as “interesting way”, “critical”, or “unexpected”. So the Omani graphics professionals would certainly solve social challenges. The lecturers here confirm the importance of finding various solutions for each problem, as a procedure towards the creative solution. This involves a creative design process in which solutions are tested in order to find the solution that works.

It has been hypothesised earlier that creativity in graphic education settings tends to involve problem solving that can be explained also as a cultural production, where this production should suit the social and cultural requirements in which it is produced (Williams, 1961; Wolff, 1981; Barnard, 2005). Such an account of creativity is argued intensively by several recent design researchers, including Ryan and Conover (2007, p.xv) who argue, “all design is a problem solving process. It embraces change and often demands a willingness to take risks”. Also, Brown and Yates (2000, p.44) argue, “to develop their abilities in creative problem solving”, and Fisher (2000, p.125) states that, “design is a core problem solving activity”.

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However, some lecturers still perceived creativity as a talent that only exists within certain people. The data show that some people still perceive creativity as an inspirational power that comes to poets and artists. This can also be seen as an illogical approach towards the phenomenon, so this research stands against such claims. Rather, in this research, it is argued that this is an irrational approach that has several weaknesses. For example it reserves the creative act for some people only. Indeed this requires some components, such as knowledge, experience, and motivation, to name a few. Such an approach reflects ancient myths of comprehending creativity. Amabile (1997, p.42) calls this approach a ‘person-centred approach’ and says it “offered little to practitioners concerned with helping people to become more creative [...] it virtually ignored the role of the social environment in creativity and innovation”.

Some lecturers also define creativity as a “componential theory of creativity”, as argued earlier by Amabile (1997, p.43). Creativity requires specific components in order to exist. Examples of these components are “knowledge”, “experience”, and “creative thinking skills” (ibid, p.43). Amabile also said, “all humans with normal capacities are able to produce at least moderately creative work in some domain, some of the time, and [...] the social environment (the work environment) can influence both the level and the frequency of creative behaviour” (ibid., 1997, p.43). Some lecturers reported some components of creativity exactly as described by Amabile (e.g. expertise, creative-thinking skills, and intrinsic task motivation): the participants repeatedly mentioned “experience” and “motivation”. Many people think creativity is something that would be difficult to achieve, and many students think creativity is associated with fear and trepidation. As a result, “creativity does not always require new or original ideas” (Cheow, 2008, p.4); rather “most creative work is an effective integration of existing information” (ibid., p.4).

‘Creative-thinking skills’ have already been proposed as a crucial component for a creative person. This research reflects positively on the ‘componential theory of creativity’ as proposed by Amabile (1997, p.43), simply because the three components of this theory (i.e. experience, motivation, and creative-thinking skills) are already suggested in the literature review as crucial aspects of the creative person. Therefore, there are some correlations between some lecturers’ responses and Amabile’s theory of creativity: this is a very significant finding for this research, as it means that the findings are already based on a valid theoretical background.

Another group of participants defined creativity from a purely psychological perspective. For example, some cognitive characteristics should be found within creative people, who can operate their brain efficiently to generate new ideas. Specific descriptions
mentioned here included “recognition skills”, “powers of observation”, “think critically”, and “recognition attributes”. Comprehending creativity in this way is a psychometric approach discussed much by psychologists such as Guilford (1979) and Torrance (1974). These scholars talk about the four dimensions of creativity (fluency, flexibility, originality and elaboration). This approach to understanding creativity is not beneficial for the research at hand, as it proposes a quantitative approach to dealing with creativity. Also, assessing creativity according to this theory makes it difficult to measure the relationships between the cause and effect. Based on what is argued here, measuring the creative act quantitatively in the graphic design context is not a valid argument. As a result, defining creativity from a psychometric approach is not valuable for the research; however, it has been discussed in the literature review chapter in order to explore how psychologists have studied this phenomenon.

In the graphics communication industries ‘creativity’ is explained also as the ability to communicate ideas creatively throughout the elements of visual graphics. Some participants have already raised defining creativity in such a way. So it is common within design and cultural studies. Williams (1961, p.44) defined the creative artist and designer thus:

The creative artist is an observer, whose brain works in new ways, making it possible for him to convey information to others about matters that was not a subject for communication before. It is by search for means of communication that we sharpen our powers of observation.

Several scholars (e.g. Barnard, 2005) have studied the differences and similarities between the creative designer and the creative artist. Barnard (2005, p.178) argues that one of the obvious similarities is that both creative designer and creative artist make and produce ‘experiences’ in a visual form, then describe these ‘meanings’ and communicate them to/within specific social and cultural contexts. However, there is no essential or effective difference between the creative artist and the creative designer. Creative designers frequently engage in the cross-domain transfer of abstract design ideas. They also often recognise alternative uses or functions for common designs. Sawahata (1999, cited in Cheow, 2008, p.9) argues, “Creative designers respond to new stimulus, introduce the elements of surprise, and solve specific problem to reach targeted goals. They enthusiastically grow and gain energy as the process moves them forward”.

Therefore, “the goal of creativity in graphic design is not to find the right answer, but to explore the range of possibilities” (Pibernik, Milcic and Bota, 2010, p.1). Antonenko and Thompson (2009, p.10) also argue, “Being creative is seeing the world [...] through different perspectives, not narrow-minded, one-way alley [...] viewing situations, objects though
different people’s perspectives”. Based on this position, it is argued here that, “Creativity in graphic design, or any visual communications discipline, is not measured in terms of right and wrong, but rather by the degree of success demonstrated in problem solving, applying visual skills, and expressing personal interpretations” (Landa, 2001, p.13).

This approach works well with the problem solving perspective towards creativity, simply because the creative solution of the ‘wicked problem’ should be communicated anyway. The communicated creative product is a cultural product that is produced by specific graphic designers for a specific social group to be added to a specific cultural context. According to Williams’s view, creativity has already been explained as a cultural product that everyone necessarily does as an everyday activity in ‘new ways’ (Williams, 1961, p.44).

To sum up, this research states that a large group of the lecturers mentioned that creativity is a problematic definition and challenging concept. This notion is repeated intensively in most of the creativity studies outlined in the literature review (e.g. Williams, 1961, p.19; Barnard, 2005, p.169). So, this research states that finding one unified agreed definition of creativity is difficult, because of infinite regression or tautology, where the word ‘creative’ is defined by using similar words such as ‘original’, ‘novel’, or ‘new’. However, this research makes a small claim in a specific context (i.e. graphic design education), based on first-hand research and on the findings of primary resources, that creativity can be approached as problem solving, which is usually also explained as a cultural production.

5.3.5. Creative-thinking techniques to foster students’ creativity

Question 5: What are the creative-thinking techniques that can foster the creativity of graphic design students?

This question investigated the techniques that can foster students' creativity. It mainly aimed to find creative-thinking techniques that graphic design students could practise to enhance their creative thinking. The answers to this question were coded first, then categorised according to the role of student, lecturer, or environment. The responses to this question were varied, as the lecturers had a wide range of answers. Therefore, many codes were generated. In total, eight themes were generated, which are outlined in Appendix 4. Each respondent suggested several techniques that are categorised under various themes; therefore it was difficult to specify whether the majority of participants preferred some techniques to others. It is argued that creative-thinking techniques are different from the pedagogical strategies investigated by the next question. Creative-thinking techniques tend to be more cognitive and can usually be practised by the students themselves, even outside
the classroom. Pedagogical strategies are, on the other hand, usually suggested by educators and managed by lecturers, as teaching methods practised mostly within classrooms.

The correlations between the findings and the expected results were very weak. The question enquired about creative-thinking techniques, but most of the answers mentioned something else such as educational methods, or assessment issues. The possible reason for such misleading answers was because of the weakness of the question, which was not explained well. This can be regarded as a limitation of this research question. Nevertheless, some consensus was extracted from the answers to this question, which was very beneficial and contributed positively in developing the pedagogical model in the next chapter.

The collected data revealed some techniques relating to the creative student that can be classified under three categories. Firstly, personal characteristics, in which the student should seek to gain the characteristics of creative people. These characteristics are discussed intensively in the literature review and examples of these characteristics are taking risks, being comfortable with ambiguity, and confidence. Secondly, knowledge-related creative abilities, where the student who is enthusiastic about being creative pays attention to learning about theories of creativity, is a self-motivated learner, makes appropriate use of technologies, and undertakes good research and analysis. The third category is the cognitive attributes that should be valued by the creative individual. These attributes tend to include more mental abilities such as divergent thinking and critical thinking.

The responses also mentioned some problem solving techniques that each student should seek to learn. The graphics lecturer is responsible for delivering these skills to the students. Examples of these techniques are showing examples of solving ‘wicked problems’ through reflecting on previous experiences of teaching graphic design and teaching the process of solving ‘wicked problems’ creatively. The lecturers should explain how graphic design students could practise this process to generate effective solutions. Examples of these processes are analysing, identifying, and interpreting the elements that feature in the context of the problem. The solution should be suitable, visually pleasing, socially and culturally accepted. This process is mentioned intensively in the literature, for example, Matthews (2007, p.4) describes how any creativity training should employ them:

Creativity training usually includes some training in techniques, which promote divergent thinking. The Creative Problem solving (CPS) program, sometimes called the Parnes-Osborn model was developed by Parnes and colleagues, it consists of six stages of creative problem solving: mess finding, problem finding; idea finding; solution finding and action planning.
The data also confirmed the importance of involving students in creative learning inside and outside the classroom. The answers of some participants valued techniques most highly that develop students' learning skills to assess their classmates' creative design work. When the Omani students further progress through their course, the learning techniques provide them with a more reliable environment in which they can provoke multiple solutions for 'wicked problems' that are appreciated by both lecturers and society. The learning-by-doing technique is a creative approach in graphic design programmes.

The data also mentioned some creative-thinking techniques that can be applied by students themselves inside and outside the classroom. Examples of these techniques are: visual mind-mapping, brainstorming, scamper, KJ, NM, Synectics, Checklist, pert, input-output, remind freely, Matrix, and De Bono six thinking hats techniques. Most of the participants here emphasised the role of graphic design lecturers in explaining these creative techniques to students. Some consensus was extracted from the data about how lecturers should assist their students to practise brainstorming, for example. Cheow (2008, p.10) suggested that “teachers provide ample opportunity for research, experimentation and revision and assignments should extend over a significant period of time so that students can investigate and reflect”.

To sum up, this research claims that, since creativity in graphic design education is defined as problem solving, it is important for graphics students to practise problem solving techniques that start by defining the problem and end with action planning. Therefore, this research states that the creative designer in the first place should practise creative problem solving techniques, guided by the lecturer and supported by the surrounding environment. The answers to the fifth question suggested a set of conditions, rather than techniques, which should surround the students in order to help them to be creative. Examples of the participants' valuable conditions are: “practical supervisor”, “environment of trust”, “visual communication spectrum”, and “advanced surroundings”. These responses describe the role of the environment in the process of students’ creative-thinking development. Nevertheless, the data showed that there are some techniques which consider the importance of social and cultural factors in promoting the creative thinking of students. Lecturers suggested that students should interact with people from different segments of society. In fact, this is very much an effective way to enlarge the possibilities within students' minds to accept various realities by practising acceptance of other people’s perspectives.

5.3.6. Fostering creativity by pedagogical strategies

Question 6: What are the pedagogical strategies usually used by graphics lecturers to foster students' creativity?
The sixth question of the survey is the fourth sub-question of this research. It investigates the pedagogical strategies that can be used by lecturers, in particular, to foster creativity in their students. These strategies are different from the previous ‘creative-thinking techniques’, which tend to be more cognitive activities that can be applied by graphic design students themselves, while the ‘pedagogical strategies’ are teaching methods usually employed by lecturers. The answers to this question were coded first, then categorised according to the role of the lecturer who is the main figure in the enhancement process. The data provoked several interesting issues that are thought to be beneficial. There were twelve themes (as outlined in Appendix 5) and they were mostly categorised similarly to the answers of previous questions. The most dominant suggestion was on creative teaching methods. Each participant came up with a mixture of techniques or tools that could be categorised under various themes; therefore it was difficult to specify the majority preferences.

Several pedagogical strategies were recommended by participants and were valued as methods that help in creativity enhancement. The lecturers have a major role in guiding the students to practise problem solving techniques by explaining them through a set of specific educational strategies. These strategies can be categorised under eight themes:

1. Strategies that develop students’ cognitive abilities, such as observation, dimensional thinking, empathy, and analysis.
2. Strategies that focus on personal development, such as meditation and flexibility in the use of attention.
3. Strategies that develop students’ creative characteristics, such as questioning the status quo, encouraging them to break the rules, and motivating them to take risks.
4. Strategies that can develop students’ self-assessment, for example, critically reflecting upon their creative works, giving them challenging exercises with specific constraints, and not judging their creative acts very often.
5. Strategies that teach students problem solving methods, such as never providing solutions and always assuming the current solution is wrong.
6. Strategies that develop students’ cooperative skills, such as peer-review, pushing them to interact with all parts of society and members of different cultures, working in groups in solving design problems.
7. Strategies that develop students’ visual library.
8. Strategies that teach the creative design process.

The results of this question indicate the role of lecturers in promoting creative communication experiences for graphic design students. Graphic design students should practice solving ‘wicked problems’ routinely in order to develop this as a lived experience. Tudor (2008, p.2) explained this by claiming “the holistic nature of human creativity as ‘lived experience’ for design practitioners, teachers and students”. Cole, Sugioka and Yamagata-Lynch (1999, p.3) described creativity as “... an essential element necessary for learning”. It is argued that accomplishing this aim can help students to reach the state of flow as described by Csikszentmihalyi (1999, p.313). Several participants encourage implementing pedagogical strategies based on project-dependent learning, which is described as “creative self-motivated learning”, either within the classroom or outside it. Such implementation would help creative students to apply their knowledge practically to solve design problems. This would be as alternative to current practice in teaching problem solving techniques for students. Adams (2005, p.15) argues, “Current classroom practices don’t focus enough on promoting creativity and innovation and even sometimes serve to destroy it”. Adams also reminds us of Cropley’s (2001) explanation “that teachers often view the creative, maverick personality as a troublemaker, stifling the student’s ability” (Cropley, 2001 quoted in Adams, 2005, p.15).

It is important to provide students with a more realistic and practical atmosphere: this method can help to fill the gap between the theoretical knowledge gained and its practical implementation in real-life applications. Studio-dependent learning actually consists of learning or gaining knowledge in the studio under a controlled environment in the presence of a graphic design lecturer. It motivates students to follow learning-by-doing techniques, which would also help them later in the design industry (Margolin, 2005, p.235). Participants here value the role of both the environment and lecturers, who are,

- Professionals from the industry who can lead by examples instead of plain teaching of theories. Differing vocational fulfilment and a broader range of personal development can prepare students to enter a real-world with a much wider range of jobs that offer challenge, income, and social status (Cheow, 2008, p.22).

Moreover, the data demonstrate the significance of training students to build up their creative portfolios. Graphics students should try their best to build up brilliant portfolios in which they show a maximum number of creative-thinking abilities. This can help them to meet job requirements in the future.
To sum up, this research states that various pedagogical strategies can be suggested to develop the creative potential of graphics students. The creative act usually goes through an integrated process, where these elements interact together to generate the final creative product. The key factor here is that any suggested set of strategies should be based on the main aims of the educational system where these strategies are applied. Western perspectives towards these strategies can be beneficial for the pedagogical model proposed by this research. However, the lecturer plays the main role in developing the creative process of solving the design problem through specific recommended strategies mentioned in the above few paragraphs.

5.3.7. Content of the design curriculum that promotes creativity

Question 7: what should a graphic design curriculum contain to promote creativity?

This question is the fifth sub-question of the research that examines the optimal content of the design curriculum that was thought to be helpful in promoting creative thinking within students. The answers to this question were coded first, then categorised according to the type of content and its effectiveness. The most dominant responses mentioned content related to art and design education. The participants of both the questionnaires and interviews responded to this question positively, so their answers have indicated that they comprehended the question correctly. Therefore, it is argued that the answers would be helpful in developing the proposed pedagogical model. The thematic analysis found that eight themes emerged from the collected answers. Very often a participant provoked more than one code, which did not necessarily belong to a specific theme. Examples of these responses are discussed in the following paragraphs and evaluated in relation to the literature review.

The data support the claim that the graphic design curriculum should contain a set of cognitive thinking content. Examples of this content are training courses in critical thinking, courses in psychology, and information about imagination and daydreaming. The literature review mentioned some modules of creative thinking developed by Harpe (2006), or lateral-thinking techniques discussed by Cheow (2008). These types of training develop the creative mental abilities of students. Other recommended content of graphic design courses includes exercises that develop students’ physical techniques, for example content that asks students to emphasise manual hands-on techniques and organisation over styling. A valuable suggestion for this issue was “frameworks for reflective practice that allow students to make tacit knowledge explicit and be built upon”, as Participant 23 said. Such courses should include structured art and design history and future trends and analysis of the historical applications of graphics.
The interpretation of the data also showed the importance of providing examples of good design and a few instances of technical suggestions, such as how to operate the design software correctly. Cultural and contextual contents were recommended, also in order to enrich the creative curriculum. Cheow (2008, p.10) argues,

On the educational forefront, identifying and facilitating creativity lies in the hands of parents, administrators and educators. Our school curriculum is still practicing what Cropley (1992, p.20) defined as ‘closed content’. What students learn are specified by other people as programs, lesson plans, exercises, projects, and the like that are written in advance.

Other examples of culturally and socially related content are context and liberal studies and passages that identify the current problems within the social context. Other recommended content includes that related to the process of problem solving, such as examples of open-ended solutions and examples of ‘wicked problems’ from the real world. One interesting response to this question was, “this means being able to discriminate between success and failure in problem solving or providing visually stimulating engagement for user or viewer” (Participant 11). The data revealed recommendations of an interdisciplinary approach, including theories or ideas from other fields such as philosophy, sociology, history, technology, and political studies. The creative process of solving ‘wicked problems’ is also mentioned within the participants’ responses.

To sum up, this research states that various types of content should be included within the design curriculum to develop the creative problem solving abilities of graphic design students. These include: content that relates to problem solving techniques; content that trains the cognitive abilities of students; content that enriches students’ knowledge about creativity as a concept; practical exercises that develop design skills, such as sketching; and content that trains the students to become self-motivated. This content and examples of it are mentioned briefly in this chapter: it is covered intensively in the next chapter, which outlines the proposed pedagogical model.

5.3.8. Assessing graphics students’ creativity

Question 8: Do you think creativity can be assessed within the graphic design discipline?

This issue was investigated by question eight of the survey, which enquired about the possibility of assessing the creative outcomes of graphic design students. The data shows that a large number of lecturers believe that it is possible to assess the creative abilities of graphics students, yet the assessment depends upon how creativity is defined. Since the
questionnaire defined ‘creativity’ as problem solving, the majority of lecturers tended to argue that there are always ways to assess creativity. However, some participants believe it is not worth assessing creativity. This notion has already been argued in the literature review chapter by reference to several scholars (e.g. Torrance, 1974; Guilford, 1979). Sternberg (1995, p.240) states, “Assessment of such a multidimensional construct as creativity requires multiple channels of measurement such as tests and inventories”. For example, a social-personality approach to the assessment of creativity is outlined in Sternberg, Jarvin and Grigorenko (2010, p.93), in which it is argued, “Developing in parallel with the cognitive approach, work in the social-personality approach has focused on personality variables, motivational variables, and the socio-cultural environment as sources of creativity”.

However, the data showed that it is sometimes difficult to apply standards to creativity. For example, Participant 32 of the questionnaires argued, “Yes, but creative design is a personal thing that should have aesthetics and logic at the same time”. It would be more suitable to assess students as a group, as recommended by some participants. However, another problem may emerge here, which is the difficulty in assessing a group of students at the same time, as each student has his/her own style. Participant 19 explained this by stating, “Some students create new ideas, but some produce regular ideas”. From a different perspective, Participant 24 stated, “Neither, it can be assessed in terms of academic, when the student is still learning the principles and the elements of design, but I think creativity should not be bordered by strict rules”.

To sum up, the data showed that there are ways to assess the creative outcome of graphics students. These thoughts have already been mentioned in the literature by Torrance (1974), Guilford, (1979), and Berenson and Carter (1995). Cole, Sugioka and Yamagata-Lynch (1999, p.8) suggested that teachers must “promote the use of journals, open-ended problems, portfolios, interviews, and performance assessment. Such measure would allow students to discover the new rules of grading alternative assessments reward their unique contributions rather than their short-term memories”. The proposed assessment components are outlined clearly in the next chapter. Therefore, this research argues that creativity, as problem solving, can be assessed within graphic design students.

5.3.9. The framework utilised to assess students’ creativity

Question 9: Are you utilising any framework, in your pedagogy, to assess students’ creativity?

This issue was investigated by the ninth question of the survey. The majority of questionnaire participants answered this question with ‘Yes’, with 11 participants responding
‘No’. Interestingly, 9 participants selected ‘Other’. There were a variety of responses that mostly described the assessment frameworks. An example is Participant 01, who said, “Am using specific scoring rubrics that vary based on project”, while Participant 14 said, “Creativity (or lack thereof) is usually readily apparent when assessing student work”. Participant 23 said,

More generally we have 10 graduate attributes that govern assessment. This includes: ‘Think creatively to generate innovative solutions.’ For design courses the end result might also have to be creative and be assessed for the demonstration of creativity in the product itself as opposed to being demonstrated by the student.

Among the interview participants, 29 out of 39 participants answered this question with ‘Yes’, with only 7 participants responding ‘No’. Interestingly, 4 participants selected ‘Other’. There were a variety of responses that mostly described the assessment frameworks. The most common category suggested a group assessment framework, (e.g. Participants 7 and 19). Participant 31 said, “By group assessment, collective evaluation process, and collective assessment”. Participant 12 answered, “Yes, group assessment, we chose the best (unique and creative) artwork then, we give other degrees accordingly”; also, Participant 4 argued, “Group assessment and individual assessment parametric”. The second category is the design principles framework: examples are Participant 2, who said, “Ideas of designing and the method of implementation in the technique”, and Participant 29: “See the element and then feel it”; Participant 16 said, “Measure it against the fundamentals of design”, and finally Participant 27 argued, “Certain criteria that judge the creativity design standards”.

