

DIGITAL ARTS IN THE CONTEXT OF
TRADITIONAL AND CONTEMPORARY CREATIVE
ARTS TRAINING AND PRACTICES

A thesis submitted for the degree of Doctor of philosophy

by

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Conference presentation/proceeding

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Preamble

This research looks at contested issues around representing digital art in creative artwork that resulted in my PhD dissertation. Taken as a whole, the written material that follows and the artefacts that accompany it are a record and a commentary on this exploration. The processes involved entailed a complex of interrelated learning which has revealed significant implications not only for creative teaching and learning art, but also for extending programming languages to capture the specific areas in which digital artists most need.

This document does not claim to be an argument followed by conclusions, as in the conventional thesis format. It is a document with reflective comments based on the creative processes explored in the research.

The readers are therefore, to a certain extent, able to chart their own course through the commentary and are encouraged to do so.

"I begin with an idea and then it becomes something else."
Pablo Picasso (1881-1973), Spanish modern artist.

Abstract

The first idea of 'Art Education' came to my mind when I wrote M.A. thesis entitled: "The Role of Art in Training and Teaching Children 6-11", Ten years ago. I was eager to enhance my study to new planning methods of Art universities. The objective of this idea was to open up our cultural institutions to the wider community, to promote learning and to extend the reach of new technologies. So, as a PhD student I liked to work on the idea of values and the hope for development.

I left all my past behind to enliven my ambition in the way of innovative art. In the world of communication and digital, I was looking for a way to connect human's intellectual values and global digital. I tried to perceive the reality of human's nature despite the extraordinary progress in computer and its components.

Therefore, it is now appropriate to move our attention to what we might do as teachers in higher education to evaluate the quality of our own work, with the key aim of improving the quality of students learning. Because, a teacher has a unique role, requiring the integration of teaching skills and capability to take an active role in curriculum support, design and implementation.

I had so many interviews with many digital artists around the world which made me to question myself: Where am I standing now? What do I intend my artwork to impart? As the global communication has brought artist to communicate globally they intend to suggest the new thinking and new form

of art. It is no longer art for art but art for communication and conveys a meaning to observers. Regarding to Oliver Wendell who interprets the best of a book he found, can also be a good expression for me in art:

"The best of a book is not the thought which it contains, but the thought which it suggests; just as the charm of music dwells not in the tones but in the echoes of our hearts." Oliver Wendell Holmes (1809-1894), American physician and writer. (Wendell Holmes)

This thesis has set out to provide a review of progress in the British universities post 60s. There was historical evidence of this tendency going back into the 19th century, when colleges founded to serve the educational needs of the growing industrial cities turned into the technological universities. The intensity of the certain of new system in England was occurred after World War II. Following post war concern about the need for technical education, and deciding to establish some colleges linked to industry. Indeed, the evaluation of new industry and demanding for reformation, become one of the most important goals in England in those days. Academic atmosphere became institutionalised on policy for technical education in 1950s and 1960s.

Appendix 1 contains the main intention to explore the progressive movement of higher education in England. However, It was not the aim to provide a comprehensive theory of the history of education but, in short, I have narrowed my attention to the history of art universities in England since 18th century up to now. So, appendix II, concentrates on the creation of the new system after the 60s and have explored how and why the process of improvement expanded during that period.

Chapter 1 with the subject "Digital Art and Iranian Education" has addressed approaches to teaching for creativity in art and illustrates how they can provide rich opportunities for students to discover experience and develop their skills in creative area.

The questions here: *How can creativity be communicated through teaching? Do we have a specific language for creativity in art? How can we explain the importance of creativity in art? How can teachers make the teaching process itself more creative?* would be an overview of teaching and learning process. As it can be an important factor for teachers to know and demonstrate “when”, “where” and “which” language can be matched by creative subject material to avoid creative problem.

Actually, creative problem solving depends on using the right tools such as, text, graphics, picture, video, links, searching, random scanning, backtracking, multiple windows, with programmable access and control of other resources such as, spreadsheets, databases, CAD, CD-ROMs, video discs, audio discs, tricks, procedures or methods of analysis. In some cases new tools and methods of analysis must be developed from scratch by the inventor before a problem can be solved and in other cases special tools and procedures must be developed to take the final critical step of enabling successful commercial applications after a university education.

Recent technological advances in the arts have created the possibility of new ways of teaching and learning. Identifying successful strategies and techniques for enabling universities to advance is a critical step towards making these goals a reality. This chapter analyse the following conceptual approaches as key issues: Restructuring curriculum and policy in Iranian arts faculties, promoting faculty development and students’ learning in the context of global standards. More specific issues included: Is there a need for a standard model to deliver university goals? How can we adapt the curriculum? What do we want from creativity and how can we be more creative?

Chapter 2 discusses the quality of teaching and learning, resulting in improvements throughout undergraduate education. Therefore, Iranian educational context needs to be considered. I have argued that to increase faculty members’ effectiveness, the existing competitive, individualistic

college structure needs to be transformed to provide a collaborative and innovative environment where the use of computers could emerge as a new practice area.

Chapter 3 represents that creative use of computers in digital art is important in learning and teaching. This chapter gives an account of the author's experiences in digital printmaking, not just as pieces of art work, but also to develop teaching and learning strategies for Iranian art universities.

Chapter 4 states that the development of a professional digital art practice has been an essential task faced by many creative professionals today. The application of digital technologies discussed in this chapter is: What is needed in order to identify a dynamic practice and critical debate relative to educational contexts? How can we visualize the practice and theory of digitalisation? In particular, what is the nature of the collaboration that explores new models of working and practice relevant to the discovery of new methods in future?

Indeed, the intersection between digital paintings, the physical body, and multimedia in collaboration with music and video art is one that this chapter discusses as a challenging teaching exemplar in forming learning values. The result promotes a new fine art context that breaks the crossing between the arts.

Chapter 5 reveals the world of modern physics and the reality of our mind and our conscious self. The study of quantum physics is the further aim to develop artists' consciousness and inner expression for the concept of body energy and interactivity in chapter 6.

Chapter 6 considers the hidden values to learn how to focus well on mind throughout the physical body. The collaborative digital art practice has analysed the intellectual activity and produced an interactive visual arts. The

study of human being fused my imagination to see and express body in a new form of art as my final project.

Chapter 7 examines and explores the idea of using digital art as a form of multimedia project and the opportunity of developing new techniques in performance. These explorations need to develop new tools to facilitate the emerging concept of the higher spatial dimensions, human body and their relationship between art and technology. The intention of this chapter, as a closing chapter, was to suggest a developing a programme, as a short experiential artwork to model a virtual form of the body and to explore the nature of consciousness in the world of the imagination.

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Chapter 1

Digital Art and Iranian Education

1.1 Introduction

It is vital to recognise that in the future digital technology will be important for art education. Digital virtuality has enabled new relationships between science researchers, artists and industry. The poet Claude Bernard (1813-1878) remarked: “Art is ‘I’: Science is ‘We’, now it is time that Art can become ‘We’.” We should turn our attention towards a richer theory to understand the sensibility of experiences where science and art are integrated with each other to build a better society.

In this context the important questions are: How can teachers communicate creativity? Do we have a specific language for creativity in art? How can we explain the importance of creativity in art? How can teachers make the teaching process itself more creative? Language in art is an important factor for teachers to know and demonstrate “when”, “where” and “which” language can be matched by creative subject material to improve the student’s capability.

The act of creation is defined in the Oxford dictionary as: To cause, to come into existence, bring into being, make, originate; Give rise to; To portray for the first time. As an undergraduate student, the idea of being creative, of

doing things never before done was like a dream. To me, it posed a challenge, it was new and the unlimited possibilities were exciting. In my final year, I realised that there was a gap between the student's creativity and the teacher's capabilities. I was looking to find a new way to make teaching and learning more creative. This is when I started to form my theses as the role of digital art in art creativity. I used my first lecturing post at university to gain experience in order to undertake research in this area. I did not deviate from this objective from that early age. Creative teaching and learning has been the centre of my pedagogy for about 14 years.

Gass argues that "a teacher's job is not to teach students. A teacher's responsibility is for students to learn" (Gass). Creativity in learning is one aspect of this task. Learning should move beyond content and skills, to enhance critical thinking, questioning, and related problem solving. Then students have the opportunity to challenge received approaches, to generate their own personal views, and to modify them through practical and creative activities. Technology can also enhance students' attitudes, values and interests; by itself it does not teach the fundamental issues such as creativity, the need for the students' motivation and the teachers' effectiveness for successful teaching and learning.

My specific interest in this chapter is to explore the possibility of advancing art faculties by addressing these new challenges in higher education. The need for change has opened new perspectives onto the use of new technologies which can offer opportunities to enhance traditional courses, encourage life long learning and enable more flexible approaches to suit the needs of students. In general, "colleges that do not expose their students to the proper use of technology are cheating them, and their students leave college ill equipped for the society of continuing learning into which they move"(Alvarez).

However, many researchers and writers argue that technology is much more than a tool; we use it to enliven our imagination too. Indeed, "they are the

engines of today's global economy”(Jackson). “No aspect of society or economy can function effectively and completely without such tools”(Alvarez). The same is true of education and improving its quality through the innovative use of technology. As McClure argues:

“I believe that information technology is going to transform the humanities and liberal art to at least the degree that they already have transformed the conduct of science”(McClure).

Increasingly, with the advent of modernism in the 20th century and the beginning of the golden age in the 21st century, universities face a variety of creative ideas in pursuing the aim of changing education and the tools used. The effectiveness of the virtual environment has put universities in the forefront of new challenges in education. Some have moved to the vision of ‘virtual university’ or global university through digital technology, distance learning and e-learning in their disciplines.

These opportunities are reflected in the current explosion in the use of the Web for teaching and learning in many universities around the world. RMIT University has branded itself the ‘University of 21 century’, California State University, Phoenix, Pennsylvania and the University of Nebraska at Omaha, have all shifted their intellectual focus and priority from the preservation or transmission of knowledge to the process of creativity itself. This chapter discusses some of the issues that arise in the development of technologically oriented higher education. In doing so it provides the context for the following discussions which look at the key issues in more detail.

1.2 Challenges in using new technology

Advances in technology and the use of computer packages can lead to better social and communication skills. This has fostered experimentation with courses to develop problem solving and group working skills. More importantly, the development of the computer and the use of new technologies

has involved universities in planning for its use and has encouraged them to achieve greater integration between themselves, industry and society generally.

Art faculties and colleges have developed computer courses, adopting a modular approach, while being experimental in their concept of module context and approach to teaching, learning and assessment. This increases the interest of students, which in turn increases the quality of feedback given with respect to art product quality. They therefore take more interest in creating higher quality art products.

Essentially, the innovative teaching and learning has provided an opportunity for them to concentrate more on the use of technological models. In these terms, the importance of new techniques for integrating computers into learning models, addresses three key issues:

- The enhancement of traditional programmes.
- The provision of opportunities to create and experience.
- The building up of life long learners: long term benefit.

1.2.1 The enhancement of traditional programmes

Given the profound effect of new technologies, we must examine how they affect traditional learning and teaching models in universities. While some teachers evaluate the reliability of new technologies in a number of different programmes and researches they continue to teach students traditionally. A good example of progressive thinking can be found in the final report by Loughborough University in April 2001, “there is clear evidence of the need to modify the current method of teaching the variety of computing courses in the art curriculum”(Baird).

1.2.2 The provision of opportunities to create and experience

“Technology can provide students with educational experiences, which they could not otherwise experience. Technology can open doors for students that they did not even know existed”(Alvarez). It is now appropriate to move our attention to what we might do as teachers in higher education to evaluate the quality of our work, with the overriding aim of improving the quality of students’ learning. Using new technology enables students to:

- Increase and improve opportunities for working with technology,
- Improve skills and creativity,
- Experience art made in a digital environment,
- Facilitate the exchange between arts, technology, science and industry,
- Reflect and encourage diversity and innovation in art and technology,

1.2.3 The building up of life long learners: long term benefit

“Lifelong learning is not just a method but a culture and an overriding concept which subsumes others such as self-directed learning credit accumulation, access, continuing professional development, distance and open learning”(Heggen and Dwyer). The use of new technology in art programmes can contribute to the creation of such a culture and necessarily has the long-term benefit of creating a community of students who attempt to enhance their art and build a community of life long learners.

For example, one university expresses its aims thus: “The objective is to work in accordance with the core business of the university. This is to educate students, promote a positive creative learning environment, allow for research interests and provide clear opportunities for life long learning”(Nottingham). Staff need to become involved in different kinds of programmes in order to enhance life long learning. For example Permezel argues: “Life long learning and increased demand for going workplace training will increase staff involvement in education and training program that meet the strategic needs of national and international organisations”(Permezel).

Faculties need to encourage life long learning and enable a more flexible, self-paced approach to suit the needs of students. Firstly, they need to advance the state of digital art knowledge through surveys of available major international software packages and secondly to provide an up to date profile of how software is used internationally in art faculties. The Report of the Learning Environment & Technology Working Group (1999) by Celia and Wheeler emphasises the need “to develop innovative approaches to learning and teaching which will enable all students to acquire the personal and professional capabilities required to empower them as life long learners and to contribute to the well being (Marra and Wheeler).

Many of the freestanding digital art computer courses challenge the existing discipline base of traditional courses, by focusing on the relationship between knowledge, experience and the skills needed in order to be attractive to employers and world markets, as well as providing access to other digital art courses. More importantly, the challenge of new technology makes us ask why we are afraid to embrace new technology to deliver course materials with the enthusiasm we should. (McClure). Positively, for me, interactive digital technologies have potential as educational tools beyond that of static materials like pencils or other traditional ways of using art materials. When used by knowledgeable artists or art teachers in an educational context, these new technologies can extensively enhance teaching and learning.

1.3 Critical thought and innovation in creative learning through new technology

Creativity and the critical thought process leading to creativity are important. Some questions that arise are: What exactly is creativity and how is it related to critical thought? How does creativity come about? Can science explain creativity?

Margaret Boden offers some new and innovative answers in her book. She argues, “Intuition, the impetus, many believe, can be scientifically examined. Using the idea that creativity involves the exploration of conceptual spaces in the mind.” She describes these spaces as, “the richness and power of the human mind and ways of transforming them to produce new ones”(Boden, Precise of the Creative Mind: Myths and Mechanism). She indicates that the human mind and human experiences are richly idiosyncratic, but this does not mean that creativity is fundamentally mysterious, or beyond scientific understanding (Boden, Creativity and Unpredictability). This leads to an explanation of creative ideas in terms of scientific exploration.

The generation of new ideas in art is not just a matter of the power of the human mind but of motivation and *emotion*. For example, in painting and performing arts, new ideas arise bodily rather than as rational objects. Thus it is even more important to know how those ideas affect work in art; also, how can we learn to improve our thinking power and become more efficient and effective thinkers? I will argue in this dissertation, however, that Margaret Boden approaches creativity from a scientific viewpoint, and in doing so fails to notice the importance of motivation that must be present in any attempt to become an efficient and effective thinker in creative environments. The theatrical director, Jerzy Grotowski has a valuable viewpoint about the creation of new ideas and discloses the reality of motivation and emotion. He says:

"Our rights as men should begin with our acts rather than with declarations or testimonials to ourselves. To be truly spontaneous is to allow free reign to the profound flux, which rises from my whole experience, even physical, but related to my consciousness. I am as I am, as far away from mechanics as from chaos; I allow the river, which comes out of the authenticity of my experience to advance, slowly or rapidly; what I must do is create between him and myself a field of creative communication". (Thornton).

Being creative, according to Grotowski means letting experiences flow like a river inside the body in order to fulfil it. It is more than just the exploration of conceptual spaces in the mind. It is the integration between soul and body. The vital point here is to know how one can learn to be more creative. To Grotowski, creativity needs to be free from barriers and emerge from darkness into a blaze of light and fill us with new ideas, which enable us to uplift our skills in any artistic endeavour. (Grotowski)

Robert Harris, points to three key issues in terms of creativity and being more creative: ability, attitude and process. He says, “a simple definition is that creativity is the ‘ability’ to imagine, or invent something new. It does not mean to create out of nothing. It is to generate new ideas by combining, changing or reapplying an existing idea”. He adds, “ ‘attitude’ is the ability to accept change and newness, a flexibility of outlook, a willingness to play with ideas and possibilities”. Lastly, he defines the third factor as ‘process’ and states that “the creative people work hard and continually to improve ideas and solutions, by making gradual alterations and refinements to their works”(Harris).

Indeed, creativity is a process in which someone with a particular skill or talent relates an insight to a particular body of knowledge they have acquired. The existing body of knowledge is as vital as the novel idea and really creative people spend years and years acquiring and refining their knowledge base for example in music, mathematics, the arts, sculpture, design, etc. The literature on creativity within the field of art education links the subject with imagination and innovation.

To have a creative imagination is important, especially for an art student. The vital challenge in today’s art education is how we can encourage students to be more creative and also, how we can enhance their skills to enable them to use their imagination and create something new. Robert Harris argues in his article “problem is an opportunity, meeting them as challenges opportunities

to improve things. Seeing the difference between what you have and what you want”(Harris). Facing up to any problem will encourage students to ask such questions and enable them develop their imaginations.

The position of creativity in relation to art is that it appears to give rise to artistic and effective growth and enriches the sensation of being free. Basically, what is described in an artistic work is the exploration and transformation of conceptual spaces not its nature itself. Creativity in artwork happens when conventions are broken and what has been accepted in the past by society is transformed. For example, Jackson Pollock, an artist who freed himself from any prior practice had exactly that as his goal. Ted Metzger, the Hoya staff writer, named Jackson Pollock as the revolutionary American painter, the witness to the birth of action painting. He says that art, for Pollock, turns around the creative process, achieving, in moments of artistic inspirations, a pure form of expression(Permezel). Now we can turn to address to this question: how can we describe creativity in art?

Creativity is primarily an individual act, creating something that is novel, useful and valuable, whether it is an idea, a process, or concept. Indeed, it is the root of innovation. Students need to develop a skill through training to enable greater potential for creative output. Creativity is the ability or power to give life to our imagination, to produce new forms and to bring something new into existence. It is the passion of our dreams happening in our lives and giving birth to hidden powers inside our mind thus creating a newness of life. It is the excitement of creating something different. Furthermore, creativity is the foundation of invention.

The birth of new ideas such as new technologies in societies and the subsequent transformation in society they cause require universities to challenge themselves and meet the cumulative demand for innovation in the curriculum by finding new solutions. Perhaps this is the beginning of a new artistic renaissance where teachers and societies push the boundaries of

knowledge. For example, “The majority of Australian universities acknowledge the need to redesign curricula to embrace internationalisation and have policies within their corporate plans...”(McWilliams). This also helps to “educate students, to perform professionally and socially in an international context”.

As a result of this need to face the challenges, faculties and schools of Art, in the same way as other faculties and colleges, have begun to break down the barriers that used to restrict artists and viewers from freely exchanging ideas and concepts. Using digital technologies offers an opportunity to illustrate some sort of relationship in virtual space, for example: digital painting, multimedia, digital printmaking and music in order to find a way of seeing ourselves beyond the boundaries in art itself. Such an activity is not only pleasurable but has also a positive effect on the creative capabilities, which could change ways of thinking and practicing teaching and learning.

However, in order to provide the critical framework to prepare students, modules need to provide skills for efficiency and opportunity in active learning. Alongside that, new technologies can help students to utilize the new techniques and to focus on creativity and artistic provision. On the other hand, the implication of practical skills fused with creativity in a range of technical abilities can link theory and practice in art education and relate it to creativity more than ever before.

Using new techniques and developing the skills of the individuals will offer students the opportunity to discover and develop their analytical spirit and also promote fulfilment of social values. Such new techniques will motivate students to achieve a higher standard, which involves them in developing their skills and capabilities. Moreover, this motivation them to investigate and evaluate ideas, learn basic skills and enhance educational systems.

The basic philosophy for pedagogical frameworks in digital art is to engage the educational environment by using new technologies for multidisciplinary creations and self-expression. Digital technologies can enable students to challenge the area of learning and to be more active in it. The challenge is to turn information into knowledge, to find ways to exploit the power of digital art in general and to help students to think and to use it interactively. These activities will enable students to take charge of their own learning, through direct exploration, expression, and communication with others.

Nevertheless, new approaches and the use of innovative tools in critical learning have a crucial role to play in facilitating a student's capability. Digital art as a creative learning platform has produced active digital materials that can provoke students and teachers to act collaboratively in the digital learning environment. Using digital technology helps students to investigate and collaborate in a real and in virtual connectedness, both locally and internationally, which can provide a good practice area and improve the progress of students.

1.4 Towards dynamic teaching and learning in technologically innovative environments

There are new experiences of technology-enabled art all around the world so we have to ask the question what are the educators looking for in teaching?

“Social and economic pressures are moving Western societies further towards a new model of social development - one that places the highest priority on learning throughout life”(Gray).

Is it better to ask, “What do we expect from our students?” or “How can we challenge the idea of high quality student learning?”

“Nowadays, the most important element in the whole picture of education is the learner”(Gray). Dr. Trigwell (2002) argues that:

“In this session two recent ideas are used to describe an approach to judging the teaching of individuals or small teams of university teachers. The first idea builds on research, which shows that good teaching is oriented towards, and is related to high quality student learning. The second is that it is scholarly”(Trigwell).

These ideas are at the core of what encourages an active style of learning conducted according to students’ capabilities. “Besides encouraging an active style of learning and problem solving approach, students are expected to be self motivated and self directed”(Marra and Wheeler). So, “teachers must be open to challenging themselves if they intend to challenge their students”(Marino).

What is clear is that the “students’ interest, motivation questioning and interaction must be on display through the learning process”(Arsham). One critical point arising from this discussion is that it is important to start with the students and not with the subject. Given these developments, we cannot turn our back on the contribution of digital technology in encouraging students to navigate through their personal path of creativity in respect to the original idea of the artist. It also helps them connect their varied experiences to the rich diversity around them and to develop their passion. That passion can be used in order to formulate new approaches and proposals for the creation of new environments and significant expression. Students can continuously explore their desire to find a personal approach to learning enabling them to interpret ideas and make a critical work area. This will help them to understand risk and it will also help them to understand embodiment and conceptual spaces in their art and dynamic process.

Similarly, the role of the teacher is important in finding interesting ways to promote exposure to globally available technologies and to explore and

communicate globally in education in equal measure. Using new technology helps us to provide an effective learning environment and to both motivate students to study and provide ‘hands on experience’ in the practice of developing international communities of artists.

Now we must expect a great improvement in the teaching and learning environment, thereby affecting the creation itself and perhaps bringing incredible changes to the entire notion of art. However, it does not mean that whoever tries to use computers in art can be a creative artist. In fact, the term ‘creativity’ in digital art makes us consider how much the technological tools can restructure or expand any aspect of art. Does any work created on the computer represent a new art? Actually, it is time to lift our eyes from where we are to where we want to be heading.

1.5 The challenge to passive learning and enhancing traditional courses

Is passive learning still to be recommended?

How we can enhance traditional courses?

To begin with, it is best to provide some reasons for considering active learning in this chapter. In comparison with traditional methods of learning, the students’ learning environment is reaching new pastures as visual arts move away from traditional forms to the new art form. Despite a number of teachers who still want to teach traditionally, there are many who argue for fundamental changes in teaching and learning and use the latest tools to make a difference to the students’ learning experience and their lives. Restructuring curricula and computer-assisted courses not only develops the students’ skills and prepares them for future life, but bridges the gap between the digital environment and traditional courses and traditional art. Similarly, these tools can be used to supplement traditional face-to-face courses and make them more interactive.

Therefore, in an effective teaching and learning environment, students can share their ideas and explore educational approaches based on new technologies. Then teachers' attitudes in the classroom and a way of thinking about teaching and learning will establish the idea that teachers and students are partners in the learning process. This is a new way of contributing to active learning, which disseminates empathy and interaction with the aim of restructuring the curriculum.

Although using new techniques in art education does not oppose traditional courses, those techniques have improved and created new opportunities for multidisciplinary courses. The computer as a multidisciplinary instrument has broken traditional boundaries, developed and fostered multidisciplinary and interdisciplinary research to bring photography, painting, printmaking, sculpture, film, video and science together.

For instance, Candy and Edmonds indicate in their article "the media used in digital art apply to many art forms, including painting, performance, film and participation"(Candy and Edmonds). Another example can be found in the exhibition *Eighth Day*, in which the editor's introduction introduces Eduardo Kac and his exhibition as a transgenic artist. The writers say "*the Eighth Day* implores us to think not only about biology, ecology and genetic engineering but also about philosophical and cultural issues raised by our use of technology for creative and other purposes"(Haahr and Drew).

In the light of these examples, we can reaffirm the importance of using new technology in art courses and providing a new opportunity for integration with other disciplines and the development of a creative atmosphere for new ways of thinking and researching to transform the humanities in art. Nevertheless, technology is used as a tool to support students who are defining their goals, making design decisions, and evaluating their progress. These experiences provide another avenue for examining the effects of new technologies on students' attitude and their potential.

Hopkins has indicated that: “The inclusion of computing tools and other new information technologies in mainstream subject work does not preclude other methods (discussion, practical experiments, dramatic presentations, etc); rather it provides alternatives and enhancements (Hopkins)”. Consequently, using new methods in art should enhance traditional methods in which the tools become software and students’ aptitude should be challenged on the digital canvas.

1.5.1 Cognitive models in digital fine art

The use of new technologies has developed enthusiasm and motivation for learning in different subjects and has prepared effective connections between new art works and students as individuals; but, how can we evaluate the effectiveness of these combinations? Does the variety of the latest techniques restrict students from exploring other methods in different formats? Does the breadth of virtual work allow students to make choices? How does it help students to explore their skills?

The move towards creative ideas has increased the demand for change and for more focus on educational issues and the need for a paradigm shift. Many art faculties still need to realise this and to bear in mind the importance of instructional design, cognitive learning models and theories that directly impact on students’ learning. Teachers can provide opportunities to improve a variety of skills and encourage students to work in critical and creative ways, making the context of the subject material much deeper, richer, and based on students’ interest.

A novel and interactive model needs to be devised by teachers and students interested in working with individual differences. Nevertheless, identifying the cognitive model leading to the development of creative ideas may help students generate novelty through their imaginations. In this respect, this study argues that the role of digital art in higher education should be helping

to shape a more inclusive society, forming the instructional process and restructuring professional standards. The implication of the critical position between theory and practice in digital art curricula may assist the new situation to be even more creative in artwork.

Indeed, combining the teaching approach using digital forms with student interaction allows students to generate much of the curriculum according to their creative needs. Giving them an opportunity to explore their inner ideas inspires them to think creatively, to achieve and discover their imagination, improve their skills, express the notion of inspiration and develop a visionary quality of mind. It is so crucial to provide fertile ground in which students can develop a wide range of skills and above all, help students learn how to develop an environment for themselves which allows them to create.

What is the crucial role of the teacher in enlightening and developing students' perception in artistic terms? In principle, the teachers' role should not be thinking about how to organise teaching. A more valuable approach is to base teaching on a conception of how students learn. The role of the teacher in helping to improve students' ability to think critically and creatively includes examining the personal qualities required of teachers by such a goal and the classroom climate and teaching practices which best support it. It is important to give enough flexibility within the projects offered so that students have enough control over what they produce, thus allowing their creativity to surface. "Cognitive flexibility, which is defined as the ability to generate several categories of possible solutions is identified as the most critical aspect of creativity training"(Doolittle).

Gass Lee makes a point of encouraging students to take risks in their research even if the outcome is wrong. According to him, this is one example of a way of teaching and learning that helps students become creative problem solvers. He states that "the specific keys to this and many other examples are: 1) To provide freedom for students to discover. 2) To respect their effort, and 3) To

protect them from suffering loss of face, either at my hands or those of their peers”(Gass). However, some other factors can be added to his notion, which specifically help art students to demonstrate their creativity in their own experiences and art work. Therefore, I recommend the following objectives be taken into consideration:

- Attract the attention of art students to their goal; this is the notion of inspiration and creativity. This goal is the core of training which is targeted to creative values considered at the high level of digital art infrastructure. Students who concentrate on their own objectives will creatively follow up their own perception, enthusiasm and visionary qualities of mind.
- Increase the understanding of arts and digital arts processes; develop students’ own artistic skills.
- Upgrade the knowledge of students in the field of digital art.
- Energise their observation of objects in the real world to make them come alive in the students’ minds.
- Familiarisation with the use of the latest digital art tools.

These experiences should help students become more proficient by advancing their level of skill. They can then expand their knowledge of the digital art form and learn to identify the artistic talents and strengths needed in order to enhance their imagination and critical faculties. Above all, they should become better observers of how artistic processes affect change in content, in skills and their relevance to teaching and learning processes in the classroom.

1.5.2 Government and strategic planning

Government intervention has an essential part in the growth of output, criteria and skills in higher education. The success of our students is the clearest indicator of how we are honouring our commitment to excellence and ease of access. The question here is: what future role is there for strategy?

We must first define what we mean by the word strategy. Strategy is about finding answers to three interrelated questions: who will we target as our students, what shall we offer these students and how can we do all this in an efficient way. If this is how we define strategy then a strategic plan will need to discover a new position for higher education. Therefore, a social partnership with government seems essential to the future because of the need to involve government in developing future skills. Now, however, government has played an important role but the general public awareness needs to be fostered in order to address the rapidly emerging issue of technological advancement, both at a strategic and operational level. For example, in Iran digital technology in art is new for the general public, who need to be convinced of its value.

If we believe that advancement is essential, then a strategic plan incorporating a policy on digital technology must be recommended for its implementation. To this end we must continue providing our students with the highest quality of professional education in art, using the advances in educational technology to transform the dynamic interaction of teaching and learning. To make our vision a reality requires specific objectives that focus and measure any efforts towards an advancement in the curriculum. In order to do this a strategic plan seems to be beneficial for art faculties and colleges.

Although, there might be a variety of viewpoints regarding this aim, there are two key points as follows:

- Government policy.
- Government action.

What is clear is that instructional materials and grants for equipment should be awarded for proposals which have the most potential value to students and the improvement of the quality of instruction at art faculties and colleges.

“ The new technologies can facilitate this development but only if policy makers are sensitive to the opportunities especially at international

level”(Gray). Therefore, government policy has to lead a marked shift towards a flexible organizational structure as the main form of initial training for students and teachers.

Government policy then needs to be implemented which does not always happen. Government action is beneficial to support the infrastructure, which provides easy access to the new technology and to basic education related to the workplace. The establishment of a strategic plan and introduction of guidelines for distributing funds for instructional material and equipment grants, which are awarded by government, are potentially valuable to students and for upgrading facilities.

1.5.3 Promoting faculty development and global standards

Besides the promotion of general knowledge using digital data, which is now distributed in most universities around the world, faculties of art need to provide a high standard of individual learning, teaching and research.

In general, this is probably the greatest opportunity for art colleges and faculties to state that we are searching for a quick way of creating standards. Success comes with change. If universities expand their horizons and make opportunities available to staff then faculties will develop the changes that lead to development in addition to government’s financial support and establishing the committees to evaluate the universities. For instance DNER in the UK makes “the availability and promotion of guides to good practice in the creation, dissemination, preservation and reuse of digital data sets”. (Powell) Some faculties in the University of Glasgow and Brighton took advantage of the digital environment and other technologies to make those systems even more productive.