The third category involved a sort of mixed framework: examples are Participant 8, who answered, “Evaluate the ability to deliver the message”; Participant 15, who said, “Criteria of idea, design, implementation and the output”, and Participant 13, who answered, “The marks are distributed for different phase of work (e.g. sketches, concept, follow-ups, finishing, cleanliness and clarity of work)”. Some participants explained plans to achieve this: an example is Participant 6: “Nothing structured but all staff members are tuned to this goal”. Participant 18 said, “Same as before: I don’t look at creativity in a student’s work because the term doesn’t specify much. But I look at the process and the methodologies a student has followed. And if that is interesting and leading to a functioning, convincing, perhaps surprising result, it might have a high level of creativity”. Participant 16 answered this with, “Yes we have specific learning outcomes”. Participant 22 said, “Design pedagogical criteria”. From different perspectives, some did not think creativity can be assessed; an example is Participant 11, who said, “Yes but it is not worth attempting to ‘assess’ creativity”. 

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The four participants who answered ‘Other’ did not agree on a specific framework, but had several concerns or ideas relating to assessing creative design. An example is Participant 1, who said, “Students need to struggle more to be assessed as creative”. Participant 6 suggests feeling and stated, “Feel the colour, see how it looks. My concern in creativity assessment is how to create beautiful art”. Participant 33 said, “First assess how the ideas have been arranged, look at the first idea initially, then see how the student works it out”, and finally Participant 23 said, “Yes, but criteria should not control students’ choices”.

The previous data demonstrates that there are various viewpoints towards how creativity should be assessed within graphic design education contexts. However, the most recommended framework is group assessment and criterion-referenced testing. Even though most lecturers said that creativity could be assessed, they did not come up with well-defined frameworks that can be distinguished and recommended as a suitable framework. Most of such responses described the process of assessment, or described the process of group assessment. Therefore, this indicates that design lecturers probably have a blurred view of the ideal frameworks that can be implemented to assess the creativity of students. However, the findings of this question provoked the idea that the assessment should cover the creative process as well as the final product. Also, the data indicate that there are some beneficial suggestions that can be encouraged to build up a workable framework based on creativity standards. Some scholars discussed this issue earlier in the literature (e.g. Harpe, 2006; Tudor, 2008).

To sum up, there was no clear suggestion or consensus about the ideal framework for assessing the creativity of graphic design students. However, the recommended framework should be designed by the lecturers themselves for a specific unit or course based on the aims and objectives of the course or unit being assessed. Further group assessment frameworks will be discussed and described further in the contribution chapter. The following question examines the suitability of criterion-referenced tests to assess creative outcomes.

5.3.10. Criterion-referenced tests to assess the creative outcome of students

Question 10: Do you think criterion-referenced tests can assess the creative outcome of graphic design students?

Surprisingly, a minority of the questionnaire’s participants argued that criterion-referenced tests could assess the creative outcome of graphic design students. For example, 9 out of the 33 participants said ‘Yes’ to this question, while 11 said ‘No’, and 13 out of 33 participants answered this question ‘Other’. Of those participants who selected the option ‘Other’, an example is Participant 15, who said, “At a certain level—but any system
will miss that which it regards as external, and so it is always open to missing the most innovative work”. Participant 14 argued, “I rely solely on assessments that force students to demonstrate to me (and the class) with verbal and visual presentations that they understand and can apply their newly learned knowledge to a real-life graphic design project or topic”. In general there was a problem with this question, as most of the participants did not understand what ‘criterion-referenced testing’ meant.

Interestingly, on the other hand, the majority of interview participants (i.e. 33 out of the 39 participants) answered ‘Yes’ to this question. Five said ‘No’, and two participants answered this question ‘Other’. Of those participants who selected the option ‘Other’, an example is Participant 36, who said, “There are certain limitations and boundaries, to satisfy the standards”; Participant 22 argued, “Yes, but the criteria should be agreed between both student and lecturers, design standards made in advance, which explains to students the limits and instructions”.

This was the final issue investigated within this research. It was concerned with the suitability of criterion-referenced tests to assess the creative outcomes of students. This issue was investigated by the fifth sub-question of this research. The data showed that there was no common consensus between graphics lecturers about the ideal assessment criteria that should be used within graphic design education. The same finding can be applied to criterion-referenced testing, which aims to test the ability of students in solving problems creatively against specific criteria. The results of this question show that this type of test was preferred by about a third of participants (nine participants), which is not the majority. However, this is an interesting finding, because it provokes a discussion about whether assessment standards hinder creativity.

The literature review confirmed that criterion-referenced testing is a suitable system to assess creative outcomes of students in educational systems in general (Cheow, 2008). Yet, this was not the case with the triangulation of findings. The possible reason for not finding enough lecturers who recommend this type of test is the fact that creativity cannot be associated with standards or criteria such as those set out by the lecturer before accomplishing the unit or the exercise. It is also interesting to find that two thirds of the participants do not agree with such assessment. Those lecturers who answered the question with ‘other’ constituted about a third of the group. They believe that assessment should be based upon the ability of the student to demonstrate creative production, independently, in both visual and verbal forms. Several other answers linked the level of knowledge and the creative outcome.
It is important to admit that there was a limitation associated with this question. Some participants did not understand what ‘criterion-referenced’ meant in the first place. This is in spite of the fact that it was explained at the beginning of the questionnaire. Still, it is difficult to argue that criterion-referenced testing is a suitable assessment method to assess creativity within graphic design education, at least within the findings of this questionnaire that has investigated the international experience.

The preliminary analysis conducted on the results of the questionnaire revealed some interesting inferences that could be made in light of what was discovered from the respondents’ replies. These inferences have been categorised under specific themes that were already defined earlier according to the research problem related areas, which were extracted from the literature.

The last section of the questionnaire and interviews was a ‘personal information section’, which consists of six sub-sections. They asked the participants their name, age, gender, country, institute, and years of experience. The answers to these questions were listed by the researcher and kept anonymous for ethical reasons.

5.4. Implications

The previous findings have important implications for developing the pedagogical model as the main contribution of this research. The positive outcome of the first three questions builds a valid and strong base for the whole argument. The combination of these outcomes provides some support for the initial conceptual premise arguing that creativity, problem solving, is something that exists in graphic design education and can be taught, encouraged and enhanced with students. This argument rationalises the attempt to define the creative act within graphic design education. The second set of implications relate to developing the state of creativity within the Omani educational system. For example, the findings of the fourth question, which discuss the definition of creativity as problem solving, would support the initial hypothesis claimed at the beginning of this research. Therefore, creativity in relation to graphic design can be defined as a problem solving activity that is explained as a cultural activity. An implication of this is the possibility of promoting this understanding towards creativity within the Omani graphic design educational context, giving a valid result to the primary research and the thesis as a whole.

The third set of implications outlines the main features or elements that should be considered when designing the proposed pedagogical model. For example, one of the issues that emerged from the findings of the fifth question is around techniques that can promote creative thinking in design students. Such techniques are regarded as one of the
main components of the model. So the findings help to specify these techniques and make them available. The same is true of the outcomes of questions six, seven, and eight. Most of the issues, elements and points emerging from these findings related specifically to the roles of the design lecturer, student, environment, social and cultural context, and design curriculum in developing the student’s creativity.

However, the results of questions nine and ten were not very encouraging, as the answers were either varied or very contradictory. For example, the data revealed by the ninth question have not suggested a specific framework that can be ideally used by design lecturers to assess the creative outcome of students. Such findings are rather disappointing, as there was a hypothesis that there is a shared assessment criterion or framework that is preferred by both international and local lecturers. However, the data have not confirmed this hypothesis. This can affect the assessment section part of the pedagogical model. Also, the results of question ten did not support the criterion-reference test as a suitable assessment system for creative outcomes, based on the various responses to this question.

To sum up, criterion-referenced testing was not recommended by the majority of international communities of graphics lecturers; however, it was preferred by the majority of local (i.e. Omani) design lecturers. This may indicate that international understandings about the assessment of creativity are different from national understandings. According to the international view, creativity should not be attached to specific criteria, as there are no standards of creativity and the students’ creative act should not be attached to specific standards. This perception is a result of how Western lecturers perceive the word ‘creativity’. On the other hand, from a local perspective, assessing the creative act according to specific agreed criteria is mostly accepted. This also reflects how Arabic lecturers comprehend creativity.

5.5. Limitations

It is important to mention the limitations that constrained this research in order to suggest ways to overcome them in the future. One of these limitations is factored into the process that is used to understand how graphic design lecturers perceive the word ‘creativity’. Design lecturers participating in the research were representative of the international and local (i.e. Omani) population. Their ideas about the investigated issues were used to inform the research, yet the data may not be representative of all design lecturers. So, this can be regarded as a limitation of this research. This research relied on the honesty of the participants’ feedback. To minimise the effects of this limitation, the data were compared with the literature review.
The second limitation is, articles on graphic design and creativity in relation to education tend to become out-dated fairly quickly. To overcome this limitation, the most recent literature was used, including research journals and online resources. Also, in order to minimise the possible biases reflected by some participants, comparisons between participants’ responses were conducted.

There was also a limitation in the questions that were asked in the questionnaire and in the interviews. For example, the second question asked about whether creativity could be taught and encouraged; similarly, the third question enquired about creativity enhancement. This has confused the participants who could not differentiate between teaching creativity, encouraging creativity, and enhancing creativity. However, the outcome of these questions confirmed that there is a common consensus that creativity is something that can be taught, encouraged, and enhanced anyway.

Another limitation that should be addressed here is the terminology problem in defining ‘creativity’. Most researchers from various perspectives have not agreed upon one clear definition of creativity. To overcome this limitation, the terminologies used in this research have been identified in the Introduction chapter, to clarify the most important words and phrases. This enables the reader to follow the coherent progress of the research and give a constituent understanding of the issues discussed in this research. Examples of these words are creativity, innovation, problem solving, creative process, design, graphic design field, and graphic design education, graphic design lecturers, graphic design students.

However, the major concern is the lack of involvement of Omani graphic design students in the research. The words “Omani graphic design students” are in the title. And the students are at the receiving end of the pedagogical strategies proposed by the model. They surely are part of the important target users. But the perspective of Omani graphic design students seems to be missing in the research. To minimise the effect of this limitation the following steps have been conducted: 1) there are future plans for follow-up studies that will involve students; and 2) the researcher had teaching experience, which enabled interaction with students.

One of the most important plans for the future of this research is the evaluation of the pedagogical model by graphic design lecturers who teach design disciplines at Omani governmental and private institutions. To conduct such an evaluation, the researcher plans to carry out focus groups sessions, where approximately four or five lecturers will sit down together to assess the advantages and disadvantages of the model. This evaluation will benefit the model as well as the researcher, who will continue practising research methods (e.g. focus group). Another plan for building upon this research is converting this thesis into a
format that is readable for all educated readers, as the current research format would not suit all readers. There is an intention to translate this thesis into Arabic and publish it within Arabic-speaking countries (i.e. Middle Eastern countries). The perspective of the book can benefit general Arabic design lecturers and their students, because of the cultural similarities between Oman and other Arabic cultures. In regard to the current outline of the pedagogical model, there is an intention to redesign the model to serve as a quick user-friendly guide for lecturers that can assist and guide them with ideas or instructions for how to promote the creativity of their students.

5.6. Summary of the chapter

To sum up this chapter, this research states that creativity in graphic design education is represented as a problem solving ability that each graphic design student should have in solving ‘wicked problems’. These problems might be encountered in the society where this creative person practises his/her creative acts. This research states that creativity is not a talent that lies with a few people: rather it is argued that all humans are all naturally creative, life itself is a flow of continuous creativity, and all human conscious minds naturally have a creative flow. The summary of each section will be outlined in the following paragraphs.

The first three semi-closed-ended questions have confirmed that there is a common consensus among the majority of graphics lecturers that they have a role in students’ creativity development, yet students should also be motivated to be creative. Creativity is also an important concept linked to graphic design education, as a domain of practising creative acts. It is argued also that such consensus is relational and compatible with the initial hypothesis argued earlier by Wolff (1981, p.138) and Williams (1961, p.39) in the literature review, that identify creativity as a cultural production in general and as an everyday activity. Barnard (2005, p.171) explains this further by stating, “The creative production of the everyday experience of reality is something that everyone necessarily does. Art and design may now both be explained as parts of a general human creativity”. Therefore, creativity is a common and routine concept with design educators: it exists and is valued by the majority of international graphics lecturers from different backgrounds. Also, it is something that can be taught and encouraged with students by specific methods.

The data showed that defining creativity is a problematic issue and a challenging concept. Williams and Askland, (2012, p.4) argue,

Despite being one of the most celebrated concepts of the contemporary world, creativity remains both highly contested and poorly understood. Scientific theories,
academic opinions, folk wisdom, stereotypes and myths overlap and intertwine, creating a complex, contingent and controversial field.

This idea has been repeated intensively in both the primary sources (i.e. collected data) and the secondary sources (i.e. literature review). It is a problem to find one unified definition because of infinite regression or tautology, where the word ‘creative’ is defined by similar words (e.g. ‘novel’, ‘new’, ‘original’). Nevertheless, the research on hand makes a small claim in defining the word ‘creativity’. It is defined as problem solving, which is usually explained as a cultural production. Based on defining creativity in graphic design as problem solving, it is argued that graphics students should practise ways and processes of solving ‘wicked problems’ creatively. Graphics lecturers should help students to practise problem solving techniques within a supportive environment. The role of the environment in the process of students’ creativity development is crucial, as are the social and cultural factors in promoting creative thinking amongst students. For example, students can interact with people from different societies with different segments.

Any suggested set of pedagogical strategies should be based on the main aims of the educational system where such strategies are applied. Design lecturers play a vital role in delivering the pedagogical strategies. In order to develop the creative abilities of problem solving in design students, it is important to include various types of content within graphic design courses. Such content should focus on developing various capabilities such as the cognitive abilities of students, general knowledge about creativity as a concept, manual design skills such as sketching, and content that would increase the motivation of students. The data showed that assessing creativity is possible with the creative outcome of students. This notion is also mentioned in the literature review. For example, Cole, Sugioka and Yamagata-Lynch (1999, p.8) argue that teachers must “promote the use of journals, open-ended problems, portfolios, interviews, and performance assessment”. The data have not shown a unified or agreed framework between all lecturers for assessing the creative outcome of graphic design. Therefore, it is argued any recommended framework should be designed by the lecturers themselves for a specific unit or course, based on the aims and objectives of the course being assessed. The majority of the questionnaire participants (i.e. international lecturers) did not prefer the criterion-referenced test, yet it was recommended by most of the interviewees (i.e. local lecturers). This indicates that different perspectives (i.e. Western/ Eastern) towards creativity as a concept affect the methods of assessment. Creativity should not be attached to specific criteria, as creative thinking should push the boundaries and go beyond the standards.
Based on the above findings, it is reasonable to argue that the topic of this study is currently of interest to the community of design educators and designers. It is timely and fills a gap in current knowledge in design education. Williams, Ostwald, Askland (2010) argue, “There is no established ‘study of design creativity’ that explores the particularities of creativity as it relates to design”. So this research can contribute to advance the idea of creativity in graphic design both among practitioners and their audience. In addition, this research demonstrates an adequate understanding of the phenomenon of creativity in the field of design education. It outlines the notion of design as a process in the West versus an application of technology in other places. The practical implications are inferred, being a raised understanding and appreciation of creativity and the design process in the Arab world, particularly in Oman. Restructuring the design curriculum based on the particular sensibilities of the Arab world can have significant implications for the teaching of graphic design there.

However, more research on this topic needs to be undertaken before the association between creativity enhancement and graphic design assessment is more clearly understood. Further research should be performed to investigate the application of the pedagogical model in promoting creativity within the Omani design education system and suitable assessment criteria to assess the creative outcome of students. Future studies on the current topic are therefore recommended.
Chapter Six: the contribution of the research
(Pedagogical Model of Enhancing and Assessing Creativity)

6.1. Chapter overview

The first three chapters discussed issues related to the research problem, research questions, aims, and the literature. Chapter Four introduces the interpretive methodology, which was implemented to answer the research questions and fulfil the aims. Chapter Five analysed the results and discussed the findings. This chapter extracts thoughts and insights, along with the main findings, to construct the major contribution of this research. The contribution is a proposed pedagogical model that can enhance and assess the creative potential of Omani graphic design students. This model basically gives some educational constructions and strategies for Omani design lecturers to assist them in the process of promoting creative problem solving abilities within their students. It also suggests some techniques for design students that can help them to be more creative. It is argued that if the lecturers applied this model efficiently with their students, and Omani students were highly motivated, a creative outcome could be expected. This claim is based on three underpinnings: 1) creativity is a problem solving activity, which is explained as a cultural activity; 2) enhancing creativity is possible throughout specific techniques and strategies; and finally, 3) assessing the creative outcome of students is also achievable.

This chapter consists of six main sections. Section 6.2 is a discussion of the pedagogical model, with four sub-sections: 1) an introductory discussion of pedagogical models in general and how they have been identified within the relevant literature; 2) the purpose of the pedagogical model on hand and its significance for Omani graphic design education; 3) the sources for developing this model; and 4) the theoretical background on which this model is based. Section 6.3 outlines the creative-thinking techniques that can promote students' creativity. Graphic design students here have a primary role in implementing these techniques. Section 6.4 discusses some educational strategies that are to be used by graphic design lecturers to foster the creative potential of students. The role of design lecturers here is primary. Section 6.5 suggests the most important content of a graphic design curriculum to support the creativity development process. Section 6.6 gives guidelines on how to assess the creative outcomes of graphic design students. It also discusses whether the criterion-referenced test is suitable to assess the creative potential of design students.

The following presentation of the model is a detailed textual format as a long explanation, clarified by some diagrams and tables. The purpose of such a presentation is to be holistic; therefore, the model is summarised visually, by diagrams, in a concise format to
be more effectively communicated. A diagram highlights the main points that condense the gist of the model, which can enable the reader to immediately grasp the contribution of the research. In academia, this is a good practice, as it actualises the research results, increases the originality of the contribution, communicates concisely, and makes one’s work more publication-friendly as well as ‘quotable’.

6.2. The pedagogical model

The model on hand would consist of the following elements (see Figure 13).

- Introductory background of the model that outlines its purpose, and its theoretical background.
- Creative-thinking techniques that should be encouraged in students (e.g. the characteristics of the creative personality that should be fostered within graphic design students (e.g. motivation)).
- Pedagogical strategies used by design lecturers to foster creativity (e.g. educational procedures, training, class atmosphere, and processes of teaching).

Figure 13: The main elements of the proposed model
- The content of the graphic design curriculum that can promote creativity (e.g. history of graphic design).
- Assessment methods (e.g. criterion-referenced testing).

Most of these elements interact with one another. In the following sections, all these areas are outlined, based on the outcomes of both the literature review and the collected data.

6.2.1. What is the pedagogical model?

The word ‘pedagogy’ is derived from the Greek word ‘paid’, meaning child, plus ‘agogos’, meaning leading. "Pedagogy is the art and science of teaching" (Bierut, et al. 1999). Hence, pedagogy has been described as the science of children's learning. In the pedagogical model, the mentor has full accountability for making decisions in relation to what can be taught to the learners, and how it can be taught. These days, the pedagogical model has been applied regularly to the teaching of children and youngsters. As adults mature, they turn out to be more and more autonomous and accountable for their own actions. They are regularly motivated to learn by a genuine desire to resolve immediate troubles in their lives (Treffinger, Sortore and Cross, 2001).

The term ‘pedagogical model’ is used in different ways, but mostly in relation to learning and teaching activities. Conole (2010, p.71) regards it as analytic lenses to outline the research, in which it usually appears in a visual abstract representation. According to Beetham (2004) the model is “a representation with a purpose” extracted from a specific pedagogical approach. Conole (2010, p.71) gives the example of the ‘Kolb Learning Cycle’, which “presents an action-based or ‘learning by doing’ model through a four-stage cycle (experience, reflection, abstraction, and experimentation)".

Kolb’s (1984) learning styles are considered to be one of the most influential learning models. This model explains how learners usually learn, rather than what they learn, so it may link to design teaching styles used in design pedagogy. This model refers to the learning style so as to clarify how students learn in a pedagogical context. Stewart and Felicetti (1992) define learning styles as those “educational conditions under which a student is most likely to learn”. Kolb (1999, p.2) argues, “Experiential learning theory defines learning as the process whereby knowledge is created through the transformation of experience. Knowledge results from the combination of grasping and transforming experience”.

Kolb proposes six main characteristics of experiential learning. Firstly, learning is ideally considered as a process, rather than outcomes. Secondly, learning happens as a constant process that is based on experience. Thirdly, learning has several conflicts and
tensions. Fourthly, learning is a procedure of originating a new knowledge, which is a result of the interaction between personal knowledge and social knowledge. Fifthly, learning is an all-inclusive process that attempts to adapt the world. Sixthly, learning requires a transaction between the person and the environment.

Based on a four-stage learning cycle, Kolb set out four distinct learning styles. This model finds ways to understand individual learning styles (i.e. Learning Style Inventory - LSI), and explains the cycle of experiential learning that usually applies to learners. These styles are: 1) Diverging; 2) Assimilating; 3) Converging; and 4) Accommodating, which are explained in more detail (see Figure 14), as outlined in Kolb (1999, pp.5-7) as follows:

1) **Diverging**

- The learning abilities of the individual are concrete experience and reflective observation.
- Best viewing concrete situations from many different perspectives.
- Person with this style performs better in generating new ideas.
- Have broad cultural interests.
- Like to gather information.
- Interested in people.
- Imaginative and emotional.
- Tend to specialise in Arts.
- In formal learning situations, prefer to work in groups.
- Listening with an open mind and receiving personalised feedback.