These advantages create opportunities for art faculties to communicate with other departments or companies and thereby to enhance the knowledge and

experience of their students and staff. The News and Views (2001), for Universities states that “the free and open communication of research results is essential to the goal of expanding knowledge in America”, and then adds that “...without doubt, the new partnership between academic and private sectors has been good for Americans. In 1999 technology transfer from universities to industry contributed \$38 billion to the economy, over 300,000 jobs and forming hundreds of new companies”(News& Views).

The main problem in art faculties is financial. Thus, finding a way to reduce the money problem is vital. This indicates the close relationship between universities, their faculties and the economy in exposing students to what is possible. Moreover, eligible art colleges and faculties can become sufficient through the provision of funds to improve and strengthen their academic quality. This is another opportunity for universities to involve themselves with new challenges.

Many parameters and studies are considered in the recent research literature on art education (Weiss) and the unique development of the technological and cultural framework of education, which is to be evaluated using the following criteria:

- Facilitate computer laboratories. For example, software applications, colour printers, equipment to make slides, equipment to make CDs, scanners and digital cameras.
- Up-to-date computer laboratories.
- Request more accessible networks and server space.
- Improve potential value to the students.
- Potential value of computer laboratories in the general improvement of the quality of instruction
- Department or college support funds (supplies, materials, equipments, etc).
- Enhancing the synergies in the area of joint degrees, multidisciplinary approaches, shared modules, shared teaching.

- Workshop availability to faculty, staff and students in areas such as the use of computers to increase productivity and instruction.
- Support services as an integral part of the system providing training and help in the use of complex data sets and playing a key role in the provision of training in the use of digital information.

1.6 Fostering creative thinking in teaching and learning

The expectation of “what you have” and “what you want” and transmitting the idea to others makes it real. Teaching others in a meaningful way is a deep expression of creativity. The question here is how do we engage with students in a meaningful way? Similarly, the qualities that the arts give students in a very real sense are flexibility, choice and action. The value of the arts and their influence on students’ personal and professional lives will continue to simulate and expand the imagination and the ability to search out meaningful, creative ideas. What we need to do as teachers is to encourage them to keep their eyes on things, because an idea is potentially present in anything. This is the connection between art and real life.

Fostering critical and creative thinking abilities is vital in order to build students’ understanding of the concepts, skills and processes of their methods for constructing and evaluating knowledge. “To accomplish these goals students must become more independent, self supporting and flexible”(Diederik). What is desired is that students recognise when more information is needed, which type of knowledge is required, are able to find and organise information, and generate and evaluate a number of approaches to human situations and problems. Proactively seeking these situations and problems and devising solutions will build confidence and make it easier for students to relate to actual life events.

Iris Vardi argues, “according to Roggiero (1988), the fostering of thinking needs to be holistic, covering both the critical and creative”. The writer adds,

“in this way both the production and evaluation of ideas can be developed”. Within such a holistic framework, a connection can be made between disposition skills and process(Vardi). G.A. Davis recommends some key elements concerning flexibility, a comfortable environment in the classroom and effectively taught subject areas that illustrate how students share many common problems, issues, solutions and ways in which to develop creativity. He indicates, “the present recommendations to 1) teach creativity consciousness, 2) reinforce creative traits, 3) help students understand creativity, 4) teach principles of creativity and problem solving, 5) teach idea-finding techniques, 6) exercise creative abilities, and 7) involve students in creative activities should help make creativity training more sensible, comprehensible, organised and effective”(Davis).

Although all of the key issues mentioned above are important in developing creativity, nevertheless art students need to be taught more new technology and how to work together for common goals. They need to learn how to apply these to everyday situations. They need to think independently and make their own choices. The recent advancements in teaching and learning have established creative values in art in higher education. The use of the latest tools has underpinned the idea of revision in teaching and learning. It has also highlighted the importance of a student centred curriculum in which students learn by using open-ended materials as they engage in hands-on creative art activities.

The goal of incorporating critical and creative thinking processes into art curricula is to develop individuals who value knowledge, learning and the creative processes. These can be described as qualities of good thinking processes and as types of thinking which are generally considered to be involved in the creation or generation of ideas, processes, experiences or objects. Accordingly, this type of thinking encourages teachers to re-examine their concepts and find ways to motivate their students to improve their skills.

However, much teaching still takes place without any thought as to how students learn.

At this point I feel that we, art educators and trained artists in fine arts, are at odds between the past and the present. We can declare that the future of art education is in greater flexibility and exploring the interrelationships in creative arts, tying divergent disciplines together. On the other hand, the scheme suggested by Herbert Read emphasises three elements of art education: “observation”, “appreciation” and “expression”. He says that an education, for him, is the correlation and putting together of these forms, a synthesis and “let it all come back to the surface”(Thisle).

In truth, these issues allow students to develop the ability to make a positive impact. Exclusively, in the field of art, this ability will generate the type of classroom environment in which the teacher helps students to create and which involves those students taking on new ideas in order to acquire a strong sensibility as critical and creative thinkers. How does this happen? The problem here is finding the best way to encourage students to use their abilities to seek out their own particular interests.

The students will increase their abilities in creative thinking and will use other abilities such as evaluation, especially to recognise problems and redefine them. It is important to engender an environment of comfort and trust which will allow effective critical and creative thinking. This is a way of encouraging creative thinking that takes into account the needs, viewpoints and arguments of others and is built upon an analysis of one's own motives.

These kinds of experiences can provide a conceptual model enabling students to create a virtual product that focuses on revealing the gaps between their creativity and everyday objects. Students use digital media to enhance the way they think about their work and therefore to document their own design process and find new relationships between their art, the artistic materials and

everyday life. New ways of thinking lead to learning approaches that could, in turn, develop new types of interaction between technology and art.

In summary, we could say that artists and students conceive their art through a combination of passion and imagination in order to generate perfect artistic results. Thus, students can envisage their desire for new directions in every day life. For instance, the Design Studio III Part III module for art students in painting, which I have chosen as my case study from Iran, has focused on a new look at experimental research that is critical of traditional painting, and allows students' capabilities to grow in the limitless virtual world.

1.7 Conclusion

As a consequence of our exploration, we believe that new methods have substantial application in curricula. There is still an obligation to support computing laboratories and increasingly, the network infrastructure to make a productive system. Despite some opposing ideas that using the new methods and techniques in the curriculum will prevent students from giving enough attention to their teachers and the module, we can ask ourselves how we can successfully introduce a new system. Our belief is that we should prepare students for a future life based on international standards and there is a vital need to help them learn how to function meaningfully in society.

There should be continuous research to ensure that creativity and innovation will lead to the design and context of the curriculum within the college's art goals to:

- Target the needs and interests of students
- Keep raising awareness of current technology
- Concentrate more on abilities, attitudes and skills
- Gain insight into the purpose of digital art in society
- Add digital art to courses

- Work with business in a way that allows students to contribute to the community; this basic goal will strengthen the relationship between business and the community
- Evaluate the software tools and the interaction between them

It is important to investigate how teachers communicate the values of creativity in the classroom environment. As I have discussed in this chapter, that communication is not limited to knowledge, on the contrary it requires certain abilities, attitudes and skills which, in turn, requires the development of cognitive models which leads to creative ideas.

There is growing understanding that creativity is a quality common to all human beings in some measure and can be enhanced by personal effort or by learning. The major factor is how the rapidly evolving creative environment outside the classroom can persuade students to apply their understanding and interpret their environment, which will develop new and creative new ideas and communicate them with others.

We, as teachers, accept the reality that the creative climate will empower students to expand their imagination towards creative learning. However, proof of the effectiveness of creativity is not yet conclusive, but in the early stages and many anecdotes suggest its great power as a learning aim. According to Barrone, who six years ago referred to the fact that “what happens over the next five years or so will be an acceleration of the pace of change, as the effects of these technologies spread through the disciplines and across the campus”(Barrone). Following Caputo, we should say that “change is inevitable, but it will be thoughtful and reflective so as to take advantage of new opportunities and insights...”(Caputo). So, it is time to embrace the new generation of audio and video, to change and adapt, because, if we do not change, others will do it for us.

To makes sense of this in the future, we must not simply write about changes, but make a material contribution to emerging practices. We need to uphold our capability for upgrading and regenerating faculties which work best when used in a practical way. Indeed, I would go further and argue that we must step off the edge and onto the shifting surface. By establishing the creative values in the curriculum we prepare students for the realities of a changing world and being more productive, where the arts are seen as powerful agents of social and economic regeneration. As Croald Dahj says, we make realities out of our dreams and dreams out of our realities. We are the dreamers of dreams and the authors of reality.

I will continue by seeking answers to these questions: Where does this exploration stand? What are the biggest gaps? I will provide a background to the traditional curricula in the next chapter, and will then introduce the proposed technology-based learning and teaching model based on my art experiments using digital art in fine art.

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Chapter2

Critical Comparative Analysis:

Transferring IT to Higher Education in Iran

2.1 Introduction

Learning and innovation arise from multi-talented groups of people when they work in close collaboration and exchange knowledge and ideas, thereby shaping future direction. The focus is not on solving problems but on looking for the next opportunity, using creativity to find hidden connections and insights into new ways of thinking, and new societal challenges. Computers can help create such a creative learning environment. Interactive educational technology makes it possible for students to explore the content of their subject knowledge creatively.

Iran's higher education distinguishes between Art Faculties and Art Universities. Here I refer to them jointly as art universities. I reviewed programs and research perspectives to substantiate my claim for the importance of new techniques for integrating computers into learning models for art universities in Iran. As an Iranian and who has ten years of teaching experience in Iranian art universities, I wish to confront the difficulties of complex software and the inevitable difficulty of training staff and students in Iran to feel comfortable with the new technology. Students will increasingly have access to personal computers and will expect digital technology to be

used by staff to develop their skills in fine art. Therefore, there is a need for more research-based evidence in the application of digital technology. Comparative models of British and Iranian approaches will be used in three stages: development of the model, analysis of the model and application which will lead to enhanced teaching and learning linked to creativity.

It is important to demonstrate to educationalists and students in Iran that technology will offer them an opportunity to enhance both their skills. However, some may argue that technology is simply an expensive replacement for the traditional tools of the artist. This chapter provides a critical discussion and suggests theoretical and practical approaches to fine art teaching. The following chapters will draw on interviews and my experiential work using digital technology to create fine art.

2.2 Comparative model of UK and Iranian educational systems

Within the past two decades the phrase, “development of education” (PENNSTATE, Special Collections library), has become part of the habitual speech pattern of educators. “Changes in industry are prompting universities to face up to the reality that urgent attention needs to be paid to the establishment of new technology. The explosive growth in computer assisted courses, Internet connections, multimedia and collaborative software environments are generating a new wave of better teaching tools”(Moin Namini, Edwards and Patel). Digital technology can add value to students’ learning. However, most universities in Iran are still biased towards traditional methods.

For example, in Azzahra University, only some modules make use of computers in art so not all students have the opportunity to develop computer skills. This lack of knowledge requires a fundamental rethinking of common

practice, and a new form of didactics that challenges art students. Art universities in Iran need to be convinced of the importance of enhancing effectiveness and developing practical strategies that involve digital technology.

The recent movement for curricular reform in higher education in America and Australia is the result of evaluations that take place throughout undergraduate education. The use of new technology in teaching and learning in most universities around the world, such as Phoenix, RMIT University and National Institute of Arts at The Australian National University has led to notions of the 'virtual' or 'global' university. Iranian educators could enhance effectiveness by evaluating their teaching and developing practical strategies for their own 'virtual' university.

The present situation in Iran illustrates that art plays an important role in individuals' lives and the structuring of society. There has been a steady growth in the number of art universities over the past years. Whilst there have been a large number of recommendations regarding technical education in art universities, methods of learning and teaching have remained substantially unchanged for at least ten years. It is useful to compare existing educational models in the UK and Iran. Such a comparison will point to strategic avenues for further thinking and research in key areas, such as how art faculties can break down barriers and seek to integrate technology into the mainstream.

Iranian art universities need to develop national and international communication. In this respect, they could take some lessons from instructional projects in western universities and contribute to the debate around maximizing the effectiveness of programmes of this kind. As mentioned earlier, the comparison of art universities in the UK and Iran will increase awareness of the need for a shift, and also provide the opportunity for advancing new technologies in universities.

Some universities and colleges in Tehran have begun to advance their modules based on the new standards set by Azzahra University. They have begun to use computers in students' final projects in some modules. These are good examples for enhancing traditional methods. Similarly, a number of researchers have explored digital technology. For instance, the analysis of colour in Persian paintings by an academic in the faculty of art at Azzahra University (Moin Namini). The analysis of colours help the artist to explore more colour and their important role in painting. The digital method of analysing colour creates new opportunities enabling us to see colours individually and to mix and change them easily.

Exploring the value of colour in Persian painting is the vital goal of this research. It is expected that this research will be integrated into students' programmes to provide the opportunity for art students to not only analyse and study colours and their effects, but also help them to gain module objectives much faster than traditional approaches in the colour studio. This kind of research is promoted at university level by the Vice Chancellor of Azzahra University and has the potential to be used in fine art modules, and subsequently as an input to national frameworks for educational reform. However, a national framework is still lacking. The Supreme Planning Council in Iran chaired by the Minister of Education, Research and Technology has not yet formulated and adopted new educational programmes and regulations, at least not in art universities.

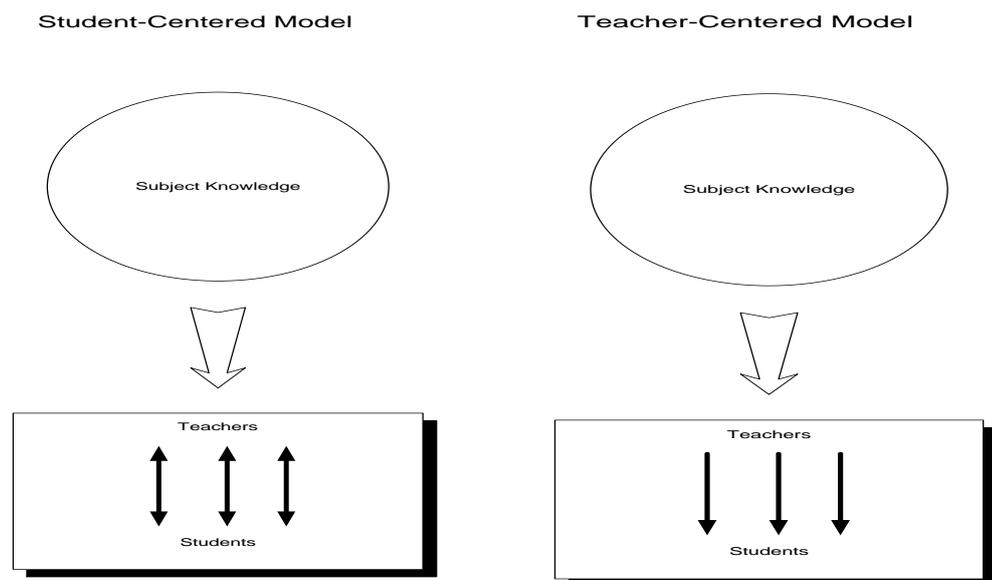
Figure 1.2 shows the current and proposed models in Iran. It can be seen that the proposed model introduces an openness in which teachers and students can share their ideas for enhancing their skills and the quality of their education. "In the effective teaching and learning environment, they can share the ideas that teachers and students are partners in the learning process"(Moin Namini, Edwards and Patel). In comparing the proposed model with the current model it is envisaged that the classroom is not just information and teacher-centred. The western model provides an environment in which

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students can challenge new approaches and use new technology to develop their learning skills and to question and develop their creative practices.

The impact of technology on western education during the last two decades has been profound (Palmer, The Theorisation of the Digital Computer in Art & Design Education Conference; Moin Namini, Edwards and Patel). In the 21st century, the vast majority of art universities have computers in place of more traditional approaches to assist with the variety of modules in art faculties in UK. The revision of art curricula and reconceptualisation of some subjects is an important focus in using new learning technologies. The rapid advances in computer capabilities and purposes have inspired instructional changes on all levels, resulting in a paradigm shift from the teacher directed to the learner centred classroom (Garland).

Figure 1.2. Current and Proposed Model in Iran



This fundamental shift is characterised by current concepts of digital technology based on evaluation and research. While some art faculties in the west have modules that use computer and digital technology for learning and teaching, others still need to introduce computing into their undergraduate modules. Iranian art universities can benefit from the experience of other universities and departments worldwide to enhance their capability of using new technology. For instance, a recent survey in the Education Department of the University of New Hampshire evaluated the level of computer usage and found that computers made a positive contribution to learning and teaching for both faculty members and undergraduate students (Garland).

One of the most significant developments of recent years in art faculties in the UK is the emphasis on critical and contextual work. Although, in the UK, arts organisations have been encouraged to adopt a broader view of their role in society, by diversifying to meet changing cultural educational and performance needs (Art Council of England, 1997, p.17.para.43), many continue to be dominated by mechanistic structures and procedures. (Renshaw, "Inside the Guildhall School of Music and Drama") Therefore, Palmer states digital technology is as important as we claim it is because it forces us to question our assumptions concerning experience, not because it allows us to build castles in the air (Palmer, "The Theorisation of the Digital Computer in Art & Design Education Conference"). He argues that if we need to understand the sensibility of experiences in our art it needs to enhance our theory about the digital environment. Perhaps, if we focus our attention deep enough we will find that the effect of digital technology has been similar to the impact that photography had on the art world in the nineteenth and throughout much of the twentieth century (Constable).

The editors of 'the journal of nineteenth-century visual culture' state, "Revisionism, the attempt to open and broaden the canon, has been applied more aggressively to nineteenth-century art than to any other period". It has

resulted in an atmosphere of experimentation with new speculative approaches to the study of art. (Note)

All of those activities have had both positive and negative effects. On the one side, it brought in a challenging environment in different fields of art such as: “illustration, photography, caricatures and posters”, but on the other hand, it regularly seemed to be an arena in which researchers of different viewpoints argued and represented their opinions.

Nevertheless, the invention of photography in the 1830s caused a radical change in the way people saw things and also opened a new window onto the world of art. After two centuries, it is interesting to note that digital art and new technology are the challenging new ideas among artists and changing society’s view point in the same way.

However, digital technology is still not extensively used in all UK art faculties, but over the last few years its use has become more widespread in art faculties. The establishment of Digital Futures in September 1999 in Ravensbourne College illustrates the creative use of digital technology and the implementation of this strategic focus(Duncan).

So far the applied research into the effectiveness of different uses of computer and digital technology has failed to recommend its suitability as a learning resource in the UK and Iran. There are many different arguments as to whether the involvement of digital art technology would create a shift from the transmission of knowledge to the process of creation itself and thus overcome the problems of current education. For example, at RMIT, California, Phoenix and Pennsylvania state universities (Moin Namini, Edwards and Patel), the prevailing discipline base of traditional modules is challenged to focus on the relationship between knowledge, experience and skills. In doing so, collaboration between institutions in the production of new materials will be attractive to employers as well as providing access to other

modules. Therefore, using all the sources in this study it is possible to critically analyse the barriers preventing a greater utilisation of new technology in art. These barriers fall into seven distinct groups: policy, finance, curricula, subject areas, teaching tools, teacher and student relationship and assessment, which will be discussed later.

2.3 Theory and critical thought

My position is that technology may improve the quality of learning and teaching. Many questions are unclear such as: “Does it work?” and “How do I do it?” What is being done elsewhere in the sector, and what has been introduced as good practice must be considered.

Educators, policy makers, and government bodies are now seriously debating the kinds of structural reforms that would have seemed wildly idealistic just a decade ago. For instance, many critics of American universities such as Arizona State University sees technology as an important tool in bringing about the kind of radical changes this reformation demands. Having seen the way in which technology has transformed the workplace, and indeed, most communication and commercial activities, support for the use of technology to promote fundamental university reforms appears to be reaching a new high.

Whereas fine art education can benefit from computer technology, we must develop a core curriculum that serves academic staff well and offers students the opportunity to integrate computers into their own discipline. Meanwhile, we need to move towards sharing the experiences of change, implementation, integration and development. There is a need for industrial projects to be shared with academia, especially with students, and for industrial collaboration to help art universities advance and enhance the quality of their teaching and learning skills to support graduates in their working lives. We should listen to our industrial colleagues and work to integrate their needs into

our framework. Notably, the technology transfer that has traditionally been from university to industry will begin to flow in both directions.

We as art educators must find a way to pull together towards some common priorities and objectives, rather than making dramatic statements or pulling in our favourite direction. There is a need to design the methods of generating technology to solve educational problems, theoretical or practical, small or large, simple or complex. This ability must be fostered and developed by computer-assisted modules. Therefore, advances in technology could help art universities to enhance the quality of their knowledge, skills and disciplines based on traditional methods of teaching art.

The potential of technologies such as multimedia applications and computer networks are obvious. These kinds of innovation have their major impact on the nature of computer related curricula (Plomp, Nieveen and Pelgrum). Using outdated tools in Iranian art universities is contrary to industrial practice and the same problem can be seen in some art faculties in the UK. They need to incorporate the new methods and shift their curricula to interdisciplinary collaborations, both professionally and pedagogically. Diggle argues that art academies are ill equipped to respond fast enough to the dynamic shifts and developments in these global environments that influence the human condition(Diggle).

Educators in the UK and Iran need to focus on defining what kind of problems to solve. Baird states that industry is getting ready for global education and the training market place and art faculties need to be aware and ready (Baird). In this case, national and international communication provides an effective area in global education for both art faculties and industry. However, despite the awareness in the west, lack of communication between Iranian art universities and the global and internal standard setters, such as California State University or Azzahara University, prevents many of them from responding quickly. Therefore, Baird's argument can be considered and

extended to find a solution for global education in such a creative environment.

Over the last few years, the arguments in some UK universities have led to more effective use of art software packages. Educators in art faculties using advanced digital technology question the nature of the language of art in terms of what it is and how it is used. Janthia Duncan has initiated the development of an IT infrastructure to support art education at Ravensbourne College. A prime aim of the project is to enable the creative use of digital technology. She discusses the implementation of this aim as part of the college's new mission set in 1994. She provides evidence of developing digital futures for the period 1999-2001. According to her the college is sharply focused on new approaches: experimentations with digital technology, developments of new transferable skills and the reinvention of contextual studies (Duncan).

Computers can be used in education in many different ways. Firstly, the use of computers as an "object" of teaching and learning refers to teaching and learning about IT and secondly the use of computers as "tools" for improving teaching and learning. Figure 2.2 shows the communication among teachers, students, IT, industry and universities and it also illustrates the importance of using computers in education. This figure is a guide to find a relevant answer to what the barriers are or what mechanisms are needed. The barrier here is the educational process not the context itself.

However, answering these questions reveals two ways of using computers in teaching and learning, and the relevant shift in relation to this sort of training in art curricula that is involved.

2.3.1 Information technology

Information Technology as a powerful tool for learning (Bovtenko). Important gains have occurred both in the theoretical understanding of IT and in their widespread deployment and use. Because education is the practice of a kind of communication (Plomp, Nieveen and Pelgrum), it is important for us to find some way to bring IT together with the ideas of communication and education (Gray).

2.3.2 The use of computers as collaboration tools

The use of computers for supplementing learning has been an area of investigation almost since they were first available (Westhead). They provide a commonly available platform for encouraging students to develop their skills. Examples include:

Facilitate the distribution of authority in the learning process.

Change the scale of students' relationship to the material.

Improve communication (teacher/student, student/student).

Improve flexibility in the delivery of some learning materials.

Exposes students to skills they will need for the 21st century job market.

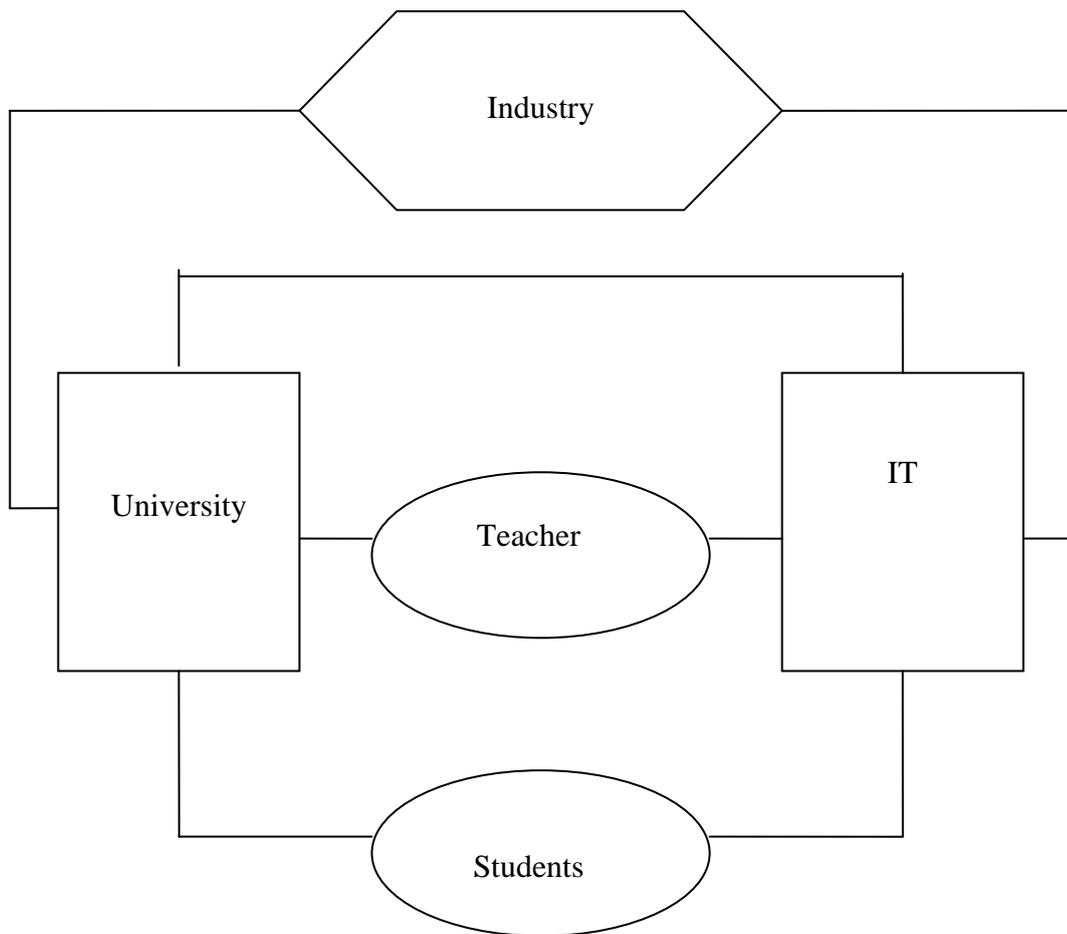
Baird states that there are still others who think differently and the educational process for them is just the delivery of information. They do not use IT because they do not have enough time and large numbers of students are involved. He states that if the truth were disclosed to them they would not be afraid because their students know more about the technology than they do. Then he adds that there is the fear that it can lead to loss face and in turn respect (Baird).

This might be the reason for those who think that using new technology will undervalue the teachers' role; educators in both the UK and Iran have this same fear. Nevertheless, the critical thought here introduces the coherent

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model discussed below, which then concentrates even more on communication and collaborative strategy. There is a need to provide art faculties with the latest hardware and software to promote the idea of the best possible education with appropriate new technology.

Figure 2.2 - A Model for Necessary Mechanisms



2.4 Towards pedagogical change in fine art education in Iran

Extensive changes in subject material have implications for the creative element of the pedagogical environment in art. By using digital art technology in fine art education, the context of Iranian art universities can be developed. There are consistent, widespread and strongly endorsed views from the sources which contributed to this study on what now needs to be done at national level to give further support to the use of IT. These views can be categorised into:

Digital structure

Need for research

Link to accreditation and quality assessment regimes

Funding models

After the victory of the Islamic Revolution in 1979, Iran witnessed one of the most eventful periods of its history, which brought about a need for transformation in the social structure. The ‘revision’ program was launched in Iran. In the period from 1979 until the present time there have been major changes in some science and art modules in higher education. In order to adopt new policies and to be able to respond to the new needs of the Revolution, the Ministry of Education, Research and Technology promoted higher education and established institutions for this purpose. The various projects have been established to create a new educational system, to set new standards in fundamental and applied research, and to institutionalise the values created by the revolution (Higher Education in Islamic Republic of Iran).

In 1994, I started my first university lectureship. I set out to identify and measure the skills and knowledge that students gain from using technology. I began to identify the measurable indicators that will provide insightful and valid information into what makes classrooms effective and asked “how can

we expand and use vital forces effectively?” and increasingly, “how can we leverage such understanding to originate better education?”

We carried out an initial survey of educationalists’ views on educational changes in Iran. A news magazine at Azzahra University states that:

“We can not respond to the needs of society within the out dated methods...we will do our best to enhance the quality of education in the upheaval of a changing world”.

News Magazine of Azzahra University, p.5, (Minister of Education's Speech.).

When I interviewed academic staff in the art department at Azzahra University, many questions arose, such as, can we cope with an increasing need for interdisciplinary collaboration, both professionally and pedagogically? Can we develop symbiotic industrial relationships without sacrificing academic integrity? Are not our curricula based on outdated assumptions? What should computer based courses entail?

These questions have implications for identifying applied research into the effectiveness of computers and they define the constraints and priorities, which are changing the climate and curriculum. These fundamental changes will confront art universities as they begin to develop industrial affiliations. We cannot deny that there is still some insufficiency in the field of education. Generally, a lot of attention is paid to academic research, while little attention is given to the practical development of students, where more emphasis is placed on the theory itself than on the students’ utilisation of learning. It is necessary to study students’ demands and take corresponding measures. The Ninth International Conference on College Teaching and Learning on Technology stated four significant hurdles to which must be overcome:

“What is the ‘minimal’ technical competency that a faculty member will need for integrating technology into instruction?”

Once the essential technical skills are acquired at the functional level, how does the faculty member manage the massive amounts of information found on the Internet?

Having searched through the reams of digital data on the Internet and identified potential web sites, how does the faculty member evaluate these web pages for their instruction?

What are some effective strategies that will facilitate the incorporation of technology in classes?" (Aloia)

However, these questions bring some reality to bear on the key issues of the use of new techniques and how they can be incorporated into the Iranian mode. One of many examples is the project Designintro, a teaching programme developed by design staff at Ulster University, which aims to promote lifelong learning in undergraduate design applications. This programme focuses upon the principles and philosophies, which are the central transferable core of the discipline rather than embedding the casual use of more traditional methods in design teaching (Lawrence and Baird). Currently, Iranian art universities continue to develop a traditional pedagogy, but our perception here focuses on the need for Iranian higher art education to move from its current infant phase to the professional level.