2) **Assimilating**

- The dominant learning abilities are abstract conceptualisation and reflective observation.
- Best at understanding a wide range of information and putting into concise, logical form.
- Less focused on people and more interested in ideas and abstract concepts.
- Find it more important that a theory has a logical soundness than practical value.
- Important for effectiveness in information and science careers.
• In formal learning situations, people with this style prefer readings, lectures, exploring analytical models, and having time to think things through.

3) **Converging**

• The dominant learning abilities are abstract conceptualisation and active experimentation.

• Best at finding practical uses for ideas and theories.

• Have ability to solve problems and make decisions based on finding solutions to questions of problems.

• Prefer to deal with technical tasks and problems rather than with social issues and interpersonal issues.

• Important for effectiveness in specialist and technology careers.

• In formal learning situations, people with this style prefer to experiment with new ideas, simulations, laboratory assignments, and practical applications.

4) **Accommodating**

• The dominant learning abilities are concrete experience and active experimentation.

• Learn from ‘hands-on’ experience.

• Enjoy carrying out plans and involving themselves in new and challenging experiences.

• Act on ‘gut’ feelings rather than on logical analysis.

• In solving problems, rely more heavily on people for information than on their own technical analysis.

• Important for effectiveness in action-oriented careers such as marketing or sales.

• In formal learning situations, prefer to work with others to get assignments done, to set goals, to do field work, and to test out different approaches to completing a project.
Based on the above discussion and Kolb’s learning cycle as an example, the term ‘pedagogical model’ is fairly similar or close to frameworks. In this sense, pedagogical frameworks, is a broad principle through which theory is applied to learning and teaching practice (Conole, 2010, p.71). However, some researchers (e.g. Lau, 2009, p.153) believe that it is fairly difficult to develop or build a model or programme that can enhance graphic design students’ creativity “due to the diversity of interpretations of creativity”.

The research on hand argues against this idea, as creativity has been interpreted as problem solving, which is explained sometimes as a cultural activity. But to ensure the success of this model, several roles should be involved within it, including the role of the environment, the role of graphic design students themselves, the role of lecturers, and the role of the design curriculum. It will also require actual implementation and evaluation before it can be approved as a workable model. Cheow (2006, p.4) believes that it is important to think of methods that can facilitate creativity. He suggests,

We need to view ourselves, the environments in which we function, and the media we use in a relatively objective lens. The basic problem solving methodology involves speculative formulation of reasoning, techniques, tools, and adequate information to resolve issues and select the ultimate solution that leads to an explicit goal.
6.2.2. The purpose of this model

Pedagogical models usually intend to develop an effective learning experience in the form of instructional orders, stages, advice, or commonly subject-related exercises. They are ‘mediating artefacts’, as mentioned by Conole (2010, p.132), which “enables teachers to making better use of technologies that are pedagogically informed”. Generally, pedagogical models are utilised by educators, university lecturers, and researchers. They aim to guide and instruct them into educational innovation by using them as teaching approaches or guidelines that assist the learning and teaching process. Tudor (2008, p.2) defines the model by arguing that it is more than specific course content, activities, and assessment; rather, it comprises “the important role of qualitative human attitudes, values and beliefs”. The model should train the learners to acquire the required “design knowledge, skills and processes through specialised educational practices” (Tudor, 2008, p.2).

As stated earlier, the purpose of this study is to develop a pedagogical model that can assist Omani graphic design lecturers to enhance and assess the creative potential of their students. This has been named the ‘Pedagogical Model for Enhancing and Assessing Creativity’. This model expects to enlighten us, at least within a small scale, to distinguish the creative outcome of Omani students and what it looks like. This model would serve as a guideline for design lecturers who teach graphic design courses in some Omani institutions. It intends to develop the creativity of Omani graphic design students through proposing a set of strategies, techniques and instructions. Graphic design lecturers would use this model as an extra component within design curricula when teaching graphic design-related courses for Omani undergraduate students.

6.2.3. The resources for developing this model

Figure 15 below shows the main resources used to develop this pedagogical model:

![Figure 15: The resources used to develop the pedagogical model]

1. The literature review: a set of educational strategies, creative-thinking techniques, important elements of design curricula, advice and instructions for graphic design lecturers and students.

2. Qualitative survey investigation through two methods:
Online questionnaire: out of 50 design experts, 33 responded to the online questionnaire. The aim of this questionnaire was to investigate definitions of creativity, creativity enhancement and creativity assessment, in relation to graphic design education. The reason for it being international was to reflect the global experience of creativity as situated within graphic design education.

Interviews with graphic design educators: out of 40 design experts and educators, 39 responded. The aim of these interviews was to investigate the same issues investigated by the questionnaires, but from a local perspective. Design lecturers were selected from Omani design institutions in order to acquire a national experience of creativity in relation to design education.

6.2.4. The theoretical background of this model

There are different styles of learning and knowledge acquisition based on the fact that students acquire knowledge differently. Some learn ‘by doing’, some learn by “reflection, either individually or in a social context” (Conole, 2010). Lindström (2006, p.63) argues that creativity can be fostered, “through the integration of production with perception and reflection”. But in general, learning is a transformation of experience. Conole (2010) argues, “knowledge is information already transformed: selected, analysed, interpreted, integrated, articulated, tested, and evaluated”. Noticeably, “pedagogical models usually align with a particular pedagogical approach or learning theory” (ibid., 2010, p.5). She confirms the importance of learning theories by stating, “Theories of learning provide empirically-based accounts of the variables which influence the learning process, and explanations of the ways in which that influence occurs”. Conole, (2010) grouped learning theories into three main areas: associative, where the learning is seen as an activity through structured tasks; cognitive, where learning happens through understanding; and finally simulative, where learning is seen as a social practice.

This model values the socio-cultural theory of creativity developed by Csikszentmihalyi (1996). He constructed the nature of the relationships among three parties in the evolution of the creative process. Tudor (2008, p.11) summarised these parties as: firstly, the ‘domain’, which is the “social context and cultural interpretations of the scope”; secondly, the ‘field’, which is “the official body of knowledge”; and thirdly, the ‘person’, who is the main actor of the creative process. To outline the characteristics of the contemporary creative graphic designer, it is inevitably valuable to refer to Wenger’s (1998) description of the ‘social theory of learning’ mentioned by Tudor (2008, p.11). Wenger summarised the essential aspects of ‘becoming’ an arts practitioner in three main aspects: “creative understanding”, “creative
participation”, and finally “creative confidence”. Therefore, it is argued that Wenger’s learning theory is ideal because it understands student participation as “learning is experience, learning as ‘doing’, and learning as ‘belonging’ and learning as becoming” (Tudor, 2008, p.11).

One of the main studies that tried to develop a framework for enhancing creativity was a PhD research project conducted by Hanri Harpe in 2006, entitled “Cognitive and Behavioural Strategies for Fostering Creativity in Graphic Design Education” (Harpe, 2006, p.3). It contains a set of cognitive and behavioural strategies that can be used to enhance and assess the creativity of graphic design students. The research problem of Harpe’s study was that there is a lack of formal structured approaches to fostering creative abilities in graphic design education in South Africa (Harpe, 2006). Therefore, she sought to develop a framework that can foster the creativity of graphic design students systematically, but only through cognitive and behavioural strategies. However, the research on hand does not focus only on developing the cognitive and behavioural abilities of students. It rather suggests a holistic approach; in which, students, curricula, environments and lecturers all have roles in developing the creative potential of students. This notion was mentioned by Donald Welch, who argues, “A holistic approach is essential in the teaching of creative thinking” (Welch, 2006, p.92).
Figure 16: The pedagogical model
6.2.5. Creative-thinking techniques that can promote students' creativity

Data gathered by the primary resources and through the literature review suggested several creative-thinking techniques that graphic design students could practise to enhance their creativity. These data value the role of the student in applying these techniques, simply because these techniques require a motivated learner in order to be effective. It is argued that creative-thinking techniques are different from pedagogical strategies (discussed in the next section). Creative-thinking techniques tend to be more cognitive or behavioural, and can be practised by the students themselves, even outside the classroom. Pedagogical strategies are, on the other hand, usually suggested by educators and implemented within classrooms by lecturers, as teaching methods.

Creative-thinking techniques that relate to the creative student are classified under four categories. The first of these is personal characteristics, in which students should gain the characteristics of creative people. These characteristics are discussed intensively in the literature review. The most important characteristics are mentioned within this model. Examples of these characteristics are: self-motivation, enjoying the work, and positive thinking. The second category is knowledge-related techniques, in which the student is enthusiastic about being creative and pays attention to learn more about theories of creativity. This type of student is a self-motivated learner, makes appropriate use of technologies, and always undertakes good research and analysis. The third category is the cognitive thinking techniques that should be valued and practised by the creative individual. These techniques tend to involve more mental abilities such as divergent thinking and critical thinking. The fourth category is the process of problem solving. These four categories are visually presented in Figure 16 and are explained in the following sub-sections.

- Personal characteristics

Graphic design students have an important role in improving their creativity through attempting to attain the characteristics of creative people. Cheow (2006, p.18) suggests, “Students need to acquire not just technical skills but also interpersonal skills”. Also, lecturers should guide their students to interact with people from different segments of society, especially those who have creative roles in society. Cheow (2008, p.9) argues, “it is important for educators to identify traits that are associated with creativity such as willingness to take risks, innovativeness, boldness, flexibility as well as valuing different behavioural and personal traits in students”. This is very much an effective way to enlarge the possibilities within students’ minds to accept various realities by practising acceptance of other people’s perspectives. Cheow also argues that several personality characteristics are associated with
creative people (ibid., 2008, p.5). Creative people can usually generate a large number of ideas, and a wide range of thoughts. They usually do or see the issues differently, and even think about them differently, using insight and intuition to find creative solutions. The following personal characteristics can be regarded as techniques and as important features of creative design students.

1. **Self-motivation**

Motivation is the most important trait that graphic design students should have in order to be creative. Tudor (2008, p.3) believes that it is important to increase the level of “self confidence in heart, body and mind through targeted teaching strategies”. This might require, “multidimensional, highly, interactive and participatory educational approaches in which the teacher actively engages in creative exchanges with learners” (Tudor, 2008, p.3). Nickerson (1999, p.416) argues,

Students need to believe that creativity is determined by motivation and effort to a significant degree. They need to understand that creative products are seldom produced without intent and effort, that there is considerable evidence to support the belief that most people have potential they never realize and that persistent effort to develop that potential is likely to be successful [...] truly outstanding creative works in science and art have often taken many years – sometimes the better part of a lifetime – to produce the outstanding outcome. They need to understand that if one really wants to be creative in a substantive way, one must be prepared to work at it.

Based on De Bono’s ideas about motivation, Lau (2009, p.157) argues, “As design educators, we should understand the students’ humenes by understanding their psychological behaviours, such as insight, humour and surprise. Then perhaps we would be able to develop students’ intrinsic motivation by making interesting tasks and projects”. Adams (2005, p.9) argues, “People will be most creative when they feel motivated primarily by the interest, satisfaction, and challenge of the work itself”. Dineen and Collins (2004, p.2) argue, “Learner motivation is related to learning styles, because it is premised on the individual and the contingent nature of knowledge”. As a result, if students are motivated to become creative, this can boost their openness to experience and their tolerance for ambiguity.

2. **Enjoy the work**

Based on the Csikszentmihalyi (1996) theory of increasing creativity, Edwards (2000, p.2) argues, “The more you can increase the enjoyment of your work, the more you can
develop the sustained attention and playful work habits that are required for creativity”. More practically, Csikszentmihalyi (1996) gives specific steps to maximise creativity:

Before going to sleep, imagine what you will most enjoy about your work on the following day, and then eventually visualize all the tasks that you will enjoy; invest more effort in your tasks; and ruthlessly pare away distractions and unnecessary tedium. Increasing effort leads to greater mastery and enjoyment – essential elements for creative work; to enhance enjoyment and stave off boredom and work to enhance the complexity of whatever you enjoy doing.

3. **Cultivate curiosity**

Creativity can certainly be enhanced by “actively cultivating curiosity, as well as learning how to let go of mental habits that offer the security of established knowledge at the expense of developing childlike curiosity” (Edwards, 2000, p.1).

4. **Imagination**

Creative students should always use the power of the imagination. Imagination can help them to access something that lies very deep inside them. Cheow (2006, p.6) argues, “Communicating a design that embodies our total experience through design requires a creative imagination for it allows us to express ourselves by allowing thoughts and actions to occur in a more holistic manner.”

5. **Positive thinking**

A student with a positive mood performs more creatively on a range of graphic design tasks. The positive mood of individuals facilitates the fluency of idea production, whereas a negative mood inhibits it. Therefore a student’s mood during the creative-thinking process is, to some extent, affecting their creative performance.

6. **Take chances**

Students should be inspired to take chances, and always try new approaches, and continually reflect on their practice. Students should free their creativity, which can lead them to genuine outcomes; they can free themselves gradually from conventions, and raise their process of inquiry.

7. **Practise meditation**

According to Csikszentmihalyi (1996, p.345),

Regular meditation cultivates openness to novelty, while it concentrates energy within a discipline that focuses attention. Meditation does seem to activate a detached curiosity while anchoring attention on an object, such as the breath, stomach, mantra, or chant.
It can also reduce anxiety and anger and diminish the effects of emotional memories that cause creative blocks, leaving more energy free for creative work.

8. **Imitate characteristics of creative people**

In addition to the previous characteristics, some other characteristics of creative people are recommended to be imitated by graphic design students. They are outlined as follows in Table 9.

<table>
<thead>
<tr>
<th>Challenging assumptions</th>
<th>Being responsive to new ideas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recognising similarities and differences</td>
<td>Making unlikely connections</td>
</tr>
<tr>
<td>Taking risks</td>
<td>Attribute listing</td>
</tr>
<tr>
<td>Fact finding</td>
<td>Capable of sustaining hard work</td>
</tr>
<tr>
<td>Seeking changes and adventure</td>
<td>Impulsive</td>
</tr>
<tr>
<td>Non-conformity</td>
<td>Undisciplined</td>
</tr>
<tr>
<td>Building on ideas to make better ideas</td>
<td>Looking at things in new ways</td>
</tr>
<tr>
<td>Taking advantage of the unexpected</td>
<td>Ability to adapt to special circumstances</td>
</tr>
<tr>
<td>Seeing the issues differently</td>
<td>Tending to find creative solutions</td>
</tr>
<tr>
<td>Accepting various realities</td>
<td>Generating a large number of ideas</td>
</tr>
<tr>
<td>Recognising opportunities and possibilities</td>
<td>Finding order in chaos</td>
</tr>
<tr>
<td>Recognition skills</td>
<td>Powers of observation</td>
</tr>
<tr>
<td>Bridging broad categories</td>
<td>Coping with new information</td>
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<tr>
<td>Going beyond boundaries</td>
<td>Innovative thinking</td>
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<tr>
<td>Entrepreneurship</td>
<td>Initiative</td>
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<tr>
<td>Sophistication</td>
<td>Engagement</td>
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<tr>
<td>Innovativeness</td>
<td>Boldness</td>
</tr>
<tr>
<td>Thinking critically</td>
<td>Ability to communicate ideas creatively</td>
</tr>
<tr>
<td>Enthusiastic about being creative</td>
<td>Searching for means of communication</td>
</tr>
<tr>
<td>Ability to analyse critically</td>
<td>Sharpening the powers of observation</td>
</tr>
<tr>
<td>Flexibility</td>
<td>Being comfortable with ambiguity</td>
</tr>
<tr>
<td>Intuition</td>
<td>Continued learning</td>
</tr>
</tbody>
</table>

Table 9: Characteristics of creative people

- **Knowledge-related techniques**

Design lecturers and students should work together to develop students' learning skills and knowledge-acquisition abilities. Students should involve themselves in creative learning inside and outside the classroom. When the Omani students further progress through their course, the learning techniques provide them with a more reliable environment in which they can provoke multiple solutions for ‘wicked problems’ that are appreciated by both lecturers and society. Learning-by-doing is a creative approach in graphic design programmes. Lindström (2006 cited in Cheow, 2008, p.10) suggests that “teachers provide ample opportunity for research, experimentation and revision and assignments should extend over a significant period of time so that students can investigate and reflect”. The following
attributes are highly valuable for developing students’ knowledge, which eventually contributes to develop their creative abilities.

1. **Extend experience in the field**

   It is important to understand the value of the experience factor in enhancing students’ creativity, as they usually make use of their previous “personal experiences and prior successful cases to form a knowledge base for exploring creative ideas while evaluating them” (Lau, 2009, p.155). Lau believes that “creative thinking is nurtured by both prior internal and external experiences of design students”. Edwards (2000, p.2) suggests some exercises that may help in developing the experience of creative students. They start by: 1) enjoying the novelty of experience; 2) regularly writing brief notes; 3) detailing what most surprised them and what they most surprised another with each day; 4) writing and reading these notes to make the creative person more capable of appreciating their development; and 5) finally, illuminating new trends or uncovering desires that have been long suppressed.

2. **Keeping a journal**

   Journals are an effective way to record ideas that one thinks of spontaneously. By carrying a journal most of the time, students can create a collection of thoughts on various subjects that later become a source book of ideas. Modern devices such as smart phones or tablets can help record ideas and support them with pictures, voice, or drawing. Creative people often have insights at unusual times and places. By keeping a journal, one can capture these ideas and use them later when developing and organising materials in the prewriting stage.

3. **Practise free writing**

   When students write their ideas freely, they usually focus on one particular topic and write non-stop about it for a short period of time. The idea is to write down whatever comes to mind about the topic, without stopping to proofread or revise the writing. This can help generate a variety of thoughts about the problem in a short period of time, which can later be restructured or organised following some pattern of arrangement.

4. **Applying 6W techniques**

   6W is a strategy or method that is used in creativity teaching to develop the learner’s creative-thinking ability. According to Hsiao and Lin, (2004, p.244) this strategy was established by Osborn (1957). Basically, it addresses the questions ‘What?’, ‘Who?’, ‘Why?’, ‘When?’, ‘Where?’ and ‘How?’ of a specific problem or case. Obviously, there are only five Ws and one H, yet it is known as the ‘6W’ method (Hsiao and Lin, 2004, p.244). These questions aim to spur ideations, through addressing every possible detail related to the
problem. The questions should be asked to stimulate the right answers (Treffinger, Sortore and Cross, 2001, p.31). It is argued that the application of this method in design education can be beneficial in more than one aspect, for example, asking and answering these questions can assist the creative designer to conduct a deep reasoning process.

5. Matrixes technique

These are a set of cells in which students write ideas and juxtapose these ideas with one another by matching the cells (Cole, Sugioka and Yamagata-Lynch, 1999, p.16).

- Cognitive thinking techniques

These techniques tend to involve more mental activities such as critical thinking, divergent-thinking techniques, and use of metaphor, random association, morphological synthesis, and idea checklists. It is argued here that these techniques should be valued and practised by the creative students either inside or outside the classroom. These techniques can be practised individually or as group. Lecturers should explain these creative techniques to their students. For example, they can practise brainstorming techniques to solve ‘wicked problems’. Some of these techniques are explained in the following sub-sections.

1. Creative Pause

One of the less complex techniques of enhancing creativity is the ‘Creative Pause’. Mich, Franch and Berry (2006, p.3), explain that it “… entails stopping the analysis process, letting the mind explore, and embracing lateral thinking”.

2. Brainstorming

According to Adams (2005, p.15), ‘brainstorming’ was originally suggested by the classic creativity pioneer, Osborn (1957) in his book *Applied Imagination*. Brainstorming is a technique that involves generating a list of ideas in a creative, unstructured manner. The goal of brainstorming is to generate as many ideas as possible in a short period of time. The key tool in brainstorming is using one idea to stimulate other ideas. During the brainstorming process, all ideas are recorded, and no idea is disregarded or criticised. After a long list of ideas has been generated, one can go back and review the ideas to critique their value or merit. Students from Eastern cultures usually have different approaches to reflecting in the brainstorming process. Lau (2009, p.161) thinks “design students will often employ a silent approach during group discussion or brainstorming exercises”.

Brainstorming sessions should first involve 15-20 minutes for people to think individually and write their ideas on an anonymous piece of paper which is then handed in to the facilitator. All ideas are then discussed openly with a view to first considering
how each one could be feasible rather than the more common approach of seeking to criticize or find the reasons why it wouldn’t work. (Johansson, 2004, p.110, cited in Adams, 2005, p.15).

In brainstorming there are two main phases: 1) idea generation; and 2) idea pruning (Mich, Franch and Berry, 2006, p.4). When lecturers use this technique, they should encourage their students to be open to all ideas, and encourage them to look at unusual situations, without any limits on the imagination, “… but rather incentives should be given to look for new solutions” (Mich, Franch and Berry, 2006, p.4). Also, “the more ideas the better: The quantity of ideas put forth is more important than their quality” (ibid., 2006, p.4). Finally, “improve on the ideas of others: Make use of the ideas of others and build on them with practical experiences of testimony, understanding that no one is the exclusive owner of any idea” (ibid., 2006, p.4).

3. Mind or visual mapping

Mind or subject mapping involves setting out brainstormed ideas in the form of a visual map or picture that shows the relationships between these ideas. One starts with a central idea or topic, and then draws branches off the main topic, which represent different parts or aspects of the main topic. This creates a visual image or "map" of the topic, which the individual can use to develop the topic further. For example, a topic may have four different branches (sub-topics), and each of those four branches may have two branches of its own (sub-topics of the sub-topic). This includes both divergent and convergent thinking. Harpe (2006) developed the visual mind-mapping technique, which stimulates visual thinking.

4. The Six Thinking Hats of Edward De Bono

The aim of this technique is to look at the problem from all points of view. It is a powerful technique for graphic design students, as it can help them to make better decisions by encouraging them to move away from the usual ways of thinking. It can assist them to understand all of the dimensions of the problem, challenges, or opportunities. This method, basically, can train students to look at the problem from emotional, intuitive, creative or negative viewpoints. Without it, they underestimate resistance to plans, fail to make creative leaps and do not make essential contingency plans.