Answering the question of how this can be achieved is part of my PhD research. Given the nature of computers and their related technology, I intend to explore their influence on my practice and specifically on my creativity. I focus on the creative use of the digital environment to enable me to develop a new and unique palette for personal expression. Digital technology enables me to move to higher levels of expression and beyond the early expectations of the capability of this technology, especially by using different software packages that expand expression and support a search for individuality and uniqueness. Thus, these new techniques challenge my capability. Artistic expression is transferred into digital formats and integrated into digital

structures, especially in educational settings. This may provide an opportunity for me as an individual to discover new ways to enrich classroom activities.

In this respect, Janthia Duncan argues that digital technology offers more accuracy in the output of images, and also provides a creative environment for a range of practical applications. She argues that in referring to students' understanding of what technology does and why, the college is therefore not only concerned with "digital technology" but with experimenting and developing new ways of exploiting it (Duncan).

The Iranian context might benefit from her argument, but it should be carefully considered. All this evidence is an argument for a transition and an upgrading of the quality of learning skills in Iranian art universities. For example, CNDLS in Georgetown University provides evidence of the transformation that can be achieved in. CNDLS provides a menu of services focused on improving teaching and students' learning through various assessment strategies. It can help the faculty assess the impact of different pedagogies and evaluate the impact of technology on students learning in the classroom(Assessment & Curriculum Development).

In principle, the new way of teaching and learning compared with the mechanical forms of teaching introduces a freer and more spontaneous approach allowing students to be creative. To increase the effectiveness of the Iranian faculty members, the current competitive and individualistic faculty structure and culture must be restructured to a cooperative, team based faculty structure.

In order to review appropriate material in universities, committees need to be established. These committees could be instructed to consider the current and future needs of students and develop the quality of teaching and learning. This could lead to the enrichment of individual learning, teaching and research to a high standard comparable to that in western art faculties, and open a new

window in Iranian art universities. Such a survey of western pedagogical research and practice will enable Iranian art universities to explore their differing priorities. One example of this is the final report by the University Committee for the Advancement of Teaching (UCAT) 2000-2001 at the University of Nebraska (University Committee on Advancement of Teaching, Ucat) which provides a new direction in improving the teaching and learning process. Such committees can assist the faculty to improve their instructional capabilities. A similar initiative by Iranian universities can enable them to reach such global standards too.

Discussion about using technology is focused on particular questions and implements the virtual modules alongside the traditional modules. The effectiveness of technology has encouraged professionals to pay attention to the importance of its communicating in course subjects and the importance of developing the general skills of productive, self-paced learning. However, it is argued that the discussion of the use of technology in college teaching commonly focuses on *how* to use it, while the important issues are *when* and *why* it is appropriate(Clif).

The widespread usage of digital technology has confronted most art faculties around the world with the challenge of improving the quality of students' learning. Fundamental changes in methods of research, academic communication and international marketing have provided a new opportunity for art higher education to progress. Similarly, a new environment of learning has promoted creative skills based on students' interest. The question of how this relates to digital art technology is the critical issue.

Recent developments in digital art technology need to be explored in relation to the role of art in the faculty curriculum. It could be argued that the best way to enhance the quality of teaching and learning is to exploit it as a research project. Many leading global art faculties have undertaken research projects as part of the teaching process, examples are Ravensbourne College's

commitment to ‘the creative use of digital technology’, the experience in Ulster University and ‘Creativity and Embodied Mind in Digital Fine Art, funded by an AHRB (Arts and Humanities Research Board in UK) innovation Award to John Haworth, Manchester University(Haworth). These are examples of creative processes that generate the possibilities of using new techniques and also highlight the important influence of digital technology in fine art. These projects enable artists to explore and experience their ideas and free themselves from traditional boundaries.

The openness in universities in western countries and the current debate on the use of digital technology has introduced a new thinking on collaborative approaches between students and their teachers. Multidisciplinary courses, joint degrees and synergies offer opportunities for art faculties to develop better communication and upgrade their skills. The advances in the use of digital technology in art modules do not oppose traditional courses but such elements tend to make a course more interactive and create a close relationship between teacher and student by sharing their idea and taking a risk. Although, some teachers are still teaching students traditionally while they evaluate the reliability of new technologies in a number of different programmes and research initiatives. (Moin Namini, Edwards and Patel).

As the aim of using digital technology is to provide a creative environment in class, we must therefore expect this approach to minimize the direct interference by the teacher with the students’ learning while at the same time providing rich opportunities for discovery. Nonetheless, it does not preclude guiding students when necessary and it should be remembered that teachers are responsible for everything that occurs in their classroom. Baird describes three basic types of academics based on the experience in Ulster and conversation with others throughout the UK:

Committed developers who are well read in the latest literature

Really interested but under pressure and can not find time to commit

Ground Zero, scared and hope it will go AWAY

He notes that if “we agree the first group are committed and able then we can concentrate on the second and third groups, the majority of the academic staff presently operative in the sector” (Baird). The difficult situation in Iranian art universities illustrates the same experience as Baird had; the suggested model could enhance the awareness and incorporation of the recent advances.

Making use of the advances in new techniques will create opportunities for more creativity and will help students and teachers understand why they are doing something new and experimentation should never be feared. The results of using new techniques may be successful but gradual. However, further gains in knowledge will increase the significance of the use of digital technology and the effectiveness of that technology will become more noticeable. Stephen Ehrman, notes, “Some of today’s methods of thinking are different or impossible to do (or to learn) unless the thinker is using technology. It is difficult to teach many of the skills of modern statistics, physics, graphic arts, music, and sociological research, for example, if students and instructors have no use of computers. (Ehrman).

2.5 A Proposed model for creative processes

The creative process in fine art can be enhanced through educational technology. In Iran the traditional practice has been to ignore the role of technology to help artists in the creative process. However, there is a need for art universities in Iran to consider using digital technology, not only to enhance the creative process, but also to produce digital fine art.

Our proposed model is an adaptation of the UK model discussed previously. The process of problem solving using computers necessarily involves the choice or creation of a model for translating IT to art, which is a crucial consideration. Hence, we need to learn, teach, facilitate and manage this process among art faculties. Table 1.2 shows the implication of using new

technology, but there are still several problems which prevent art faculties from communicating new ideas. Some examples of these problems have already been discussed.

As mentioned above, there are some traditional teachers who still follow their old teaching methods. They do not want to try new methods or inform students about changes in other countries. Crucially, this relates directly to a lack of knowledge and experience. These teachers are scared to embrace the new challenges that international developments bring. In order to solve this problem, we need to enhance the awareness of the benefits of using digital art to enhance knowledge and improve students' skills for future employment. This will encourage us to create new modules, run more creative workshops and develop communications between faculties.

The lack of communication and the fact that new ideas are not shared prevent students from experiencing creative learning in the teaching and learning process. Using digital art in the learning process encourages art students explore their ideas and enhance their skills. Sharing new ideas between students and teachers may encourage teachers to make their modules more creative. Creating collaborative atmospheres and new or computer-assisted modules may enhance the teaching and learning process. It may also create an attractive environment in which students can explore their particular area of interest and learn more about it.

Transferring IT to Higher Education in Iran:**Table 1.2 The Implication of Using New Technology**

Units of Analysis	Impact on L&T	Impact on Society	Current Role of IT	Proposed Role of IT In L&T
Faculty Centred	-Lack of Sharing new idea among faculties -Lack of communication between L&T	Self-centred	Help to share idea	Introduce new technique & develop skills
Teacher-centred	-Lack of creating -Teacher lack of experiences	-Tradition -Lack of awareness of international development	-Upgrade knowledge -Help students self dependent -Improving skills -Make ready to market	-Workshops -Create new courses -Communication among faculties more than before
Changing Process	-Lack of assessment committee -Lack of advanced training programmes for L&T	Following the old method	-	-
Facilitating faculties	-Lack of enough computer labs -Lack of funding support -Lack of workshop L&T -Lack of system support -Need to equip with latest methods	-Lack of Government support -Lack of communication inside and outside the university -Lack of communication with work place	Created the collaborated atmosphere	Creating new opportunity for upgrading skills & keep late to date
Policy	-Lack of facilitating faculties to be independent -Lack of communication with national& international gallery& equal right for all teacher& student	-Lack of awareness -Close society	-	-
Passive learning	-Lack of communication L&T -Lack of share idea -Lack of creative T&L	Following old methods	Introducing new courses and collaborated atmosphere	Interactive & close relationship between teacher & students

In order to reinforce high levels of technological knowledge and to use the latest techniques in the curriculum there is a need to keep asking questions such as: what is the role of theory and practice in emerging subject disciplines and how can the proposed model be implemented as a critical element in our changing society and culture? The expected result is a creative environment with greater use of software packages, better social and communication skills, and modules which enable experimentation in art universities in Iran and the UK.

Although this movement began in 1994 in some universities and art universities, such as Arizona State University and the University of Alberta, the effectiveness of global standards still fails to provide an environment in which new technologies in art structures and procedures can be fostered. At the same time, there has been a proliferation of educational reform efforts in Iran aimed at upgrading students' requirements. The result was an increase in the number of modules and the establishment of new art universities, but the nature of the instruction remained the same and the course content failed to advance skills in all subjects.

A new willingness to consider fundamental change and innovative approaches is apparent in the current wave of reform involving governors and policy makers, as well as teachers. Support for the use of technology to promote fundamental university advancement appears to be more important. Faculties cannot accomplish this on their own; the universities' endeavours in this area are linked with those of governors, policy makers and state legislation, all of which play an important role in promoting academic innovation. They also contribute to a vibrant university wide policy debate on how to promote teaching, learning and effective support for research and scholarships in a rapidly changing higher education system (Stir General Search). Moreover, universities are aware of the changes but are either understaffed or lack the expertise to make necessary improvements [24]. In contrast, there are many cases where art faculties have invested in technology that was not well used

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and where computers gathered dust in a corner. The proposed model will require the following:

- Policy
- Action on the part of universities
- Digital workshop and management committee
- The innovation award grant
- Highly trained support services
- Curricula
- Teaching tools
- Assessments
- Teacher-student relationship

Perhaps the above priorities in the proposed model will help art universities to enhance their awareness in revising the frame work of their technological education. For example, new technology from international advances can be supported by policy makers. The following target the teacher–student relationship but is not an exhaustive list of the significant impact of digital technology on teaching and learning:

- Role of teacher
- Role of student
- Role of technology
- Role of creative process
- Role of digital art technology

Ultimately, more work needs to be done in establishing guidelines for improving and developing computer based modules that share international standards, and on achieving international academic collaboration focusing on future change and adopting techniques or technologies. To do so, I considered some key parameters on art education as follows:

- Equip a computer laboratory. For example, provide software applications, colour printers, equipment to make slides, equipment to make CDs, scanners and digital cameras.

- Request more accessible networks and server space.
- Add potential value to and generally improve the quality of instruction.
- Provide department or college support funds (supplies, materials, equipment, etc).
- Enhance synergies in the area of joint degrees, multidisciplinary, shared modules, and shared teaching.
- Arrange workshops for faculty staff and students in areas such as using computers to increase productivity and instruction.
- Provide support services, which are an integral part of the system. They will provide training and help in the use of complex data sets and play a key role in the provision of training in the use of digital information. (Moin Namini, Edwards and Patel)

2.6 Conclusion

We need to change the tools we use in line with changes in technology. Nevertheless, developing a curriculum based on new technology requires the development of a large national and international repository of pedagogical frameworks and infrastructure. Theory and practice must be integrated throughout the curriculum. We should look for ways to integrate modules, perhaps through some kind of spiral approach, rather than removing them wholesale. Students are increasingly concerned with training for the future while we are concerned with education in the present.

From the “successes” we have learned that technology often produces unexpected benefits for students and teachers. From the “failures” we have learned that implementation without thoughtful planning or sustained support is nearly always futile. It seems certain that new technology will be increasingly adopted into the curriculum.

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In order to modernise the art universities in Iran, they must achieve more advanced skills in each subject area based on technological changes. Similarly, contributing to current debates, research themes and findings as discussed above can be helpful in providing a creative environment for the use of computers and access to the most recent advances in technology.

I have studied the UK educational model, simply because I am writing doctoral dissertation in the UK. I am aware that important and valuable lessons can be learnt from American and Scandinavian models. Therefore, I suggest that the comparative models are needed to consider collaborative work among faculties, departments, institutions and support partnerships with experienced faculties.

Finally, in order to make a difference alongside increasing efforts towards a more advanced use of technology, those projects have to be collaborative, collective and should be extended to other academics with the uptake of new teaching techniques (Miller). Mostly, in creative art, we should be precise about the processes involved in being more creative and how this helps to create a new dimension in art where we find out how we can use these tools as innovative ways in which to create new work.

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Chapter3

Digital Art: Enhancing Interactive Creative Processes in Fine Art through a Personal Critical Framework

3.1 Introduction

Digital technology has had a significant impact on the development of digital art and has created new directions in research and teaching in fine art. The Internet has added the dimension of global communication and the marketing of digital art, consequently, universities have developed a global perspective. Digital technology creates an art-base filled with digital fine art works generated by art faculties and art universities.

However, as Janthia Duncan argues, despite their commitment to the creative exploitation of digital technology, Ravensbourne College in the UK was very 'undigital' five years ago. She states that they were terribly backward and that the traditional English designer could not see the potential of computers and said: "NO COMPUTER". The College developed an IT and centralised infrastructure around 1997, which has helped to promote digital learning environments and deliver fine art in a fundamentally different way (Duncan).

Therefore, digital art has become a significant part of an artist's life and this is reflected in a broad range of international markets. Despite the negative reactions to the use of digital art, I argue that the result of using it will promote academic output in visual art related works and improve learning and

teaching strategies. The artwork reflected upon here explored the practice of fine art including drawing, painting, performance, printmaking, and digital art. This work will form the basis of the learning and teaching strategy for module titled The Design Studio, Level III part III in the author's Faculty of Art at Azzahra University. All the digital works will be regarded as collected works for the module and it will subsequently be developed for other Iranian universities.

This chapter outlines a framework for the understanding of the creative processes in digital fine art and digital printmaking; it also clearly states that the effectiveness of digital technology along with the experiences of students enables them to develop individual skills. However, in order to focus on potential understanding, this area needs a conceptual framework, which applies to a wide variety of different materials and the involvement of the individual. It appears that having such a framework can emerge as a new approach in the curriculum which will develop traditional fine art thereby confirming its importance as a creative tool within the curriculum.

Accordingly, the work produced in this chapter also provides a critical framework for the understanding of traditional and digital fine art and printmaking. However, it is important to recognize that such an effective framework will involve students in both the analysis and production of digital fine art products. This will improve their ability to think critically and analytically, thereby increasing their involvement in their own individual learning process and widening their personal experience.

3.2 The motivation

Recently, expression in art has been revolutionised by digital art. Research, challenges in art, and innovation in higher art education have been affected by it and greater awareness of digital art has given artists the opportunity to

experience and, in many cases, embrace the new form of creative thinking afforded by digital art. The debate is now concerned with the direction of digital art.

Art theories based on digital technology and inspired by literary theorists have become interesting to digital artists (Spalter). Based on such theories and new ways of communication, artists have now concentrated their efforts in creating special pieces of personal digital art leading to personal fulfilment. Emerging popular culture in the USA, probably brought on by literary works like ‘Tales of the Wild West’ lead to the Avant pop movement which is influenced by Andy Warholⁱ while POP “Pop”-culture has become an icon or symbol of American capitalism. It is this personal fulfilment combined with a theoretical basis that motivates the author’s work.

In 1993, Mark Amerikaⁱⁱ, drew the world’s attention to the new wave in art which he named “Avant Pop” (Colorado) by creating “Alt-X”, one of the first content-rich sites on the Web at the time and “Grammatronⁱⁱⁱ”, a four-year net art project in 1997. The idea in creating such Websites was to emphasise this new movement rooted in “Mainstream Culture” and to find wild and adventurous ways to ‘love it for what it is’. Amerika felt that the latter strains of post modernism also attempted to do this but were unable to find the secret key that led right into the mainstream cell so as to facilitate and accelerate the rapid decomposition of the host’s body (Avantpopmanifesto). However, like post modernism, he too failed to identify the ‘secret key’ in his argument but his inventions in the early 1990s resulted in his online artwork such as PHON: E: ME^{iv} and encouraged educators ‘to go for it’.

In February of the same year, Kathleen Chmelewski, Nan Goggin, and Joseph Squier, three artists and designers trained in traditional mediums created ad319 from the simultaneous efforts of all those attempting to embrace new digital technology. They attempted to pool their knowledge by working as a collective to find an effective way of addressing the issues as contemporary

artists, designers and educators. One output of this collaborative approach was the @art gallery (www.art.uiuc.edu/@art), one of the first curated art sites on the web. In 1995 an international digital exhibition, “Art as Signal: Inside the Loop”, was curated for the Krannert Art Museum. “Body, Space, Memory” [BSM^v] ([Access Science Story](#)), is the conceptual description of their collective work.

These changes have begun to have an impact on traditional education. Peter Renshaw(Renshaw) for example, argues that the importance of redesigning education is connected to changing the context and patterns of work in art institutes. According to him, the rapid changes taking place in the cultural industries may help colleges to pioneer new avenues of training, research and development for professional artists, composers, choreographers, creative producers, directors and teachers throughout their careers. Changes in industry are prompting universities to face the reality that, despite the explosive growth in computer assisted courses and Internet connections, multimedia and collaborative software environments are generating a new wave of better teaching tools. This requires educators to recognise the role of the new technology as a *creative* process.

The first step in a creative process is to think about the characteristics of art works as well as the emotional response they provoke although it needs to be remembered that digital fine art, as with other art forms, emerges from a strong sense of inspiration. The overriding emphasis of this study is to look at the beneficial use of digital technology, rather than examine the problems. The figure studies in the Design Studio module have no boundaries and limitless content.

This module could support the philosophy of a shared creative environment, in which students respond to the notion of cultural unity. However, there are still traditional artists and educators who think that any critical analysis will lower the reputation of the Iranian educational system in the eyes of the rest of

world. Indeed, one objective of the module is to equip students with social communication skills and make them aware of the disparate social factors they will encounter in society.

It was expected that resistance would be encountered to such changes, something that has been experienced by Dr. Ziapour, a respected figure in the community and the author who was a figurehead in the avant-garde in Iranian Modern Art. In contrast to traditional and classical artists he started to establish his idea of 'New Art' over a fifty-year period. Now after fifty years and along with the other movements in Iran, a new digital fine art movement especially in drawing and painting needs to be found. Although, sooner or later digital art will be part of Iranian culture even though it is still currently rejected by traditional and classical artists.

Sefton Green (Sefton Green) discusses the challenges of digital art. One of these challenges is to find ways of developing cultural knowledge and a curriculum offering opportunities to work creatively with multimedia. Acknowledging digital art in formal education can lead to the eventual development of curricula but it is more important to form a culture which integrates the traditional arts. It not only offers opportunities to work creatively, but creates new ideas of how it can challenge and enthuse learners.

The substantive aim of the current study is to argue for and describe ways in which the use of digital technology can create new opportunities for artistic and creative work within the Iranian context. As a result of using digital technology in fine art, I started introducing software into modules, and I will continue to develop this in the future. However, David Puttnam^{vi} indicates in the book "Young People, Creativity and New Technology" that although it is impossible to accurately predict the future of learning nothing is impossible and he makes a valid point about the impact of ICT on what is taught. However, I want to transform not only what is taught but also how it is taught through my paintings and create a reality in which the use of new technology

could become a new dimension of “creative work” and produce “creative learners”.

The goal is to explore and expand the potential of digital technology as a tool for art education research and to that end, this study has reached the point where some fundamental questions must be answered, for example:

What do I expect to gain as a creative artist and a creative teacher?

What do I need to do as a creative learner?

Why is it important to be a creative learner?

How can I demonstrate the usefulness of digital technology in creative learning?

What is the impact of the previous questions on being more creative?

My research started in October 2002, when I managed to have a private lesson with Jeremy Sutton^{vii} after several discussions over the Internet during a period of some months about digital painting and traditional art. We agreed that neither of us were opposed to traditional art whether that art was created traditionally or digitally. Sutton’s main question was “What are we going to say?” Or “what do we wish to say to our viewers?” Our minds try to find shape and meaning in our lives thereby identifying patterns and transforming those patterns into visual relationships. In order to do this, it is important to start with a goal and a vision.

That was the first time that I consciously selected a particular creative process which is deeply rooted in cultural themes, but much more innovative. It could be something new that engages with new technology and appears to be authentic but is not traditional. Despite an authentic expression of new movement in art, I developed an innovative process of Persian painting^{viii} using batik a few years ago but that is in the past. I am interested in the future and how something different can be introduced into Iranian art education, what the problems are likely to be and whether it will be successful.

When I started putting my ideas into practice experience, I had not thought of the problems that might arise; on the contrary I was eager to improve opportunities to advance the art module in order to develop an innovative teaching and learning atmosphere. That could be the essential purpose of the digital era, in present and future technological environments. The consideration of these issues would construct an argument relating to the impact of digital technology in art and would also include the application of digital media reflecting western art practices to foster creativity based upon the Iranian cultural activities. But, how can digital application improve the Iranian cultural achievement?

3.3 Experimenting in digital fine art for creativity and teaching

As has been suggested above, my practical work and digital outputs may prepare students to find ways to exploit their power to create challenging experiments with digital technology, help them to think interactively and encourage their ideas.

The process of experimental work provides the imagery of how digital art can be resourced in terms of educational benefits and future work. It attempts to motivate debate about the opportunities to advance students' skills, as they will be the creative thinkers and artists of the future. These activities will provide infrastructure for guiding questions of research such as with whom, how and with what kind of knowledge should students learn and how can they best develop learning tools. It may also enable them to take charge of their own learning through direct exploration, expression, and communication with others in their area.

Although I tried to respect the traditional process at first, I made myself draw digitally via an A4 Wacom Tablet. Consequently, while producing the first

three pieces, I tried to sketch and chose a dominant view and significant angle out of so many other compositions. Then I drew the chosen pieces digitally and changed them step-by-step based on “what I want” or “what I was looking for” towards my goal. When I showed my first digital exploration to Barry Edwards and Nandish Patel (my supervisors) in late December 2002, they really encouraged me to continue and produce more creative pieces if I could.

I met with James Faure, a British digital artist, at the Digital Art Seminar in the Deluxe Gallery in London in January 2003. Meeting James in his studio and having an interview with Janthia Duncan^{ix} of Ravensbourne College concentrated my focus on digital printmaking and encouraged me to look for a new way to represent and challenge my own interpretation and thoughts. I decided to combine digital printmaking and traditional art to encourage new thought about the future of art in Iran and the subsequent likely change in culture. However, this raised many questions in my mind such as is digital technology better, does it enhance me as an artist, and how can it be used as a tool?

My approach in this particular project was to explore and experiment with the digital possibilities in relation to the traditional art methods. I followed my desire and the passion I had to involve myself with something new and different. The first picture I composed in my mind was the creation of a dreamy atmosphere based on one of the famous Persian myths Khosro and Shirin^x (See Figure1.3). This story is visible throughout the history of Persian painting and many artists have interpreted it differently. It tells of the love between the King of Persia and the beautiful Princess Shirin^{xi}, who also loved Farhad. I have interpreted this story in the past with traditional materials but this time I created a new look digitally.

The scene I chose was the The Death of Farhad, who killed himself after hearing of Shirin's death, a lie spread by King Khosro to deter Farhad from loving her. I sketched it from different angles and chose one that expressed Shirin's deep feelings of loss in hearing of Farhad's death. Then I tried to understand how my subjects preferred to position themselves in relation to the digital space, in order to explore and perform a unique fictional piece. This enabled me to experience and use different objects within the interactive digital space painter work area of the package. This led me to reflect on the distinctions between traditional painting and digital space.

That formed the basis of this new challenge to fine art, which argues that art has the ability to operate on the viewer with a unique power and using new techniques demonstrates an evolution in art and technology. These approaches provide an important framework for thinking through reality and expressing a particular idea powerfully. Digital printmaking is a process of creation which develops the experience of an individual, increases their professional understanding and develops a new kind of expression.

I drew The Death of Farhad using the feeling of sorrow I imagined in the darkness and stillness of the Bisutun Mountains. The movement of colours and the possibility of exploring the different kinds of digital palette let me immerse myself in Shirin's spirit. It seemed that as soon as she touched Farhad's blood, her soul could direct me to the fictional scenario of love and death (See Figure2.3)

To me, the digital experience is a new culture which expresses and inspires the content of art. It demonstrates the need to think about the real world in a different way. Significant changes are also needed in the nature of learning itself in order to create virtual and unique images. In fact, the experience encouraged me not only to learn the material but also to think it over and integrate it into a new form of art.

Figure1.3 The first composition of first image



Figure2.3 The digital printmaking of first image



I created my second piece by combining music with painting. While I was listening to Beethoven's 5th Symphony (See Figure3.3), I drew some wavy lines and created an image of a girl, who was floating smoothly in a dreamy atmosphere amongst the notes. What I felt deep inside reminded me of the past, which was coming to life and moving off the paper. Dance with Beethoven's Symphony was a sequence of painting emerging from my mind and produced a sharp completed piece with just some wavy lines. I scanned Beethoven's notes into the computer and made my background ready in the Photoshop environment (See figure4.3).

I intended to keep it simple and just used one colour. The feelings arising in my mind flowed seamlessly through my fingers and moved into the painter's work area. The challenge was to combine a mix of classical and traditional sensations, impulses, and notions. In these terms, my digital experience here, which was working from figurative motifs rooted in tradition, would be my first analytical move towards digital interaction, and this, along with other linked principles, could be incorporated into traditional teaching in Iranian art education (See Figure5.3).

Reflecting on this piece, I experienced an extraordinary sense of the divisions between traditional and digital methods. Most importantly, it was the relationship between reality and virtuality where I looked into the hidden aspects of the human experience and found something there to share with my viewers. I began to get a sense of the dimensional world and had several new ideas about the treatment of time and space which is developed in further chapters.

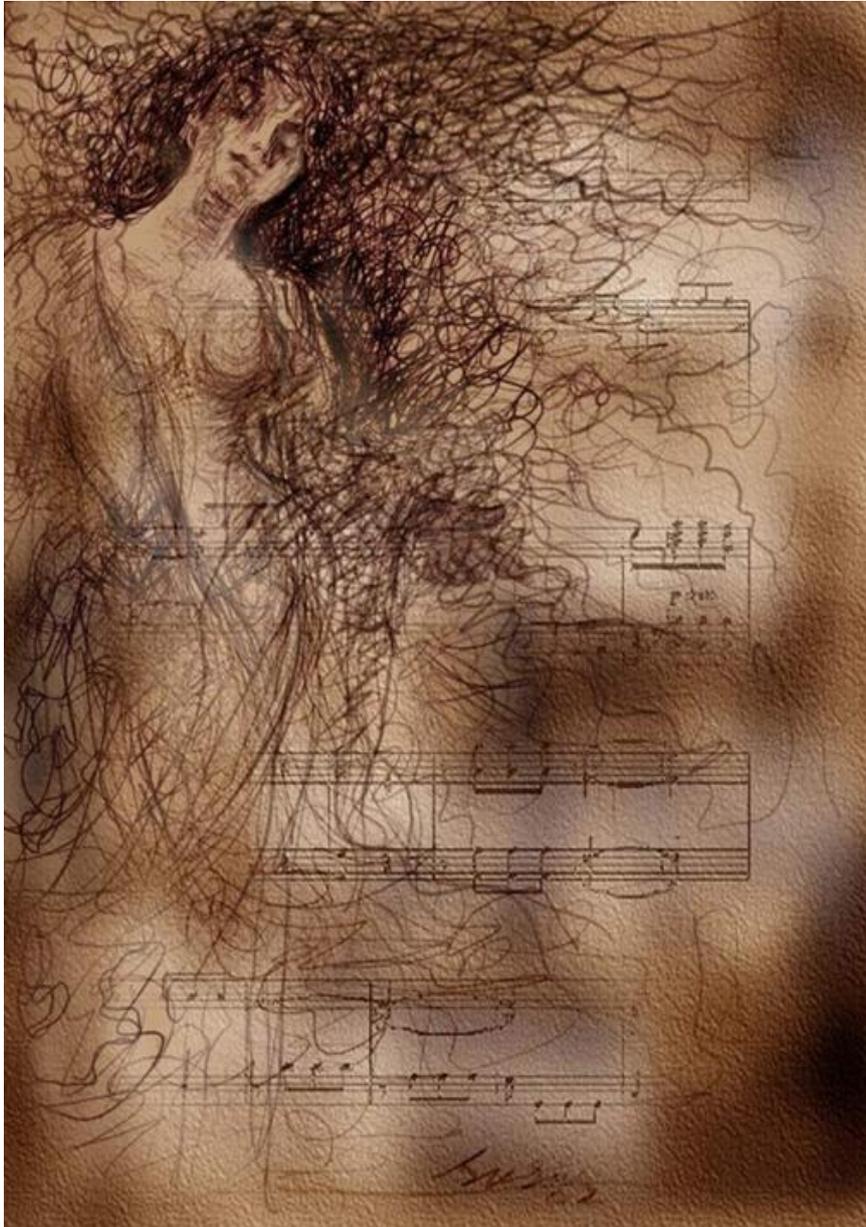
Figure3.3 The first composition of second image



Figure4.3 The composition of music in digital printmaking



Figure5.3 Digital printmaking in traditional root



My daughter, Yasaman, was the subject of my third piece, where I operated more in virtual space and used the capability of the painter as a goal in my mind. I had to decide what I wanted to express and what was important for me to share with my viewers. I started the third piece with traditional method of sketching on paper and tried to draw it again on the digital work area. This experience was amazing because it broke the traditional limits of the physical paper form of expression. At first I just concentrated on drawing the figure as it was, concentrating on light and shadow as I used traditional methods of drawing (See Figure6.3).

In the digital work area, I displayed all the palettes; Brushes, Colour Sets, Brush Controls, Objects, Tools and Art Materials. Before starting to paint I had to make a tidy work area with all the tools ready, so I followed the process of saving palettes from selecting them in the window menu. I saved the palette arrangement for easy recall (Window > Arrange Palettes > Save Layout) which meant that I could easily access the sets of colour, the pen tools and light, and shadow at the same time.

The next step was to exploit the appropriate techniques to express what I wanted to say. I chose “Dry Media ---- Charcoal” from the Drawer Push bar and continued just by changing colours, sizes and profiles from “Colour sets” and size in “Brush Controls”. This gave me the freedom to follow my inspiration. I had to make sure to “Save As” with a new version number after applying an effect or dropping the layers as I worked. I saved the work as it progressed, using the process throughout to change the end result and experience with different Brush Tools or textures. The finished version was considerably different from what had initially been visualized. I saved it in different versions in order to be able to choose the best for printmaking and for use in discussion in the classroom. I kept all the saved versions in a project folder and created an archive.

That was not only a means of exploring but of creating fresh ideas out of the creative mind if the objective is to be a creative learner. Working with the painter programme provided the opportunity to save the whole creative process into a short educational movie (See Figure7.3). It could be used to bring students together to think about their past work, what they need to do in the future for better results, to pick the best unique palette of their experience, and contribute to professionalism.