Edward De Bono’s theory behind these techniques is the fact that different people see different issues from various perspectives. For example, some people are rational, some emotional; some people are more pessimistic than others. Usually, pessimistic people would be more defensive, while emotional people do not have enough abilities to take decisions calmly and rationally. So, De Bono (1993) thinks that if the individual looks at the problem
using all of the approaches, they can take the right decisions and plans, which can increase “the ambition, skill in execution, sensitivity, creativity and good contingency planning” (ibid., 1993). To use this technique within the class, there are six thinking hats that represent different styles of thinking, as follows:

**The white hat:** This is a thinking focus on data, facts, & information needed. Students who wear this should focus in the data available, all relevant information for the problem, and state what can be learnt from them. Also, students can specify the gaps in their knowledge, and “try to fill them or take account of them” (ibid., 1993).

**The red hat:** This is a thinking focus on feelings, hunches, gut instinct, and intuition. The student who wears this hat should “look at problem using intuition, gut reaction, and emotion”. Students here should anticipate “how other people will react emotionally”, and “understand the responses of people, who are not fully aware of the reasoning” (ibid., 1993).

**The black hat:** This is a judgment hat. The student who wears this hat should “look at all the bad points of the decision. Look at it cautiously and defensively” (ibid., 1993). They should try to see why it might not work; this can help to specify the weak points in the plan. It helps to “eliminate them, alter them, or prepare contingency plans to counter them” (ibid., 1993). This hat can be regarded as one of the most beneficial parts of the whole technique.

**The yellow hat:** This is a positive and optimistic hat, which can help the student who wears it “to see all the benefits of the decision and the value in it. Yellow Hat thinking helps to keep going when everything looks gloomy and difficult” (ibid., 1993).

**The green hat:** This hat signifies creativity: “a way of thinking, in which there is little criticism of ideas” (ibid., 1993).

**The blue hat:** The blue hat signifies process control: “This is the hat worn by people chairing meetings. When running into difficulties because ideas are running dry, they may direct activity into Green Hat thinking. When contingency plans are needed, they will ask for Black Hat thinking” (ibid., 1993).

- **Techniques and processes of problem solving**

  Graphic design students should seek to learn the processes of problem solving. These processes usually require identifying, analysing, and interpreting the elements that feature in the context of any ‘wicked problem’. The solution should be suitable, visually pleasing, socially and culturally acceptable. The graphic design lecturer is also responsible here for teaching these processes to students. Lecturers should explain how graphic design students could practise them to generate effective solutions. Cheow (2006, p.3) argues, “by
understanding how the design process and systems work, educators can stress the importance of articulation during brainstorming because it permits conscious and autonomous self-reflection”. It is important to find various solutions for each problem, as a procedure towards the creative solution. So this involves a creative design process in which the solutions are tested in order to find the solution that works.

Cheow (2006) believes that successful graphic designers are assessed against the ability to solve design problems creatively. Therefore, creative designers should practise creative problem solving techniques, guided by the lecturer. Lau (2009, p.161) argues, “In order to obtain workable creative solutions that address various design problems, design students need to realise the process and procedure of creative thinking”. An example of these techniques is the Creative Problem solving (CPS) technique, developed by (Osborn, 1957, cited in Cave, 1999), consisting of five stages of creative problem solving: mess finding; problem finding; idea finding; solution finding; and action planning, breaking the problem into its component parts and developing a list of ideas to improve each one.

The process of problem solving which this research proposes starts with Preparation, which is the first distinct stage that identifies the problem and its related data. Secondly, incubation, which is an important phase in the creativity process, in which the creative designer sinks into his/her unconscious mind; thirdly, Illumination, which is the stage of insights, the bright ideas and solutions, that emerge at this stage; and fourthly, Verification, where the individual usually considers the possibilities of executing their insights to a doable solution (Lau, 2009, p.162).

6.2.6. Pedagogical strategies used by design lecturers to foster creativity

The role of the lecturer is very important as the main factor in operating this pedagogical model. This model will emphasise the role of graphic design lecturers in explaining these creative techniques to students. Peter Lyman argues,

The key problem with innovation is not about technology, and is not about interesting new pedagogical models, but rather centres on who owns the issue of the pedagogy and the content of instruction. It’s not the institution; it’s the faculty member, the individual faculty member.(Lyman, cited in Harley, Matkin and Goldstein, 2002, p.22).

Therefore, design lecturers have the major role in encouraging their students to be active, reflective, and independent learners, and to deliver these skills to them efficiently. Also, the role of the lecturer within the educational context would be to provide “reflective practice” (Pereira, 2001, p.2). Students can then interact creatively and learn collaboratively, and be critical and implement the collaborative reflection skills. Therefore, it is important to
construct “flexibly structured learning environments, which allow different learning experiences” (ibid., 2001, p.4). Such environments should support learners to involve themselves in real social and political problems, in which the experience of the learners can contribute to solving evolving issues. The ideal environment should “encourage independence, risk-taking, and intrinsic motivation” (Cole, Sugioka and Yamagata-Lynch, 1999, p.4).

Pedagogical strategies used by design lecturers are classified here under seven categories (see Figure 16). The first category is creative teaching strategies, in which design lecturers should use various strategies to stimulate students’ creativity. Examples of these strategies are: creative discussion, teaching by doing, and life experimentation. The second category includes strategies that value the supportive class atmosphere, for example, providing a creative teaching environment that can enrich the creative interaction between students. The third type of strategy is that which trains students to solve problems creatively. The fourth type of strategy enhances students’ cognitive abilities. The fifth set of strategies focus on personal development. The sixth category includes sets of strategies that can develop students’ cooperative skills and develop self-assessment. The seventh sets of strategies are those that can develop the creative design process. All of these strategies are discussed in the following sections.

6.2.6.1. Creative teaching strategies

One method of developing the creative educational environment is developing the relationships between the lecturer and their students in a creative education context. Design lecturers should encourage students to be active learners and creative students. “When teachers create a ‘responsive’ classroom environment students are less apprehensive about their creative expression and sharing those ideas in class. A ‘responsive’ classroom environment is optimised when teachers are “respectful of unusual questions, respectful of imaginative and unusual ideas” (Cole, Sugioka and Yamagata-Lynch, 1999, p.4).

Lau (2009, p.153) suggests six factors that should be considered by design educators “before formulating their creativity training”. These factors are: “1) identifying design students’ thinking habits; 2) developing students’ intrinsic motivation by fun; 3) developing students’ positive and forward thinking; 4) enhancing students’ self-determination; 5) managing students’ emotions; and 6) removing students’ obstacles to creativity”. These suggestions agree with the results emerging from the collected data in this study. Design lecturers should build up students’ self-awareness and consider the design students’ different thinking habits before applying or implementing any creativity training. Such consideration helps to specify the most effective required training suitable for these students. Moreover, design educators
should understand students as humans through understanding their humour, surprise, insights, and other psychological behaviours. This would help to develop students’ intrinsic motivation.

Several studies (e.g. Amabile, 1996; Lau, 2009) have confirmed that the lecturer is the principal factor in education, and this is why this model is designed for the lecturers. “Design educators need to play an essential role in releasing students’ creativity by intentionally removing potential obstacles to creativity in order to facilitate the design students’ creative-thinking process and to shape constructively their learning attitudes” (Lau, 2009, p.161). Students usually feel more creative if they feel connected and attached to a specific community, so the role of lecturers is in pushing the students to be more socially based. Teachers should also push their students towards a high level of expectations, which can lead the students to higher achievements. Lecturers are advised to encourage a spirit of play and experimentation with students, by providing them with time and resources (Amabile, 1996), and push them to break the rules and take more risks in solving ‘wicked problems’.

6.2.6.2. Strategies that value the supportive class atmosphere and environment

Several factors are responsible for producing an effective creative environment. The environment and classroom atmosphere should be prepared before any creativity exercises. Dineen and Collins (2004, p.2) argue, “Research suggests that the biggest single influence on the classroom environment is the teacher/lecturer”. Kerka (1999, p.2) argues, “There is consensus that the environment in work and educational institutions is a great influence”. Also, Wright (1990, cited in Cole, Sugioka and Yamagata-Lynch, 1999, p.9) argues, “Teachers can create a supportive environment for creativity by encouraging students to see creativity as a learned process, which can be attained through effort and practice”.

Research conducted by Cole, Sugioka and Yamagata-Lynch (1999) outlined four areas that can provide a “supportive environment for fostering creativity”. These areas are: 1) ‘personal teacher-student relationship’; 2) ‘assessment’; 3) ‘openness and freedom of choice’; and 4) ‘classroom activities’ (Cole, Sugioka and Yamagata-Lynch, 1999, p.11). It is argued that, “Learners become motivated when offered ownership and responsibility, when their input is valued and when they feel able to try out new ideas in an atmosphere which encourages ‘What if?’ questioning and experimentation” (Dineen and Collins, 2004, p.2). Motivating students to follow a learning-by-doing style, and constantly changing the classroom environment, would help to achieve this goal. Such an environment offers the possibility to relax and is fun when working alone (Pibernik, Milcic and Bota, 2010). If the educational environment is supportive, then it is:
Recommended that teachers accept and encourage creative thinking, tolerate dissent, encourage students to trust their own judgments, emphasise that everyone is capable of creativity, and serve as a stimulus for creative thinking through brainstorming and modelling (Cole, Sugioka and Yamagata-Lynch, 1999, p.4).

Examples of elements that support these ways of teaching are offering students opportunities to explore and experiment with their surroundings with responsible supervision and guidance (Pibernik, Milcic and Bota, 2010).

Harpe (2006, p.vi) suggests a set of strategies that can “be used to maintain and stimulate creativity in graphic design education”. These strategies are as follows: “The creation of safe, democratic, non-controlling classroom climate”, for example, “Deliberate use of music and humoristic activities in the educational milieu” (Harpe, 2006, p.iv). This can provide students with a more realistic and practical atmosphere. Other educational strategies that are thought to have potential to improve the creativity of students are: 1) implementing project-dependent learning and encouraging creative self-motivated learning, either within the classroom or outside it; 2) gaining knowledge in the studio under a controlled environment; and 3) filling the gap between theoretical knowledge gained and its practical implementation in real life applications (ibid., 2006, p.iv).

6.2.6.3. Strategies that teach problem solving

Creative problem solving (CPS) has been suggested to be one of the most important capabilities emphasised within this research, and is thought to be very suitable for graphic design students. It is a “process that provides a structured way for children and adults to intentionally produce more creative ideas, responses and solutions” (Dahlberg, 2007, p.2). In general, all CPS models consist of three main stages: 1) find problems; 2) solve problems; and finally 3) implement a solution. This model suggests the following process (Figure 17).

![Figure 17: creative problem solving processes adopted by this model.](image)

Cheow (2006, p.6) argues,
For creativity to flourish there must be encouragement and stimulation of imaginative and unconventional environment. This is particularly true in problem solving activities where one explores uninhibited ideas and concepts, exercises capability to reconsider and explore ideas in direct contradiction to accepted facts.

According to Sternberg (1988),

Creative individuals actively seek all possible ways to solve problems instead of waiting passively for good ideas. Therefore, based on the above discussion, positive and forward thinking is crucial to developing students’ creative-friendly learning behaviour in problem posing and solving (cited in Lau, 2009, p.158).

Based on the above quotations and on first-hand research, it is argued that the lecturers have a major role in guiding the students to practise the process of problem solving. They should never provide solutions and always assume the current solution is wrong. Also, graphic design students should practise solving ‘wicked problems’ routinely in order to develop this as a lived experience. This would help them to apply their knowledge practically to solve design problems.

6.2.6.4. Strategies that enhance students’ cognitive abilities

Cheow (2006, p.14) believes that the role of graphic design lecturers is “inspiring curious minds, recognising raw talents, and challenging students to think beyond their perceived capabilities”. This research suggests the following strategies: lecturers can also undertake them to develop students’ cognitive abilities:

- Encourage divergent thinking and defer judgement.
- Train them how to connect several ideas and how to see similarities within differences.
- Train them in observation and dimensional thinking.
- Teach them how to practise empathy and analysis.
- Encourage them always to imagine.
- Foster the “What if?” attitude.
- Teach them how to practise intuition and deep emotions.
- Guide them how to see unusual connections.
- Teach them how to combine several ideas in one big idea.
- Practise the thinking processes with them.
• Allow them to discover relationships between variations.
• Develop their analytical thinking.
• Develop their unconscious mind through conscious activities.
• Develop the visual imagination of students.
• Show them how to create unusual associations.

6.2.6.5. Strategies that focus on personal development

The creative personality of the lecturer should inspire students to be creative. Dineen and Collins (2004, p.2) argue that,

Successful lecturers (in terms of fostering creativity) are themselves self-motivated, creative thinkers, acting as models for their students. They offer individual attention and opportunities for independent learning. Teaching styles most conducive to the fulfilment of creative potential are those which encourage student responsibility through ownership, trust, and a low level of authoritarianism.

This includes offering rewards that recognise achievement or enable additional performance but maintain intrinsic motivation rather than controlling behaviour. “The anticipated reward is an essential component in facilitating students’ creative thinking and performance” (Lau, 2009, p.158). This confirms the importance of motivating students to creativity as a keystone of creative personal development. Motivation is explained further in the following paragraph.

According to this model, engagement is an important attribute that the learner (i.e. the graphic design student) should develop. It can offer a chance to improve high-level recognition skills, with a specific emphasis on interactively and the exploratory environment. Tudor (2008, p.4) believes that “… facilitating creativity in learners can most readily be achieved when teachers are creativity self-aware and learners are knowingly engaged in a proactive manner with investigating ‘potentialities’ via the production of future-oriented modes of learning”.

Amabile (1996, cited in Dineen and Collins, 2004) values the importance of a student’s creative engagement in problem solving activity. The design lecturer should allow their students to engage in creative activities. This engagement is effected by the nature of the task set. Amabile divided tasks into two types: algorithmic and heuristic. In algorithmic tasks there is a sort of clear structured path leading to the creative solution, for example “learning how to operate a simple software programme or how to solder metal” (ibid., p.3). On the
other hand, heuristic tasks usually have specific identifiable goals, but there is no route-map towards the solutions. The role of students here is more important, as the student should “find his/her own way through territory which is essentially uncharted, using existing knowledge and experience and also, crucially creative intuition” (ibid., p.3). In this case, there is no sense of direction and no certainty of the steps or knowledge is required. Therefore, heuristic tasks are thought to require creative thinking, while algorithmic tasks are not. This research finds the following approaches are valuable:

- Teach students flexibility in the use of attention.
- Help students to reach the state of flow as described by Csikszentmihalyi (1999, p.313).
- Always emphasise personality characteristics.
- Practise with them the acceptance of new ideas.
- Foster respect for the brief (Pibernik, Milcic and Bota, 2010).
- Encourage them to be capable of sustaining hard work.
- Cultivate and stimulate curiosity.
- Increase their self-actualisation.
- Motivate them towards openness, the characteristics of spontaneity and sensitivity.
- Continuous motivation, initiative modes, and imaginative perception.
- Mediation cultivates openness to novelty.
- Honour gut feelings.
- Push students to be more positive with forward learning behaviour and forward thinking.
- Increase their willingness to take risks.
- Encourage flexibility, being inquisitive, questioning societal norms, always being turned on, inner drive, and fantasy.
- Push the boundaries to challenge old ideas.
- Encourage students to ask questions.
- Push students to attain their self-actualisation (ibid., 2010), personal identification, and individual approaches.
• Increase their competitive spirit.
• Train them to meet completion deadlines.
• Increase their self-confidence.
• Critically reflect upon their creative works.
• Give them challenging exercises with specific constraints.
• Do not judge their creative acts very often.

Following these strategies would enforce the creative personality in students. Cheow (2008, p.22) argues, “differing vocational fulfilment and a broader range of personal development can prepare students to enter a real-world with a much wider range of jobs that offer challenge, income, and social status”.

6.2.6.6. Strategies that can develop students’ cooperative skills

Lecturers should train students to work in groups in problem solving. “The teaching strategies in graphic design education are increasingly paying attention to the need to train designers to work collaboratively” (Pibernik, Milcic and Bota, 2010). “Provide a mix of styles and backgrounds with opportunities for group interaction […] teams may be more creative compared to the individual in isolation and this is why teamwork is often the vehicle employed by design studios seeking to enhance creativity” (ibid., 2010). This research further suggests the following:

• Train students to practise peer-review.
• Promote creative communication experiences.
• Push students to interact with all parts of society and members of different cultures.
• Allow free choice in task engagement.
• In groups, encourage them to practise their self-expression.
• Fun when working in a group.
• Exchange of ideas.
• Push them in group work.
• Never engage in a comparison with others (ibid., 2010).
• Collaboration with others.
• Feeling of belonging to a group (ibid., 2010).
• Creating a collaborative environment.
• Allow students to engage in social and cultural creative activities.

6.2.6.7. Strategies that develop art and design knowledge

The creative person should develop in-depth domain knowledge as a condition for being creative (Adams, 2005, p.6). It is also important here to “… narrow the gap between teacher and learner, which cast the teacher in the role of facilitator and provide opportunity for active, even playful, engagement by learners, emphasising the process as well as the outcome” (Dineen and Collins, 2004, p.2). Hsiao, Liang and Lin (2004, p.247) argue, “In order to enhance students' creativity, it is necessary to discuss the knowledge essence of creative thinking and to cultivate students’ comprehensive perspectives of such matters after implementing this creative thinking teaching model”.

Adams (2005, p.6) argues that in order to enhance students' creativity, it is important to enlarge students' knowledge, both in depth and in breadth. This can be achieved through “greater focus on interdisciplinary study and having students collaborate on group projects with team members of varied interests” (Adams, 2005, p.6). It is important to train students to build up their creative portfolios. Graphics students should try their best to build up portfolios in which they show a maximum number of creative-thinking abilities. This can help them to meet job requirements in the future. Both the literature and the study on hand suggest the following:

• Make students aware of beauty and aesthetic aspects.
• Train them to challenge rules of design.
• Inspire their aesthetic taste.
• Developing their graphic design expertise.
• Lecturers should inspire their students with knowledge, feelings, and moments of discovery. In this way, lecturers can be the source of creativity.

6.3. Graphic design curriculum that can promote creativity

The design curriculum of any course, subject, or model should work to promote the creative thinking of graphics students. For example, it should focus on developing the cognitive, imagery, idea production, and problem solving techniques. However, this model does not suggest a specific creativity programme to be implemented in teaching creativity for graphic design students. Rather, it describes the shape, features, and underpinnings of a
superlative educational programme that is thought to be able to develop the creative potential of graphics students. For example, conceptual combination courses are usually used to stimulate new combinations and convergent thinking, through techniques such as using analogies and metaphors.

Any suggested creative programme should stimulate imaginative thinking and strategies of knowledge acquisition, setting exercises that require creativity and designing tasks that motivate students to work in groups. The use of divergent-thinking exercises and open-ended challenges are also recommended. The creative training should train students how to enlarge their visual library, through visiting museums and exhibitions, for example. The design workshop is also a form of organising a productive creative work within an educational environment. The workshop can improve students’ problem solving skills and competencies. This may eventually increase their understanding of all issues relating to the specific project. Moreover, play has an important role in developing the creative process; therefore, the design curriculum should offer playful exercises.

Swanson (1994) argues, “the Bauhaus, which was grounded in craft ideology and stressed intuitive solutions to design problems, provided the model for much of modern design training” (p.52). Therefore, any modern design programme should focus on the development of learners’ innate creative potential, and develop the curriculum towards this aim. Most pedagogical theories (e.g. student-centred) emphasise the importance of enforcing specific elements with students, such as imagination, curiosity, self-confidence, teaching approaches and methods, and learners’ responses.

In the 1930s the pioneers of Bauhaus (i.e. Hannes Meyer; Laszlo Moholy-Nagy) integrated several disciplines into graphic design education such as philosophy and sciences (Swanson, 1994, p.52). This confirms the idea that design in general, and graphic design specifically, are integrative and synthetic fields, which require a “wide-ranging education” (Swanson, 1994, p.52). For example, “The model for UK art and design education is the atelier system which enabled studio apprentices to gain skills, knowledge and ultimately independence, through guided practice of their craft. This approach continues to inform art and design pedagogy” (Dineen, 2004, p.3).

Design curricula should be designed to promote synthetic and analytical thinking. The combination of these types of thinking would result in creative thinkers. However, design educational curricula should not only enhance students’ creativity, but should also teach them about the field of creativity itself, for example by increasing the use of problem- and project-based learning in the classroom. This would assist students to realise their creative potential through understanding the enhancement methods. With this knowledge, graphic design
students would make the right decisions to pursue creative activities and be guided towards the development of their abilities. For example, it is important to allow the students room to choose their own projects. This would help not just to control them, but to allow them to develop.

As argued earlier, creativity is a crucial part of graphic design undergraduate curricula, yet Elton (2006, p.1) argues that, “the increasing audit culture which has been imposed on universities by unreasonable - and at the same time ineffective - quality demands is inimical to the development of creative curricula”. Elton, (2006, p.4) defines creative work as work that “must be more than merely ‘new’; it must show originality, significant […] at the student’s level […] it must involve critical judgment on the part of the creator […] it cannot be produced under controlled conditions”. In order to have a curriculum that can encourage creativity, students should initiate the learning process and be only supported by teachers, who should be ‘facilitators of learning’ (ibid., 2006). So, creativity is possible if learning starts with the student.

The essence of the graphic design curriculum should contain some content related to art and design, such as future design trends, art and design history, and analysis of the historical applications of graphics. Cognitive creative content is also important, as it can promote students’ critical and lateral thinking. Examples of this content include: brief psychological information about perception; some information about imagination and daydreaming; and information about the left and right brain. Moreover, lecturers should offer their students all required access to software and support for learning, along with adequate supervision and faculty support for classroom materials by offering alternatives and sponsoring their activities. This can help to develop students’ theoretical, manual, and digital skills. However, digital activities should focus on the quality of the final creative outcome through providing quantitative productivity. The curriculum should include some information about how to operate the design software correctly, and instances of technical suggestions.

The graphic design curriculum should also include content that enriches cultural, contextual, and visual thinking. This would help to develop students’ interdisciplinary approach in acquiring knowledge. Theories or ideas from other fields such as philosophy, sociology, history, technology, and political studies can all enlarge students’ interdisciplinary awareness. Another example is context and liberal studies and passages that identify certain cultural or social problems within specific contexts. Finally, it is recommended to have some content that offers open-ended solutions and examples of ‘wicked problems’ from the real world.
6.4. Assessing the creative outcomes of graphic design students

This research argues that it is possible to assess the creative outcomes of graphic design students. Since creativity is defined as problem solving activity, it is argued that there are always ways to assess creativity. One example of an assessment method is the social-personality approach outlined in Sternberg, Jarvin and Grigorenko (2010, p.93). It simply focuses on personality variables, motivational variables and the socio-cultural environment as sources of creativity. Yet it is difficult to apply standards to creativity. It would be more suitable to assess students as a group rather than as individuals. But it is also difficult to assess a group of students at the same time, as each student has their own design style: for example, some students create new ideas, but some produce regular ideas. In general, creativity should not be bordered by strict rules.

In regard to the framework utilised to assess students’ creativity, the following is some advice and suggestions for lecturers that can be implemented when assessing the creative outcome of students.

- See the element and then feel it.
- Look at the process and the methodologies a student has followed.
- Assess the demonstration of creativity in the product.
- Specific scoring rubrics that vary based on the project.
- Group assessment or collective evaluation process.
- Choose the best (unique and creative) artwork, then give other marks accordingly.
- Individual assessment parametric.
- Measure work against the fundamentals of design.
- Evaluate the ability to deliver the message.
- Criteria of idea, design, implementation and output.
- Distribute marks for different phases of work (e.g. sketches, concept, follow-ups, finishing, cleanliness and clarity of work).
- Relate the work to specific learning outcomes.
- Criteria should not control students’ choices.

To sum up, there are various viewpoints towards how creativity should be assessed within graphic design education. The most commonly recommended framework is group assessment and criterion-referenced testing. A suitable framework should be designed by the lecturers themselves for a specific unit or course, based on the aims and objectives of the course or unit being assessed. There is no well-defined framework that can be distinguished and recommended as an overall suitable framework. There is a blurred view of the ideal...
frameworks that can be implemented to assess the creativity of students. The assessment should cover the creative process as well as the final product. Design lecturers and educators should build up a workable framework based on creativity standards in their institution.

In regard to the suitability of criterion-referenced tests to assess the creative outcomes of students, criterion-referenced testing is a suitable system to assess creative outcomes of students in educational systems in general (Cheow, 2008), although there was no common consensus between graphics lecturers in the primary research about the ideal assessment criteria that should be used within graphic design education. The same finding can be applied to criterion-referenced testing, which aims to test the ability of students in solving problems creatively against specific criteria. Assessment standards may hinder creativity. Creativity cannot be associated with standards or criteria such as those set out by the lecturer before accomplishing the unit or the exercise. The assessment should be based upon the ability of student to demonstrate creative production. Also, the assessment should be independent, in both visual and verbal forms. The assessment should link the level of knowledge and the creative outcome. Assessments that force students to demonstrate to the lecturer (and the class) with verbal and visual presentations that they understand and can apply their newly learned knowledge to a real-life graphic design project or topic can be useful. The criteria should be agreed between both student and lecturers so that creativity can be assessed at a certain level. However, there should be certain limitations and boundaries, to satisfy the standards.

6.5. Chapter summary

Based on creativity defined as problem solving, this research ends by proposing a model that is thought to be an important contribution to Omani graphic design education. It offers an effective and new learning experience for graphic design lecturers in relation to creativity enhancement. The framework of this model is based on both the outcome of the literature review and the data gathered from the questionnaires and interviews. For this research project, the intention was to develop this model in an efficient way and produce it in a professional way, because of the fact that it would be regarded as the main contribution to this PhD research. Therefore, it would be reasonable to suggest this model to The Omani Ministry of Higher Education, for it to be applied and adopted within the Omani graphic design higher education system.

It is important to provide graphic design students with a theoretical foundation that will assist them to enhance their creative abilities. Therefore, one aim of this model intends to guide Omani graphic design students using specific techniques that can train them in how to
improve their creativity. In regard to creative assessment, group assessment is recommended; and the criterion-referenced test is recommended for the Omani educational system, as the majority of local design lecturers prefer this assessment. However, from an international design education point of view, it is difficult to argue that criterion-referenced testing is a suitable assessment method for assessing creativity within graphic design education. According to the international view, creativity should not be attached to specific criteria, as there is no agreed-upon standard of creativity and the students’ creative acts should not be attached to specific standards. This view is a result of how Westerners perceive the word ‘creativity’. However, although this perception applies in the West, it is not the case in Oman; therefore, this research concludes that assessing the creative act according to specific agreed criteria is acceptable.

The ability to generate new ideas is one of the most important underpinnings of the design industry. Students should already have conducted sets of projects through their studies that develop creativity. The theoretical or practical projects are required for realising the creative process, developing the imagination, developing ideas, and testing all ideas in real communications contexts. The following points describe the required abilities of creative graphic designers as concluded in this research.

1. **The ability to find suitable solutions for ‘wicked problems’**
   Some assigned tasks require creative thinking ‘outside the box’, which in turn requires the ability to identify the right box to work in. Students here should identify the problem, understand it, suggest several solutions, test one solution, and finally implement the most suitable solution.

2. **The ability to think critically and analytically**
   Students here should be able to take decisions and suggest suitable solutions through the ability to analyse the task systematically. Firstly, they must grasp the mission of the task or the type of the problem that should be solved; secondly, they must understand the elements of the problem and thirdly, rearrange its content to suggest a suitable solution. All ideas require continuous assessment of their effectiveness at solving that, which was mentioned within the design brief.

3. **The ability to communicate**
   Design students should be able to communicate with others creatively, either variably, textually, or through visual form. All these are forms of communication. Designers should carefully read and comprehend the design brief.

4. **The flexibly to work within a group**
Students should understand and practise this skill, through respecting others' opinions, interests, and preferences. Students should understand the mechanisms of cooperation with specialists from various fields such as marketing, public relations, engineers, traders, and programmes specialists. Modern graphic designers are usually involved with internal designers, digital games designers, website developers, and architects.

5. The ability to think divergently

It is important to train students to think outside conventional frameworks, which enriches their abilities to create new communication points concerning the openness of uncertainty and adventures, and moves them towards creative thinking.

6. The ability to be self-motivated

Self-motivation helps students to discover the concepts, ideas, and theories that help the essence of design ideas to flourish, associated with the mission of graphic design and its purpose. All this requires students to be continuous learners, which allows them to control the creative process and work imaginatively, either under pressure or when working for a long time to complete the required work. Self-motivation nurtures the ability within the students to answer the critical questions, which makes them try to solve them, rather than asking the lecturer to suggest the solutions.

For graphic design students to be creative, they should have specific skills and abilities. They would use these abilities after completing a degree in graphic design. Therefore, they should be able to identify problems effectively and develop strong, appropriate, conceptual strategies for specific target audiences, producing these concepts in a manner that effectively communicates them to the intended audience.
Chapter Seven: Conclusion

7.1. Chapter overview

This chapter is a conclusion of the whole study. It starts with Section 7.2, which gives a general summary of the whole research, followed by Section 7.3, which summarises the significance of the research and the implications. Section 7.4 gives a summary of the contribution of the research to the body of knowledge. Section 7.5 outlines the recommendations and further study. And finally, Section 7.6 outlines the limitations of the research.

7.2. General summary of the research

This thesis has investigated the issue of creativity in graphic design education. It sought to identify how creativity is defined within graphic design education contexts. Creativity is an important concept for both individuals and society, but it is problematic to define. Creativity is culturally defined and orientated. Similarly, graphic design is situated between arts and science in a ‘fuzzy’ reality of ‘social problems’ or ‘wicked problems’. Graphic designers ought to find solutions for these problems, yet the design outcome, its meaning, and cultural production are usually valid only within a ‘local’ context (i.e. Oman). This research is based on Williams’s (1961) definition of creativity as a conceptual framework.

The main purpose of this investigation was to propose a pedagogical model that can enhance the creative potential of Omani graphic design students. This purpose was based on three underpinnings: 1) creativity in graphic design education can be defined as problem solving, which is also defined as a cultural activity; 2) creativity can be encouraged, enhanced, and taught within graphic design students; and 3) the creative outcome can also be assessed within design educational contexts.

With regards to the research problem, there is an underestimation of the importance of creativity in the Arabic design education system in general and in Omani design education in particular. This has resulted in the Omani design education system lacking a framework for creativity, causing a shortage in structured pedagogical programmes that can enhance Omani design students’ creativity. In order to solve this problem, there is a need for a pedagogical model that can offer a systematic approach for lecturers to guide them in enhancing the creative problem solving abilities of students.

The type of investigation undertaken to explore the research problem and address its purpose was a comparative cross-cultural study of creativity and how it is defined in both Eastern and Western cultural contexts. The data were collected through employing semi-
structured questionnaires and semi-structured interviews as part of a survey approach. The questionnaire targeted international lecturers, while the interviews were conducted with graphics lecturers who teach design courses within Omani higher education institutions. The collected data was analysed using a thematic analysis method, where it was coded first and then categorised according to different themes, which were extracted from the literature review that had already been based on the research aims and research questions.

All these concerns were picked up by proposing the process that can lead to answering the research questions and fulfilling the aims. To satisfy this purpose, this research went through a procedure that started with defining creativity as ‘problem solving’, then reviewing the literature to distinguish the main concerns relevant to creativity in relation to graphic design students. Accordingly, a set of questions was developed and answered by a qualitative interpretive survey approach. The final inferences were used to develop the proposed pedagogical model.

**7.3. Significance of the research and implications**

The following conclusions can be drawn from the present study. Firstly, creativity is a crucial component in contemporary design education. The second major finding was that creativity can be taught, encouraged, and enhanced, at least within the graphic design educational context. The relevance of creativity, as problem solving, is clearly supported by the current findings. The present study also makes several noteworthy contributions to identify pedagogical strategies that can enhance the creativity of graphic design students. Such strategies are only one part of the proposed pedagogical model developed within this research. The other parts are creative-thinking techniques that can be used by graphic design students to promote their own creativity and the description of the curriculum features or content that would be effective in developing Omani creative designers.

One of the more significant findings to emerge from this study is that creativity is important in design education but nobody knows what it is, therefore there is a blind faith that it can be taught and it can have a beneficial effect. The data confirmed that creativity is the ability of students to show their problem solving abilities in graphic design. This research finds that all people are creative because they receive the world fresh, and unconstrained: creativity is nurtured by knowledge, experience, and enhancement. All these require self-motivated, consistent learners. Creativity is not a gift or a talent belonging only to some people, and it is not only a pure cognitive phenomenon. Some types of thinking styles do not support creativity: those that are convergent, deductive and logical.
The current findings add substantially to our understanding of the capabilities of graphic design students that will help them to meet the requirements of the design industry. This would work well with the primary aim of design education as stated by the Omani Ministry of Higher Education. One of the important aims of design education in Omani design institutes is developing students’ proficiency in various skills. Such development would support the fresh graduates to engage in the design industry through building up strong portfolios, and passing successfully through work interviews. This research has discovered that newly graduated students should develop sets of skills and abilities that assist them to practise the graphic design profession effectively to meet cutting-edge requirements. Design industries in developing countries such as Oman should respect the profession of design, the designer, and their roles in visual communication, cultural and social change.

The results of this research support the idea that creativity is an issue integrated into graphic design, especially in regard to design education. This can help to improve the standards of the Omani design education system, as it demonstrates a new understanding of creativity in design education. It can contribute to changing how both creativity and design are comprehended within the educational systems of developing countries such as Oman. This would result in developing the state of creativity within the Omani educational system through promoting the problem solving definition among design educators, lecturers and institutions.

Most of the issues and points drawn from these findings related specifically to the roles of the design lecturer, student, environment, social and cultural context and design curriculum in developing the student’s creativity. Therefore, this research outlines the main features or elements that should be considered when designing any potential pedagogical model for creativity enhancement. This study outlines the roles of each element in the development of creativity.

7.4. Contribution of the research to the body of knowledge

In regard to the necessity of this research, the research provides new knowledge through filling some of the gaps in design education research. Firstly, this research contributes positively to advancing and promoting the idea of creativity in graphic design, both among practitioners and their audience. Secondly, this research has demonstrated an understanding of the ‘creativity’ phenomenon in the field of graphic design education. Thirdly, it has introduced the notion of creative problem solving in design processes in the West versus an application of technology in developing countries (e.g. the Arabic region). The practical implications are inferred, being a raised understanding and appreciation of creativity.
and the design process in the Arab world, particularly in Oman. Fourthly, restructuring the design curriculum based on the particular sensibilities of the Arab world has significant implications for the teaching of graphic design there. The main contributions of this research are outlined in the following points:

### 7.4.1. Developing a pedagogical model

The main outcome of this research was the pedagogical model described in Chapter Six of this thesis. This model is thought to be able to enhance and assess the creative abilities of Omani undergraduate graphic design students. It serves as an educational guideline for design lecturers to empower graphic design students to maintain their creative energy and apply it within the design profession. This model is important because it outlines several strategies, techniques, and instructions which are thought to improve the creativity of graphic design students in Oman. It consolidates research insights and transforms them into applicable strategies for design education. It is this outcome that proves this research has attempted to fill a knowledge gap in Omani graphic design education, and offered suggestions to design educators for improving students’ creativity.

This model intends to give university lecturers guidelines on how to adopt better methods that can assist students to foster their creative potential. Lau (2009, p.164) argues that, “a foundation creativity training module is crucial to challenging design students’ fixed paradigms by introducing various creative and design thinking styles, as well as by shifting their habitual ways of doing things”. Therefore, this model is expected to reflect positively with students, as it can extend their creative output. Through applying this, design students can engage in creative processes physically, digitally, and mentally, which can certainly foster their creativity. This contribution can be regarded as a national initiative for creativity enhancement in Oman.

### 7.4.2. Developing a definition for creativity in relation to graphic design education

Most of the literature demonstrates an agreement that creativity involves the two main elements of ‘novelty’ and ‘appropriateness’; therefore, it is to some extent an identifiable word in common sense. However, this research has taken a different approach towards the word ‘creativity’. Creativity is defined here as problem solving which is also explained as a cultural activity. This study has given the reader an idea of the nature of the creativity in education, which was again located specifically within ‘global’ and ‘local’ graphic design education contexts, based on the fact that the Arabic education system and Omani graphic design education system have their own model for defining the creative act. This research has made some contribution to advancing the current understanding of creativity within the graphic design context, specifically in Oman. It has outlined the meaning of creativity as discussed in
some related studies (e.g. Tudor, 2008; Lau, 2009; Williams, 2010). This study clarified more precisely the nature of the creative abilities of graphic design students.

7.4.3. Advancing the issue of creativity assessment

In regard to assessing the creative outcome of design students, it is believed that experienced graphic designers (i.e. those with deep knowledge of the field) have experienced many design outcomes through their profession; therefore, they have the ability to distinguish between creative design outcomes and non-creative ones. Creativity can be genuinely enhanced and assessed, as is claimed by several scholars, including Torrance (1974), Guilford (1979) and Sternberg (1999). Creativity is a measurable concept because the value of creativity is determined only by the society that perceives it. It is clear that if a given group of creators agree a measure by which to evaluate a given creation, then creativity can be assessed. An example of this is a designer who wins a graphic design competition because of his distinguished creative outcome.

7.4.4. Studying creativity in relation to design education context

This research is one of the few studies that have studied creativity enhancement in relation to graphic design education, especially within the Arabic region. Williams, Ostwald and Askland (2010, p.14) argue, “There is no established ‘study of design creativity’ that explores the particularities of creativity as it relates to design”. Based on this notion, it is reasonable to argue that the topic of this study is currently of interest to the community of design educators and designers. It is timely and fills a gap in current knowledge in design education. So, this research provides new knowledge through filling existing gaps in graphic design and creativity research.

This research contributes positively to advancing the idea of creativity in graphic design, both among practitioners and their audience. In addition, this research has demonstrated an adequate understanding of the ‘creativity’ phenomenon in the field of graphic design education. Another contribution is the provision of a snapshot of differing views regarding creativity in design education as perceived by international lecturers versus Omani lecturers.

7.5. Summary of the recommendations and further study

These findings suggest several courses of action, for example, suggesting this model to the Omani Ministry of Higher Education to be applied within the design higher education system. A reasonable approach to tackling this issue could be to redesign the pedagogical model to serve as a quick, friendly user guide for lecturers that can assist and guide them with ideas and instructions on how to promote the creativity of their students. More
information on creativity assessment would help to establish a greater degree of accuracy on this matter. If the debate is to be moved forward, a better understanding of creative outcome assessment frameworks needs to be developed.

However, further study needs to be done to evaluate the proposed pedagogical model, and whether it is really effective in enhancing the creative potential of design students or not. Such a study would be necessary in the near future to conclusively and thoroughly test the findings. The usefulness of a number of possible future studies using the same experimental set-up is apparent. It would be interesting to assess the effects of the notions, concepts and ideas outlined in this study in real-life settings. In the near future, the researcher is willing to conduct such further research. This conclusion thought to open up new questions for the next researchers who are interested in the topic. This research studied creativity enhancement in graphic design education, but it is believed that there are many other related areas that should be examined, as follows:

- Creativity within one or two design courses taught within any Omani design institution.
- Assessing how the graphic design profession is identified, defined and comprehended within Arabic design educational contexts in general.
- Examining the extent to which creative design can solve 'wicked problems' that face the Omani cultural and social spheres: in which forms, and by which methods?
- Looking at possible outcomes to be expected after applying this model within the real Omani design education context.
- Investigating the advantages and disadvantages of the proposed model.
- Looking at the challenges that face its application and how they can be avoided in the future.
- Investigating further the assessment of creative outcome such as ipsative and formative assessment.

Even though this research has outlined several techniques, strategies, and methods that are designed to increase the creative potential of design students, further investigation is still required. Future research should therefore concentrate on the investigation of programmes, strategies, methods, techniques or instructions that are already used to enhance creativity of graphic design students. Any further study should focus on the effectiveness of these methods, as it is necessary to test their strengths and weaknesses.
Also, it would be interesting to compare experiences or understandings of individuals within the same cultural group about creativity in the design industry. Another future study could identify the obstacles to creativity in Arabic countries in general and in the Omani context in particular.

Furthermore, more research on this topic needs to be undertaken before the association between creativity enhancement and graphic design assessment is more clearly understood. Further research should be performed to investigate the application of the pedagogical model developed by this research in promoting creativity within the Omani design education system and suitable assessment criteria to assess the creative outcome of students. Future studies on the current topic are therefore recommended.

7.6. The limitations of the research

Finally, a number of important limitations need to be considered. The first is factored into the process that is used to understand how graphic design lecturers perceive the word 'creativity'. Design lecturers participating in the research were representative of the international and local (i.e. Omani) population. Their ideas about the investigated issues were used to inform the research, yet the data may not be representative of all design lecturers. So, this can be regarded as a limitation of this research. Also, this research relied on the honesty of the participants’ feedback. To minimise the effects of this limitation, the data were compared with the literature review.

The second limitation of this research is related to the literature used within this study. Articles on graphic design and creativity in relation to design education tend to become outdated fairly quickly. To overcome this limitation, the most recent literature was used, including research journals and online resources.

Thirdly, there was also a limitation in the questions that were asked in the questionnaire and in the interviews. For example, the second question asked whether creativity could be taught and encouraged. This question confused the participants as it asked about two things at the same time (i.e. teaching creativity and encouraging creativity). Enhancing creativity is different from encouraging creativity, as in the enhancement process the creative student has a role in his/her creativity enhancement, whereas encouragement is usually provided by the lecturers to the student. However, the positive responses from the lecturers helped to provoke another important finding and overcome this shortcoming. Similarly, the third question enquired about creativity enhancement. This confused some participants who could not differentiate between teaching creativity, encouraging creativity, and enhancing creativity.
There was also some confusion with the question enquiring about creative-thinking techniques. The correlations between the findings and the expected results were very weak. The question enquired about creative-thinking techniques, but most of the answers mentioned something else, such as educational methods or assessment issues. The possible reason for such misleading answers is the weakness of the question, which was not explained well. This can be regarded as a limitation of this research question. Nevertheless, some consensus was extracted from the answers to this question, which was very beneficial and contributed positively to developing the pedagogical model. Also, there was a slight confusion with the last question of the survey, as most of the participants did not understand what 'criterion-referenced testing' meant.

The fourth limitation of this research was the lack of the evaluation of the model, which would answer the question as to how the researcher knows this model will work in the real field. To minimise this limitation, it is explained in the Introduction that the main research aim is to develop the model, as a first step towards improving pedagogy in Omani graphic design education. The researcher has thought about possibilities for future studies that will include evaluation of the model.
Bibliography:


Blair, B. (2006) 'At the end of a huge crit in the summer, it was 'crap' - I'd worked really hard but all she said was 'fine' and I was gutted', Art, Design & Communication in Higher Education, Vol. 5, Issue 2, 83–95.


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Kerka, S. (1999) 'Creativity in Adulthood', ERIC: Digest No. 204, Clearinghouse on Adult, Career, and Vocational Education, ERIC: Columbus, OH.


Appendices:
Appendix (1)
The previous methodology plan

**Phase One**

**Purpose**

1. **A. Surveys**
   - 1. Semi-structured questionnaire
   - With 200 graphic international
   - To investigate how creativity is recognised, defined, and identified by graphic design experts within graphic design discipline

2. **B. Case study**
   - 2. Semi-structured Interviews
   - With 40 design lecturers teach in Oman
   - How current Omani graphic curriculums value the creativity?

3. **Documents analysis**
   - Of six Omani graphic design curriculums

**Phase Two**

**C. Experimental study**

4. **4. Observation**
   - To observe and record students' creative behaviour in designing
   - (Group A) 25 students
   - Experimental group
   - (Group B) 25 students
   - Control group
   - 25 artefacts

**Phase Three**

**Purpose**

1. **Create the Criterion-referenced**
   - Analysing all collected data

2. **5. Visual data analysis**
   - To assess the final outcome of all graphic students against the
Appendix (2)
The Ethical Clearance Approval Form

Ethical Clearance Checklist
(TO BE COMPLETED FOR ALL INVESTIGATIONS INVOLVING HUMAN PARTICIPANTS)

If your research is being conducted off-campus and ethical approval has been granted by an external ethics committee, you may not need to seek full approval from the University Ethical Advisory Committee. However you will be expected to provide evidence of approval and the terms on which this approval has been granted.