Indeed, my experience then was the same as when I practiced in the Painter8 Workshops with Jeremy Sutton (See Figure8.3) at Hackney College. It was deemed necessary to use these possibilities for the education, communication, interaction found in digital art. There were a group of artists and representatives from different companies and colleges who were interested in using Painter8 to contribute towards a creative and comprehensive education in the field of digital fine art.

The three-day course started with a review of the programme, its structure, purpose and the tools that would be used. First, Jeremy gave examples of the assignments and showed student results and secondly he presented some of his works step by step in order to introduce the flexibility of Painter in creating a digital painting and in each section he reviewed his experiences via a video projector and two digital TVs at the same time. He then asked us to create our work within our digital studio and palette based on one of our selected artists, we had to use their colour sets in our work area to inspire their colour in our work. In the third step every one got the opportunity to review their work and share feedback.

Figure6.3 The first composition of third image



Figure7.3 The process of creating Digital painting for third image

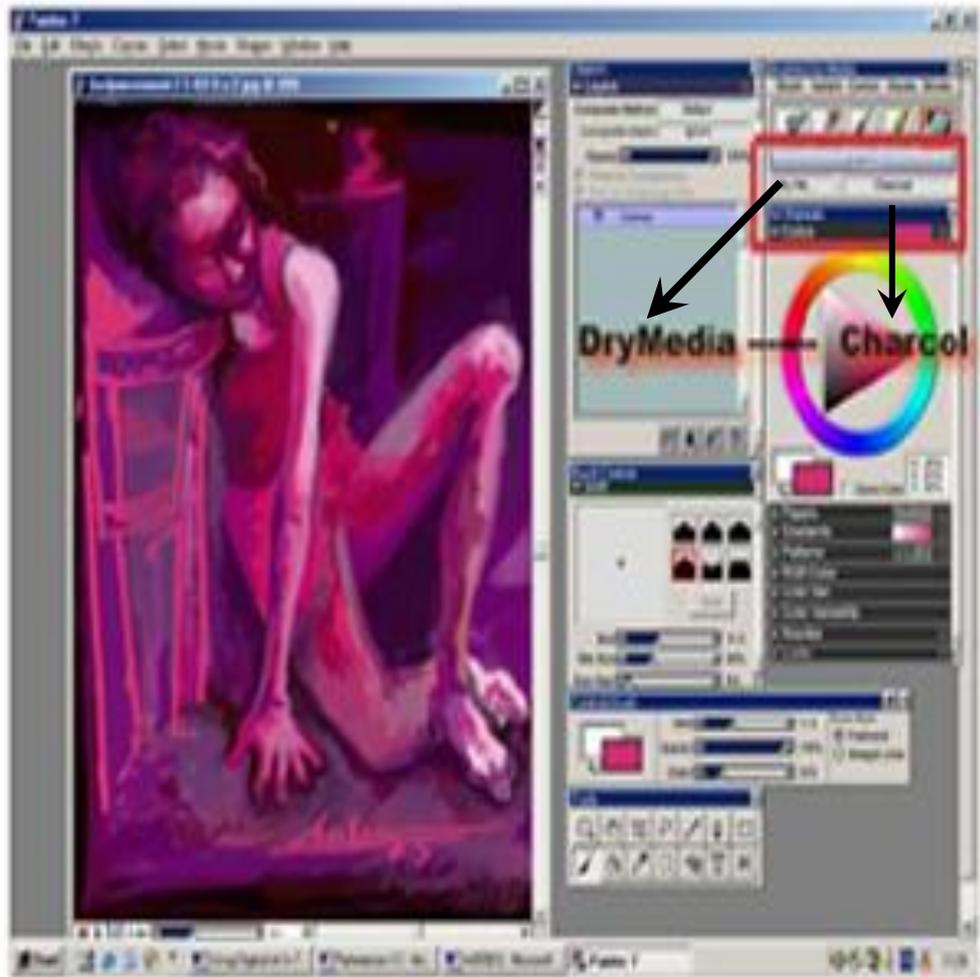
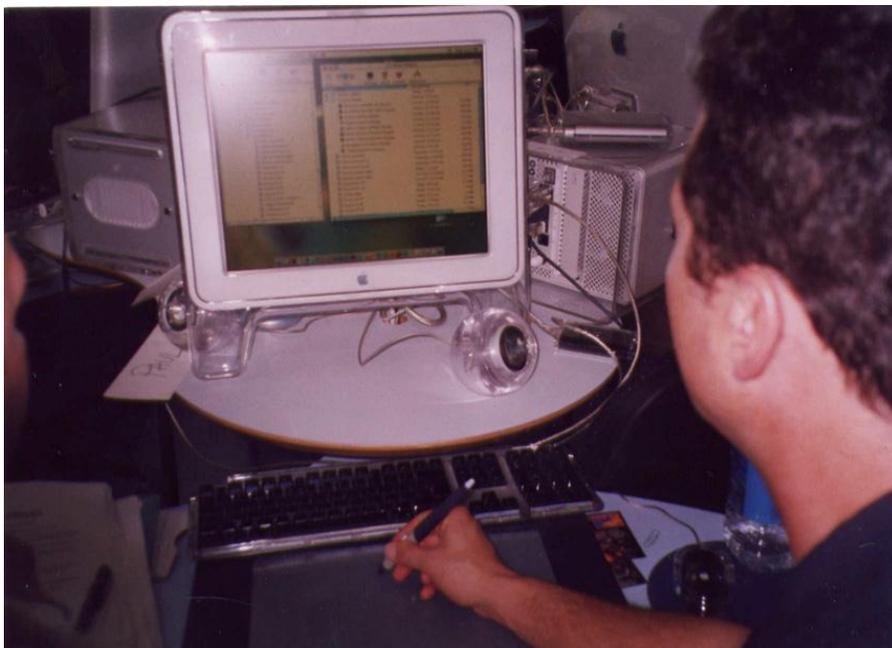


Figure8.3 Jeremy Sutton in painter 8 Workshop



Max Davison, defines the feasibility of using Adobe Photoshop in his experience thus “It is extremely easy to learn and to teach with and its capabilities seem to allow possibilities rather than limit them” (Davison), I had the same experience with Painter, both programmes can be easily manipulated and moulded to create new dimensions of fantastical practice. Compared to real space in classical and traditional work, electronic space is like the space in films: it has the potential to make you experience and migrate into any extraordinary environments that exist in your mind and creative thought.

In *Computers and Design in Context* (Kyng), the authors decide to find out how best to use computers when creative activities are the goal. They chose two groups of users who have had computer systems designed for them. In this investigation, the two groups; information system designers and artists and designers are convinced that using computers in their work has a fundamental implication in the nature of skills and the quality of the effort required, but in two different ways. For example, the information system designers concentrated more on the market and were mostly tied to groups, manufacturer, and individual customers. However, the artists and designers worked individually, but like to communicate with others in the course of their work. Furthermore, the authors write about time and space, which have been discussed as an important factor for them while they are working with a computer system.

Certainly, the extent of this study for any group of artists is relevant to all artists. The domain of each user in the second group needs to be considered individually rather than placing them in one group and comparing them with the first group as a whole. The way an artist uses a computer is not just a scientific exercise. Apart from the time factor and the efficient use of space suggested by authors, the significant point in the artists’ pilot plans is the *way of seeing objects rather than just looking at them*. It could be argued that artists have employed the computer to create, to exploit the possibilities for

communication and expression found in digital art. Thus, in response to the question of how many different packages to consider and evaluate, the number of packages may be important to the first group of users, but for the second group of users even one package could make the use of computers increasingly practicable. The use of different packages also depends on each user in the group, as in the original experiment, the author put all the artists and designers in one group.

As previously mentioned, the most significant point to be taught in the module is the study of the body and figurative motifs; every student could then produce an individual project based on the subject title. Working in a digital environment helps students to explore a wide range of capabilities in multimedia display, presentation and interactive environments for the performance and exhibition of their artistic output. Using this talent in the production of new pieces will also allow students to raise the production quality of the module, which will, hopefully, raise the overall quality of educational production in this medium. Using this kind of art programme could bring together the benefits of both traditional and digital fine art that underpin students' awareness and engagement with the subject.

Shirin was the next image which provided a new subject to explore the impact of digital technology on contemporary culture. The first step was to organize and use the "fictional" spaces in the work, highlighting new ways of experiencing and navigating space-both physically and spiritually. Shirin is an imaginary story, which represents such an illusive atmosphere when she was surrounded by so many rumours of Farhad. In this exercise I overlaid and composed multiple source images together in a single image. First, I scanned source material at resolution at least as high as I needed. Then I saved it as TIFF files rather than JPEGs to keep it compatible with the work area in Painter and Photoshop. I then resized it at the resolution I wanted.

Secondly, I modified the digital tools in Adobe Photoshop and made the background with my scanned photos of cactus allusion and stinging criticism (See Figure9.3). Then I converted it into the Painter workspace and started to paint with the variable brushes to create a mysterious texture based upon the content and objective in this project. Thirdly, I arranged the workspace in Painter and set the palettes as previously I explained. I created a new file based on the size of the canvas, and adjusted the resolution and paper colour to fit the print size. The paper colour set for this piece needed to express the mystery of the world which surrounded Shirin so I chose a purple background. Then I had to choose an appropriate brush offered by the pen tools controls. I chose “Dry Media -----Artist Pastel Chalk” from Brushes. Then I drew “Shirin” separately in the Painter workspace. I then followed the process of copy and paste on the ready-made background in Adobe Photoshop to place one image over another to make a shadowy layer, and then Edit>transform>scale to make the image fit on the canvas, which is visible in (SeeFigure10.3&11.3).

Figure9.3 The collaboration of digital photography and digital painting in the process of digital printmaking



Figure10.3 The Process of digital printmaking

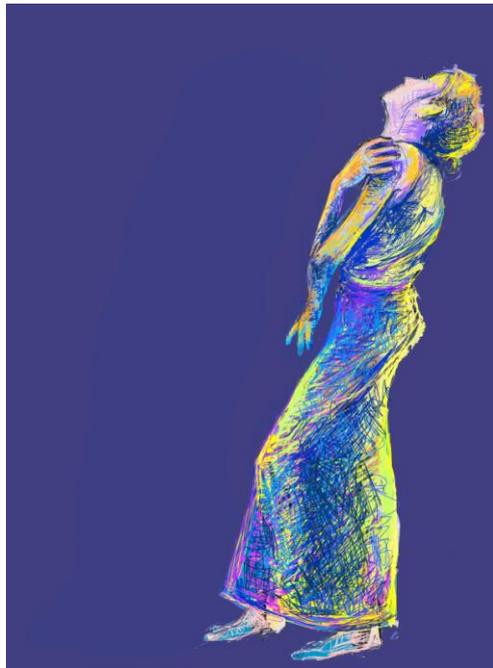
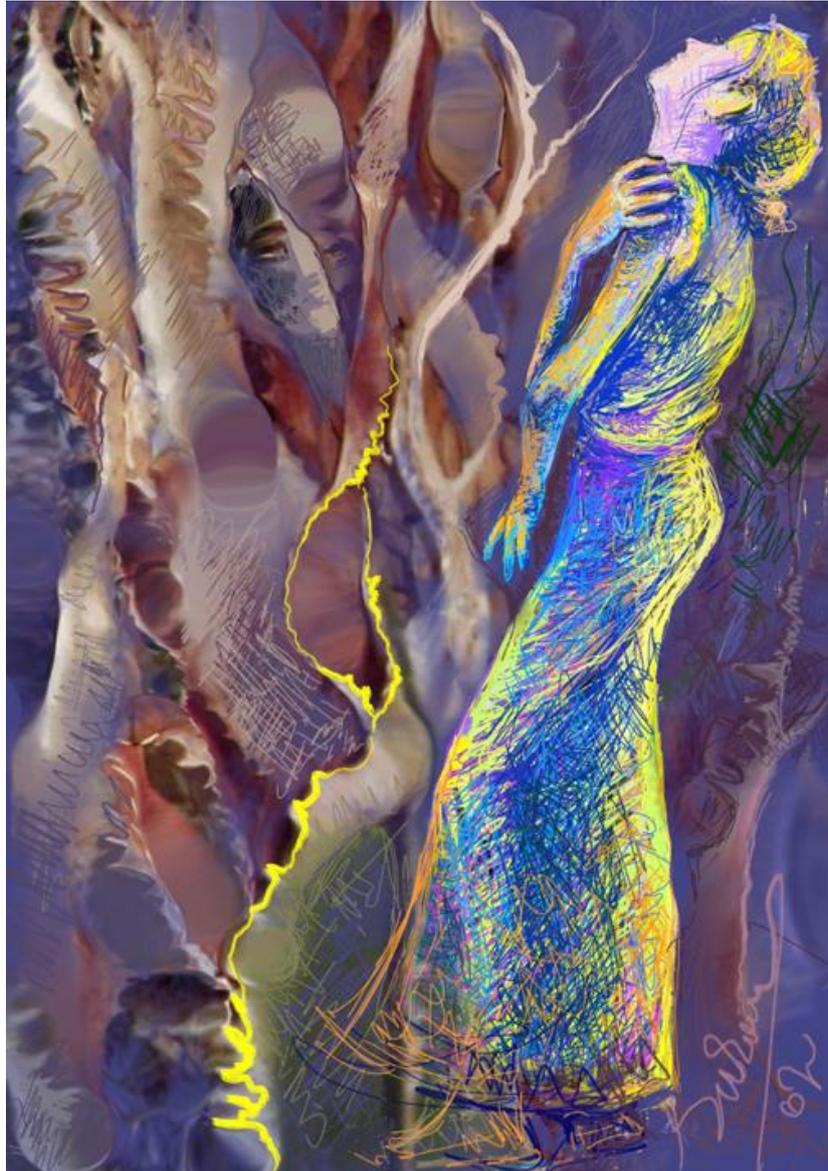


Figure11.3 Digital print making of Fourth image



Lastly, I analyzed the objective of this exercise which was to gain an insightful creative approach while creating the imagery. I also wanted to review my decisions regarding the techniques best suited to what I wished to achieve.

The fifth image I decided to create was an exploration of the human body which I called 'Anatomy'. This work represents a place where ideas and statements are rich and artistic freedom is unconstrained by dimensions. The creation of the body through the floating colours takes the atmosphere of this piece beyond reality and into an unlimited digital boundary (SeeFigure12.3).

This investigation describes the way that students can realize their individual creative potential through using digital fine art, and go beyond the simple transfer of images in the mind onto paper. It shows how students can extend their boundaries through the efficient use of a computer and the liberation of a creative mind (SeeFigure13.3) and (See Figure14.3).

Figure12.3 The process of fifth printmaking



Figure13.3 The process of completing the sixth digital painting

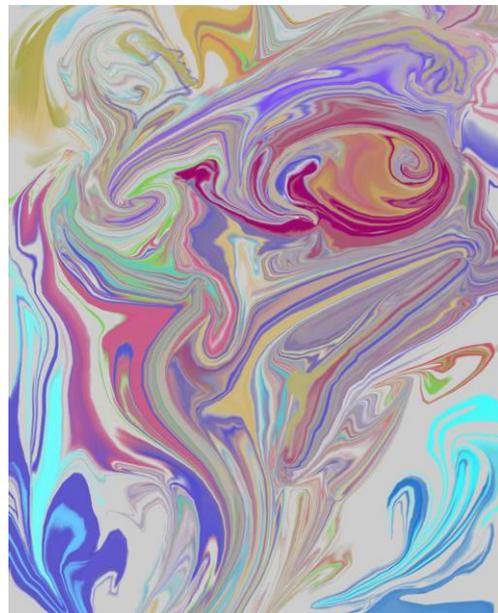
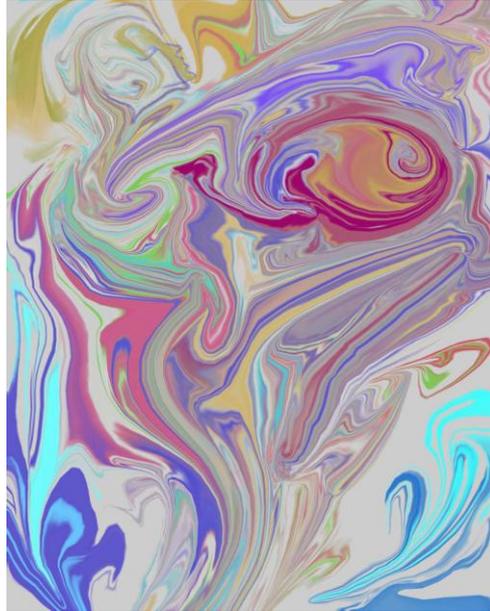
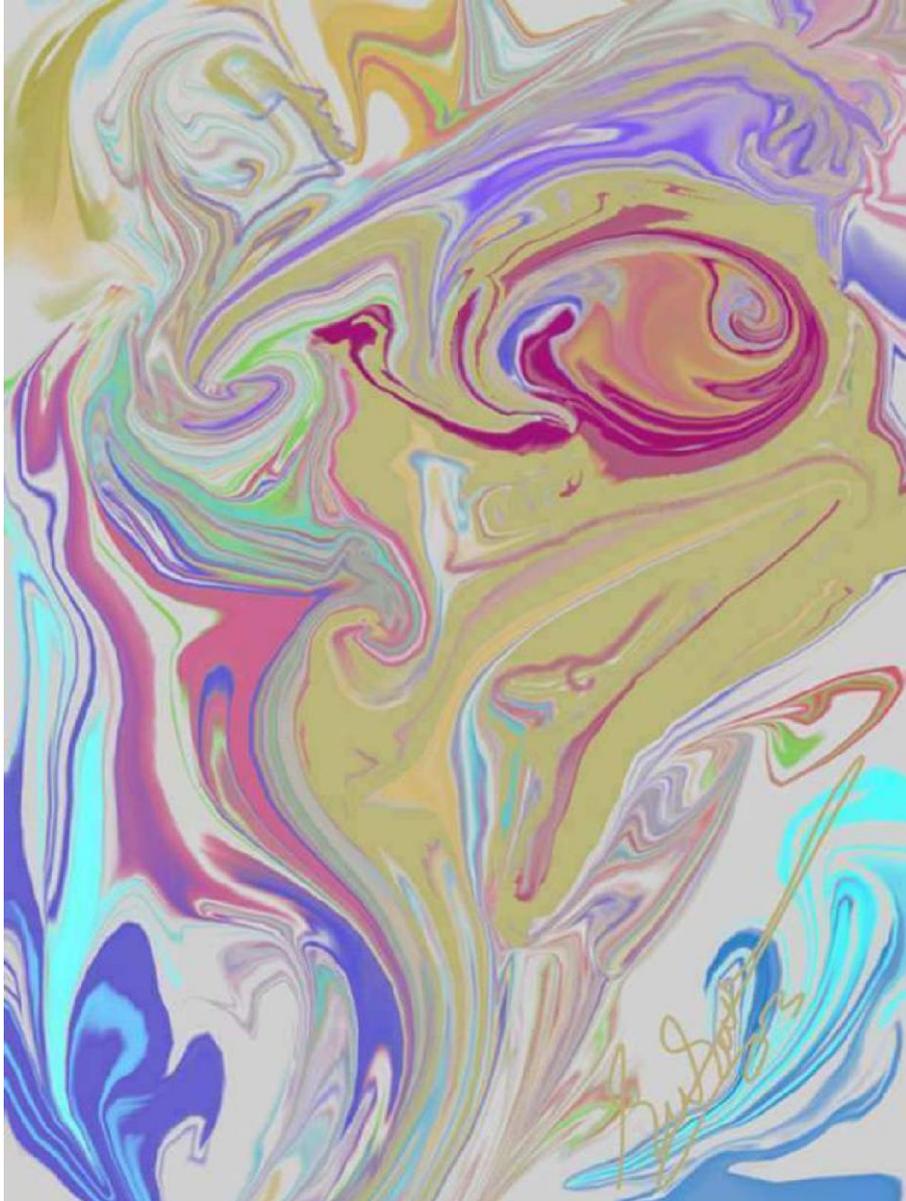


Figure14.3 The Printmaking of sixth image



The last image in this part is 'The Dancers'. The expression of an unidentified atmosphere created by the two dancers, increasingly defines a mysterious world in various shades of black, red, pink and purple (See Figure15.3)

This process introduced a fictional digital space in which a vanishing point perspective is the most important factor in the completed result. In such a post-surrealistic space the focus is not just been on the unconscious and conscious mind but the image can change itself into a new form, as in Figure11.3.

Seeing a man weaken before a strong and determined woman with the freedom to splatter paint like Jackson Pollock or take a stand against the ideology of the day like Martin Luther King or Billy Holiday reveals a link between learning life skills in a relationship and creating art. Such an interpretation of human biological cells points to the reality of the existence of the two dancers in every single moment of their performance. This investigation reached the point where time cannot be mentioned as just a measurement of the length of a process, which has been an important factor in the use of computer art, but it can be seen as a process in which real space prepares for the interactivity of virtual space. In fact, what I mean by the interaction of time and space is that the sort of space where time could potentially deploy third dimension into the two dimensional space.

Figure 15.3 The digital printmaking of seventh image



3.4 Digital print technology compared with making traditional print

Connecting with the national and international markets has had a significant role in the development of artists' creative talent, their professional lives and future potential. In many areas, digital markets have already provided opportunities for the development of their creative skills. The incentive to develop creative skill is the mark of a successful society which has created a streamlined movement to deal with art education as a creative process. In this respect, printmaking has become popular in Fine Art and has also become a vital part of creative expression. In the years ahead, digital print technology will enter the mainstream of art through various research projects. (Sounds Like Mexican Chuing Gum...!).

Traditional printmaking is a specific category in the field of painting, which has its own rules. The process of using any technique from beginning to end is different depending on which technique is being used; for example, Lino cut print, wood block, or even metal. However, students need to follow the same guidelines during the working process in each technique but the content of their final projects is based upon their individual expression. It takes weeks for students to make and test sketches in order to make them ready for their final projects. On the other hand, the movement towards the use of digital art might take time to be completed. Although, in traditional printmaking students explore traditional methods using different techniques, there is limited space for personal research in different media and the latest techniques.

“The high-end printers, despite having many variables, provide artists with high colour resolution beyond the adjustable settings to create the desired effect in the resulting image. Then it is a matter of how the artists pull it all together in creating the desired artwork (Sounds Like Mexican Chuing Gum...!)”. Accordingly, working in a digital environment potentially

provides opportunities for artists and students, who previously did not have the resources to explore various media and techniques, to use different formats for their projects. It offers an opportunity to further develop their skills, improve personal expression and make research possible in a variety of media and techniques.

In contrast to digitised ways of creating work, the traditional printing press was invented over 500 years ago when Johannes Gutenberg and artists such as Albrecht Dürer, Martin Schongauer, and Lucas van Leyden began printing engravings, but “Digital printmaking continues to evolve and improve. Now artists have drawn their attention to move towards their experiments to see new forms of expression in art, and to come up with unexpected failures. Printmakers could look forward to hardware and software improvements, new papers by Pictorico, Crane, and Arches Paper, and better dyes from Lysonic, Cone^{xii} Editions, and others(Sounds Like Mexican Chuing Gum...!)”. Thus any thing could happen during any digital art process. As previously mentioned, there is still plenty of room to expand and motivate new ideas in digital art.

It could reveal some potential point in using new technology beyond the variety of unexpected failures in a projects output. Despite the various advantages and disadvantages of digital fine art print and traditional print making, digital printmaking, enables artists to print their work without loss of quality and to manipulate images at different stages of a print's production. It is a new way of printing where artists do not have to produce a complete set of prints at one time while “there is nothing to prevent digital artists from producing more prints. However, traditional printmaking processes require an entire run be completed all at once and also, in most traditional printmaking, the plates are destroyed after the project’s done (Sounds Like Mexican Chuing Gum...!)”.

Additionally, using digital technology enables students to view their sketches from different angles or provide different viewing options for an enlargement, for example at 300 dpi or 150 dpi for the study of details, at the same time. A further advantage is the opportunity to select the best option and organise it as their final project. Thus, the colour archive displays the range of colours and, in this respect, the images in the archive are truer to the tonality of the originals.

3.5 Analysing the personal critical framework in terms of the traditional and the digital

The subject of using new technology in new art forms draws our attention to analyse the critical overview based on traditional and digital ideas, terms and approaches. In this context, artists and their activities are to be seen as a kind of investigation that shapes the knowledge of the process and critical thought. Indeed, analysing the current exploration critically in terms of new and traditional art forms will result in a mutual understanding of how creativity and the intellectual thought processes differ between the traditional and digital methods.

Although digital art enables a re-examination and exploration in contemporary art beyond the potential challenges in this area, other questions arise. For example, Does ‘...digital art provide(s) such extraordinary potential and has (it) already created such incredible platform to re form the notion of art?’, ‘What do we observe now with using new technology?’, ‘How do we define this?’ ‘Can we place this use of digital art within existing structures in fine art disciplines confidently?’ It is significant to maintain that digital art is developing in a way that we can't predict, but in this case it is hard to discover how it functions and which platform is compatible with the new ideas.

However, creating art using traditional methods gives artists the freedom to re-examine and re-experience their imagination until they no longer want to continue or finish their journey; but in digital experience work never seems finished. Most of the time, resources are changed and other procedures tried out but digital art is a process that leads to an unpredictable content, which is unique and encourages artists to explore further. In traditional art forms the subject changes but the techniques and palette remains the same. In contrast in digital art not only changes the subject but the techniques and palette also change and offer the artist new experiences to the extent that there is no destination in digital art. In fact the journey never seems to end. The need for any change is not restricted in a certain period of time like it used to be in the traditional art, it is a challenge for one's entire life.

The point here is that digital artists use digital technology as a medium. The computer and its components are only a technical element in their practice, and not the main thing. They just need to find the appropriate tools and a work area which is compatibility with their object in order to explore their imagination. Because the artist's mind always is looking for a new idea, their imagination moves beyond the existing devices they have previously used. On the other hand, digital artists want to experiment with a unique exploration, which is different from anything else in order to make use of the new possibilities available in the new art form.

However, digital technology offers greater scope, which the artist alone cannot solve because new computer programs need to be written. This is the moment in art where programmers develop their ideas based on the new requirements of digital artists, solves the problems and bridges the gaps between technology and artists' ambition. However, there might be some immediate restriction for artists but we have to accept the reality of digital technology, which will bring even higher quality and more choices for artists in the future. The issue of restriction in digital arts demonstrates an awareness

of further development of ideas and creative vision, already being used in their practice.

3.6 Outputting and Professional Values

When I came to the last step of my project, I had to consult somebody with expertise in printmaking. Thus, I needed to find somewhere with high quality printing to modify longevity, quality and the colour gamut in a print project, whilst charging a reasonable price for the whole process. I decided to contact the Apple print centre, where I had bought my Wacom tablet and met Sean Coding who was the PC adviser there. I talked to him about my project and got some ideas for the final process of my experiment. I tried to meet Sean after three months when my work was ready to print but he had been promoted to director of the “Square Group”.

To start my exploration, I was looking for a way to combine traditional fine art with digital fine art print. Firstly, I wanted to print my digital images on “silk”, a traditional material which I’d previously used rather than digital canvas or something similar in order to gain the same texture as the digital images. Secondly, I wanted to do some painting on top of the digital prints with traditional brush strokes and colours.

We considered the print process as a creative work based on a new achievement in printmaking, therefore I described the project’s objectives and asked that silk be used instead of canvas. However, silk was not a suitable print surface; firstly, because it could not be wrapped around the printer’s drum whereas other types of paper are made as a roll and designed for use in digital printers and secondly, the only surfaces the printer was adjusted for were digital canvas, watercolour paper or a similar material.

Consequently, the idea of using “silk” as a traditional material instead of the usual digital print surface failed as a process in combining digital printmaking and the traditional form. The next step was further work on the all-digital prints result. I tried to paint with traditional colours and brushes in order to do some additional work on one of the sample prints. I could not get as good a result as I did with batik painting for which I used silk. Indeed, the digital canvas was not a suitable work area for the batik painting, which is where I really wanted to carry on working.

Despite these failures and some technical difficulties, I decided to paint a piece on the digital work area and convert it onto silk in order to have experience in combining digital media with the traditional batik technique. That was an opportunity for me to experiment and understand how the digital palette can give ease of movement around the work area with the variable brushes. I converted the painting from the virtual workspace to the traditional work area which I had not done before. However, the differences between textures and brush strokes prevented me from having the same result in digital painting, but I discovered a new way of drawing. This enabled me understand the relationship between the digital and the traditional, and to respect the values of drawing lines in digital and abstracting them onto the traditional workspace to create a new vision of traditional printmaking. I asked myself how I felt, as an artist, about this piece of work in relation to work created by more traditionally methods and had to decide if I wanted to keep on working in this way.

The following week, Sean asked one of his colleagues to process the entire output via the Epson 10,000cf colour proofer using cyan, light cyan, magenta, light magenta, yellow and black colour fast inks. The output resolution was 1440dpi continuous tone. The paper chosen was Epson Canvas stock, Weight 390gsm. In order to gain brilliant colour in the outputting process, to balance the image stability and colour gamut, longevity and also fading colour in print making which depended on the stock, lighting conditions and even the

atmospheric conditions the high quality inks were suggested. However, their system was set up to a Euro standard colour process, which was not suitable for my artwork, they were run in a unique way and the process was one of trial and error. Indeed, during the colour calibrating process and after several tests, Sean and his colleague decided to leave my artworks in an RGB format and used a full gamut profile on the colour proofer to achieve the best results instead of using the CMYK format.

As a result of this I felt that I had to look for something extremely specific in my process as a new idea and go back to traditional methods in response to any resistance to boosting Iranian cultural achievement. That was when I recognized that it could be a way to combine traditional fine art with the digital form in art education. I envisaged works of art created with old and new techniques embodying original ideas making viewers a part of the artwork. I found that the major advantage of the computer is flexibility and the capability to experiment with the positioning of various elements, changing the size, and colour. This flexibility is also a disadvantage. When I am using traditional media, my options are limited because major changes require re-starting or re-doing a part of the picture, which can take a lot of time.

However, this could include digital images with various aspects of aesthetic quality and critical interpretation of digital prints combining painting and traditional art forms to provoke new thinking about our future. This could also evolve in a way that takes the outcome of the art away from the artist and puts it into the hands of the observer. The art could take the form of digital prints creating a unique product with new aesthetic qualities.

Cone, a developer of printmaking software, archival inks and a pioneer in the field of digital fine art print making since the early 1990s, argues that the move towards new technology is having an impact on artists of the future. He explains that since computers have had a significant role in classrooms,

universities and art students' studies, more and more students have been disposed to study new software applications to incorporate digital technology into their works instead of learning more traditional printmaking methods. He states that "art students could benefit from workshops to relearn traditional printmaking to show how traditional printmaking can be combined or enhanced with the inclusion of digital output". (Sounds Like Mexican Chuing Gum...!)

Designing workshops such as these may benefit art students by challenging their capabilities but the question here is how this could be achieved and what options they could look at. Clearly, it is important to go into detail with the techniques and differences to reveal whether there should be a technical aspect to the process.