If you believe this statement applies to your research, please contact the Secretary of the Ethical Advisory Committee for confirmation.

If your research is transferring into Loughborough University and approval was obtained from your originating institution, there is a requirement on the University to ensure that appropriate approvals are in place.

If you believe this statement applies to your research, please contact the Secretary of the Ethical Advisory Committee with evidence of former approval and the terms on which this approval has been granted.

It is the responsibility of the individual investigators to ensure that there is appropriate insurance cover for their investigation.

If you are at all unsure about whether or not your study is covered, please contact the Finance Office to check.

Section A: Investigators

Title of Investigation
Enhancing Creativity of Omani graphic design students

Name, Status and Email Address of Senior Investigators (University Staff Research Grade II and above):
(Similar to responsible investigator where appropriate)
Simon Downs
Student supervisor J.T.Downns@lboro.ac.uk
Department: School of the Arts

Name, Status and Email Address of Other Investigators (other University Staff and Students):
Salman Alhajri
PhD Research student S.A.S.alhajri@lboro.ac.uk
Department: School of the Arts
A1. Do investigators have previous experience of, and/or adequate training in, the methods employed?

   Yes □   No* □   *If No, Please provide details below

A2. Will junior researchers/students be under the direct supervision of an experienced member of staff?

   Yes □  No* □   *If No, Please provide details below

A3. Will junior researchers/students be expected to undertake physically invasive procedures (not covered by a generic protocol) during the course of the research?

   Yes* □  No □   *If Yes, Please provide details below

A4. Are researchers in a position of direct authority with regard to participants (eg academic staff using student participants, sports coaches using his/her athletes in training)?

   Yes* □  No □   *If Yes, Please provide details below

If you have selected one of the answers above marked with an * please provide additional information on how you intend to manage the issues (please continue onto a separate sheet if required), then submit this checklist to the Secretary to the EAC:

Section B: Participants

Vulnerable Groups
Will participants be knowingly recruited from one or more of the following vulnerable groups?

B1. Children under 18 years of age
   (please refer to published guidelines)

B2. People over 65 years of age

B3. Pregnant women

B4. People with mental illness

B5. Prisoners/Detained persons

B6. Other vulnerable group (please specify)

Yes* □  No □

# If the procedure is covered by an existing generic protocol which refers specifically to the vulnerable group(s), please insert reference number here

If the procedure is not covered by an existing generic protocol, please submit a full application to the Ethical Advisory Committee

Chaperoning Participants
If appropriate, e.g. studies which involve vulnerable participants, taking physical measures or intrusion of participants' privacy:

B7. Will participants be chaperoned by more than one investigator at all times?  
Yes ☐ No* ☐ N/A* ☐  * If N/A, please provide details below

B8. Will at least one investigator of the same sex as the participant(s) be present throughout the investigation?  
Yes ☑ No* ☐ N/A* ☐  * If N/A, please provide details below

B9. Will participants be visited at home?  
Yes* ☑ No ☐ N/A* ☐  * If N/A, please provide details below

* Please submit a full application to the Ethical Advisory Committee.

If you have selected one of the answers above marked with an + please provide additional information on how you intend to manage the issues (please continue onto a separate sheet if required), then submit this checklist to the Secretary to the EAC:

Section C: Methodology/Procedures

To the best of your knowledge, please indicate whether the proposed study:

C1. Involves taking bodily samples:  
Yes* ☑ No ☐

C2. Involves procedures which are likely to cause physical, psychological, social or emotional distress to participants  
Yes* ☑ No ☐

C3. Is designed to be challenging physically or psychologically in any way (includes any study involving physical exercise)  
Yes* ☑ No ☐

# If the procedure is covered by an existing generic protocol, please insert reference number here

If the procedure is not covered by an existing generic protocol, please submit a full application to the Ethical Advisory Committee

C4. Exposes participants to risks or distress greater than those encountered in their normal lifestyle  
Yes* ☑ No ☐

C5. Involves collection of body secretions by invasive methods  
Yes* ☑ No ☐

C6. Prescribes intake of compounds additional to daily diet or other dietary manipulation/supplementation  
Yes* ☑ No ☐

C7. Involves testing new equipment  
Yes* ☑ No ☐

C8. Involves pharmaceutical drugs  
Yes* ☑ No ☐
C9. Involves use of radiation
   Yes ☐ No ☐

* If you have answered ‘Yes’ to any of the above please submit a full application to the Ethical Advisory Committee

Section B: Observation/Recording

D1. Does the study involve observation and/or recording of participants?
   Yes ☐ No ☑ If No, please go to Section E

If Yes,

D2. Will those being observed and/or recorded be informed that the observation and/or recording will take place?
   Yes ☐ No ☑

* Please submit a full application to the Ethical Advisory Committee

Section E: Consent and Deception

E1. Will participants give informed consent freely?
   Yes ☑ If yes please complete the Informed Consent section below.
   No ☐ *If no, please submit a full application to the Ethical Advisory Committee.

Note: where it is impractical to gain individual consent from every participant, it is acceptable to allow individual participants to "opt out" rather than "opt in".

Informed Consent

E2. Will participants be fully informed of the objectives of the investigation and all details disclosed (preferably at the start of the study but where this would interfere with the study, at the end)?
   Yes ☑ No ☐

E3. Will participants be fully informed of the use of the data collected (including, where applicable, any intellectual property arising from the research)?
   Yes ☑ No ☐

E4. For children under the age of 18 or participants who have impairment of understanding or communication:
   - will consent be obtained (either in writing or by some other means)?

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E5. For investigations conducted in schools, will approval be gained in advance from the Head-teacher and/or the Director of Education of the appropriate Local Education Authority?

Yes ☐  No* ☐  N/A ☐

E6. For detained persons, members of the armed forces, employees, students and other persons judged to be under duress, will care be taken over gaining freely informed consent?

Yes ☐  No* ☐  N/A ☐

* Please submit a full application to the Ethical Advisory Committee

Deception

E7. Does the study involve deception of participants (ie withholding of information or the misleading of participants) which could potentially harm or exploit participants?

Yes ☐  No ☐  If No, please go to Section F

If yes,

E8. Is deception an unavoidable part of the study?

Yes ☐  No* ☐

E9. Will participants be de-briefed and the true object of the research revealed at the earliest stage upon completion of the study?

Yes ☐  No* ☐

E10. Has consideration been given on the way that participants will react to the withholding of information or deliberate deception?

Yes ☐  No* ☐

* Please submit a full application to the Ethical Advisory Committee

Section F: Withdrawal

F1. Will participants be informed of their right to withdraw from the investigation at any time and to require their own data to be destroyed?

Yes ☐  No* ☐

* Please submit a full application to the Ethical Advisory Committee

Section G: Storage of Data and Confidentiality

Please see University guidance on Data Collection and Storage

G1. Will all information on participants be treated as confidential and not identifiable unless agreed otherwise in advance, and subject to the requirements of law?

Yes ☐  No* ☐

G2. Will storage of data comply with the Data Protection Act 1998?
Section H: Incentives

H1. Have incentives (other than those contractually agreed, salaries or basic expenses) been offered to the investigator to conduct the investigation?

Yes ☐   No ☐   *If Yes, Please provide details below

H2. Will incentives (other than basic expenses) be offered to potential participants as an inducement to participate in the investigation?

Yes ☐   No ☐   *If Yes, Please provide details below

If you have selected one of the answers above marked with an * please provide additional information on how you intend to manage the issues (please continue onto a separate sheet if required), then submit this checklist to the Secretary to the EAC:

Section I: Work Outside of the United Kingdom

G1. Is your research being conducted outside of the United Kingdom?

Yes ☐   No ☐

If Yes, you may need additional insurance cover/clearance for your research.

If, having completed this checklist, you will be making a full application to the EAC this issue will be checked for you as a part of the process. If however you do not need to complete a full application please contact Hiten Patel (H.Pate@lboro.ac.uk).

Section I: Declarations

Checklist Application only:

If you have completed the checklist to the best of your knowledge without selecting an answer marked with an * or †, your investigation is deemed to conform with the ethical checkpoint and you do not need to seek formal approval from the University's Ethical Advisory Committee. Please sign the declaration below, and lodge the completed checklist with your Head of Department or his/her nominee.
Declarations
I have read the University's Code of Practice on Investigations on Human Participants. I confirm that the above named investigation complies with published codes of conduct, ethical principles and guidelines of professional bodies associated with my research discipline.

Checklist with additional information to the Committee:
If, upon completion of the checklist you have ONLY selected answers which require additional information to be submitted with this checklist (indicated by a +), please ensure that all the information is provided in detail and send this checklist to the Secretary to the EAC.

Full Application Needed:
If on completion of the checklist you have selected one or more answers which require the submission of a full proposal please download the relevant form from the Committee's web page.

A copy of this checklist, signed by your Head of Department should accompany the full submission to the Ethical Advisory Committee.

Signature of Responsible Investigator

Signature of Student (if appropriate)

Signature of Head of Department or his/her nominee

Date

Advice to Participants following the investigation
Investigators have a duty of care to participants.

When planning research, investigators should consider what, if any, arrangements are needed to inform participants (or those legally responsible for the participants) of any health related (or other) problems previously unrecognised in the participant. This is particularly important if it is believed that by not doing so the participants well being is endangered. Investigators should consider whether or not it is appropriate to recommend that participants (or those legally responsible for the participants) seek qualified professional advice, but should not offer this advice personally. Investigators should familiarise themselves with the guidelines of professional bodies associated with their research.
Appendix (3)
Defining creativity within graphic design education

- First: Results of the Questionnaire

1. Creativity as problem solving
9 participants out of the 33 defined ‘creativity’ as problem solving or creativity is being the student’s ability to solve graphics wicked problems. For example, Participant 02 said; “By solving design problems in interesting ways. By offering unexpected solution to design problems”. Another example is Participant 04: “Problem solving ability”. Also, Participant 01 answered, “Critical design problem solving”. Interestingly some participants (e.g. Participant 23) explained their account of creativity as ‘problem solving further, arguing “In education there is a need to distinguish between the student showing creativity while they learn techniques and problem solving, and graphic design embracing wider social challenges in the professional realm”. Participant 06 answered this question with “There is more than one solution to any problem and the way you weigh the value of each suggestion by its elegance and smartness is the creative measure”. Participant 22 developed this account further, saying, “Students not only problem-solve, but problematise, the topic; when the process takes them to new terrain and murky waters, and involves much play and renegotiation”.

2. Creativity as a personal traits
5 participants out of 33 perceive creativity as personal ‘conscious’ skills that can be developed by a person. Examples of terms and words mentioned in this context are “curiosity” “exploration” or “way of seeing”, “instincts and personal beliefs” or “genuine interest”. Among those 5 participants two lecturers perceived creativity as “approaching the complex ideas” or “giving simple metaphors”. Accordingly, for graphics students to be creative, they should enhance their “drawing skills” or “resourcefulness”. With the same understanding, Participant 01 said, “personal attribute and identity”. It is a conscious skill of which the student is aware.

3. Creativity requires specific conditions to exist
Three participants made links between creativity and some conditions such as “knowledge” or “experience”. This approach to creativity can be named as ‘Componential theory of creativity’ as argued by (Amabile, 1997, p.42). It is defined here as a combination of elements, as argued by Participant 18: “Creativity shows through a combination of elements: The use or non-use of stereotypes and clichés; the combination of the visual, verbal, the medium, also sound and other atmospheric elements”.

4. Creativity is a cognitive attribute: psychometric approach
Creativity was here perceived as a cognitive characteristic that exists in some people only. It involves “idea generation” or “concept generation”, or perhaps more high recognition attributes, such as “recognition skills” or “power of observation”, “think critically”. This understanding is a psychometric approach as argued by Paul Torrance: Participant 15 answered “fluency, flexibility and originality and elaboration” or “ability to resolve the concept into an outcome”. So this approach identifies creativity as a set of cognitive abilities of the creative person, for example “ability to put different ideas”.

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5. Creativity is inspirational power coming to poets or artists

Interestingly, only two participants approached creativity from an irrational and romantic viewpoint. It is argued earlier in previous chapters that to define creativity as an attribute of certain individuals cannot be supported. Yet, some participants perceived creativity from a mystical perspective. Examples of such responds are, "light bulb", "unique", "unexpected solutions", or "exercise of rhetoric". For example, Participant 10 said, "Through solutions that come out of left field, perhaps anarchic, certainly original, definitely not referential... those ideas that hit you like a light bulb above the head".

6. Problematic definition and challenging concept

Two participants described creativity with problematic and vague terms; examples of these words are "original", "new", "unexpected", "provocative", "novel works", or "uniqueness of ideas". The participants here believe creativity is a strange concept so cannot be defined. For example, Participant 19 said, "There is no creativity", even when describing creative design as "innovative design". These people also either beg the question or set up an infinite regress.

7. Creativity is the ability to communicate

Also very few participants (2) perceived creativity as the ability of a graphic designer to communicate his/her ideas with others. To be creative, "the message is clearly communicated" or it is "the exploration of the balance between aesthetics and effective communication". These participants regard the "aesthetic appeal or effect" as complementary to the communication, which explains the 'creative act' in general. For example, Participant 11 said, "ability to communicate intended message". Communication is also deeply cultural – only members of the ‘same’ culture can communicate with each other, as Williams says: this is also creativity and involves shared values and beliefs.

8. Creativity explained as a product

Five participants defined creativity as a product that is produced by graphic designer as well as that produced by an artist. It is perceived here as "the process of art making and the product itself", "product is somehow exceptional" by the specific culture. It is important here to have a culture and audience who judge the creative act. For example, Participant 18 said, "The ability of the designer to step back and not egocentrically create something that he/she likes, but something that caters to the proposed audience/target group". Creative people here “put things and objects in other uses” therefore, the creative “product operates by enticing the viewer to think/ feel/ act differently”.

To sum up, the most dominant approaches gained from the answers to this question were either creativity as problem solving or as a cultural production. Most graphic design lecturers defined it in these two ways. However, there were some new approaches in understanding the ‘creative act’ reported by several lecturers. This is in addition to some completely irrelevant responses from two or three participants.

- Second: results of the Interview

1. Creativity as problem solving

13 participants out of the 39 defined ‘creativity’ as problem solving or creativity is being the student’s ability to solve graphic design problems. The problems were defined as briefs, assignments, and design cumulative projects. For example, Participant 3 said; “Creativity is
unlimited, it is not conditional with any form [...] it is the ability of graphic designer to solve design problems”. Another example is Participant 12, who said, “It is the using of imagination to solve design problems by providing workable graphics solutions”. Also, Participant 13 argued, “The ability of the student to use the countrywide and science to produce graphic design and advertising means they are a very open minded designer, in other words it is to feel some cultural aspects of design problems; in Oman not everything is accepted easily”. Participant 15 answered, “it is the ability to find a creative solution in a form of the correct usage of the space, composition, colours, principles of design, and other elements: creativity of graphic design is to give output of a certain standard which is acceptable by the society that receives it for a particular reason”. Participant 17 argued that it is, “the ability to think critically and the ability to analyse what they have been given as a solution for the task, it is the ability to identify design problems in human minds in order to solve it, so it is to come up with specific solutions”. Participant 22 answered this question with, “Creativity in graphic design is finding novel solutions even if there are no problems, such solutions should complete other products, graphic designers usually have the ability to solve design issues with excellence as per requirements, it is coming up with an inventory of lots of things”. Participant 26 developed this account further, saying, “It is the capability of the student to come up with new ideas for design problems; copying others’ ideas is not creative”.

2. Creativity as a personal trait or motivation

4 participants out of 39 recognise creativity as a personal ‘conscious’ trait or motivation that can be developed by a person himself/herself. Examples of phrases and words referring to this understanding are Participant 13 who answered, “Creative graphic design is open minded”, also, Participant 1 said, “Creative graphic design student who is unusually talented and open minded people who have creative thinking”. An example of a participant who defines it as motivation is Participant 6, who said, “It is a capability with the learner”, Participant 32 argued, “Catalyst or a starting point in order to create an unusual thing”, and Participant 18 who stated, “Creativity is the mission of the good graphic designer, it is good performance, it is continuous improvement”. Therefore, “graphic designers should be motivated to try several ways to make things better”.

3. Creativity as a cognitive attribute or process

Creativity was here perceived as a cognitive characteristic that exists in some people or as a process. Example of such responses are; “No end of ideas, infinity in thinking” (Participant 7), “It is the ability to understand anything easily, it is not restricted within a certain territory”(Participant 13), “It is the thinking process to identify the right idea that work well for the specified brief, so it is a direction of the critical thinking”(Participant 24), “It is the ability to think in a critical manner that comes from a strong theoretical background”. Participant 14 linked this understanding with education and argued, “The meaning of creativity in teaching is to elaborate detail, or to bring an entirely new things that were not on the table, or to come up with horizontal or vertical ways of thinking, and repeated additions that are possible to demonstrate creativity” (Participant 35).

4. Creativity requires specific conditions to exist

Five participants think here that creativity requires specific conditions to exist: examples of these conditions are “environment” or “experience”, so “creativity is not conditional with any form”. For instance, Participant 15 argued that, “It is using certain rules to determine the creative design, graphic design abilities in the environment, creativity is also linked to the time, as its outcome may be discovered at later stages”. In another example, Participant 20 said, “It is
associated with environment”. So, these participants comprehended that, “Creativity is not just like magic, it doesn’t come just suddenly”, “It is a building in previous experience, it is a cumulative knowledge”, “Creative graphic designer must be involved in several fields such as science and in all aspects of life”, also, Participant 26 thinks, “Everything detected by such new technology will open the field of creativity”. Participant 39 said, “Revisions, readings: education is very important, for a designer to implement a new idea he has to have the background to make him able to work it out properly”. Participant 7 linked it with design principles, arguing, “Creative idea should include all design principles in order to be a creative idea that attracts everyone”.

5. Creativity as inspirational power existing in artists

Only three participants perceived creativity as a rational and inspirational power that usually comes to poets or artists. It is argued earlier in previous chapters that, it is nonsense to argue that some people are born creative and some are not creative. Yet this belief still exists with some lecturers who teach graphic design to Omani students. Examples of those participants are Participant 24, who answered, “It is a talent with some students that can be improved”, and Participant 26 who said, “It is a state is already been with the designer based on the creative person him or herself”; other answers are, “It is a capability with students” and “It is the flow of thoughts” (Participants and respectively).

6. Problematic (circular and tautological) definitions

About five participants described creativity as a problematic and vague term: examples of these descriptions are, “unlimited”, “the idea in terms of modernity and originality”, “creativity is a concept of implementing new ideas with the designer to improve with time”, “Students may able to produce valuable things from simple material”, “Something new and useful”. The participants here believe that creativity is a strange concept so cannot be defined. For example, Participant 19 said “There is no creativity, because there is more than one definition of creativity”, “It is a subjective issue”, “Even when describing creative design as ‘innovative design’, “It is a concept of creative skills”, “Quality of work”.

7. Creativity is the ability to communicate

Four participants explained the creative act as the ability of a graphic designer to communicate efficiently. Examples of these responses are, “Creativity is new ways to communicate the appropriate result, it is a power of content expression” (Participant 22), Participant 18 confirmed this idea by stating, “Creative students usually try to add something new through the successive hints that reach the society, either in the context of function or in the context of form”. Communication here is a cultural activity, so “Any artwork that attracts or draws the viewer’s attention, and also shocks them, it should be new, communicable, and attractive: creativity is the ability of the artwork to get out of the ordinary attention,” as Participant 13 said.

8. Creativity explained as a product

Three participants described creativity as a product that is produced by the artist or graphic designer. It is perceived as a “new product”, and, “If the student has done the required creative exercise, then the creativity would be in a creative product” (Participant 1). Yet, the product should be appreciated in the surrounding socio-cultural context. Participant 34 said, “Creativity is the basic and seed essentiality to build up a graphic artist or a graphic designer”, similar to Participant 27, who argued, “It is a high level of motivation with graphic designer who always
does work that is distinct from others. Creative designers create a unique product that is judged by society, this person always comes up with new ideas”.

9. Creativity is the combination of aesthetics and function

A large number (about eight) of participants approached creativity as a combination of aesthetics and function. Example of such responses are; “It is function and beauty”, “Creativity requires a balance between the aesthetic and communication parts in graphic design, it is going beyond the standards, seeking for a better quality in students’ capabilities, it is the process of enhancing the quality”(Participant 23). Participant 35 described creativity as, “The art based on the character, image and the third pillar, and how to gather between them, and according to the hints given by the Professor in the lecture: if the student was able to gather them in a creative or unusual manner, in this case we consider him as a creator”. Also, Participant 15 answered this with, “And these all belong to the main factors to creative design or successful design in creative art”. Other participants described the role of the graphics lecturer by stating, “A good lecturer can feel the creativity once comparing between all graphics works, it is the combination between the aesthetic element and functional element” and “It is a skill that can be improved by continued design work”(Participant 38).

10. Creativity is visual experience

Finally, five participants perceived creativity of graphics student as visual experience. Those participants associated creative production with the visual experience that the graphic designer has. One participant said, “When you see more, you learn more and this is the path of creativity”, “It is improvement in visual experience, by enlarging the visual library”, and Participant 16 stated, “Compensation of crafts and science and looking at many options of seeing visuals”.

To sum up, the majority of participants’ answers to this question defined creativity as problem solving as defined within the graphic design context. Yet, interestingly, some new approaches in understanding the ‘creative act’ were reported by several lecturers. This is in addition to some completely irrelevant responses from several participants.
Appendix (4)
Creative thinking techniques to foster students’ creativity

- First: Results of the Questionnaire

1. Person-related techniques

Three main themes (i.e. creative skills, personal characteristics, and cognitive attributes) can be categorised within ‘the role of the graphic design student’ to enhance his/her creativity. Firstly, the creative abilities emphasised by several participants. Some examples of the most repeated codes are, “exploring others’ ideas”, “rigorous attention”, “learning creativity theories”, “appropriate uses of technology”, “enhancing thinking techniques”, “do good research and analysis”. Some other creative skills seem to be practised inside the design classroom: examples are, “talking objectively”, “observation in class work”, “drawing with the whole body”, “repetitive and frequent sketching”, and “rule-breaking to produce new visual material”. Secondly, some participants referred to personal characteristics that the creative student should consider. Examples of these characteristics are, “take risks”, “comfortable with ambiguity”, “physical experience”, “rigour”, “confidence”, “visual literacy”, “clarity”, and “research”. Thirdly, some participants valued more cognitive attributes as important components of an individual’s creativity. These responses are different from personal characteristics, as they seem to be more mental abilities than personal characteristics. Examples of these attributes are “divergent thinking”, “imaginative free thinking”, “productive thinking”, “lateral thinking”, “critical thinking”, and “theoretical applications”. Such attributes would stimulate the unconscious mind of the creative person to behave creatively.

2. Problem solving techniques

More than five participants considered the importance of delivering problem solving techniques as a way of fostering the creativity of students. These lecturers mostly comprehended creativity as ‘problem solving’ accomplished by the creative graphic designer. Examples of codes that represent this approach are, “solution is grounded in a real world context”, “showing examples of creative problem solving”, “understanding the design problem”, “problem solving skills”, “everyday problems”. Creativity can be developed by “multiple solutions” or learning how to find “possible ideas and solutions”.

3. Certain conditions that enhance creativity

A group of participants valued a specific set of conditions that should surround the creative student. Interestingly, such conditions were reported here as techniques carried out by a “practical supervisor” within an “environment of trust”. Such an environment should be “visual communication spectrum advanced surroundings” that usually produce “non-visual sensory experiences”. The main feature of such a supportive environment is the responsible lecturer who would be “inspiring teachers and lectures” and a “critical friend to the student” who always gives “formative feedback”, and “constructive criticism”. The participants here encourage “non-visual sensory experiences”, “mutual learning” and “changing physical environments” from time to time.
4. **Socially or culturally constricted techniques**

A large number of participants emphasised the role of social elements in enhancing the creativity of graphics students. These have been classified here as techniques and organised under social or cultural techniques. Some social codes reported by participants are; “interaction with people of different segments of society”, “members of different cultures”; this requires “understanding of social context” which is a new knowledge anyway. Accordingly, “Creativity is shown by an individual’s response to external conditions and stimuli”, such as comprehending “outside knowledge experience”, and “understanding people’s mind-sets, behaviour and habits”, which requires “collaborative work”, “interdisciplinary teamwork”, and a “competitiveness with smart people”. Some cultural codes are; “fostering culture of risk”, “observation of culture” and “understanding traditions and cultural models”.

5. **The process of creativity as techniques**

A large number of participants stressed more creative processes and regarded them as techniques. The creative people ether in classroom or outside the class should implement these techniques. For example, creative design processes that lead to creative outcomes would be “knowledge in graphic design”, “research before creating something”, “exposure to interesting design”, and “experimentation with mock-ups and drafts”. Examples of creative design steps are; “looking for design analogies”, “reflection”, “and use of poetry to mobilise complex ideas” and “waiting-time to let ideas develop”. They also suggested some practical techniques that support this process, for example; “use of mixed media”, “Hands-on exercises”, “and revising variations on a theme”, “forced constraint patterns”, “rapid sketches”.

6. **Creativity thinking techniques**

A few participants mentioned creative thinking techniques that they approved as being effective in enhancing the creativity of everyone. Example of codes reported here are, “mind maps”, “random stimulus”, “scamper”, “music mania”, “TRIZ”, “Brainstorming”, “creative Pause” and “six hats type techniques”.

7. **Creativity assessment techniques**

The answers of some participants gave more attention to assessing the creative act. These participants classify these assessment techniques as required skills for graphic design students. Examples of these codes are, “give marks”, “don’t over-assess”, “assessed tasks focus on process”, “assessment criteria”, “minimising assessment”, “failure as a necessary component”, “group feedback” and “group critiques”, “frequent critique”, and “fail is required”.

8. **Lecturer-related techniques**

Finally most participants emphasised the role of graphic design lecturers who deliver and enforce all the previous techniques. The codes mentioning this role, include “teachers demonstrating a positive attitude”, “encouraging experimentation”, “develop automatic poetry exercises”, “reinforcement of progress”, “use of verbal and visual language”, “encouragement”, and “redirecting things (generating hybrids)”. This should be considered within “challenging projects”, “less time constraints”, and “using heuristic tasks”.
argued: “So more than ‘techniques’ I think it is about an ethos, a way of creating conditions where the person’s identity, the process of their learning and art making, and the product, are given the space and guidance for creativity to develop”.

- **Second: Results of the Interview**

The fifth question investigated the techniques that would foster the creative acts of graphic design students. The answers of this question were coded first. The total number of themes was five, as explained in the following paragraphs. Each respondent suggested several techniques that are categorised under various themes; therefore it was difficult to specify what the majority of participants prefer and what the most repeated techniques were.

1. **Student-related techniques**

A large number of participants (i.e. fourteen) suggested several techniques, which mostly are not creative thinking techniques; rather they are sorts of educational strategies. Such strategies come in the form of instructions for graphic students that are thought to be helpful in raising their creativity. One of the most dominant answers to this question was that students need a “**Strong base of knowledge and experience**”(Participant 2), “**Students should receive a lot of visual experience to increase the library, enrich the visual library, develop the eye coordination, students should follow basic design rules which would open the perspectives**”(Participant 37), “**See lots of things to know what is happening around them by reading**”(Participant 31), “**Students need to know how to think out of the box**”(Participant 5), “**See any idea from different angles**”, “**Observe nature**”, “**Discuss one issue in group, travel, visiting cultural places in the country**”(Participant 16), “**Link it to the practical side**, “**Using both computers and manual techniques**”, “**Research the design, knowledge, computer skills, reading books and internet, research one project**”, and finally, “**Visual communication skills**”(Participant 26).

2. **Lecturer-related techniques**

Also, a large number of participants (i.e. eleven) proposed a set of techniques that obviously are not creative thinking techniques; rather they can be classified as pedagogical teaching methods. They are in the form of useful ideas to be facilitated by graphic lecturers with the purpose of developing students’ creativity. Examples of these responses are; (Participant 7) “**Encourage the students to learn more about the history of the previous artists and designers**”, “**Do not limit students within the geographical boundaries**”, “**Develop the curiosity with students which is the catalyst factor of creativity**”, “**Teach them how to notice the world with a creative eye**”, “**Explain the differences and similarities between the different schools or types of art and design**”, “**Encourage students to observe**”; “**Challenge them with new exercises, encourage them to see things differently**”“**Refreshing their minds, polishing students’ sensation towards design, outside the class encourage them to observe, enrich visual knowledge, visual exposure eye, the enrichment of the visual and the artistic library**”, “**Encourage the creativity process, the process of attracting attention**”, And finally, “**Encourage them to develop their Design Portfolio**”.

3. **Socially, environment, and culturally related techniques**

The third group of participants were those who have suggested some social, environmental, and cultural related techniques. This set of responses is not in a form of creative thinking techniques; they were suggestions that should be considered by design
educators, during the creativity enhancement process. Examples of these answers are; “Learn about concepts (Participant 14), ideas and images, of cultural environments”, “Visit exhibitions and museums, technologies”, “Accompanying reuse the environmental stuff and recycle”, for example; “Using plastic to build beautiful things”, “Expose them to the environment differently”, “Try to improve the product, once get satisfied also try to improve it further to reach the public and people who should appreciate the creative product, students discuss his/her idea in front of the lecturer and other students to receive feedback”.

4. Art and design related techniques

The fourth group of responses can be categorised as art and design related practices that were provoked by about five participants. None of these responses can be regarded as ‘creative thinking techniques’. Examples of these responses are; “Drawing some sketches, “Eye movement”, “Use of colour and the idea”, “Controlling the colour, layout, lots of research, which help to re-innovate”, “Redesign and reformat, practice and think in paper, design basics, photography, experience, samples of senior students”, “Expand the visual library either from the internet or from books”, “The paper, pencil, computers, colours and, internet, designing for function and aesthetics, for example chair and keyboard”, “Browsing many designs before starting the design process, one page research with one supported picture, famous artist design artworks, figural photographic work”.

5. Creative thinking techniques

Finally, very few participants have answered the question directly, by suggesting specific creative thinking techniques that can be utilised by graphic lecturers and would help to enhance students' creativity. Some examples of such responses are; “Brainstorming”, “Improve the visual library”, “Take a certain word and draw it more than six or seven times”, “Always question themselves, the flow of ideas and then the flow of creativity”, “The thought process should be documented”, “Enrich the existing library in their mind”. To sum up, it is noticeable that the previous four sections have not answered the fifth question, sufficiently. The possible justification of this will be outlined in the discussion chapter. Participant 14 said, “In developing countries we don’t have a freedom to express our ideas without any restrictions: students need to be more confident.”
Appendix (5)
The pedagogical strategies used by graphics lecturers to foster students’ creativity

- First: Results of the Questionnaire

1. Creativity techniques

Some participants believe some techniques can help lecturers to foster the creative abilities of graphic design students. A few examples of such techniques are; “mind-mapping”, or mapping, brainstorming, short exercises, and “exposure encouragement”.

2. Cognitive abilities

The second theme mentioned by the participants can be categorised as cognitive abilities that can be developed with students. Examples of these codes are, “observation”, “dimensional thinking”, empathy, “good analysis”, and “insistence on critical thinking”.

3. Personal development

The third theme considers the role of the creative student him/herself to develop their creative abilities assisted by the lecturer. Participants here suggest ways that should be utilised by students to improve their creativity through following practical actions. Examples of reported codes are; “flexible in the use of attention”, “contemplation”, “meditation”, “travel usually broadens the mind”, “provide confidence” and “thought experiment”. They argue such attitudes would “encourage originality”, “model the behaviour”, “knowledge hunting” which resulted eventually in “life-long learning” creative personality.

4. Develop student creative characteristics

The fourth extracted theme reflects also on the characteristics of the creative student and how they should be developed. The role-player here is the lecturer and the beneficiary is the student. Some characteristics that should be enforced are expressed in the following codes; “questioning the status quo”, “creating an emotional response”, “breaking the rules”, “motivate them to take risks”, “enjoy ambiguity”, “increase their curiosity” and “inquisitive and explore”. Such creativity characteristics can be encouraged through, “role play”, reading encouragement, and “what-if experimentation”.

5. Develop student’s self-assessment

The fifth theme that should be considered by the lecturer was to develop students’ self-assessment. Examples of codes representing this theme are; “critically reflect upon their creative works and process”, “challenging exercises with specific constraints”, “critique sessions”, “do not judge”, “open briefs”, “regular criticism”, “teach them how they could postpone their judgements” and “critical reflection on the part of the lecturer”.

6. Teaching methods for problem solving

Several participants repeated some teaching methods that should be implemented by graphic lecturers. Some methods are common and used frequently such as, “Discussion”, “encouraging”, “challenging”. Also, there are creativity related methods; examples of codes
that mentioned this are, “concise feedback”, “never provide solutions”, “and assume the current solution is wrong”. Participant 18 said, “all students solve the same problem (e.g. each student design 6 examples, results in more than 20 designs which inspire all students)”. Some practical methods were coded as, “encouraging Individuality”, “give them a seed, plant it in their heads, and see where that goes”, “concise feedback”, “show examples” and “give students permission to tackle assignments in unusual ways”.

7. Characteristics of lecturers

To accomplish the previous methods, lecturers should have some characteristics repeatedly outlined in the following codes. “Don't focus on the small things like taking attendance every day”, “take them easy”, “do not check to see who's tardy to class discipline”, “expecting them to get their work done on-time and done well, and finally “patience and understanding”.

8. Develop students’ cooperative skills

Some participants reported some cooperative learning skills also. Such skills would affect the level of creative abilities for both the individual and the group. Examples of codes repeated here are; “cooperative thinking”, “peer-review”, “sharing”, “collaboration”, “interact with all parts of society and members of different cultures”, “valuing all ideas”, “working in groups” and “not demanding too much from them”.

9. Developing their visual library

Some ideas reported by participants mentioned the importance of visual experience. Lecturers enlarging the students’ libraries would result in improving students' creativity further. Examples of codes reported here are: sharing rich arrays of creative outcomes to projects, “sharing the back-story”, and “encouraging activity”.

10. Developing the teaching environment

Numerous participants emphasised the role of the teaching environment in developing the creative abilities of students. Codes summarising this theme are, “create a safe environment”, “create space for uncertainty”, “technical training”, “supported learning and contextualisation”, “create an atmosphere of creativity”, “atmosphere of trust and support”, “encourage playfulness” and “writing on subjects without any restriction”. Participant 09 suggested a “use of interactive lectures on interactive WIFI board which is connected to 6 PCs at the same time can foster each individual's work”. Such an environment would result in “revealing parts of the world that students may be unaware of that they can fold into their own work”.

11. Develop the design process

The eleventh theme considered the importance of teaching the design process for graphic design students. The codes that signify this are, “teach full design process”, “step by step”, “focus on process and ideas”, “complete incomplete drawings and stories”, and the "design thinking" process, which starts at the end -- what the user wants/needs -- and works backwards in design and process challenges students are facing.
12. The contents of the creative graphic design course

The last theme extracted from the answers to this question considers the value of the creative content of graphic design courses. Participants here suggested some content that would help graphics lecturers to enhance their students’ creativity. Examples of repeated codes within this theme are, “postmodern design”, “graphic design history”, “analysing others’ work exercises”, “discussions of culture, people, the way people do things”, “cultural models”, “teach them anything can be achieved”, “problem-based tasks”, “heuristic tasks” and finally “providing methods for students to develop their practice”.

- Second: results of the Interview

- The sixth question investigated the pedagogical strategies that can be used by lecturers, in particular, to foster creativity in their students. The answers to this question were coded first, then categorised according to the role of the lecturer who is the main player in such enhancement. The total number of themes was nine and they were mostly categorised similarly to the answers to the previous questions. Yet the most dominant suggestion was on creative teaching strategies. All these themes will be explained in the following sections. Each participant came up with a mixture of techniques or tools that could be categorised under various themes; therefore it was difficult to specify the majority preferences.

1. Creative cognitive strategies

A few participants answered this question by suggesting creative thinking techniques. Such techniques would help lecturers to foster the creative abilities of graphic design students. A few examples of such techniques are; “Mind-mapping”, “Brainstorming”, “Ideation exercises”, “Visual mind map”, “Criticism”, “Analysis”, “Inspiration”, “Giving students an alternative way of thinking to redesign something which they already have seen before”, and finally “Teach strategies that show students how to produce many ideas in the same time”.

2. Develop student creative characteristics

The second extracted theme reflects also on the characteristics of the creative student and how they should be developed. The role-player here is the lecturer and the beneficiary is the student. Some characteristics that should be enforced are expressed in the following codes; “Urge the students to do more research or self-learning”, “Encourage using books more than the Internet”, “Take photos with a camera all the time”, “Develop visual library and all cultural dimensions”, “Continuous learning”, “Encourage students to participate in competitions”, “Encourage self-learning”, “Teacher should keep in touch with the student and with the environment”, “Work with students closely”, “Students have to be exposed”, “Constant feedback”, “Ask students to observe different types of design and different types of art work”, “Teach them how to express their opinions”, “Digital and communication awareness”, “Openness to all views”, “Look at other senior students’ artworks”, and finally, “Understanding the psychology and social situation”.

3. Teaching strategies

About eight participants repeated some teaching strategies that should be implemented by graphics lecturers. Such strategies are common and used frequently by those participants within the classroom. So they are different from the previous section. Examples of these
strategies are; “Use more than one style at the time”, “Different ways in teaching the course”, “Discussion”, “Show them some ready-made designs”, “Give the student the absolute freedom to design the work”, “Asking them to come up with different or extraordinary ideas”, “Motivate them to watch TV advertisements and analyse their contents”, “Encourage them to see things differently”, “Let students browse and visualise”, “Screening new materials”, “Always expose students to new materials”, “Discuss style of learning”, “Encourage students to imagine”, “Explain to student the state of (enlightenment, I found it or Eureka)”, and, “Let student demonstrate some subjects”.

4. Teaching methods for problem solving

3 participants out of 39 mentioned teaching methods that should be implemented within the graphics classroom to develop students’ problem solving abilities. Examples of these methods are; “Create a design problem”, “Specify certain elements in order to solve it”, “Give more practice in drawing and design”, “Lecturer should help students to cover every side of the problem to stimulate creative production”, “Confront students with questions and problems”.

5. Characteristics of the lecturer

The implementation of the previous methods and strategies require a creative lecturer who should have some characteristics suggested by five participants, outlined in the following codes; “Good relationship between the lecturer and his students”, “Lecturer being a good example and source of knowledge”, “Lecturer not comparing students”, “Consider the cultural and social factors”, “Come down with thinking to reach the same level of student thinking in order to get students’ concentration and know what students think about”, and finally, “Lecturers should give the initial hints and add a sensory dimension for the student”.

6. Develop students’ cooperative learning skills

Some participants also reported some cooperative learning skills. Such skills would affect the level of creative abilities for both the individual and the group. Examples of codes repeated here are; “Teamwork”, “Open framework with establishment of rules”, “Group work motivates all students and helps to transfer the experience amongst themselves”, “Create between students the spirit of challenge to let each student show his/her personality in his/her work”, “Group reflection”, “Display student’s work with group”, “Asking students to work in groups”, “Reflect on other students’ experiences”, and finally, “Teach student how to criticise his/her colleague’s work”.

7. Teaching environment

Five participants emphasised the role of the teaching environment in developing the creative abilities of students. Codes summarising this theme are; “Reflect on the environment”, “Enrich the surrounding environment”, “Working with different tools”, “Expose the environment differently”, “Gaining experience from outside environment”, “Provide the right environment that is appropriate for the creativity”, and finally, “Give students different classes based on their different environments”.
8. Developing the design process

The eighth theme considered the importance of teaching the design process for graphic design students. The codes that signify this are, “Sketches for specific design”, “Re-design the same idea”, “Students make sketches”, “Drawing”, “Research”, “Practise the design process”, “Ask students to think first and then design”, “Improve students’ skills step by step”, “Start from general to specific, from easy to difficult”, “Convince them to see different ideas that would improve the design”, “Use paper and pencil at the initial stages to let ideas follow”, “Students complete the learning process”, “Teach student the process of doing the assignment”, “Sketches are the most important part in the design process”, and finally “Sometimes imitate the design”.

9. The contents of creative design courses

Finally, nine participants emphasised the importance of including specific contents of the design course as a main component of the creative curriculum. Such responses do not answer the questions. Examples of codes that represented this theme are; “Design basic”, “Explain the purpose of the course”, “Visit museums and exhibitions”, “Trip about one artist”, “Unify the curriculum”, “Different pedagogy”, “Historical backgrounds”, “Teach the student design ideas or the idea of design”, “Computer games, and slide shows”, “Let their minds refresh”, “Visit museums, buildings”, “Students should know why they are learning the graphic design course”, “Ask them to write a report about that exhibition”, “Taking into consideration the design principles”, “Font elements”, “Balance”, “Take some workshops”, “Exercises”, “Practise the basics of design”, “Explaining the role of each tool of graphics”, “Use previous design artworks to explain the concepts”, and “Visit archaeological sites”.

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Appendix (6)
The contents of graphic design curriculum that used to foster students’ creativity

- First: results of the Questionnaire

1. Cognitive thinking content
   Participants suggested some content for the design curriculum that can be categorised under cognitive thinking content. Examples of codes that can be classified under this theme are, “creative thinking”, “critical thinking”, “courses on the psychology”, “creative pause”, “imagination and dreaming”, “random stimulus thinking and designing exercises”, “thinking strategies modules”, and “lateral thinking techniques”.

2. Manual techniques
   Another group of participants emphasised the importance of descriptions of manual techniques that should be included within the ‘creative’ design curriculum. The repeated codes of such contents are, “demonstration”, “skills (tech and manual)” and “Hands-on content and organisation over styling”. Participant 23 stressed that, “frameworks for reflective practice that allow students to make tacit knowledge explicit and be built upon”.

3. Art and design related topics
   The fifth theme that was analysed here was topics that related directly to the art and design context. The proposed contents here were coded as follows, “carefully structured art and design history”, “design training”, “exhibitions”, “design methodologies”, “portfolio creation”, “future trends and analysis of the historical application of graphics to certain issues”, “exposure to a range of examples”, “understanding semiotics”. Examples of some technical suggestions were; “use of CS5 software” and “provides examples of good design”.

4. Cultural and contextual studies
   There were also some participants who advised it was necessary to include cultural and contextual contents that can enrich the curriculum. Under this theme there were some repeated codes such as, “context of cultural history”, “contextual and liberal studies”, “modes of designedly inquiry into a context”, “international art histories”, “historical context”, “identification of current gaps in knowledge”, “made into contemporary cases”, and “study abroad/exchange programmes”.

5. Problem solving based projects
   This theme was suggested by some participants, and represented in the following codes; “variety of exploratory projects”, “problem solving tasks with open-ended solutions”, “and quizzes on terminology”, “students can discriminate between boring and superficial and exciting solutions to problems”. Participant 17 argues, “This means being able to discriminate between success and failure in problem solving or providing visually stimulating engagement for user or viewer”. This last response is interesting because it reproduces this research’s account of creativity.
6. Various subjects

The interdisciplinary approach is suggested by some participants to include various fields of knowledge within the curricula of graphic design. Examples of codes representing these fields are, “philosophy”, “history”, “reading about related topics”, “service learning”, “analysing others’ work exercises of observation”, “social”, “political”, and “technological awareness”.

7. Creative projects

This theme was suggested by few participants and shows up in the following codes: group tasks, excursion study, class projects, no course structure, subjects’ artistic guidance workshop, variety of approaches, and “projects outside of the classroom”.