What I have discovered about my work by creating a piece of artwork is that it shows the captured moment of my imagination in a real form. In this process I considered my ability to broaden the view angle of various opportunities, which was impossible in traditional form. That was an area, which enabled me to create several different frames and chose the best format compatible with the fantastic sense of the individual subject. However, in the traditional method I needed to create so many sketches for every single project and for any changes that I needed to start the entire work from the beginning every time. However, in the digital environment I could get to any part of the digital exploration simply and quickly. This perfectly illustrates the potential of digital tools to create and enliven the Fine Arts; it encouraged me to see what else I could find on the virtual palette.

3.7 Conclusion

This work shows the difficulties that may be encountered when artists and art students have not been involved with computers but where they have acknowledged using them to communicate and develop their creative talent. Essentially, the differences between *being digital* and *not being digital* does not point to “how innovative” but could streamline the pathway to the future and develop an excellent model of art education. The revision of art history over the last 60 years has shown that any new movements have been the result of the need for change. However at the beginning, most of them were rejected by society, but were they rejected just because they were new art? Or were they rejected because of the lack of understanding that resulted in such resistance?

The answer to both questions could be because of new art and resistance. Paul Valery notes that there is a physical component in all the arts, which can no longer be considered or treated as it once was and which cannot remain unaffected by our modern knowledge and power(Valery). Indeed, any new movement is new for an exact period of time and every period has its keywords, which help us to understand and describe it, it will not be any longer because society will change. For instance, Monet was creative for his period and Jackson Pollock’s action painting was new and creative in that particular period. How about now? Do we have to follow their styles and reproduce the out of date techniques or keep looking at an innovative movement while respecting the past?

Clearly, any new wave or new idea will take time to be accepted into and increase general knowledge and converting any doubt of those new ideas to trust. In many areas, digital fine art could place artists and students in a position to enable them to analyse any innovation in the digital world over recent decades. Consequently, the important point in this exploration of digital

technology is the opening into the practice of printmaking, which has its own disciplines.

The explosion of new technology over the last decade has meant an ever-increasing range of alternatives for artists looking to explore new resources. In terms of this, every aspect of life could bring innovative thinking into the imagination and insight to experiment with unique ideas and resources for taking any risk and challenge in art. Nevertheless, the creative learner aims to learn new skills and meet the challenges of a new movement. Although, the "digital age" is starting to crystallize into a definable movement, there is still plenty of room for expansion(The Daily Digest of Arts& Cultural Journalism).

A noticeable correlation here is the relationship of digital imaging to traditional painting. The simplicity of using digital space in a taught module could be a step forward in developing this module towards publication in a digital form on CD-ROM and exploring painting and drawing in collaboration with other media. It will also concentrate on the distinctive differences between projection and digital printmaking and find an appropriate answer as to how this would reflect in the process of creativity and learning and teaching. Accordingly, the exploration of this module will focus more on time and digital images in live performance as further work.

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Note

ⁱ <http://www.warhol.dk>.

ⁱⁱ Amerika was named one of Time magazine's top 100 innovators for the new century in 2001, in 2000, was known as a pioneer and one of nine Internet artists in the digital art field. His work was the first time Web art and selected to be shown at the Biennial, arranged by the Whitney Museum of American Art in New York.

ⁱⁱⁱ “Grammatron” took place in cyberspace, used a mix of images, words, music and customized computer codes that allowed readers to follow their own story line by choosing from multiple hypertexts.

^{iv} The second major web art project, which was nominated for an International Digital Arts and Sciences Web by Award PHON: E: Me, was an mp3 concept album that has sound, words, digital animation and customized code work. It was commissioned by the Walker Art Centre in Minneapolis and exhibited internationally at venues like the Centre Georges Pompidou in Paris and Videobrasil in Sao Paulo, Brazil.

^v [BSM] was ad319's first collaborative artwork, and also indicated the addition of Robb Springfield as the group's fourth member. BSM was produced both in CD-ROM format and on the web. The piece uses the human body as a repository for memory and emotion, and explores the notion that particular memories take up residence in very specific physical locations. Two years later a “printmaking studio for the 21st century” held in July 1997 at the National Museum of American Art and was an artist-in-residence there for twenty-one days with Krause a well-known, articulate spokesperson for digital art and professor of computer graphics at Massachusetts College of Art and the other four members: Helen Golden, Bonny Lhotka, Judith Moncrieff, and Karin Schminke; they come from various parts of the country and work together to gain recognition for fine artists working with digital media. In addition to their roles as artists-in-residence, they invited members of the public to play with the computers and produce small colour prints of their own. The week-long experience in September 1997 was designed to introduce a select group of museum curators to digital imaging

^{vi} Sefton Green, J Foreword by David Puttnam

^{vii} Jeremy is also a well respected artist specializing in portraiture and the human figure. Jeremy's artwork, which has been published and exhibited extensively, has won awards in contests that include the **1997 IdN Design Awards**, the **1996 Micro Publishing News Art Contest**, the **Bit.Movie '96 Computer Art Festival**, the **1995 Campbells Art of Soup Contest** and the **1995 Computer Pictures Design Contest**. Jeremy has a Bachelor of Arts degree in Physics from **Oxford University**, England. He studied art at the **Ruskin School of Drawing and Fine Art**, Oxford, and at the **Vrije Akademie, The Hague**, The Netherlands. Visit Jeremy's educational art web site, www.portrayals.com (recipient of **Animated GIF89a Artists Guild Grand Award**, **Magellan 3-Star Site Award** and a finalist in the **New Media QuickTime Web Challenge**) where, besides Jeremy's online gallery, you'll also find a computer art resource guide, Painter tips and information on output issues

^{viii} Miniature

^{ix} Interview, December 2002.

^x Written between 1177 and 1180, "Khusrau and Shirin" was dedicated to three patrons: the Seljuq king Abu Talib Tughrul ibn Arsalan, Atabak Shams al-Din Abu Ja'far Muhammad Jahan Pahlavan, and the latter's brother, Atabak Qizil Arsalan. About 6,500 distichs in length, the story depicts the love of Sassanian Khusrau Parviz towards his Armenian queen, Shirin. Shirin is in love with Khusrau as well as with Farhad, a famed stone-cutter, commissioned by the king to cut a channel in the Bisutun mountain. When the king learns about Shirin's love for Farhad, he becomes jealous. To test Farhad's love, he sends Farhad a message informing him of Shirin's death. Upon hearing this, the stone-cutter throws himself down the side of the mountain and dies. Khusrau lives with Shirin until he is assassinated. Shirin kills herself and joins her lovers.

^{xi} Jon Cone collaborates as master printer with a number of artists, such as Richard Avedon, Kiki Smith, Robert Rauschenberg, Gordon Parks, Helena Chapellín Wilson, and many others, and has seen a variety of techniques. For instance, paintings and other objects too large for scanning can be captured by digital camera. Hand-drawn lithographic separations can be photographed digitally, and then combined on computer before printing. A scanned, screen

printed, or digitally printed image may sometimes serve as the background for a drawing, photograph, or painting, all of which may be combined into a mix of handiwork and digital imaging that is digitally output to create an original work of art.

Chapter4

The Embodied Experience of Digital Painting, Performance, Multimedia and Printmaking

4.1 Introduction

Computer technology gives artists the opportunity of using faster and more precise digital devices than ever before. It also enables them to explore their capabilities beyond the restrictions of pencils and brushes. “Over the last decade the practice of graphic design has undergone a momentous change as pixels have become a handy substitute for print and software has lessened the profession’s reliance on its traditional tools of pen and Paper” (Charlotte and Fiell).

In fact, digital technology has new tools and resources which bring the atmosphere of innovation and experiment to our research cultures, and indeed to computer-enhanced research practices. More importantly, this new research area has currently provided digital resources for artists and educationalists to generate strategies and opportunities for creative education in the field of art. In general, it has a potential role in teaching, learning and research linked with new technology that would be an ideal candidate as an educational goal in digital printmaking or a multi-media programme. The impact of digital technology on art boundaries between disciplines is dramatic and leads to convergence with other disciplines (such as fine art, film, illustration, and music)(Charlotte and Fiell).

Such resources lead to new approaches in digital art such as combined programmes integrated with other disciplines which can expand students' professional careers in digital art practice. This allows modern universal education to become an important component of digital artists' exploration of the world in the last decade. The experience of fusing music and performance with painting is the objective of this chapter. These experiments are aimed at identifying:

- How paintings position themselves in relation to the music, film and video clip, in order to orientate and perform a task.
- How objects can be explored and used within a scenario in an interactive digital space.
- How preferable this fusion is when creating an image.

4.2 The unison of the project

Today, the art of drawing and painting together, has reached new dimensions and become an independent global visual language. It is an opportunity for an interchange of ideas and experiences and to introduce fresh ideas and fantasies of the artists' world, which are reflected in their imaginations and innovative practices. We must expect great innovation to transform itself and perhaps even bring about an amazing change in our very notion of art (Jarvis). An exciting challenge exists between technology, hand, mind and heart. It is illustrative to see how a virtual space has changed the traditional idea of art. The central point of the digital environment in art is not to reproduce the real world but to create a new form, which will present various unique interactions. The experiments and experiences reported here are concerned with the following key issues:

How the fusion of interactive digital art presents new perspectives in the field of painting.

Whether digital technology be used to enrich the context of interactivity.

The techniques and media which could be used in order to take advantage of collective methods in fine art.

Digital painting plays an increasingly important role in the imagination and allows the viewer to enter into a dialogue with the computer by interacting with graphic structures through media installation. Once I planned to take advantage of the emphasis of multimedia and music on painting, I started to create something new. As I was interested in something radically different, the collaboration of music with painting was a key idea. Using traditional music was not my objective in this research, although any digitally enhanced traditional music would be suitable for my idea.

I looked for some kind of digital music with the theme of myth and the values of Iranian culture. I searched the Internet for known Iranian researchers or composers who had recently worked and composed digital music. After many hours searching different sites and listening to sample music, finally I found my match.

Kiawasch Sahebnassagh, composer and computer-installation artist, has a theory and philosophy about art and music which appealed to me. He has produced recognised works based on electronic and computer music. We had a progressive debate about the role of digital art, which has taken a leading role in some artists' lives. Our discussion aimed to reveal the value of using computers to find new ways in the true sense of the word and we were able to draw up an agreement for our first joint project.

4.3 Personal experience

The term 'digital painting' as it is understood in contemporary art is the use of a variety of digital techniques in order to modify images on screen and use them to express ideas. Using the possibilities of digital technology has

brought the opportunity to focus on multimedia packages and the ability to apply them in practice. Now we are in a position to evaluate the possible impact of the transition into an era in which simple images can be replaced by motion pictures. To me, a move from a single image to creating a project with a metaphorical theme linked to new technology had a potential role as an exemplary study.

“A travel inside the body” was an initial attempt beyond painting to create something simple but at the forefront of critical issues affecting both music and painting. It expressed the evolution of forms with powerful new imagery and a revised sense of surface and presentation, as well as techniques which could enrich and enliven the fine art world. Paul Klee and Kandinsky are two remarkable examples of artists who were influenced by music in their paintings. My additional emphasis was to express spiritual values and explore this relationship closely.

I wanted to represent the heart and the soul of music, art and the spirit to make a positive impact on the lives of artists, industry and our society at large. Painting is one of the best elements of expression but the addition of music is another element beyond that which can interpret the internal expression even more effectively. Indeed, music can respond and appeal directly to the artist's ‘internal element’, which Kandinsky calls the period of the great spiritual. For instance, it can be seen in “Kandinsky’s ‘Impression III’ (See Figure1.4), which is the expression of internal feeling that is impossible to describe with the traditional vocabulary (Meyer)”. That was exactly what I wanted to achieve.

In the virtual studio, the representation of a figurative character drawn in an expressive ways was an essential aspect of this project. Beyond that I was so fascinated by the emotional power of music to invite viewers to move smoothly inside the inner part of body and to release them in what they see,

imagine and interpret. However, music is expressed through sound and time, it allows the listener a freedom of imagination, interpretation, and emotional response through the images. Saheb Nassagh's music in digital media had an important sense of emotional power and presented aesthetic ways to form and manipulate audio material. Ultimately, it represents a working towards an understanding of the relationship between the actual and virtual forms of the body.

The process consisted of a single image that was used with other images to demonstrate the body of the animated work resulting in an interaction of digital painting, multimedia and music. The visual effects, building on the "still imaging", software applications for image processing and movie rendering in the editing process required adjustment. This made it possible to modify the images and to add music on the screen as an entire movement.

Figure1.4 Kandinsky and his 'Impression III

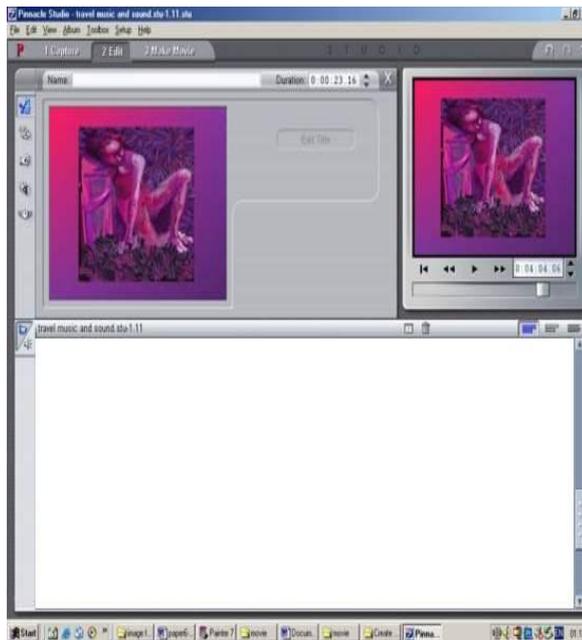


In this particular piece the processes and descriptions of how to interpret the music are directly related to the act of collaboration. In fact, 'music' is an

effective language in which visual art can demonstrate the inner expression more efficiently than creating a single image based on the entire context. It communicates with images and generates a descriptive and an explanatory dialogue. In this way the computer opens up the way to go a step further than existing methods and to enter the arena of limitless effect with shapes, colours and music. Such an experience gets to the root of emotions, feelings and advances in a new art form.

“A travel inside the body” was an experience which enable students to use digital tools to create a unique project and to engage in aesthetic and conceptual practices in contemporary art. However, observations and the evolution of forms and ideas were the nature of this project; I could explore my passion through the creation of images and objects. The interaction of digital painting with music caused me to take personal risks and rethink nearly every aspect of my work in order to devise new virtual techniques (See Figure2.4). These investigations helped me access my own beliefs and my ability to understand the world in a broader context.

Figure2.4 The process of interactive digital painting with music



The journey of the first project for me led me to plan another piece and to express what music does. A piece that captivated me was ‘The Lullaby UnderThe Ruins’. Kiawasch had composed this after an earthquake in 1990 which demolished the beautiful city of Roodbar, situated in the mountainous region of the province, 268 km. from Tehran. As soon as I listened to this piece, the sounds seemed to surround me and released a great motivating energy. I tried to visualize the scene with visual representation of the information and image examples including 2D Illustrations, photographic copies, each in varying degrees of detail, pattern and colour of the various parts and created the work with energetic brushstrokes, even as the sounds were created with great energy and named it ‘Sense of Life’.

‘Sense of Life’, (See Figure3.4) is the portrayal of a story including events, physical movements, and even interaction between the various media, it leads to a sense of discovery and practice (SeeFigure4.4& Figure5.4). It demonstrated an expressive process of the human sense, wishes and hopes when livelihoods were destroyed (See Figure6.4 & Figure7.4). Music and painting work hand in hand to express the lullaby under the ruins, which could still be heard (See Figure8.4, Figure9.4 & Figure10.4).

Not so far away, a little girl had layed down and died when just a minute before she was imaged as a wonderful piece of abstract expression which stressed values such as self-expression and emotion in the real world (See Figure11.4). There was nothing left except her colourful scarf under mountainous soil (See Figure12.4). To me even that was an interesting abstract vision between death and life. This project increased my passion to work with music in my painting. It helped me see all the images in my mind and have them before my eyes. It was at that special moment when I realized painting could develop powers in the same way that music does. Besides, the lines, colours and pattern of the circles in images symbolized the wavy atmosphere in association with the composition, which allowed the music to come forward and to express feelings of sorrow (See Figure13.4 & Figure14.4).

One of the most important things to me was the integration of music with digital painting which was directly influenced by the music, where Kiawasch Saheb Nassagh’s music took me out of reality and moved me in my mind to know exactly *who we are, where we are, and why we are here.*

Figure3.4 The journey of the second project



Figure 4.4



Figure 5.4

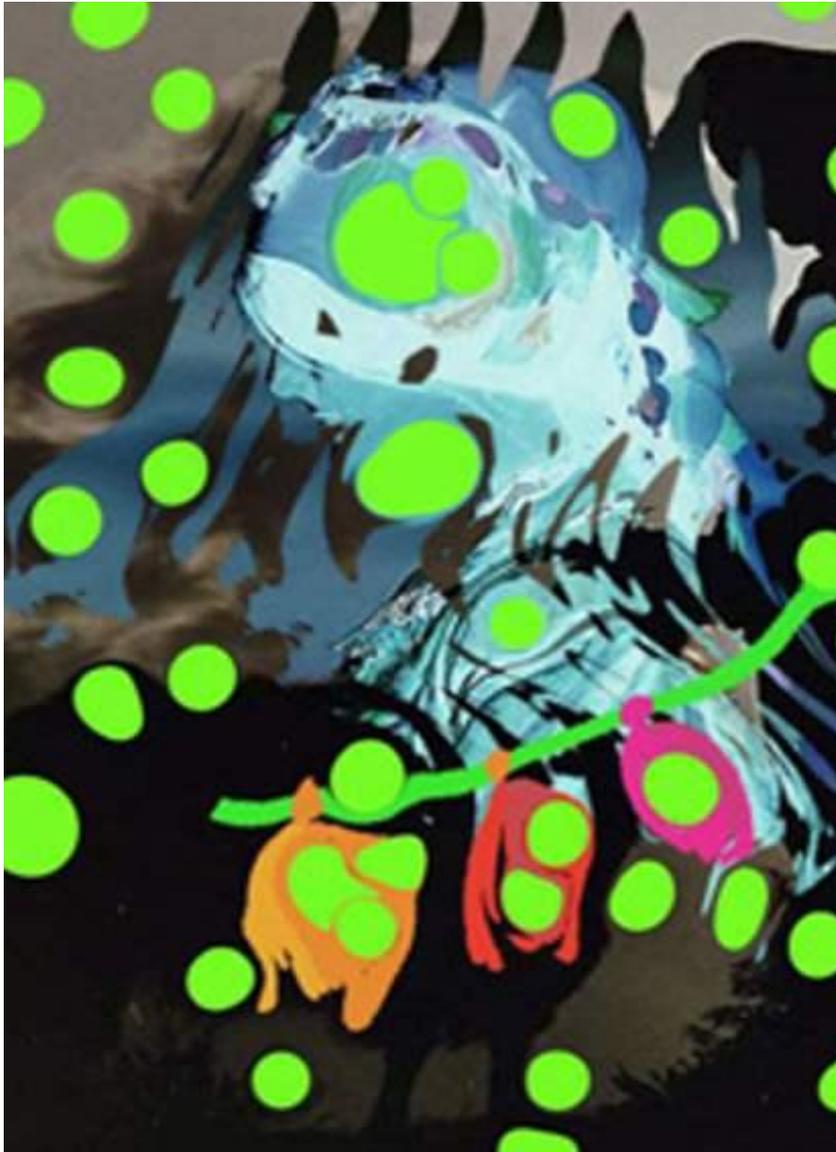


Figure 6.4

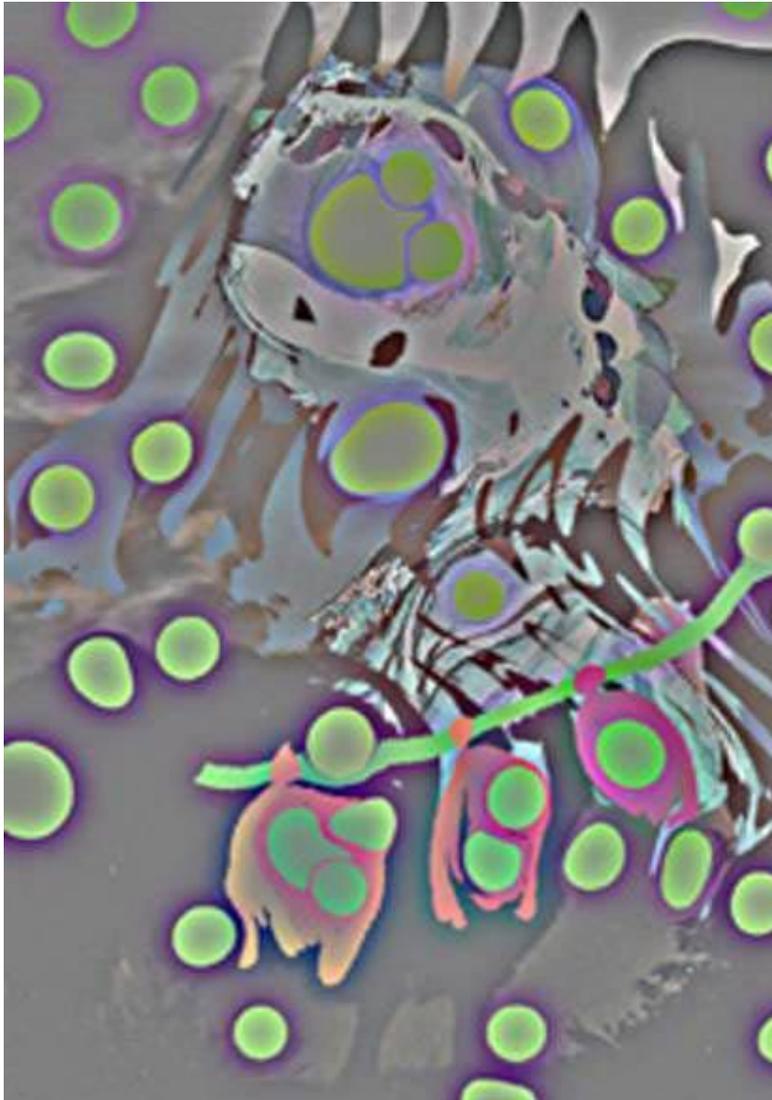


Figure7.4



Figure 8.4



Figure 9.4

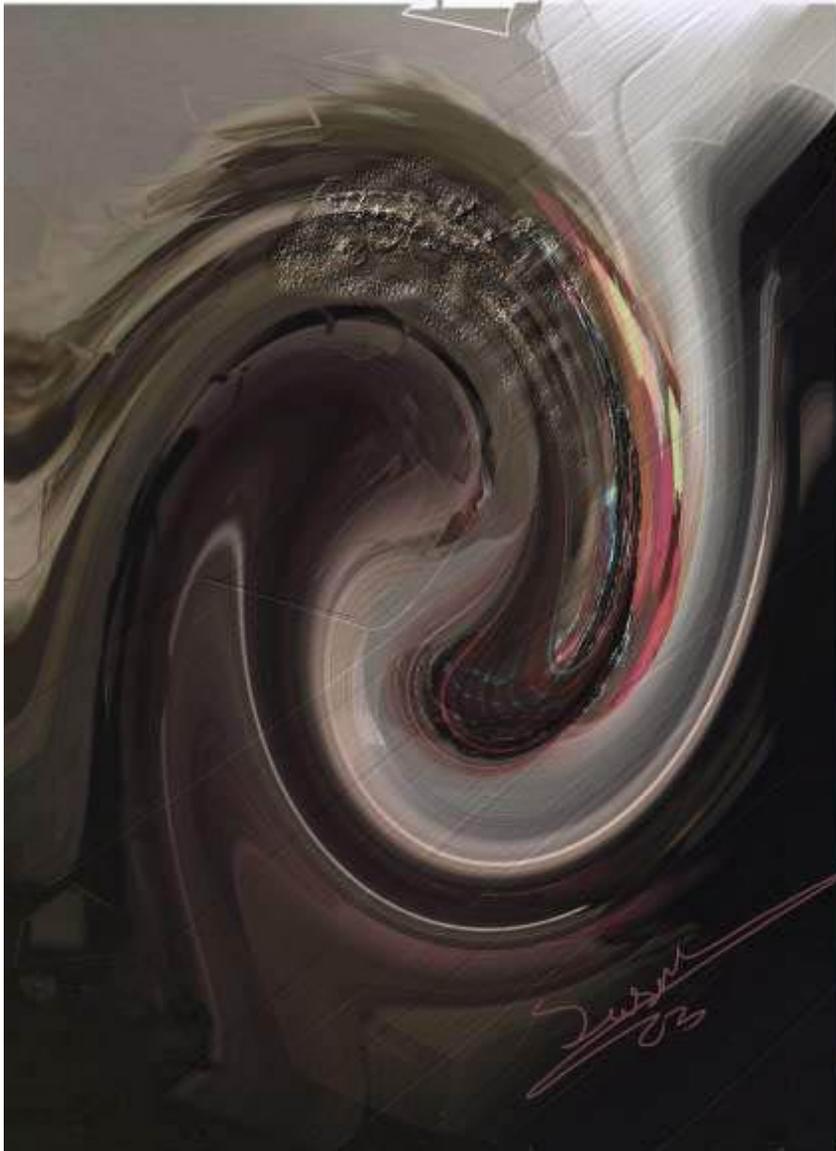


Figure 10.4



Figure 11.4



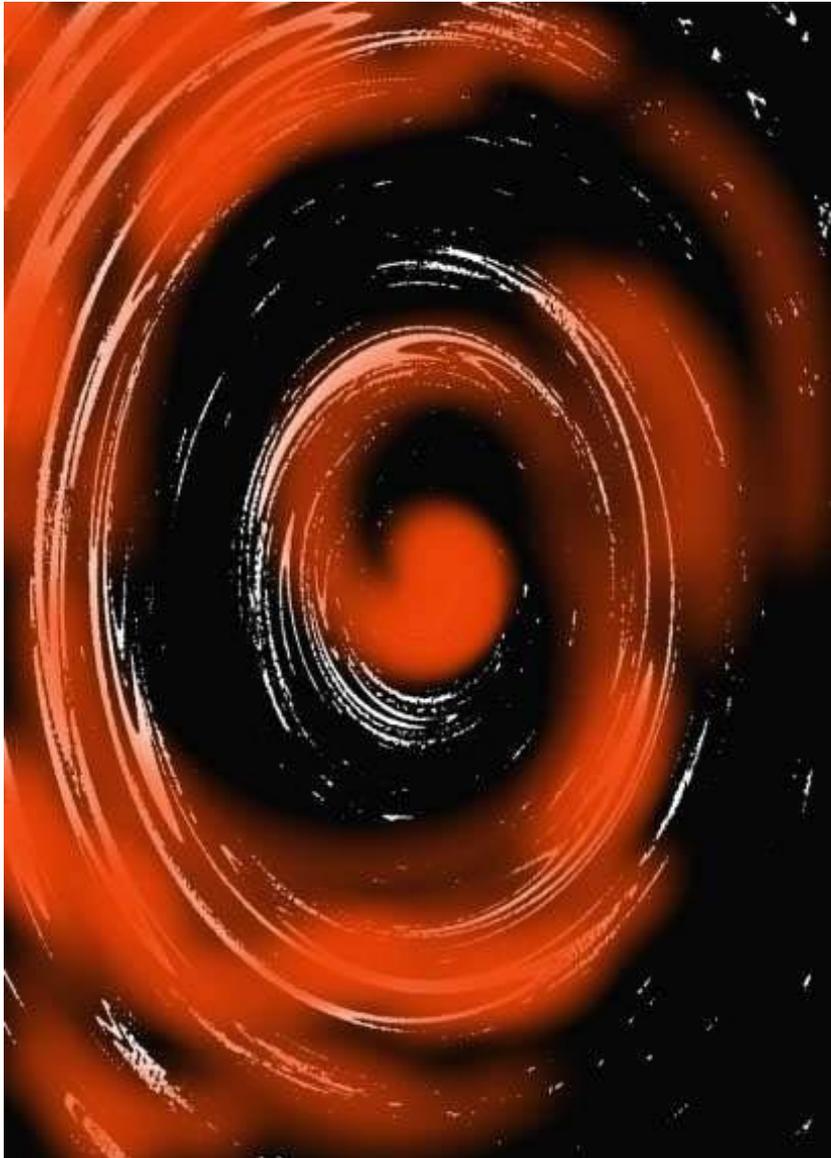
Figure 12.4



Figure 13.4



Figure 14.4



4.4 Taking risks in an interactive digital art experience

The challenges in contemporary art have influenced, not only students' propensity to visualise and interchange ideas but also the ways in which they interact with each other through their art. However, digital technology has been applied in important areas of science and technology, but its influence in the arts has not yet been felt as much as we might expect in the educational sector (Franke).

Digital technologies could, in fact, be used to change the way we think rather than the way we do things. It could be a way to learn the most effective use of technology in education as a process and journey in our life, not as a destination and actual result (Blount and Lowell). Paul Valery emphasized his indicative notion about new art 60 years ago:

“We must expect great innovations to transform the entire technique of the arts, thereby affecting artistic invention itself and perhaps even bringing about an amazing change in our very notion of art” (Valery).

Over the years, the value of his idea has been seen in the creation of the ‘New Method’, opening up a new direction in digital art. Thus, we have to consider the latest digital developments in a new practical notion of space. The need to communicate is the moment for expression and the representation of merit and perfection in the end result. To that extent the following key issues, will be introduced:

- To take personal risks.
- To understand the importance of process in practical process.
- To develop guidelines and best practice.
- To explore strategies for maintaining digital content.
- To experience progress in new areas of virtual space.
- To exercise the ability to create new art forms.
- To explore personal expression through digital art.

In light of the above, artists need to present their creativity beyond the traditional media available and explore how the interaction between them and their audience can be achieved through their art. Painting or some other creative means of expression must be able to communicate and transmit the idea of using new technologies. At this stage it is possible to maintain that technology may not completely change the way fine art is taught but will provide a range of useful tools with which artists and students can “take risks and embrace opportunities to integrate computers into their art works”(Baumgarner).

I decided that I preferred my artistic experience and development in the fine art discipline to expand through forms of art other than painting and expected improvement rather than perfection in my work. Analysing knowledge and learning interactive approaches from my experiments encouraged me anxious to think critically and find solutions when any problems arose. This kind of practice in new media showed new forms of interaction to convert it into another form of art.

The second part of this investigation showed how students could use their passion and take risks with the interactive process in the world of multimedia. In this case nothing could stop me taking risks and exploring my talent in different workspaces. Therefore I decided to try a new media technique currently being explored in the creation of art, namely video art, digital installation and digital painting. Although, the term ‘modern technology’ includes many areas such as digital painting and multi-media applications, the practices are varied, and depend greatly on the involvement of the individual. I preferred to provide productive learning knowledge, which could be modified to the personal needs and interests of students at the end. I was in a situation where I could analyse how much the use of new media in learning and teaching offers new possibilities for the processing of knowledge.