8. Design process contents

Finally, there were some participants who emphasised the importance of including the design process as a main component of the ‘creative curriculum’. Examples of codes that represented this theme are, “process work flow”, “allowing the students to work within a constrained objective project with limitations, and then allow them to run free, within those limitations”, “creative thinking is only part of the process” and “full design process”. Participant 11 suggested a set of step-by-step processes as follows. Listing these steps is interesting as they match with steps mentioned earlier in the literature review. They will be examined against a list of steps that represents the design process, to see the inferences and differences between the two lists. This will help to suggest specific steps for the design process.

- Define the message/brand you are trying to communicate
- Define to whom you are trying to communicate to (target market)
- Research what everyone else is already doing (so you do something original)
- Using words, write down a bunch of ideas that may work
- Put those words into a visual. Repetitively sketch idea after idea
- Feedback and critique
- Continue to improve your idea until it’s near perfect to present to client
- Expect frequent discussions with your client throughout the process: remain focused and keep the lines of communications open
- Real-life design projects
- A variety of challenging projects
- Collaboration among students
- Peer and instructor critiquing
- Present and defend ideas and design solutions
- Working on only one project at a time
- Allow students to choose their projects (with instructor approval) This invests students in their projects
- Class time to work on projects
- No written tests: all projects should force students to demonstrate their knowledge with a visual and verbal presentation.

- Second: results of the Interview
The seventh question examined the superlative contents of the design curriculum that would promote the creativity of students. The answers to this question were coded first, then categorised according to the type of content and its effectiveness. The most dominant responses were related to the importance of digital and manual content within the design curriculum. All are explained in the following five sections. Each participant came up with a set of suggestions about the effective contents that can be categorised as follows:

1. **Content that involves manual and digital skills**
   
   Thirteen participants have valued the manual and digital content to be included within the design curriculum. Some examples of these codes are; “Theoretical materials and practical materials both are important”, “Control the digital, and use it with manual”, “The ability to enhance technological and hands on skills”, “Use both manual and digital in teaching design”, “Digital provides quantitative productivity”, “Work with the fundamentals”, “Manual and technological are both important”, “The theory is part of it or practical”, “Exercises that develop manual and cognitive skills”, “Increase the manual work (i.e. practise), this will help students to use their hand more”, and finally “Use traditional tools and new tools”.

2. **The structure of content**

   A large number of participants (i.e. about eleven) answered the question emphasising the content structure of design courses. Examples of the codes signifying these themes are; “Rearrange the content”, “The graphic design curriculum should be specific and uniform”, “There is no particular approach”, “Plan or structure”, “Clear pedagogy”, “Sequence”, “Greater freedom to the faculty member in the delivery of a particular sequence or a particular context”, “The curriculum should be fixed with a specific approach”, “Theoretical and a practical approach”. Participant 32 stated, “The design exercise should develop the connection between students mind, eye, hands, paper and pen”.

3. **Creative design curriculum content**

   Also, a large number of participants pointed out the ideal content that would be effective in enhancing the creativity of students. Examples of these responses are; “Several books”, “Exercise”, “New creative design curriculums”, “Different fields of arts”, “Syllabus or the course description”, “The study plan should be open, should not be identifying to the student, giving them areas of freedom”, “Specific exercises for specific topics”, “Encyclopedia books and wide reaching DVDs”, “Old theories of graphics”, “Internet links, the purpose of graphic design that will help them to use such knowledge as a fuel for creativity”, “Design elements and fundamentals of design and how to use them”, “Software skills”, “Magazines”, “Use up to date software as they have new features”, “Learn from internet tutorials”, “Multiple resources”, and finally, “Materials that develop research skills”.

4. **Design process content**

   Six participants suggested content that develops students’ understanding of the design process. Examples of such responses are; “There is no sequence in the curriculum”, “The development of initial layouts”, “Course syllabus”, and “Design works of previous designers”, “Find information from the internet”, “Carry a sketch book to capture any idea comes to their mind”, “Theories that explain the nature of the design process”, “Variety of exercises starting
from easy to difficult", and “Process of learning should be completed by students themselves”.

5. Various types of content

A small group of participants suggested content that can be categorised under various themes. For example, Participant 15 suggested cognitive thinking content: “Ideas that are not self-generated; they are generated from the observation itself”. Participant eight suggested content regarded as art and design content, that is, “Tools and design equipment”. Participants 38, 9, and 12 proposed content that is mostly cultural and contextual studies: “Historical background”, “Adds more value to the graphic work”, “Explain the surrounding culture in the country”. Participants 1 and 19, recommended content relatively regarded as design principles. Examples of these codes are: “Start with the simple needs of the student (i.e. design basics)”, “Explaining design is basically a tool that conveys certain message to the target audience”. Participants 33 and 11 suggested content that can be classified as problem solving based. They are, “Different design schools and styles”, and “Examples of wicked problems and their solutions”. Finally Participants 6, 14 and 20 valued more the content that develops communication skills with students, such, “Effective communication”, “Means the more the skills you have”, “The more effective will be the communication”. 

Appendix (7)

The following documents are a formal record of Evidence of Training in and Application of Appropriate Research Methods. This first document is a formal letter issues by Sultan Qaboos University to ask proposed institutions to provide the required assessment for the researcher. The second document is example of the interviews forms filled by the researcher before starting the face to face interview. The third document is example of a complete transcript of interview number (13). The final document is example of the thematic analysis.

7.1 A formal letter issues by Sultan Qaboos University to ask proposed institutions to provide the required assessment for the researcher.

The translation of the letter:

To whom it may concern.

In the name of Allah the most beneficent and the most merciful

This is to certify that the researcher, Mr. Salman Amur Alhajri, a lecturer in the Art Education Department, collects research data on about ‘creativity enhancement for Omani graphic design student’ as part of his PhD project. We would like you to kindly assist him to collect the required data through allowing him to meet some staff working in your institution. The researcher will deal with all collected data in a confidential manner, and they will be used solely for study purposes.

Please, accept our best wishes and appreciation
السلام عليكم ورحمة الله وبركاته...

وهب،

يقوم الباحث/ سلمان بن عمر الحجري، المحاضر بقسم التربية على جمع بعض البيانات العلمية كجزء من بحث الدكتوراه الذي يقوم به حالياً حول تطوير الإبداع لدى دارسي التصميم الجراحي، وكذلك نرجو منكم التعاون معه في سبيل إكمال هذه الدراسة من خلال مشاركته مع بعض أعضاء هيئة التدريس بالجامعة التي تتفقون.

إليها.

علماً بأن الباحث سيتعامل مع جميع البيانات بمنهجي السرية والأعراف للبحث العلمي فقط.

ووفقوا بقبول جزيل الشكر واعتزام التقدير...

[توقيع]

ج. محمد الطافر عثمان
مساعد المديرية للدراسات العليا والبحث العلمي

[التوقيع]

[العنوان والرقم]

[العنوان والرقم]

[العنوان والرقم]
### 7.2 An example of the interviews forms filled by the researcher

**Sample group:** Graphic design lecturers and educators (Oman)

<table>
<thead>
<tr>
<th>The questions</th>
<th>Question Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is ‘creativity’ either important or real in the creative industries?</td>
<td>Yes or No</td>
</tr>
<tr>
<td>If the answer to the previous question was ‘Yes’ do you believe that creativity be encouraged or taught?</td>
<td>Yes or No</td>
</tr>
<tr>
<td>Can creativity be enhanced?</td>
<td>Yes or No</td>
</tr>
<tr>
<td>How do you recognise the creativity within graphic design discipline?</td>
<td>Open-ended question</td>
</tr>
<tr>
<td>What are the techniques that can foster creativity in graphic design students?</td>
<td>Open-ended question</td>
</tr>
<tr>
<td>What are the pedagogical strategies that can be used by lecturers to foster the creativity within their students?</td>
<td>Open-ended question</td>
</tr>
<tr>
<td>What should a graphic design curriculum contain to promote creativity?</td>
<td>Open-ended question</td>
</tr>
<tr>
<td>Do you think creativity can be assessed within graphic design discipline?</td>
<td>Yes or No</td>
</tr>
<tr>
<td>Are you utilizing any framework, in your pedagogy, to assess students’ creativity?</td>
<td>Yes or No</td>
</tr>
<tr>
<td>Do you think criterion-referenced test can assess creative outcome of graphic design students?</td>
<td>Yes or No</td>
</tr>
<tr>
<td>Do you think it is important to teach graphic design students by both analogue and digital education systems? Or you think technology is enough, for enhancing creativity of those students?</td>
<td>Open-ended question</td>
</tr>
</tbody>
</table>
Personal Information

<table>
<thead>
<tr>
<th>What is your name? (Optional)</th>
<th>What is your age? (Optional)</th>
<th>What is your gender?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>27</td>
<td>M / F</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>What is your country?</th>
<th>What is your institute?</th>
<th>How many years you have experience in teaching graphic design?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>13 years.</td>
</tr>
</tbody>
</table>

**Arabic Translation:**

اختبار محيطي المراجع

اختبار يقيس ما يعرفه الطلاب وما يستطيعون أداءه في ضوء معيار (Criterion) محدد ومثير وهو في ضوء مستوى أداء مجموعة من الطلاب أواها الاختبار نفسه مثل referenced test.

الاختبارات المحكية المرجع هو تقرير أي من الأهداف التي تأتيها الطلاب. يقدم هذا النمط من الاختبارات المحكية المرجع تعريفية مرجعية عن مدى تقدم الطلاب الرئيسي نحو الأهداف التعليمية المختارة. وعادة ما تعطي هذه الاختبارات وحدات تشريعية صغيرة لها علاقة مباشرة بها تم ترميزها. عند تصنيف هذا النوع من الاختبارات حدد المعلمون درجة معينة (Cut-off score) ترميزها. عند تصنيف هذا النوع من الاختبارات حدد المعلمون درجة معينة (Mastery) بحيث يصف كل من تجاوزت درجة هذه الدورة بأنه حقق درجة الإنطلاق. إنفلان (أي إتقان تعلم المحتوى)، معظم الاختبارات الوطنية المعروفة في الولايات المتحدة تعتمد اختبارات محكية المرجع. في هذا النمط من الاختبارات من الممكن أن يحقق كل الطلاب الدورة القصوى إذا حققوا كل المعايير الطويلة لهذه الدورة.

**Source**

مكتب التربية العربي لدول الخليج، مصطلحات التقييم والقياس (الاختبارات والاستماعات).

تاريخ: http://www.abegs.org/Aportal/Article/ShowDetails?id=647

التصفح: 26 مارس 2011
### 7.3. Example of a complete transcript of interview number (13)

<table>
<thead>
<tr>
<th>Interviewer:</th>
<th>“I’m doing this interview with the faculty here at Ibri college of applied sciences, Ibri Oman. This faculty will introduce himself and his qualification and his experience right now.”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty:</td>
<td>Salamu alaikom, I’m Wismateen, my qualification is master of finance in graphic design. I’m working in the ministry of high education since last three years.</td>
</tr>
<tr>
<td>Interviewer:</td>
<td>Is creativity real important or real in the creative industries?</td>
</tr>
<tr>
<td>Faculty:</td>
<td>Yes</td>
</tr>
<tr>
<td>Interviewer:</td>
<td>if the answer is yes, do you belief that creativity can be encouraged or taught?</td>
</tr>
<tr>
<td>Faculty:</td>
<td>Yes</td>
</tr>
<tr>
<td>Interviewer:</td>
<td>can creativity be enhanced farther?</td>
</tr>
<tr>
<td>Faculty:</td>
<td>Yes</td>
</tr>
<tr>
<td>Interviewer:</td>
<td>how do you recognise the creativity with the graphic design discipline, I mean if u have like syllabus for a course or books like curriculum for graphic design, you as faculty have good experience to recognise, aha, this course might enhance or develop the creativity with students. Would you say something about this?</td>
</tr>
<tr>
<td>Faculty:</td>
<td>Of course, there is creativity, there is no end of this word the “creativity”, it’s infinity.</td>
</tr>
<tr>
<td>Interviewer:</td>
<td>I mean in terms of the main items that cover in the syllabus, you may say will add something, or I’ll cancel something from this syllabus to enhance the creativity in the beginning of the semester?</td>
</tr>
<tr>
<td>Faculty:</td>
<td>Yes of course, I think this is in our hand, and we see the students here about the caliper of the student, then we decide ok this is digest or not because what I feel that hearing specially in Oman, I feel it is difficulty about what think is about because the student doesn’t expose in the industry and didn’t see.</td>
</tr>
<tr>
<td>Interviewer:</td>
<td>okay, this is sort of challenging, okay yes …</td>
</tr>
<tr>
<td>Faculty:</td>
<td>Yes. first we have to show the thing what is in the world then they think about the creativity. Okay this is good but this is sort of techniques, I’m asking this question right now you explain very well one of the main problems or challenging that Omani students usually have.</td>
</tr>
<tr>
<td>Interviewer:</td>
<td>Now, what are the techniques that can foster the creativity in graphic design students? Do you think there are specific techniques that in your hand as lecturer and you can suggest from the administration side or the society side?</td>
</tr>
<tr>
<td>Faculty:</td>
<td>Yes there are many ways of the techniques; maybe we have to be work with the student in the some of the workshop. As I said there is no end of creativity and we have to see things differently, such by encourage the students to expose the environment differently and this is the part of creativity.</td>
</tr>
<tr>
<td>Interviewer:</td>
<td>Are there any techniques from your side, from the society would like to encourage the society to do something or guide the student to do something to enhance their creativity. What ever you suggest I’ll appreciate it?? We’ll talk about difficult strategies inside the class room or inside the lab, that we usually face, and that’s two way relation between you and your students.</td>
</tr>
<tr>
<td>Interviewer:</td>
<td>It’s okay, let’s move to other question, What are the specific strategies that can be used by lecturers to foster the creativity with the students inside the class room or inside the lab. If you came early morning on Saturday and very happy after long weekends, very nice feeling! And have in your mind specific strategies to do in that week is different sometimes but you suggest strategies big tackle strategies?</td>
</tr>
<tr>
<td>Faculty:</td>
<td>Yes I think it is important for the, when you think about a graphic design subject, but, but I think that we are concentrate on the subject more here</td>
</tr>
<tr>
<td>Interviewer:</td>
<td>but some of these strategies can be used in different disciplines, right? In one</td>
</tr>
</tbody>
</table>
of them is can be used with, the, like littering with printing, ad design, different disciplines, but you keep using this, for example is like refreshing their minds by brainstorming some educators start with the, like, computer games and slide shows and to let their minds refresh, so I’m trying to find out if there is any hidden strategies somebody use.

Faculty: This is my strongly believe that, if you see the things, you are more confident to do any work, or maybe that related to creativity or related to the design; but you see the world first, if you don’t see the world, I feel that, you didn’t do any creativity.

Interviewer: So this is from the students side

Faculty: You have to be exposed, you have to see the things, you have to be go.

Interviewer: you think, this is the outcome of the students that supposed to do, or?

Faculty: No but this is the part of the creativity, if you see, I’m telling that, if you see the world first, and you get informed first, then you think about the creativity later; creativity, is just not like a magic, it doesn’t come just suddenly.

Interviewer: yes exactly, so are you trying to say that, you would encourage students to observe;

Faculty: Yes, observe and get knowledge first

Interviewer: how do you do this? This is like principles, but there are steps in the class; some lecturers bring, like 5 encyclopedia books or five very reach DVD-s, and they show their students etc, but how you do to let student know, are you taking them out for trip or something.

Faculty: yes we take the bricks from outside and we give some preference of the cost.

Interviewer: Museums, buildings etc, okay!

Faculty: yes, we already paid for this.

Interviewer: so you did use one of the strategies?

Faculty: I told you in the beginning, when you see more, you learn more and this is the path of creativity.

Interviewer: ok, this one, everyone agree about this, you can do it nicely by different techniques, now secondly, are there any techniques, are you like group, or brainstorming, mind map, because this is what I’m looking for.

Faculty: But we are working with all true lands not hand, we are not forming any group because here, of-course we can work with the group, but we have no time and we have more students, so I feel that, we have to work with all projector and some of the good books, so there is something challenging.

Interviewer: so if challenges are not there, you might use some other strategies, but if you have difficulties because of the more strength here;

Okay let us move to another question, do you think, creativity can assist with graphic design discipline or with graphic design students, so you can say, okay, this is particular art work, or design work is better than others because so and so, because its more creative, because it does have this etc. do you think creativity can assist?

Faculty: yes of course

Interviewer: Okay, let us move to another, do you utilise or use any frame work now in you daily ably to assist student’s creativity right now? If you say it’s okay, art work is higher than other students, why? And now, currently how can you assist creativity, this extra level, you understand? Is it by feeling?

Faculty: yes, is by feeling, but the element also, what element are they using.

Interviewer: So the element is the framework not your feeling, because you feel something so try

Faculty: no but if you see how we feel, when we see the element when we see the design then we feel.

Interviewer: Okay, alright, but feeling is secondary, first is the element

Faculty: yes, first we see the element then we feel.

Interviewer: okay this is what I’m looking for, until what extent do students reach the level of
Faculty: I feel that, student need to struggle more, because students didn’t expose to the industries, students didn’t expose to the design, and what I feel that, in Oman itself, there is less design, still in the beginning area of design, that is what I feel, so I feel that this takes time, to recognise all these things and to treat the time.

Interviewer: Nice, okay, let us move to yes and no questions, so, do you think that creativity and reference test can assist creativity outcome of the design students, I’ll explain a little bit about this; I explained it by Arabic unfortunately, not in English; and this might be like this, because it is well known in English criteria reference, what I mean by criteria reference is once you have a criteria like designing a poster, you focus on eye catching, you focus for slogan, you focus on the contrast and the background, you focus on several elements, right, this is what I mean by criteria, to assist this criteria, so do you think, this kind of test can assist the creativity?

Faculty: yes

Interviewer: good, now let us move for the final question and we are in the end of this interview thirteen, do you think its important to teach graphic design by both analog and digital education systems, or you think technology is enough for enhancing creativity of those students; you think many manual teaching using with digital or only digital?

Faculty: no, I strongly believe that to first work with the fundamentals and the fundamentals always come with the more hand involved.

Interviewer: this is the truth in the hands anyways; but why you suggest you students to work with hands?

Faculty: no, because I strongly believe that, they have to use their hands and then the computer, it is a technology, and the computer is nothing but the technology, enhancing the creativity.

Interviewer: Exactly

Faculty: first you that, what is the basic element, basic one is how to control this phase, we are giving the paper to use.

Interviewer: okay, so you are enable the student to control this phase

Faculty: Yes, you have to know this phase, you feel the color, see how it looks, and then after this, this is more important

Interviewer: ok, this is interesting, okay, this is one, and now tell me another why! Why manual is good, in the beginning?

Faculty: Yes, in manual, I feel that student learn many things, like patience in the manual, this is very fast, else when we learn some texture it creates 10 hours, and the students also learning patience in design; and controlling in work; and also enjoyment, and in a group activity they talk friendly, it is more important, then move to digital world.

Interviewer: and the work they can work as parallel way.

Faculty: this is also possible, but first we emphasise on this.

Interviewer: Alright, in the end of this interview, I really appreciate your feedback and your answers for my questions, and I’m sure this will reflect positively on my research

Faculty: okay, thank you

7.4. Example of the thematic analysis

<table>
<thead>
<tr>
<th>No</th>
<th>Theme</th>
<th>Codes</th>
<th>Categories</th>
<th>Number of respond s out of 33</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Creativity as</td>
<td>“make suggestions about the options for”</td>
<td>Ability graphics</td>
<td>9</td>
</tr>
</tbody>
</table>
| problem solving | creative problem solving”
- “solving design problems in interesting ways”
- “offering unexpected solutions to design problems”
- “critical design problem solving”
- “Finding new solutions,
- new combinations, new approaches”
- “Solutions to problems need to be innovative”
- “It is type of solving design problem”
- “there is more than one solution to any problem and the way you weigh the value of each suggestion by its elegance and smartness is the creative measure” | students to solve design problems |
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<tbody>
<tr>
<td>2</td>
<td>It is a gained personal traits with few people - Curiosity - exploration - way of seeing - “Idea generation” and “concept generation” - “personal attribute and identity” - “drawing skills” - “play and renegotiation” - Resourcefulness - “approaching the complex ideas” - “giving simple metaphors” - “playfulness” - Elegance, optimal</td>
<td>Conscious skills</td>
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<td>3</td>
<td>Creativity to exist require specific conditions Knowledge “a combination of elements” “The combination of the visual, verbal, the medium” Experience instincts and personal beliefs genuine interest</td>
<td>Conditional Creativity</td>
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<td>4</td>
<td>Creativity is a cognitive attributes, psychometric approach recognition skills, power of observation, think critically, cultivated fluency, flexibility and originality and elaboration Resourcefulness “ability to resolve the concept into an outcome”</td>
<td>Psychological attributes Unconscious skills</td>
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<td>5</td>
<td>Creativity is inspirational power comes to poets or artist “light bulb” “unique” “unexpected solutions” “exercise of rhetoric” “ability to put different ideas” “ability to express messages”</td>
<td>mystical and romantic definition</td>
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<td>“ideas that hit you like a light bulb above the head”</td>
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<td>6</td>
<td>Problematic definition and Challenging concept</td>
<td>Original, new, unexpected, provocative, interesting approach, “novel works”, out of the box ideas, Quantity of ideas, differences between, ideas, speed of generating new ideas, and uniqueness of ideas, definitely not referential, “Innovative new design” “There is no creativity”</td>
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<td>7</td>
<td>Creativity is the ability to communicate</td>
<td>“the message is clearly communicated” “ability to communicate intended message” “aesthetic appeal or effect” “the exploration of the balance between aesthetics and effective communication”</td>
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<td>8</td>
<td>Creativity explained as a cultural product</td>
<td>“put things and objects in other uses” “the process of art making and the product itself”, “product is somehow exceptional” “the product operates by enticing the viewer to think/ feel/ act differently”</td>
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<td>9</td>
<td>Creativity explained as a process</td>
<td>“original process”</td>
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<td>10</td>
<td>Irrelevant responses</td>
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