So, when my supervisor, Barry Edwards, invited me to work on his video clips I was very excited (See Figure15.4). This experience was extraordinary because in this project I had to work directly on moving images, which was completely different from the first two projects. An important issue here was how this work translated into another format and how reproduction of a work may convey particular characteristics of that work, but is dramatically different from that work. Therefore, I had to find a compatible movie program, which would allow me to change, edit and move on to another programme. Among the variety of multimedia programmes I chose Premier, which was compatible with my favourite programme, Painter (See Figure16.4).

The first step was to find a suitable platform to work on the captured video footage. I used its facilities for making a new format of the original video footage. After finding a compatible programme I needed to transfer it onto the editing timeline. Then, I had to re-edit the video and divide it into small parts and which were worked separately. It took time to divide the original movie into particular parts based on the chosen timeline to make it possible to open in Painter. Therefore, if the original movie was more than 18000 frames then it would be divided to at least nine parts in order to gain accurate results at the end (See Figure17.4).

Figure 15.4



Figure 16.4

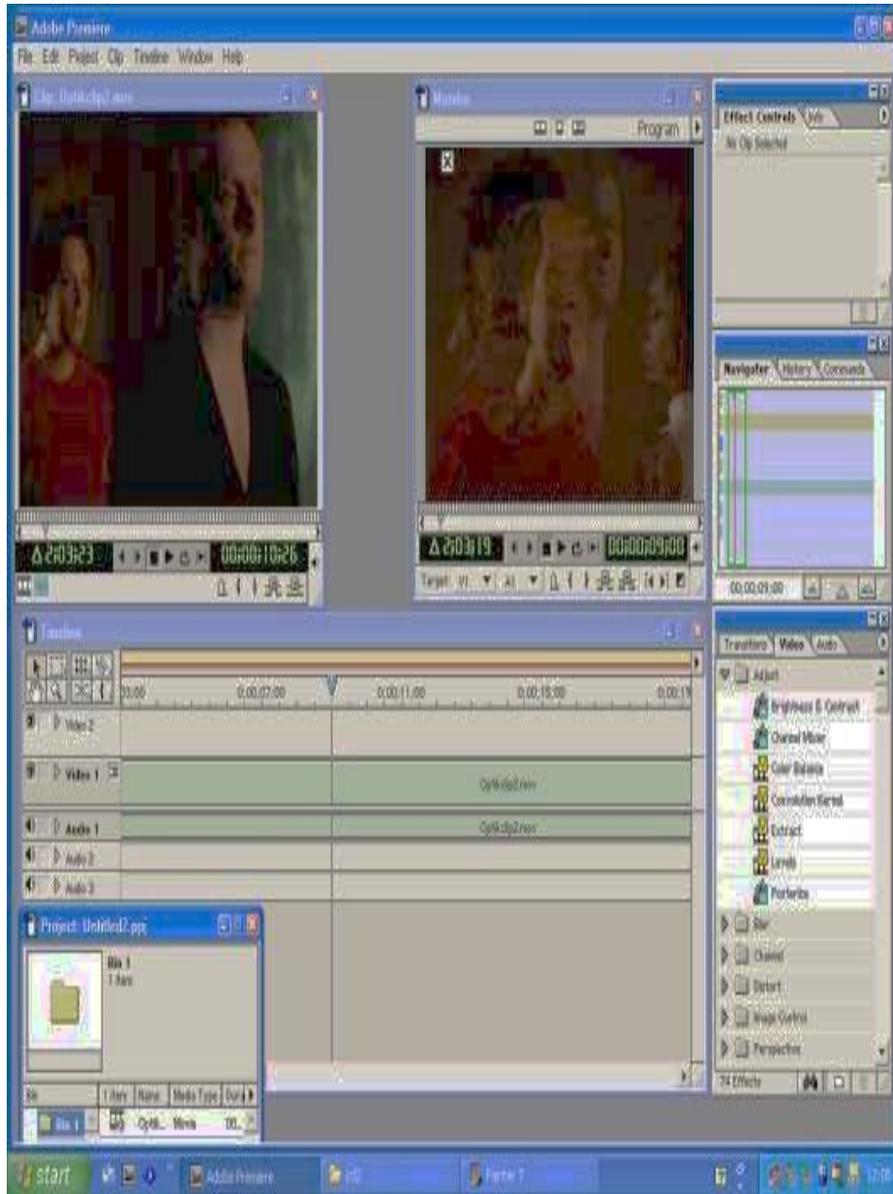


Figure 17.4



After continuous trimming, I had to export each trim into the compatible format for Painter and Photoshop or other relevant programme. The hardest part of this project was working on every single frame, which took a long time. The frames needed to be regulated, to adjust the changes in each frame and complete the entire sequence from the first frame to the last frame.

For example (See Figure18.4), in one shot, there were at least 30 frames of a simple hand movement. Therefore, I needed to start adding new and attractive features, or use a particular brush stroke frame by frame. More often, I had to go back and follow my previous drawing line and I continued towards the last target. It was difficult to make a slight change or to create a line in each frame in order to make an animated painting and to develop the entire change in the last frame (See Figures19.4, 20.4, 21.4).

Many times I needed to change everything, to start with a new palette of brush strokes, and a new colour set to express the particular shot. Once I had to keep the chosen colour set in one shot and match it with the collection of colour sets in the rest of my work to harmonize the colours in my workspace.

Figure 18.4



Figure 19.4



Figure 20.4



Figure 21.4



The research in this study was intended to highlight new approaches to enable students to learn and progress but it also gave me confidence and a new avenue in the field of digital research. From such a base students can develop the ability to analyse facts, generate ideas, defend opinions, make comparisons, draw suggestion, evaluate arguments and solve problems. Digital technology has provided a unique space for students to better understand themselves, take risks in their practical education and become involved in virtual environments to exercise their imaginations. More importantly, using new techniques will create a critical platform for students to promote the solutions and choices that digital technology can offer.

This exploration also looked at moving pictures in significant poses and captured them as a perfect motion of body movement. All the captured movie images were kept in specific folders for further exploration in digital printmaking in different palettes. This was really useful and saved a lot of time when I wanted to create something unique from many media sources. Next, I tried to change the colour form and composition of each image within the trimmed clips. I concentrated on colours and dissolved colours in some images, which was an expression of the existence of energy when performers crossed each other (See Figure22.4, 23.4), or moved along together in unison (See Figure24.4) This technique aimed to activate the sets of new colours, new shapes and created mysterious motion sequences as new frames were inserted between existing frames. In some other parts of the exploration I focused on form and composition and changed the composition by adding new objects (See Figure25.4) or using a particular brush stroke to create a new vision (See Figure26.4).

Figure22.4



Figure23.4



Figure24.4



Figure25.4



Figure26.4



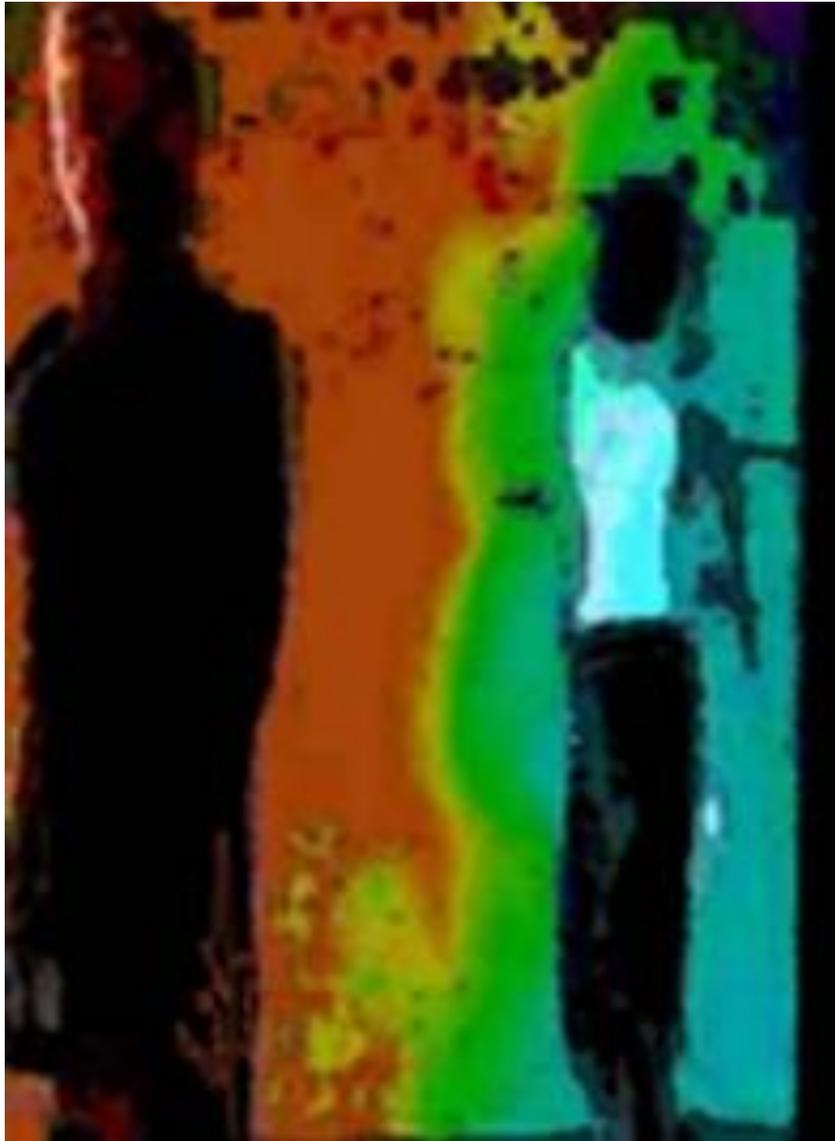
The last step of this exploration was to create new images for digital printmaking. I chose some attractive poses, which I had already saved in a folder. I then painted directly onto images taken from video footage and created a new background in order to make a complete change in the virtual canvas area. This allowed me to develop my imagination in each canvas individually. I explored my experience in the extracted frames, a process of using a variety of brush strokes, filters and introducing new colour sets in each frame. The abstract of body and movement in each image was the interpretation of a story, which, to me, flourished inside them. Working in the virtual palette offered many choices for changing the texture colour and even the figure simultaneously. These investigations gave me the freedom to choose the best composition on the canvas area and also the opportunity to save any changes to the file for use in other projects. For example, in the first attempt at 'The Relationship' (See Figure27.4), the tangible changes were focused on the relationship between two bodies.

Choosing warm colours surrounded by a dark background around the canvas created a mysterious atmosphere in this piece. The abstract expression of these two figures takes viewers on a secret journey in the scene; however, the composition itself creates a strong relationship between the two figures while each of them acts separately. In this particular composition, the colours have an important role in expressing the feeling between the two figures and also introduces an harmonic and imaginative view to the scenario. Splashing the colours made by watercolour brush strokes, brings the work together (See Figure28.4), and the silence of the darkness makes the dissolving movement of the figures much smoother. The textures and colours all work together to increase the sensibility of the scene and attract the inner eyes throughout the piece.

Figure27.4



Figure28.4



I experienced an extraordinary moment when I watched the original clips several times, trying to catch the perfect pose of these two performers each time, to re-create it and make an abstract surreal/abstract expression of these figures. As soon as I captured the desired still images, I chose the one with the best expression and position as a perfect base on my digital canvas. It was also an opportunity for using the other media, within an interactive environment. This goes beyond simple movement into creating an environment that seeks new exploration in art and technology. To me, as a student or as an artist interacting with the various media, it leads to a sense of discovery and practice, which develop fresh ideas about the unpredictable process of artwork. Although, David Ross has indicated the unpredictability of digital exploration and its function at the basic and complex level, the digital exploration was hard, even for him, to understand and looked like moving in the dark(Ross).

Indeed, these kinds of exploration in digital art are an unpredictable process in a new art form but can be defined as knowledge that artists have never seen before. Although, digital exploration is not hard to understand, it takes time to value its capabilities and use creative thought in an innovative context. It is like moving in an unknown world rather than in the dark, when, with every touch, so many critical ideas illuminate the new aspect in virtual space. Using digital art opened and broadened my vision to the world and certainly felt like something new when compared to traditional art. The unknown mysteriously sparked my passion, fired my enthusiasm to learn more and highlighted the opportunities for further possibilities in the world of digital art.

My second experience in this series of work, 'Mask' (See Figure29.4) was concerned with rich colours such as deep red or pure blue. I began to paint the expressive possibilities with a definite kind of visual space in this canvas. I used another still image from the captured video footage, added new colours

and used watercolour brush stroke to create an appropriate workspace (See Figure30.4).

I had the idea of superimposing the floating forms and colours onto some of the objects as well as uniting them, which seemed too discrete. The main composition was focused almost in the centre of the canvas and roughly to the edges, which I kept dark in order to increase the communication with my viewers. The ready-made captured image was kind of a background or texture for the fusion of such a creative experience, which helped me to develop my imagination and create a new palette in digital art in combination with digital multimedia (See Figure31.4).

Figure29.4



Figure30.4



Figure31.4



Essentially, this activity was a fusion of the knowledge of:

- Techniques
- Skills
- Abilities
- Attitudes
- Interests
- Values

To develop the understanding, it must be recognised that learning is not just about gathering information; it is most effective to use a context as a part of the educational process. Every single activity will encourage students to explore further and find new approaches to their own individual process of learning. Accordingly, the main practice of this study concentrated on the development of new creative approaches to movement, performance, creativity and collaboration with other art forms. These approaches focused on the virtual space and embodiment of moving images and also on an exploration of the relationship between drawing, paintings, multimedia, new media and their potential for the combination of art methods. In this manner, learning will move beyond the context and skills, and incorporate critical thinking and appropriate analytical questioning.

The analytical theme in the third experience ‘Body, Movement and Conversion’, was an emphasis on the floating energy among the three performers when they crossed each other. The invisible energy floated over the three performers but I wondered how I could illustrate the sense of the physical body and asked if it would be possible to view their interactions and relationships in the confines of time and place.

Indeed, the angles of vision of the three performers had a distinctive relationship with a kind of geometric shape, which brought them together in an unusual vision. The sense of physical body in this particular practice was

not about 'how visible it was', it was about the expressing the invisible existence of energy surrounding the physical bodies as they moved from one position to another. The virtual palette was useful in exploring the importance of time and place and the fact that everything at every time and in every place exists simultaneously and the mixture of yellow and orange, created a thoughtful atmosphere in a shadowy storyline (See Figure32.4).

The creative notion of this practice directed my attention towards the body's values in a way that demanded my imagination portray its capabilities in a format beyond the 2D dimensional space. Digital art helped me to pass through the human skin, move into the inner shells, and feel the human cells one by one. I began to experiment with modifying the virtual patterns made of pyramids, spheres, and changed entire bodies to a geometric surface of the three dissolved bodies visible with inner eyes.

This exploration gave me the opportunity to study different compositions built in the virtual world. I was able to position different filters and use different brush strokes to create a comprehensive work combining technical and theoretical aspects of digital art. However, working on traditional canvas has its own expression in creating the variety of brush strokes based on the subject, but traditional canvas and the traditional palette were unable to express the particular scene as expected. The process of seeing the body and its interaction with other bodies needed to be explored in a reflective virtual environment with the use of appropriate brush strokes and filters. I managed to progress and expand my imagination by exploring the interaction of time and place experienced in crossed images in the real 3D dimension, which is our life. This led me to think about interactivity, body movement and their reflective positions in time and place for my next project.

This same scenario could be applied to students' work and their activities. The alteration of the original image and its reproduction as a new image will play

a critical role in the senses, imagination and physical integration to communicate ideas, and form a critical discipline in art. This process will lead students' work towards different contexts and will provide different opportunities in terms of artistic production. In accordance with my experience, digital technologies have built up a new pathway in the world of contemporary arts, have brought up the issues of exploration beyond current limitations, and have made artists move one step further towards valuable educational connections.

Figure32.4



The next image ‘Body, Movement and Conversion 2’ (See Figure33.4), was specifically directed towards the concept of digital painting and its relevance in the digital still image taken from the video footage. In this process colours and shapes were considered as an essential phase of a project. The exposure of deep red passing through purple was the expression of human senses where the artist can taste shapes; hear colours and experience other sensory crossings throughout the body. In fact, it was an exploration of the senses, which extended beyond the physical restrictions of the body and attached themselves to the world of the virtual.

Thus the use of digital technologies offers students the opportunity to enter into a sort of dialogue with their creative capabilities. The reason for using still digital images as a basic application was to revitalise the relationship of software programs and the physical body in the digital environment. It will also put students in a position to evaluate the possible impact of the transition to the new art form. In this regard, I drew on my entire experience in painting and highlighted the unexpected possibilities in digital printmaking that may influence students’ behaviour and thinking.

Figure33.4



4.5 Potential contribution to digital understanding

Anne Morgan Spalter, in her book “The computer in the Visual Arts” put another theoretical discussion of computer graphic and interactive multimedia on a new footing. She opens a debate concerning the development of the computer and digital combinations by showing artists’ approaches, their comments and new opportunities through the graphic medium. Her book emphasises the variety of art work of contemporary artists, designers, illustrators and photographers such as: Andries Van Dam, James Faure, Alvy Ray Smith, Roger Mandle, William J. Mitchell, Michael Wright, Joan Truckenbrod, Richard Rosenblum.

More importantly, she focused her attention on: ‘how computers are used in art and design. In fact, she revealed the actual use of computer, its efficiency and confidential space for exploring new options. Morgan’s book is an example of exploration in digital space, which enables artists to examine other possibilities in one process and to look for varied choices in particular investigations. In chapter 11 she turns her attention to interactive multimedia as a technical challenge in creating a multimedia piece in order to integrate multiple data types. It seems that, for her, ‘multi’, refers to the various types of ‘data’ and input and output that are combined into a single creation (Spalter morgan)

Thus the term ‘data’ is based on its dynamism and not just based on making artwork with more than one medium, as is already evident in the theatre, mixed media art works and movies, so it is not actually new. The point here reveals that the combination of theoretical issues and physical tools for photography, animation, video production, and programming are now united in a single studio in a box. In the light of this students can explore their imagination beyond 2D, and even 3D dimension in order to broaden their professional artwork.

According to Scott deLahunta new art forms such as photography, film, (digital print making and digital painting and installation) will have an impact on theatre and dance and that, along with them, new media technology will give rise to new art forms. He has also indicated that a re-invention of live performance can take place from inside its existing forms and from outside in the development of new art forms and disciplines.(deLahunta)

In fact, creating an innovative exploration may integrate the learning process for special purposes. Therefore, using a new art form will develop traditional thoughts and encourage students to navigate other angles and see beyond the window. In this regard, however, a number of experiments are in progress but there is much unexplored information that needs to be exposed and to bridge the gaps in the entire knowledge of digital art.

4.6 Conclusion

The meeting between painting, performance and multimedia portrays the fusion between artists, the process of the artwork, interactions, and creative changes. The major theme of the use of digital technology in painting is an insight seen as a dynamic process, causing a change in reality based on students' attitudes and their actions. This can change students' vision to be self-challenging and as a reflective learning process.

As a result, we need to provide a place in the curriculum for students to reflect critically upon the nature and implications of technology while they are engaging new technology in their professional studies. More likely, the use of new technology uses an apparent interface that encourages the interactive learning processes and modified artistic environment to give students the potential ability to change and begin to take shape. In fact, the challenge is to help students and artists become better tool users and focus on the quality of the activities enabled by the technology.

On the whole, creating a new archive taken from raw data, provided me with a new opportunity to follow my passion for collaborative research across disciplines with other materials. In fact, it brought a hope that the continuous demand for collaboration in the development of fine art and technology may arise and persist in the future. It also highlighted the fact that the creation of new multimedia projects generates a powerful motivation. I intend to collaborate on interactive methods to consider how they can be applied to both educational and artistic environments. My next practical project will look at technology and the virtual environment.

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Chapter 5

The Embodied Digital Journey Beyond Modern Physics

5.1 Introduction

This chapter will be a stepping stone to the next two chapters, where we can create what we perceive about the world around us and see the vision of human self awareness, cultural metaphor and the new form of art. It is an attempt to value the power of human imagination in the convergence of modern physics with a deeper perception of the universe. Regarding this envisaging of a new world wherein physical and spiritual dimensions are rediscovered may have a crucial role in artistic productions.

According to physics, the world around us is made of molecules and atoms, these ideas were developed by Albert Einstein, Neils Bohr and Werner Heisenberg in the early twentieth century and were organized and redeveloped by Planck as ‘The Theory of Quantum’. Quantum theory developed as a new notion in physics to understand the essential interaction of matter and the radiation effect, which could not be satisfactorily explained by classical physics during the early 20th century. (Whitaker)

The idea of quantum theory and predicting new dimensions in the universe was an extraordinary development in the world of physics. According to

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Michael Riordan modern physics had a crucial role in the history of the 20th century, he named it 'the birth of the Information Age'. It has also impacted on other sciences, for instance: astronomy, biology and cosmology, which have changed the way of thinking about nature and the universe. (Riordan). In particular, it was a great achievement for physicists, scientists and even artists to know the reality of universe. It also enabled them to bridge ancient philosophical thought about the human mind, the universe and the world of quantum.

Modern physics theories such as quantum fields and virtual dimensions aim to investigate quantum theory and may have a considerable effect upon the creative process. That led me to think about exploring the idea of using physics to express myself and to see the objects or subjects of my work in terms of quantum theory and virtual dimensions rather than the other evidence in physics. In fact, the idea of better observation of quantum theory, modern physics and the convergence with philosophy heightened my self-awareness enabling me to know my world better and so demonstrate my passion and expression in a practical process.

In this chapter physics is interpreted from an artistic perspective. However, the aim is not to open an extensive discussion about science or philosophy but to reveal the notion of the human being in the external world in an artistic sense and to explore the functions of the brain in the internal world.

The focus is on asking questions about our being in terms of physical and energy forces, extending to spiritual existence. I focus on recent scientific research on time-space, matter and consciousness to investigate the knowledge of the reality of our mind and the role of our consciousness in the physical world. Basically, this provides the background to an understanding of modern science; taking a historical, cultural and philosophical view of our

ideas about ourselves may change the way we see the world and ourselves as an interactive body.

5.2 The human body, the mind and consciousness in the world of quantum

The human body does not consist of just the physical body with a brain, but possesses something extra and independent of the body based on the nature of being. Science may contribute to future studies of the relationship between the brain and the mind and there is still much discussion, argument and comment about human consciousness as modern physics has aspired to know the reality of human body and mind.

New research on this regard has focused more on consciousness and philosophical arguments about mental worlds and quantum mechanics than attaching to the theory of brain and the function of cortex as matter. As Dona Zohar expresses in her debate on quantum theory:

“Quantum theory is our most successful physical theory ever. It can provide us with a radically new understanding of various aspect of our experience... We conscious human being are the natural bridge between the everyday world and the world of quantum physics and that a closer look at the nature and role of consciousness in the scheme of things will lead to a deeper philosophical understanding of everyday and to a more complete picture of quantum theory”. (Zohar)

New physics theories lay open two different worlds of physics: classical physics and modern physics. Classical physics depends upon the quality of evidence and the modern physics depends on personal experience and assumptions about the mental world. Accordingly, modern physics extends into an understanding of the unknown world of information, which has a

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crucial role in our understanding of the mind and consciousness. In contrast Zohar, in the *Quantum Self*, illustrates Newtonian physics as ‘wholly mindless’.

She argues that the physical was set against the mental as a world apart. Two entire worlds come out with two different dominions of existence, and for the most part they remain with us today and are fixed in our way of perceiving ourselves. (Zohar) Zohar introduces a new way of seeing the world. Her perception about the world of consciousness and the mind points the way to a new science, which may eventually reveal the reality of the consciousness and the human mind.

Penrose, in *The Shadows of the Mind*, opens up his own argument with the questions: “Has science failed to understand consciousness?” and “Do we need scientific revolution?”. He illustrates his thesis with mathematical logic and endeavours to make his readers challenge current assumptions and reconsider traditional concepts. To him, the mind is not something other than physical but is based on “the brain’s vast complexity”. He states “for physics to accommodate something that is as foreign to our current physical picture as is the phenomenon of consciousness, we must expect a profound change”. (Penrose) Nevertheless, he tries to point the way to a new science, one that may eventually explain the physical basis of the human mind.

In fact, the book is, in some ways, an attempt to discover the relationship between the phenomenon of consciousness and the world of modern science. As a mathematician, Penrose tries to prove the existence of the mental world through the mathematical and physical worlds. The terms ‘consciousness’ and ‘mind’ have physical rather than mental values for him which he relates to the scientific world-view. Perhaps his attempts point to the direction where the mathematical and physical aspects of worlds come first.

As he says:

“I have not had much to say about the issue of consciousness in general ... just one particular mental quality: consciousness understanding, especially mathematical understanding”.(Penrose)

Nevertheless, to Penrose, the mental world, which is influenced by the platonic world of mathematical forms¹ and the world of physical reality, is defined as the third priority in the world of human beings. He calls the world of mathematics ‘the world of perfect form’ and argues that “to me the world of perfect form is primary, its existence being almost a logical necessity and both the other two worlds are its shadows”. (Penrose)

Although, he points to the perfection of the mathematical world, he does not give the exact answer to the reality of the world of the mind and the consciousness phenomenon based upon scientific viewpoints. He just opens a discussion and asks his readers to see “how science moves in the future”. Finally, he ends his arguments with the deep issue that “we are far from explanation”, then he states:

“I have referred to three worlds and the mysteries that relate them one to another. No doubt there are not really three worlds but one, the nature of which we do not even glimpse at present”.(Penrose)

Moreover, mental activity, which Penrose has mentioned in human mental lives and the mental world, is “concerned with mathematical truth”. Despite human understanding, which somehow reveals different levels of conscious comprehension, he notes, “we in truth are capable of some kind of direct access, through that platonic quality of ‘understanding’ to the very ways in which our universe behaves at many different levels”. (Penrose)

The terms ‘consciousness’ and ‘mind’ lead Penrose to illustrate the relationship between these three worlds to show mathematical laws and their

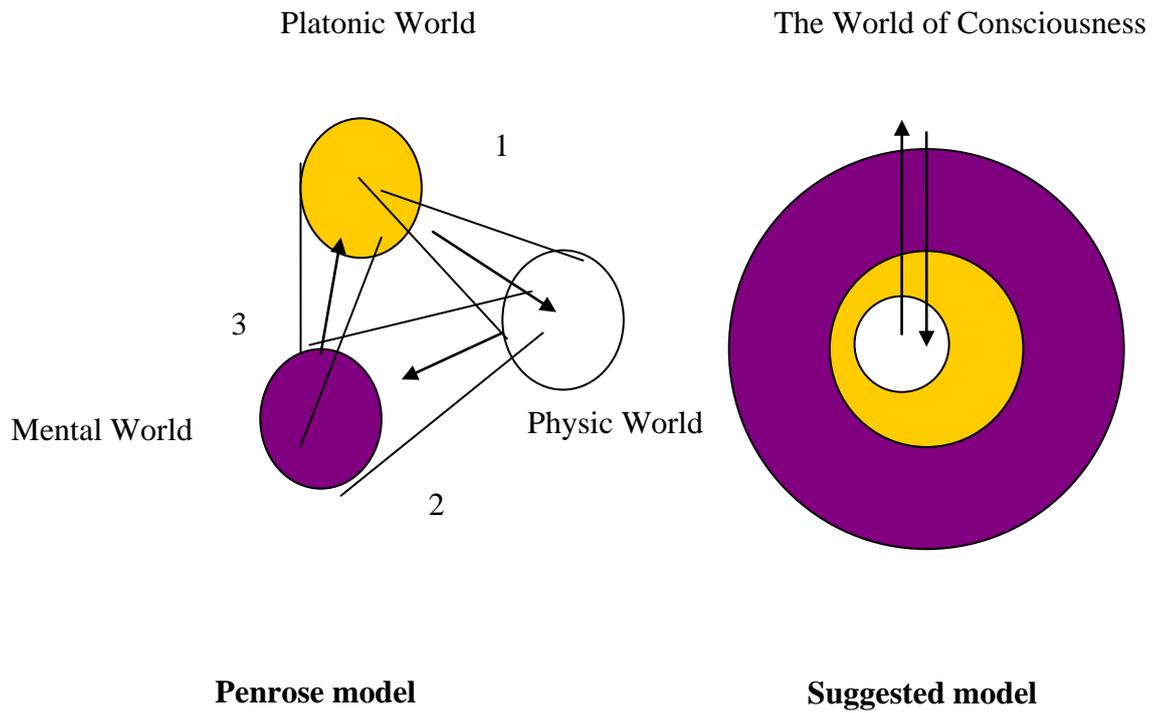
role in the mysterious behaviour of the physical world. He argues referring to figure 1.5:

“...Somehow the very world of physical reality seems almost mysteriously to emerge out of the platonic world of mathematics. This is represented by the arrow down on the right, from the Platonic world to the physical world”. ... Finally, “our mental world seems to come equipped, appear nevertheless mysteriously able to conjure up abstract mathematical forms, and thereby enable our minds to gain entry, by understanding, into the platonic mathematical realm, pointed by arrow upwards on the left”. (Penrose)

I would like to introduce a new illustration at this point, which reveals my expression of the existence of the mental world and its relationships with the two other worlds. Again, with reference to figure 1.5, it seems to me that the existence of the external and internal world is an unreal distinction. Penrose’s three worlds actually exist within the human body and emerge, step by step, as levels of our consciousness. Rather than live in mental worlds, we actually live in our true self which is hidden in our consciousness.

Human understanding of the consciousness phenomenon opens a new window to the mental world and its activity; another window will be opened and will change our level of consciousness. Because of this, it seems that there are no separate isolated worlds. Everything exists in us but our mind is the avenue to our self-conscious and our mental world via mental activity. Figure 1.5 compares Penrose’s idea about the three worlds based on his viewpoints in comparison with my suggested model.

Figure 1.5 The interpretation of the mental and physical worlds



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To me, the most impressive examples of our conscious perception of such mysterious worlds focus on our inner vision by which we see them, as in Penrose's definition, with the ability to "smell of out truth or beauty". It is not easy to define the unity of consciousness, however, the debate in this chapter intends to make the reader focus more on the human body, understanding and mental activity which all have a potential role in an artist's work and creation.

Naturally, the truth is not what we see; the truth is what we cannot see. In order to see the internal world, or mental world we need to know where we stand now and where and what our future understanding of the world maybe. Our inner vision arises from when our mind challenges the existence of 'subjective reality' and goes beyond the objective material world; the question is now whether we can we illustrate our unseen world in artistic ways.

Euan Squires describes these challenges as a 'third revolution' brought about by quantum mechanics. "This challenged the basic belief, understood in all sciences and indeed in whole of human thinking, that there exists an objective reality a reality that does not depend for its existence on its being observed".(Squires) However, he defines the quantum phenomena as 'the experience of an external reality' but, as I argued earlier, the objective of this chapter is not just about observing the objects and the process of assumption of the objects with our measuring eyes to prove the existence of an external world and the way of normal seeing.

According to these authors, quantum physics is an enlightening tool which we can use to go beyond the physical world and clarify the nature of consciousness, which arises through the interaction of particles, photons, virtual photons and electrons. Significantly, the term 'modern physics moves us from the third dimensional mode towards the new age of a higher dimensional form of existence, which is an era of harmony, progress, knowledge, and enlightenment. These examples reveal modern physics as a

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way to understand the new science of human psychology, its moral and spiritual implications; it can illuminate our understanding of everyday life and the nature of consciousness. As Zohar describes it “our relationships to ourselves, to others, and to the world at large”.

According to Zohar, perhaps, quantum physics more than anything else, promises to transform our conceptions of being as a particle and the concept of movement, which rests on virtual transitions, forewarning a revolution in our perception of how things relate. (Zohar) Following on from this view, I would like to add that our entire perception about the world around us and the insight of an unseen existing world may provide an opportunity for us to experience ourselves as matter within a body.

However, in terms of quantum mechanics, our being describes the reality of particles and the movement of waves, our consciousness illustrates our personal identity which links us to the past, present and future to define who and what we are. As Zohar indicates: “through quantum memory, the past is alive, open and in dialogue with the present. As in any true dialogue, this means that not only does the past influence the present but also that present influences on the past, giving it new life and new meaning, at times transforming it completely”. (Zohar)

In connection to this, we should note that modern physics might help us to understand the reality underlining the observations of the external world in relation to our internal world. At this stage, we have to emphasise that, although what we see and what we feel about our being is the picture of reality we need new pictures. In particular, for example, the interpretations of our existence in the present can be a definite link to our past and future across time. (Zohar)

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In the book *David Bohm's World: New Physics And New Religion*, Kevin J. Sharpe discusses Bohm and his research in the area of quantum physics. He notes that “one of his principle drives is to clarify the idea of connectedness; he believes every thing connects with everything else”(Sharpe). His comment about ‘connectedness’ brings us to understand that our mind connects us to the universe through our consciousness. In truth, our mind and body interact and this, in turn, relates us to the universe.

Whatever consciousness may be, it cannot be just our brain function and neurone connections in the cerebral cortex. Quantum theory can present a new understanding of our experience and create a new worldview of the new physics integrated with the human world. Our consciousness is, undoubtedly, influenced by our perception and our thoughts.

In principal, however, our spiritual experience of our world depends on our notion and understanding. Interestingly, Zohar describes “the unity of consciousness as ‘the Blackboard’ on which all our thoughts, feeling, and perceptions are written”. (Zohar) Thus, she shows how the vitality of the new physics battles the separation and division of twentieth-century life, and replaces it with a model of reality in which the universe itself may possess a type of consciousness, and of which human consciousness is one expression.

On the whole, modern physics illustrates a new worldview and the various aspects of our understanding of the internal and external worlds. However, “the strongest influence in our modern culture derive from the philosophical and scientific revolution of the seventeenth century, which was the birth of Newtonian, or classical physics, but the new physical science of the seventeenth century had nothing to say about the spiritual or psychological side of life”.(Zohar) Zohar states in her book that the physical was set against the mental as a world apart. Nevertheless, modern physics and the quantum

mechanical phenomena have become a new perspective on the world of spiritual and have changed the way we perceive ourselves.

5.3 The perception of modern physics in the world of information

Max Planck (1858-1947)ⁱⁱ discovered the quantum theory; it describes the behaviour of particles and waves including the distribution of the radiation emitted by a blackbodyⁱⁱⁱ in the form of ‘quanta’ or a specific amount of energy. In it energy is transferred from a warm body to a cooler body by radiation, which is described by Planck’s Law^{iv} of Black Body Radiation, and illustrates radiant energy as a function of wavelength.

Max Planck first introduced this idea in 1900 along with Planck's law for blackbody radiation. He announced that every single object releases electromagnetic radiation in a considerable burst of energy. Figure 2.5 and 3.5 reveal his discovery, based on released radiation that means the higher the energy of the photon, the bluer the light the shorter the wavelength. The lower energy photons, on the other hand, represent the redder light or longer wavelengths. Therefore, any physical object has the same function while the wavelength changes. When an object becomes hotter, the wavelength becomes shorter and the total energy emitted increases.

However, Planck’s discovery was a “revolution in mental attitude”(Bridgman) but he was aware that there were still many things that had to be explained or advanced in order to make absolute sense. (Belavkin) Therefore, “he changed one basic assumption: energy, instead of being continuous, comes in distinct particles and found that the energy radiated from a heated body is exactly proportional to the wavelength of its radiation”.(A Science Odyssey) Essentially, the total energy emitted in an object based on Planck’s theory

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depends on the temperature and frequencies in the spectrum as a physical phenomenon. As an object heats up the energy increases in the form of wavelengths and the light given off will be visible in orange, then yellow, and eventually a bluish colour.

Although, Planck's quantum theory has introduced a new way of thinking since 1925, "the implications and consequences of the quantum theory, as well as its profound mathematical, conceptual and philosophical foundations are not yet understood completely".

For example, many engineers, computer scientists and even physicists now speak about the huge advantages of quantum computers and other quantum information technologies of the new century, without deeper study which is necessary for a satisfactory theory of quantum information. (Quantum Computing and Quantum Information, an Introduction for Laymen, V P Belavkin)

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Figure 2.5 Shorter Wave length \Rightarrow More Energetic Radiation

http://www.mun.ca/biology/scarr/Fg14_17.gif

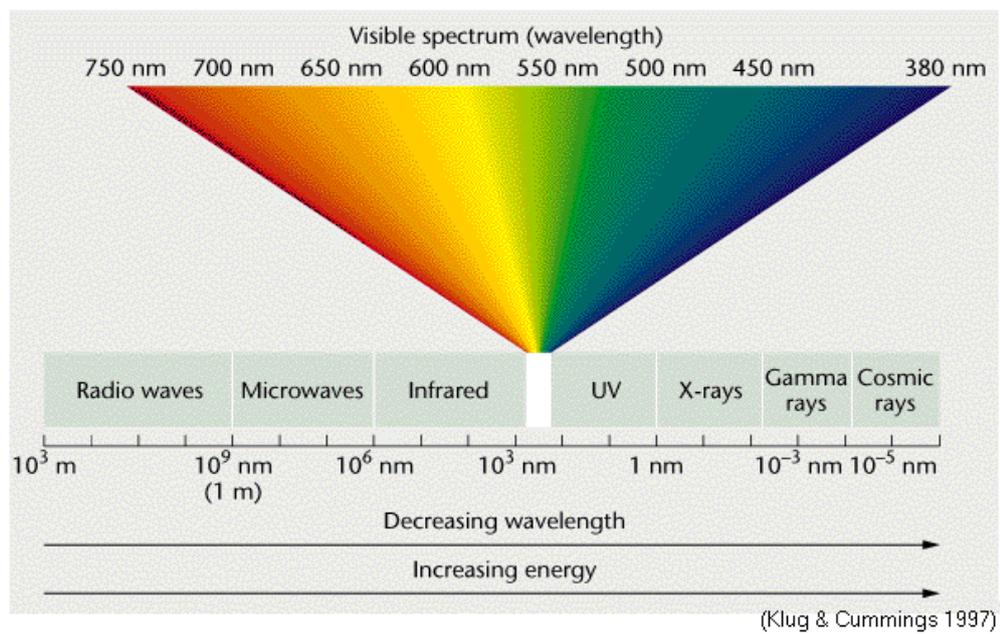
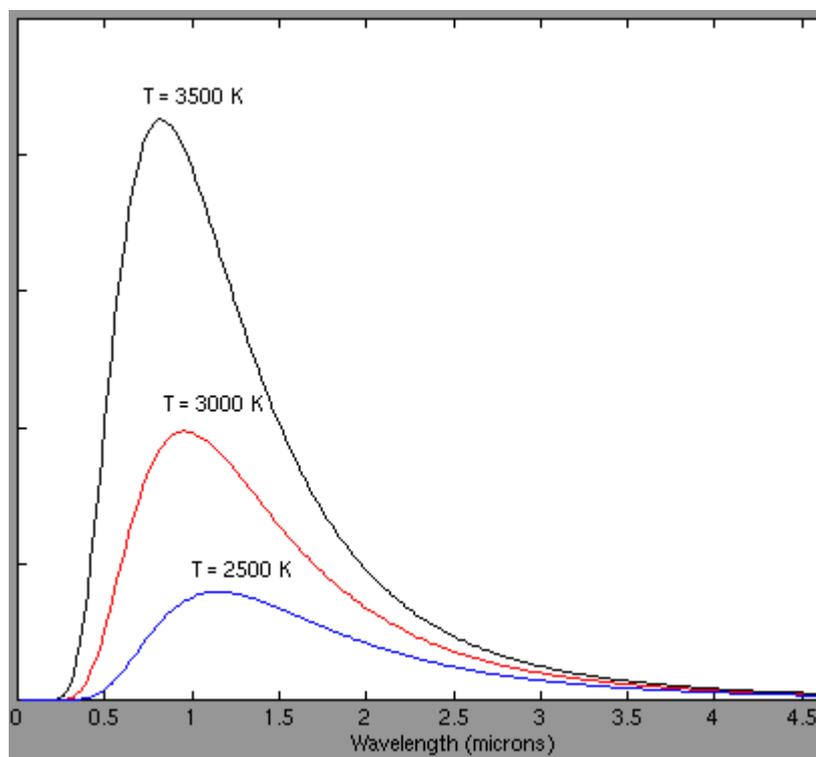


Figure 3.5 As the temperature increases the amount of the energy increases and shifts toward shorter wavelengths.

http://marine.rutgers.edu/mrs/education/class/josh/black_body.html



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Thus, modern science and quantum physics discovered by Planck were the greatest developments in classic physics. He gave birth to quantum theory and “saw the nature of the physical universe separate from man and his beliefs. To him it was the past that was restricting the future, and at the time the past was dictating science and its beliefs as he saw it, no one had come out to prove it”.(Swil)

In fact, “This development changed ‘classical physics’ to ‘modern physics’ and opened the doors for further exploration of physics”.(Quantum Computing and Quantum Information, an Introduction for Laymen, V P Belavkin) Since then, modern science has shown that quantum physics was an avenue in which to observe, navigate and explore the reality of energy as a means to the human awareness, emotion and expression in the area of consciousness of the body, energy and interactivity.

Through the quantum phenomenon, we can believe in our inner consciousness throughout the scientific notion of our physical existence in the world of information. The function of our physical body, as a system of information, is not just a physical structure made of molecules. Like all matter, we are composed of a chunk of energy and moving out of the physical world into a world of dynamic field energies. Nevertheless, the function of distributed energy and our body as a black body radiation leads us to the other basic category. In this circumstance, it tunnels under the awareness of our self-conscious to understand and utilize our unknown values.

Accordingly, in recent years, many people have begun to understand that the new physics, mainly quantum physics, is a new way of seeing ourselves within the world. Many books and articles have been written about quantum physics, quantum physics and eastern mysticism, quantum physics and healing, quantum physics and psychic phenomena all have been attempts to

articulate something that answers people's need to find their reality to be something different inside. As Zohar says:

“The tension between particles and waves within the wave/particle quality is a tension between being and becoming. Similarly the tension within ourselves between the I and the not-I, between keeping ourselves to ourselves and engaging in more or less intimate relationships is attention between staying as we are and becoming something new. The key to both is quantum wave mechanics”. (Zohar)

The function of our brain as the central part of our physical body links us to our consciousness, but to get to this stage we need to know ourselves and open our vision to the universe by answering these questions:

- What is the science of consciousness?
- What is the sense of universe in new physics?

Similarly, the definition of virtual particle about quantum and our body as a mass is physically the same. For instance, in quantum theory, energy is emitted in the form of waves or photons and it changes the spectrum. The truth is we can come up with the notion of a relationship between objects, which will be affected by the amount of energy emitted from them. When more energy is pumped into them more changes in wavelength will occur. However, Chapter Six will specify the interconnectedness of changes and wavelength in our body but, as a brief prelude, the same thing will happen to any individual by changing the level of energy: the amount of energy pumped into us will disclose the unity of consciousness.

Obviously, the interpretation of quantum theory is a way of saying that any object demonstrates the interaction between the processes of preparation and changes in different level of consciousness. This is an essential interconnectedness of the universe which analyzes the world as we see it and the world as we want to see it.

5.4 Modern physics and the exploration of other dimensions in art

The implications of new experimental findings in the world of quantum physics, point to a deep interaction between our consciousness, our mental activity and the physical world itself. In this term, changing the level of our mental body depends on our investigating awareness and movement from the material universe into this mysterious phenomenon. Perhaps the matter of how the unity of consciousness is perceived may explore the existence of other dimensions in the universe rather than restricting it to the dimensions already known, which are length, width and depth.

Similarly, “the exact numbers of dimensions are still under study but they seem there are at least ten to twelve” (Forberg), although, it needs to be understood that the multi-dimensional human nature consists of a bio-energy system and consciousness in collaboration with modern physics and its theory about the fourth and fifth dimensions.

The appearance of possible dimensions as an innovative area at the end of the nineteenth century made artists represent things beyond their palette of images that were physically and theoretically invisible. Significantly, this new expression in art dragged into the twentieth century and introduced its visual position, not in fine art, but photography. For example, the motion studies of Eadweard Muybridge^v were innovative ways of looking at movement, in which time is segmented into sequential units and strongly exhibits the relationship between frames and a split second.

In ‘Nude Descending Stairs’ (1887), Figure 4.5, Muybridge took several photographs of a nude figure walking down a flight of stairs. His photographs represent the fourth-dimensional direction as individual frames in a series, which suggest motion and the function of time. Muybridge shows the

potential value of time in an individual instance by focusing on simple activities in the human body.

However, in his work, the study of the fourth spatial dimension and function of the human body in different directions at the same time bring up different possibilities in space-time^{vi}. The creation of ‘Nude Descending Stairs’, is an example of a woman moving through the stairs as a function of time, however what is crucial here is that this simple motion reveals that our physical body has roots in the universe.

Our consciousness and mental activity have a substantial effect on the physical world. As Michio Kaku states, the existence of a fourth spatial dimension would allow us to see all the possible perspectives of an object existing in three dimensions. (Kaku) By adding the dimension of time to the three-dimensional object our consciousness is given the ability to evolve; without change there is no evolution. Thus, when we become familiar with the state of consciousness through techniques utilizing deep relaxation, we develop our knowledge and understanding with a new sense of time. We begin to feel and to experience time in new ways.

In relation to this, the experience of space-time in the fifth dimension broadens our observation towards an idea in line with quantum physics. “This fifth dimension would then correspond to quantum physics’ ‘superposition’ in which, prior to measurement, a quantum system can be in any possible state or, rather, in all possible states simultaneously”.

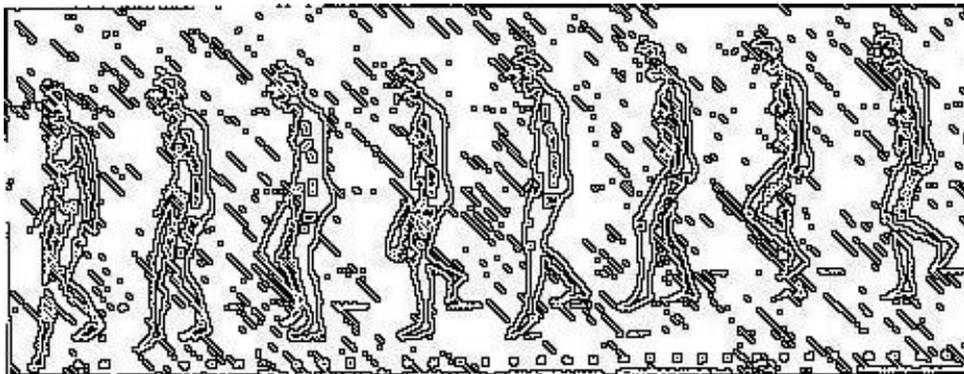
(Raithel) We can see it here as the fourth dimension in infinite repetition, in which the third dimension, moving along in time, is repeated, or mirrored. Hence, our insight represents and captures our ideas or concepts of reality and mental connections with the inner and outer world by producing images.

Figure 4.5 Nude descending stairs. Edward Muybridge, 1887.

See the original frames in:

<http://www.art.net/Studios/Visual/Mariusj/Muybridge.html>

<http://www.uta.edu/english/V/multimedia/nude.html>



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To relate modern physics and the theory of dimensions with art corresponds to an ongoing conceptual challenge for self-interpretation. It seems to me that existing beings are beyond what we are in our material universe and are absolutely unique and, as Arthur Miller says in his book 'Einstein, Picasso: Space, Time, and The Beauty That Causes Havoc', tries to find a link between modern physics and modern art^{vii}.

He opens his discussion with an important question: "What was the connection, if any, between the simultaneous appearance of modern physics and modern art at the beginning of the 20th century?" He then "has chosen to answer it by investigating in parallel biographies the pioneering works of the leaders of the two fields, Albert Einstein and Pablo Picasso...He has seen both as being focused on the nature of space and on the relation between perception and reality".(Brush)

Our self-consciousness in the virtual reality of our being, reveals the truths about us, where our images more clearly coincide with the way things actually are within and around us. This symbolizes meaningful connections in modern physics and the world of quantum physics with art whilst our mind focuses on finding or creating meaningful connections with the physical body. "Miller has shown how the most important scientist of the twentieth century, and its most important artist, had their periods of greatest creativity and the ideas of space, time, and invisible forces that made up the cutting-edge science of the day". (Brush)

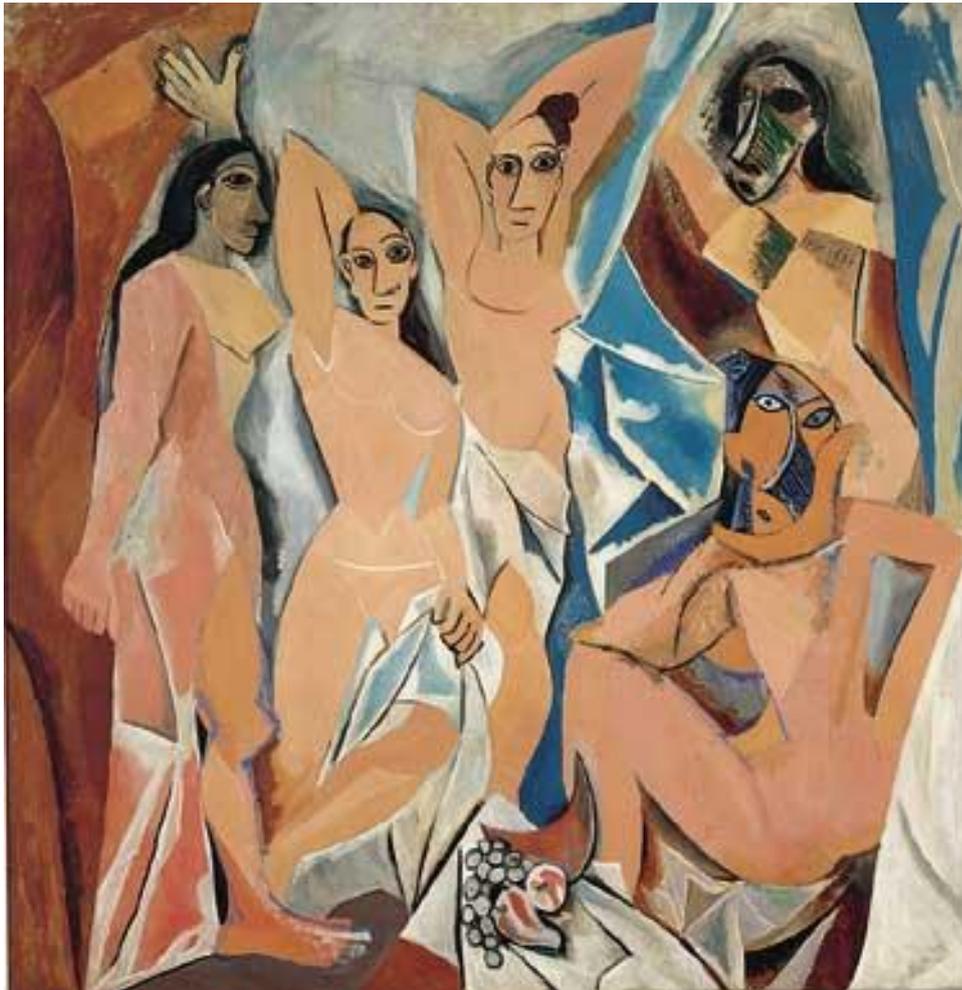
The innovative discoveries of Einstein^{viii} and Picasso^{ix} were a new fusion of the reality that offered the structure of spatial positions. Einstein and the theory of three-dimensional space with time formed four-dimensional space-time. However, Picasso actually incorporated the fourth dimension into his creations, 'Les Demoiselles d'Avignon', before Einstein did. It pictures a 4D view of moving sequence of five women undergoing a gradual geometrization as the action progresses from left to right. (See Figure 5.5)

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The fourth dimension in this artistic work touched the third dimension from multiple angles, which portrays an interpretive multi-dimensional perspective. Perhaps Cubism is an attempt to represent reality from the perspective of someone who can perceive four spatial dimensions. In this regard, Michio States that:

“Picasso’s paintings are a splendid example, showing a clear rejection of three dimensional perspective, with women's faces viewed simultaneously from several angles. Instead of a single point-of-view, Picasso's paintings show multiple perspectives, as if they were painted by a being from the fourth dimension, able to see all perspectives simultaneously”. (Kaku)

Figure 5.5 Les Femmes d'Alger (O. J. R. Version O). Completed and first exhibited in 1907, now in the Museum of Modern Art in New York City



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Marcel Duchamp^x, Figure 6.5, is another example from the twentieth century, his work uses artistic models of creative invention based on science. Regarding possible spatial dimensions, he notes that “If a shadow is a two dimensional projection of the three dimensional world, then the three-dimensional world as we know it is the projection of the four dimensional universe”. (Tracer)

Figure 6.5 Marcel Duchamp, 1998 Succession Marcel Duchamp, ARS, N.Y./ADAGP, Paris.

http://www.toutfait.com/issues/issue_1/Articles/boat.html



In 1912, Duchamp’s work portrays the inspiration of Cubist technique and abstract painting. ‘Nude Descending a Staircase^{xi}’ shows a human figure in motion, in a style inspired by Cubist ideas about the deconstruction of forms. “Unlike cubist still-life, the subject of Duchamp’s work is moving, descending a staircase with the entire downward motion being presented in one single image of simultaneity. The painting is not a single moment but a series of frames compressed into a single, unfocused image” and “play more on the time element”.(Tracer) It was a pioneering depiction of motion on canvas; art historian Linda Dalrymple Henderson states^{xii}, “Marcel Duchamp’s well-known painting of early 1912, *Nude Descending a Staircase* stands as his first fully realized response to Cubism’s pursuit of the invisible

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realities suggested by the discovery of X-rays in 1895". (Dalrymple Henderson)

The similarity between Duchamp's nude (Figure 7.5) and Muybridge's Nude Descending stairs (Figure 4.5) is that her portrayal from one view at multiple moments, as Muybridge did. This upending of theory exhibits the quantum theory and fused new ideas in the world of art. It also enabled him to bring the innovative idea of animation and liveliness beyond what Cubists did into his painting. He once declared that "My aim was turning inward rather than toward externals".(Moody)

Marcel Duchamp takes this idea in a direct fourth dimensional direction. He depicts his work as "Repetition of schematic lines, without any regard for anatomy or perspective, a parallelism of lines describing movement through the different positions of a moving person". (Walking as Art, Modern Art,) Indeed, there is nothing in it resembling an anatomical nude, only abstract lines and planes. The lines suggest her successive static positions and create a rhythmic sense of motion and nude alike occur only in the mind of the viewer. "He imbues motion into two dimensions by depicting the sweeping motions of an abstract person descending a staircase".

(Walking as Art, Modern Art,)

Thus, as a reflective symbol of the mind, these investigations of time and space-time consist of points or events that represent a particular place at a particular time. The exploration of new dimensions in the work of Picasso and Duchamp is a new angle which suggests an innovative way from mathematical origins to visual representations achieved a comprehensive definition of the fourth dimension in the world of modern physics and art. All in all, however, Muybridge, Duchamp and Picasso were the most popular examples of new approaches in art influenced by science but there are still many other artists^{xiii} who came to the same conclusions through their innovation, but space limits further elaboration.

**Figure 7.5 Nude Descending a Staircase, Marcel Duchamp, No. 2 1912,
Oil on canvas, 146 x 89 cm**



Philadelphia Museum of Art, The Louise and Walter Arensberg Collection

5.5 The unity of modern physics and art

The unity of modern physics reveals the experience of the phenomena and the awareness of the entity of all things in the world. In fact, quantum theory displays the variety of phenomena that have been related together as a mass in the entire universe. Thus, the term ‘unity’ and ‘modern physics’ refers us to the restful and balanced form of our mind which connects us to the reality of objects in a subjective way.

Nevertheless, it would be better to say that it is relationships that matter rather than the separate objects. This is the unity of our experience and understanding of our different levels of consciousness. In fact, the insight and vision of any physical object may bring us to our conscious self, which sees beyond the physical presence. Crucially, our mind and the interconnection of our consciousness enables us to understand the values of any physical object and helps us to broaden our thoughts concerning unity.

I would like to use Zohar’s interesting definition about our values, thinking and relating to the universe beyond the external world. According to her we “weave the fabric of our being through our ongoing dialogue with our own past, with our experience, with the environment and with others”. (Zohar) On the other hand, our mind is the link between us and our consciousness.

In principle, the unity of modern physics has provided the theory about the unity of consciousness, which is not the aim of this study. However, I would like to take advantage of this theory to artistically express the physical definitions of any material objects that compose my studies and their intricate and complex relationships, which gives essential meaning to the reality of the object that I see. By looking at any object, so many questions of ‘how’, ‘why’ and ‘what’ arise in my mind and desire to know the values of this physical existence and to reveal its purposes, thus, we have to find ourselves

someplace other than where we are. More importantly, perhaps, we must return to continue our investigation into the artwork as a communicative tool between us and our watchers.

In a related, but slightly different interpretation of its features, Zohar in “The Quantum Self” intends to value the meaning of the physical object by giving an example of ‘the pair of peasant shoes’ painted by Van Gogh (See Figure 8.5). However, she tries to move her readers’ attention to the reality of ‘why’ and ‘what’; but her attempt to portray the reality of life beyond the pair of shoes, reveals the relationship between the shoes and the person who has lived with this pair of shoes. She was looking to see the values of this relationship as Van Gogh intended with his watcher. She attempts to unite a dialogue between past and present, for him the wave patterns of the past are taken up and woven into now and the future, as she describes it through quantum memory that:

“We take up the past and make it ours in the present. We reincarnate the past (all our past selves) and giving it new life in a new form”. (Zohar, P105)

Her relationships between the past and present raise questions of the meaning and reality of our conscious phenomenon. Therefore, it may not be so bizarre if she has considered a piece of art as an example of inner values in the world of information. In her book she indicates that what has concerned us about Van Gogh’s works, “cannot be reduced to canvas and the blotches of paint spread around on it, nor to van Gogh’s purposes and intentions, nor even to his life history. The painting is a thing in itself, a whole which reveals something about the world which was never revealed before, and it does so by bringing together (relating) the shoes and the peasant who wore them, his labour and soil in which represent for us”. (Zohar)

However, she tries to explore something new in Van Gogh's work and weaves it into her theory in relation to the past and present, but it would be interesting to speculate on the variety of philosophical argument in this particular piece of artwork, which exhibits the nature of being. Zohar quotes Heidegger^{xiv} (1889-1976), the German philosopher and says that "seems to Martin Heidegger truth happens in Van Gogh's painting where it reveals the essence of unity and consciousness which enlightens the essence of art and truth. The bridge between truth and beauty and the world of matter- can at last be understood when we trace it back to origins of each in the wave/ particle quality". (Zohar)

There is much philosophical thought behind this piece of work which comprises a separate interpretation either against or agreeing with Heidegger's understanding. At this point, I would like to highlight some of them as key issues for my further argument:

Art historian, Mayer Shapiro^{xv}, was the first to call Heidegger's analysis into question nearly thirty years later. The main point of Shapiro's criticism was that the shoes are not those of a peasant woman, but most probably Van Gogh's own. John A. Walker has argued against Schapiro that as an art historian, it is far from being obvious that Schapiro's interpretation is true either. (Deconstructing Origin Stories)

Kockelmans^{xvi} argues that Heidegger's description is not really of peasant shoes, or really about any particular pair of shoes. In fact, the stress about the painting by Van Gogh is on equipment or perhaps on the shoes as pieces of equipment. It seems to him what Heidegger is trying to reveal is the equipment being of equipment. He writes:

"What is being described here is not an actual pair of farmer's shoes, nor the shoes painted by Van Gogh, but some pair of shoes that have been 'evoked' by the chosen example and by the painting(s) that are employed to facilitate the description'. (Haapala)

Tomas Bridges, opposing Heidegger's interpretation about Peasant woman and his narrative says "the shoes in these paintings were probably a pair of peddler's shoes Van Gogh bought at a flea market in Paris in 1886". (Bridges) However, art historians such as Schapiro, Walker, Kockelmans Tomas Bridges and Derrida discuss and try to stress the points where the emphasis lies and where the real issues are, but each of them focuses their own interpretation about Heidegger's Origins. It does not matter whether the shoes painted, belonged to Van Gogh or a peasant woman; what this piece represents is the reality of shoes which tells a story. It was as if the painter wanted his watchers to "look into the notion of truth and its relation to the work of art" and to see beyond the shoes, which in general they did not.

Although, Heidegger's central analysis in *The Origin of Art Work* "lets us know what shoes are in truth"(Young), but the term 'truth' here is not just a pair of shoes. When we gaze at this particular painting, it guides us to our consciousness of Van Gogh's own life and what those shoes meant to the painter who created this piece. Indeed, the dynamic relationship between our mind and the material content of his idea in this particular painting gives us a view of the human self which is related to the quantum self's experiences. Zohar's comment is relevant that: "no dichotomy between the inner and outer because the two, the inner world of mind (of ideas, values, notions of goodness, truth and beauty, etc.) and the outer world of matter (of facts) give rise to each other". (Zohar)

Hence, any object in our consciousness exhibits the reality of specific points which once have been part of it. Our mind, consciousness, values and belonging are woven into the world we exist. Therefore, "we are not just our brains". Furthermore, what we see as an artist is not just the physical appearance of any object or the combination of atoms and molecules. There is something beyond that. There is something beyond the content.

Figure 8.5 The pair of Peasant Shoes painted by Van Gogh in 1886



5.6 Conclusion

Every human being has a physical body, a mind and spiritual potential. What we see is a brief expression but all our lives and particular universes are a comprehensive exhibition of human thought. The combination of physical sciences and the science of spirituality both have the identical aim of discovering truth and helping man to grow physically, mentally, and spiritually, and achieve fulfilment but each one, by itself, is insufficient and helpless. Modern physics and new science has followed, with scientific thoroughness and beyond all darkness, in order to understand a reality even deeper than that of quantum theory, which the world of information is waiting for today.

For instance, introducing the fourth spatial dimension, the unity of consciousness and the reality of our mind could make an assumption that the mind does function in the fifth dimension which is incomprehensible to the brain in the fourth and third dimensions. The information from the fourth dimension may open up a whole range of possible applications for the use of digital technologies from physics to digital art. In fact, these additional dimensions can be represented along with information for other possible higher spatial dimensions, and also can be fused into the creation of new digital art form.

This is an outstanding vision of modern physics, a quantum phenomenon that shapes the patterns of mind and matter, and also the relationship between them, which connect both together. I propose to close this chapter with modesty because I am not a physicist or a philosopher, but I am so interested in working on research into the mind to advance the concept of modern theoretical physics and art in higher-dimensional space and also its relationship with our body as a mass.

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Consequently, the goal of this chapter was to manifest the true glory of the human body in the life of new physical science by citing a few artistic examples as enlightening the reality of our mind and its fusion in the world of modern science. More importantly, although the existence of the universe unifies our knowledge about human existence, I have tried to focus on how our perception of ourselves integrates through modern physics and philosophy with artistic expression and notion of art.

Overall, I would like to end by saying that this chapter has painted a form of perception and experience for the areas that are the subject for further chapters, where in the quantum term, “the past has entered a phase relationship with the present” (Zohar). In my final project exploration, these are the unique meanings of the language of the digital art form that leads the spectators, through the pleasure of looking at it closely, to illuminate its context as a work of art itself and not to build a wall of incomprehensible words.

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Note

ⁱ See more in Shadows of The Minds, Roger Penrose, and P. 412

ⁱⁱ Max Planck made many contributions to theoretical physics, but his fame rests primarily on his role as originator of the quantum theory. This theory revolutionized our understanding of atomic and subatomic processes, just as Albert Einstein's theory of relativity revolutionized our understanding of space and time. Together they constitute the fundamental theories of 20th-century physics. Both have forced man to revise some of his most cherished philosophical beliefs, and both have led to industrial and military applications that affect every aspect of modern life. See more in:

<http://www.excel-tech.com/david/mplanck.htm>

ⁱⁱⁱ A blackbody is a theoretical object that is a perfect emitter and absorber of radiation. Such an object would re-radiate its energy in a spectrum, which depends only on the temperature of the body (and not, for example, on its composition). No object is a perfect blackbody because it does not re-radiate all the energy it absorbs. It is, however, possible to approximate most objects as blackbodies. A star, for example, acts almost exactly like a blackbody. See more in: <http://feps.as.arizona.edu/outreach/bbwein.html>

^{iv} See more in: <http://www.excel-tech.com/david/mplanck.htm>

^v**Eadweard Muybridge**, pioneer photographer of the moving image, 1830-1904. Eadweard Muybridge was born and died in Kingston upon Thames, Surrey, England, but spent much of his working life as a professional photographer in America. Kingston Museum holds a comprehensive Muybridge Collection.

See more in:

<http://www.kingston.gov.uk/museums>

<http://www.artsmia.org/motionvision/>

^{vi} See more examples in:

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<http://photo.ucr.edu/photographers/muybridge/>

<http://web.inter.nl.net/users/anima/chronoph/muybridge/index.htm>

<http://www.cybergrain.com/tech/demos/muybridge/>

vii PICASSO: Before me, artists used to get ideas from the past. But as of this moment, they are coming from the future, fast and loose.

EINSTEIN: Absolutely from the future.

PICASSO: I think in the moment of pencil to paper, the future is mapped out in the face of the person drawn.

Imagine that the pencil is pushed hard enough, and the lead goes through the paper into another dimension.

EINSTEIN: Yes!

PICASSO: A kind of fourth dimension, if that's what you want to call it. . .

EINSTEIN: I can't believe you're saying this! A fourth dimension!

Steve Martin

Picasso at the Lapin Agile 1996

<http://research.microsoft.com/~cohen/Vis2000.pdf>

viii It was Einstein who contrived the Theory of Relativity. The best I can do for you in respect to this theory is to quote another, in this case, Professor Morris Kline of New York University:

"In spite of the astonishing and dramatic verifications of the theory [Theory of Relativity], many people find its four-dimensional, non-Euclidean, universe totally unpalatable. No one can visualize a four-dimensional, non-Euclidean world, but those who insist on visualizing the concepts with which science and mathematics now deal are still in the dark ages of their intellectual development. Almost since the beginning of work with numbers, mathematicians have carried on algebraic reasoning that is independent of sense experience.

See more in: <http://www.blupete.com/Literature/Biographies/Science/Einstein.htm>

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^{ix} As revolutionary as the discoveries of Einstein or Freud, the discoveries of Cubism controverted principles that had prevailed for centuries. For the traditional distinction between solid form and the space around it, Cubism substituted a radically new fusion of mass and void. In place of earlier perspective systems that determined the precise location of discrete objects in illusory depth, Cubism offered an unstable structure of dismembered planes in indeterminate spatial positions. Instead of assuming that the work of art was an illusion of a reality that lay beyond it, Cubism proposed that the work of art was itself a reality that represented the very process by which nature is transformed into art.

"In the new world of Cubism, no fact of vision remained absolute. A dense, opaque shape could suddenly become a weightless transparency; a sharp, firm outline could abruptly dissolve into a vibrant texture; a plane that defined the remoteness of the background could be perceived simultaneously in the immediate foreground. Even the identity of objects was not exempt from visual contradictions. In a cubist work, a book could be metamorphosed into a table, a hand into a musical instrument. For a century that questioned the very concept of absolute truth or value, Cubism created an artistic language of intentional ambiguity. In front of a Cubist work of art, the spectator was to realize that no single interpretation of the fluctuating shapes, textures, spaces, and objects could be complete in itself. And, in expressing this awareness of the paradoxical nature of reality and the need for describing it in multiple and even contradictory ways, Cubism offered a visual equivalent of a fundamental aspect of twentieth-century experience" (Robert Rosenblum).

See more in: <http://media.ucsc.edu/classes/thompson/picasso.html>

^x In his own words...

An-artist, chess player, cheese dealer, breather, fenêtrier
...and here's what some of his contemporaries had to say:

André Breton:

"Marcel Duchamp is the only one of all his contemporaries who is in no way inclined to grow older." See more in:

<http://www.marcel Duchamp.net/index.htm>

http://www.toutfait.com/issues/issue_1/Articles/boat.html

^{xi} Repetition of schematic lines, without any regard for anatomy or perspective—

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a parallelism of lines describing movement through the different positions of a moving person.

Duchamp

Toe upon toe, a snowing flesh,
A gold of lemon, root and rind,
She sifts in sunlight down the stairs
With nothing on. Nor on her mind.
We spy beneath the banister
A constant thresh of thigh on thigh--
Her lips imprint the swinging air
That parts to let her parts go by.
One-woman waterfall, she wears
Her slow descent like a long cape
And pausing, on the final stair
Collects her motions into shape.

X. J. Kennedy

See more in: <http://www.univie.ac.at/cga/art/modern.html>

^{xii} The present essay is drawn from Henderson, *Duchamp in Context* (forthcoming), where the issues raised here are discussed and documented in full. On the importance of X-rays for Cubist painting as well as Duchamp's *Nude*, with its additional debt to E.-J. Marey's chronophotography, see Henderson, "X Rays." For an introduction to Duchamp's *Large Glass*, see Henderson, "Ethereal Bride."

Henderson, Linda Dalrymple. *Duchamp in Context: Science and Technology in the "Large Glass" and Related Works*. Princeton: Princeton UP, forthcoming.

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See more in:

[http://www.altx.com/ebr/w\(ebr\)/essays/henderson_n.html](http://www.altx.com/ebr/w(ebr)/essays/henderson_n.html)

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http://www.utexas.edu/cofa/a_ah/peo/faculty/arh/henderson.html

^{xiii} Futurism, early 20th-century movement in art that pointedly rejected all traditions and attempted instead to glorify contemporary life, mainly by emphasizing its two dominant themes, the machine and motion. The principles of Futurism were laid down by the Italian poet Filippo Tommaso Marinetti and published by him in a manifesto in 1909. The following year the Italian artists Giacomo Balla, Umberto Boccioni, Carlo Carra, Luigi Russolo, and Gino Severini signed the Technical Manifesto of Futurist Painting.

In 1912, Umberto Boccioni created his pivotal masterpiece *Materia* in Milan, a city that was quickly modernizing and that represented the ideal vision of the new metropolis of the Futurists. Futurism was an artistic and literary movement that celebrated the machine, rejected the art of the past, and even advocated the destruction of museums. For two years Boccioni had concentrated on developing his Futurist theory of painting, which both drew inspiration from and reacted against the innovations of Parisian avant-garde artists. His investigations culminated in the dynamic, faceted forms of *Materia*, in which the artist portrayed his mother in an interior space set against a balcony of their Milan apartment, integrating the events seen outside with those within. See more in:

<http://www.guggenheim.org/exhibitions/boccioni/overview.html>

<http://www.geocities.com/tr17bb/machage.html>

^{xiv} The Origin of the Work of Art" [OWA] is a translation of a lecture delivered by Heidegger in 1936. It is a subtle, difficult and obscure text. But if it is read carefully and thoughtfully, you will also find it to be philosophically rewarding. The key is to read it slowly -- line by line -- extracting as much meaning as you can from each sentence. The following introduction provides some background and a few markers about Heidegger's creative and poetic use of language.

“As long we only imagine a pair of shoes in general, or simply look at them empty, unused as they merely stand there in the picture, we shall never discover what the equipmental being of the equipment in truth is. From Van Gogh's painting we cannot even tell where these shoes stand. There is nothing surrounding this pair of peasant shoes in or to which they might belong - only an undefined space... A pair of peasant shoes and nothing more. And yet---

...In the shoes vibrates the silent call of the earth, its quiet gift of the ripening grain and its unexplained self-refusal in the fallow desolation of the wintry field. This equipment is pervaded by uncomplaining anxiety as to the certainty of bread, the wordless joy of having

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once more withstood want, the trembling before the impending childbed and shivering at the surrounding menace of death. This equipment belongs to the *earth*, and it is protected in the *world* of the peasant woman. From out of this protected belonging the equipment itself rises to its resting-within-itself". (Heidegger, pp. 33-4) See more in:

Heidegger, Martin (1971). "The Origin of the Work of Art". In Poetry, Language, Thought. Trans. Albert Hofstadter. New York: Harper and Row. German original: "Der Ursprung des Kunstwerkes" was published in Holzwege collection in 1949.

^{xv} "The shoes that Van Gogh painted in the winter of 1886-87 must have been his own shoes, according to Schapiro, since Van Gogh had already moved from Anvers to Paris early in 1886. The shoes thus do not belong to the peasant woman but belong to Van Gogh himself. But if they were not a pair of peasant shoes, they would not evoke the peasant woman's world and the call of the earth but rather the world of the artist, a "man of the town or city." See more in:

- Schapiro, Meyer (1968). "The Still Life as a Personal Object: A Note on Heidegger and Van Gogh." In *The Reach Of Mind: Essays in Memory of Kurt Goldstein*, ed. Marianne L. Simmel. New York: Springer Publishing Company.

- Meyer Schapiro: *The Presence of the Subject*, Marshall Berman
[from *New Politics*, vol. 5, no. 4 (new series), whole no. 20, Winter 1996]
<http://www.wpunj.edu/~newpol/issue20/berman20.htm>

^{xvi} See more in: Joseph J. Kockelmans, *Heidegger on Art and Art Works*, Martinus Nijhoff Publishers, Dordrecht, 1985.

Chapter6

Body, Energy, Interactivity:

The Analysis of Conceptual Values in Visual Art

6.1 Introduction

The concept of the human body in visual arts can enthuse our imagination and remove restrictions enabling us to focus on the nature of art. My research over the last six months has been a fusion of collaborative digital art and visual art concerning the reality of the body and its interactivity in virtual space.

I have had regular weekly practical lessons with Dr. Patel, my second supervisor, since May 2004 on yoga and meditation and the potential energies of the body. I used these 'hidden' energies in the body to learn how to focus the mind and the physical body. These lessons have enlightened me and given me a new perspective from which to examine and research the concept of interactivity, its origins and inner energy and how these combine as our consciousness. Thus my approach to bring different branches of art and new technology to bear on my art and practice has led to an analysis of the intellectual activity that produces the explorative moments of interactive visual arts that reflect consciousness and the body, which is not restricted to our material world.(Penrose)

6.2 Study of the chakra system in our body

What is inside us? I have asked my self this question so many times, while I was teaching life drawing. It was crucial for me to make students aware that besides focusing on methods of observing, understanding and self-expression, they should concentrate on the reality of the energy of the body that exists in the world. In this chapter, I relate the opportunity to the experience and explore the hidden energies or value of our inner bodies. It broadened my vision to a new approach in digital art and the study of life drawing.

As an artist, I discovered that I am part of the universe, and that through my work I can convey this to my viewers. Our physical body has roots in the universe, so its movement is not just the seen body, as it moves. According the fourth and fifth dimensions, the body leaves traces at its point of departure and continues to leave traces as it moves towards its destination. We are full of energy and our environment is full of energy; the important point is that the energy emanating from us never dies, even when we are dead. “The ancient Hindus discovered that there are seven major energy wheels(Chakraⁱ) spinning along the spine, matching every major nerve or endocrine centre in the human body”. (Hopkins)

The point is that each chakra represents an individual meaning of consciousness. Our consciousness and mental activity has a substantial effect on the physical world. Thus, through practice of meditation and yoga, we begin to feel and to experience time in new ways. When we become familiar with the state of consciousness through relaxation and breathing techniques, we develop our knowledge and understanding. A new sense of the dimensions in reality and virtuality emerges. Consequently, our energy system enables us to think perceptively and with insight. These are the hidden values and excellence of our bodies.

The first step in the study of the chakra system was breathing techniques, which was the experience of deep relaxation. This experience was an opportunity to learn how to balance the body, mind and spirit through the breathing techniques. As Patel states:

“The mind needs to be relaxed. In fact, it is subtle energy in the universe, which we can use to help ourselves. By closing our eyes and relaxing our muscles, we enable to centre and focus on what we plan to do.”(Moin Namini, "Dhyana (Meditation) Workshop")

For me, this self-discovery provided a new understanding and also challenged me to draw a new picture of the current physical theory of the physical body by being in balance with the inner body. The most important part of this exploration was to develop my understanding of the reality of our mental world and enhance that knowledge in order to narrate my own experience concerning the hidden values. Therefore, I responded to these challenges by posing questions about the forms of our mental body, our consciousness and our energy system and directed my imagination towards the most interesting side of human nature: ‘our self being’ (Figure1.6).

I tried to free my mind of any external elements, focus on relaxation and the rising the energy from each chakra through regular breathing and chanting the word ‘OM’ⁱⁱ. Throughout this experience I followed Nandish Patel, my second supervisor, step by step and continued to breathe deeply which was the first step in this exploration. It happened sometimes that thoughts, and ideas came up, but I centred on relaxation and never tried to send them away. There were many times when nothing happened and I received no inspiration, but at other times the messages of creativity came later, while I was focusing deeply on my inner body.

Figure1.6- The Study of Our Consciousness and Energy System



In the second session Patel taught “the physical way of control of breathing”ⁱⁱⁱ. I broadened the process of the breathing technique to bring the body, mind, and spirit together as one. In Patel’s terms:

“The mind is distracted by so many thoughts. By keeping hands and keeping the body straight we make ourselves in a position to deep breath and concentrate on our inside. Continuing to breathe in and out from the stomach sends a message to the body and mind and thereby reduce the stress.”(Moin Namini, "Dhyana (Meditation) Workshop")

‘Pranayama’, the control of breathing, gave me the opportunity to reach my full potential physically, mentally and spiritually. Knowing about the levels of energy in the chakra system made me conscious of the material and mental side of the body. It also enhanced my understanding of the past, present and future and inspired me to I draw a picture, which enabled me to see myself and to perceive and express the meaning of human existence.

Patel opens up and focuses on the sensibility of the chakra system and how we can raise energy throughout the physical body by using the sun as an example. He explains:

“When energy rises, chakra becomes brighter it is just like the sun. When the sun shines the seeds will grow and the energy goes to chakras thereby chakras starting to shine. Each chakra is responsible for what we are as human being and as an aspect of human being such as intelligence, moral and how we behave”. (Moin Namini, "Dhyana (Meditation) Workshop")

Our physical eyes perceive only the visible atmosphere and not the invisible. There is a huge area of energy and movement beyond our perception and beyond the empirical world. Nevertheless, my personal insight into the reality of the universe encouraged me to find out more about the existence of the seven chakras, which influence each other in the way they work and in different levels of our consciousness. Another of their functions is to bring the

body back into balance and harmony with itself and nature. It is also interesting to note that energy levels and wave fluctuation of the seven chakras are vertically positioned along the spine starting at its base:

- “The first chakra is Muladhara (the root chakra). It is located in the coccyx. The colour is red. This chakra represents the physical body and corresponds to it.
- The second chakra is Svadhisthana (the sacral chakra), and it is located in the sacrum (lower abdomen). The colour is orange. The chakra represents ether energetic body (energetic matrix of the physical body) and corresponds to it.
- The third chakra, Manipura (the solar plexis chakra), is located on the fifth lumbar (abdomen) vertebra. The colour is yellow. It relates to the astral body. It depends on emotional condition of the person and can change its form due to personal conditions.
- The fourth chakra is Anahata (the heart chakra). It is located on the 5th thoracic vertebra (chest). The colour is green. It relates to the mental body (mind, related to intellect).
- The fifth chakra is Vishuddha (the throat chakra). It is located on the first thoracic vertebra, on the thyroid level (throat). The colour is blue. It connects to the karmic body (ego).
- The sixth chakra is Ajna (the third eye). It is located on the second cervical vertebra (the forehead). The colour is dark blue. It is connected to the intuitive body ("superconsciousness", intuition). Ajna chakra is a centre of physical energy.
- The chakra of Nirvana is the central chakra. It is located on the heart plexus. The colour is violet. This is the link between our physical body and Nirvana. The seventh chakra is Sahasrara (the Crown Chakra). It is located on the top of the head. The colour is white. It is linked to absolute body (the conclusion of the development of all seven bodies of a cosmic organism). Sahasrara chakra is a center of psychic energy, and the only chakra that follows its subtle body absolute in cosmic

spheres after death. It is the centre of psychic energy of the human organism. Through Sahasrara chakra, we connect to the ‘Divine Centre’.”^{iv}(Michael Nudel and Eva Nudel, Human Energy Bodies as Bio-Energy System

- Excerpts from a Book Health by Bio-Energy and Mind)

We can achieve the above by using and training our tangential vision. Perhaps, by increasing our personal experience and enhancing our visual impression we can enliven our spiritual values and develop an awareness of our true nature through our physical body. When we begin breathing and chanting, we can generate energy through the chakras from the sound of the chant. Here I would like to quote Patel’s example of the opera singers who can break glasses which illustrates the power of sound. Patel points out that ‘sound’ is very important in meditation. In this regard he delineates that:

“In the same way chakras in the body are sources of different kinds of characteristics of human being. The way to awaken them is through the sound and through pranayama are two things”. So sound is sabda^v or mantra^{vi} and breathing is prana^{vii} and pranayama is controlling breathing.” (Moin Namini, "Dhyana (Meditation) Workshop")

If, during meditation, our body feels heavy or we feel that our head is detached from our body that is sign of good breathing technique. However, that is only possible by continuing to practice breathing techniques and focusing on breathing from the bottom of our stomach through the chest and then to a higher level. It seems to Patel that, “once we know how to control the energy then we can move with it and do lots of things after. When energy rises, at first our consciousness is so narrow but by doing breath techniques it will expand”. Then he adds:

“After my meditation I have energy every where. I can push the energy to the parts of my body and simply spread it as wide as possible. ... We can develop and feel the highest level by increasing our practicing

and rising from chest to the top of head.” (Moin Namini, "Dhyana (Meditation) Workshop")

This exploration made me aware of other levels of consciousness and I expressed this by interchanging the frames of a movie or by drawing. In fact, achieving the state of relaxation which, as Patel says, helped me to expand my mind through my physical perception and to understand what reality is and how to relate to it because I understood ‘how our true nature is illustrated in Sanskrit’ originals. It also provided an opportunity for me to imagine, draw and exhibit the impression of the body floating in the ocean of energy fields.

Hence by focusing on my thinking, I learnt that ‘thinking’ is similar to the ‘heart pumping’. Patel’s comparison of the heart pumping with the mind thinking is with us and we cannot ignore it, by continuing to meditation we learn how to enhance our thinking and the level of our thinking, taking it above everyday thinking. Although, Patel states that improvements in thinking result from deeper levels of relaxation which lead to richer and deeper thoughts which are spontaneous, he states that meditation is a tool for detecting our consciousness in order to see prana. He says, “like atoms, which needs to be seen by powerful tools, our reality, needs to be seen by appropriate tools in this regards”.(Moin Namini, "Dhyana (Meditation) Workshop")

Thus, “Purity of the mind is achieved during meditation is essential to gain access to higher self”. (Chalko) Therefore, relaxation and breathing exercise are all forms of concentration and focus our thoughts on a particular stage in order to promote our capability. Therefore, by deeply relaxing the physical body, by concentrating and listening to our inner-self we gain these deeper forms of consciousness. Similarly, when we gaze, we increase our sensitivity to achieve a very similar effect. Gazing fixes the eyes on one spot and so makes the mind completely ‘blank’ with no thoughts.

6.3 Perception of hidden values throughout the physical body

Our physical body is a mysterious world, which is capable of seeing our hidden values through this mass of the material. This complicated system is designed to enlighten and can be the tool which connects and explains the values and language of our existence which lies hidden in us, although, at some point, this natural design can potentially interpret the possibility of the existence of other levels of consciousness. Just as I have experienced an elevated consciousness through my work, I would like my watcher to take control and raise their mind and spirit from a lower source to a higher level of perception.

Nevertheless, our physical body is a tool with which we can draw knowledge to the mind and consciously experience and learn how to understand our world. Artistic expression acknowledges that the physical body is an acknowledgement of the clear results and further insight gained through such perception. More importantly, our body portrays the reality of our mind and levels of consciousness and energetic centres. Michael and Eva Nudel state, "Chakra system may be accepted as a model of consciousness. They state, "the consciousness of all living organisms is based on energy travelling through the energetic systems. Chakras are centres of different levels of consciousness, ranging from the base level to the high spiritual". (Michael Nudel and Eva Nudel, Health by Bio-Energy and Mind & 21st century's New Chakra Healing)

Research on the extraordinary range of consciousness indicates that our physical body may have direct links with our mental body, and our intentions can affect the conscious world despite physical barriers and separations. This reality obliges us to accept connections that we cannot yet explain and yet it is quite magical and beyond the physical world as Pratt says:

“Some scientists speak of a ‘transcendent realm’ beyond the physical world.” (Pratt, Worlds within Worlds)

However, most of the scientific assumptions are not an accurate answer to the reality of our conscious self, as Jean Pierre indicates that, “seventy years after the advent of quantum theory, there is still no clear idea as to what its mathematics is actually telling us”. (Vigier) Pratt acknowledges in his paper that “a growing number of scientists are giving serious consideration to the possibility of non-physical realities and causal factors”. For example: David Bohm^{viii}, Biologist Rupert Sheldrake^{ix} and astronomer Tom Van Flandern^x.(Pratt, Worlds within Worlds)

There has been much scientific investigation into these matters, but no clear conclusions have been drawn. There is still much work going on in these matters but there are no clear definitions regarding the relationship between the brain, mind, consciousness, infinite energy and the existence of the other world.

In summarising the relationships between the brain, mind and consciousness the central focus in Chapter Six was on shedding light on questions such as: how can we describe our consciousness? Where is our unknown world? How are scientists searching for the answer? What do they see, and what is their goal? Now, however, my question is deeper than that: I wonder whether the origin of what I want is an effect of natural laws or beyond scientific analysis.

In principal, I may agree with scientists and physicists like Pratt when he states that there is “an infinite eternal universe” and argues that in that universe there “can be no ultimate explanation”. He states:

“But if we want to find the direct causes of events, we have to look to real substances, real forces, and real entities, whether physical or non-physical. Nothing that is capable of acting on the material world can

be absolutely nonmaterial because it would then be nonexistent”.
(Pratt, Consciousness, Causality, and Quantum Physics)

The main focus of this chapter has been to focus on ways of being human beyond the physical body and on the idea of our mental body, the universe and its interactions in the world of modern physics. Another important line of enquiry is research into the origin and evolution of the body, energy and interactivity to explain the stunning assortment, creativity and ingenuity of the new form of art. Perhaps, this creativity happens with the idea that can be illustrated by looking at human body as individual. In doing so, my concentration expresses how a quantum individual responds to the heart of *what we are about*, and how the human body, through that response, creates both her/himself and her/his world. According to the laws of physics, the universe and everything within it is the belief that there are surely abstract laws and principles floating around.

On the other hand, there are also non-physical energies hidden in the human body that, on a larger scale, introduce a vivid vocabulary by focusing on spiritual powers to express our being through our continuing experience. As a matter of fact, the reality of modern physics and the world of quantum theory has enabled scientists to experience the mystery in scientific terms. The aim of this chapter was not to engage in scientific assumptions but to show the spiritual space of being human and to use the spiritual space in my palette, which also required me to explore the yet unconcluded explorations of scientists in these matters.

There is then, a possibility that our physical body, as a system of information, may link up with our consciousness, produce meaningful information and give us a sense of being dissolved into the world of knowledge, intelligence, and inner strength which enables us to gather energy and achieve a balance between action and emotion which promotes our understanding of our universe. Nevertheless, “Ancient Indian thought determined the non-physical

energetic centres (Chakras) as sites of consciousness”. In fact, chakras are the essential part of our information system that connect the inner and outer and bridge our mind and matter. It is also interesting to note, “all humans have and use their chakras, even if they are not aware of them. “In Sanskrit, the chakra is a wheel of life, and the energetic circuit”.(Michael Nudel and Eva Nudel, Chakras as Psychic and Energetic Centers) In these terms, based upon the charka’s activity and our entire energy system, the main chakras, which are positioned on the spinal line, control the balance and potential energetic flow of the charka system.

This was, for me, a new way of seeing the figure of the body, I found my self in a position where I could see myself not as a mass of atoms or genes but as a perception of limitless potential. Thus, I was placed where I could perceive the true value of my existence running through my consciousness and patterning the scenario of virtual possibilities in a new form of expressive digital art. Here, I would like to say that this was a revealing moment about me as a person and as a being in different dialogues. In fact, understanding the Sanskrit translations of consciousness given by Nandish Patel, has led me to view the expression of my art subjects not as discrete entities but as an infinite number of different ways of expressing the subject. I tried to link this with developments in modern physics and, particularly, quantum physics. It also defined the meaning of being human and made me see how to fuse my understanding in order to go forward with my artistic ideas. Moreover, my regular meditation lessons gave me the opportunity to exercise, explore and reveal the reality of the body, its energy system and interactivity through my physical body.

6.4 Activity and interactivity in the context of hidden values

An artistic subject is a source of ambition and inspiration to an individual, it provides new ideas that play a significant role in the growth of knowledge beyond its physical presence, it also helps to us to relate with our consciousness. However, the rupture between the physical body and the mind prevents us from approaching these potential values. Hence, the conception of our being refers back to the question, what is the notion of activity and interactivity in the context of hidden values?

Zohar, in her book, *'The Quantum Self'*, expands her idea with the definition of the world as a creative channel of communication between the mind and body. She delineates the communication between the human physical worlds and between the individual and his/her personal and material context as the term 'inner and outer'. She states in her book, *'The Quantum Self'* that the "mind is relationship and matter is that which is relate"(Zohar,p219). Therefore, the body alone opens us up to the perception of the physical world and the notion of our real world in the form of the material and the immaterial.

Thus, both the material and the immaterial universe is the key leading to new sensations, which can be achieved by the practice of directing human energy through the physical body. Indeed, once we learn how to control and transfer this energy, through our entire body, can use the Prana, our consciousness, for all purposes in our life. On the other hand, once we learn how to build up our insight activities we detach ourselves in order to perform changes.

Through the centring of our perception we can be aware of the energetic realm of our thoughts, feelings and imagination, which is made up of energy from our inner body. As the concentration of insightful energy within us develops, this moment of awakening provides a new opportunity for the further practice of sensing, which leads to the experience of being entirely in the energy body.

Nevertheless, our physical body is the evidence of our existence in which state our activities portray an interactive dialogue between the body and mind. It also causes us to stretch our imaginations towards the real meaning and connections. Moreover, this kind of knowledge can lead us to answers to those basic questions of 'how', as Penrose has mentioned in *Shadows of the Mind*: "HOW come we became humans?". The term 'how' is truly an important theme in the broadening of interactivity throughout our artistic activities. However, if Penrose attempts to draw just the physical appearance of this particular phenomenon then he has ignored the reality of body and mind and their connectivity thereby seeing the human self beyond the sense of the physical basis of our body.

I would like to mention here that becoming a 'human' is the object of finding the hidden values, which are based directly upon the subtlety of our existence. Thus, in knowing ourselves, we can move towards the possibility of a different path in mechanical physics and see ourselves as a composition of waves emanating from our self-consciousness through the universe. These kinds of activities at any and every moment enhance our interactiveness and deepen our connection with our physical bodies and make a stronger energy-body.

6.5 Body, energy, interactivity

The movement of our physical body creates an invisible energy which is emitted in the form of waves. "Electrons will change the level of their orbit, which raise to a higher orbit around its nucleus, or even free it from that nucleus".(Bigelow) Besides, in modern physics the whole universe is an ocean of waves. Everything is made of waves, and every object also emits waves. Everything flows and nothing stays fixed. "The tendency of modern

physics is to resolve the whole material universe into waves, and nothing but waves”. (Pratt, Beyond Materialism)

Thus, it is interesting to note that we are part of a universe and have been surrounded by the quantum of energy and the dimension in reality and virtuality. Our hands, faces and every part of our bodies originates physical energy. “This energy influence on our body, mind, and emotions. As we move, the function of our body affects the space around us. Our movement change the situation and the “electron, (as well as other basic quantum particles), can somehow move from one point in space to another immediately”.(Bayles)

Essentially, the function of our body in comparison with any other physical object based on quantum theory is the same. For instance, “to make any progress in understanding radiation, we must specify the details of the body radiating. The simplest possible model is to consider a body, which is a perfect absorber, and therefore the best possible emitter. For obvious reasons, this is called a ‘black body’^{xi}”.(Fowler)

In fact, if we believe in our body as a mass, this phenomenon could have a similar function but with different expression. Atoms radiate energy as a result of the movement of their electrons. When an electron moves, it emits photons at specific energy levels between the highest and lowest level, which will change the level of wavelength. This happens when the level of our inner energy changes step by step and raises our mind up to the higher level of our chakras. As the Nudels describe in their book, *21st Century’s New Chakra Healing*, “there are four steps for our chakras including cleansing, balancing, normalizing, and healing in Bio-Energy System^{xii}”.(Michae Nudel and Eva Nudel)

However, our physical body acts the same as the other object in Planck’s black body radiation, but the focus is more on the evolution of the

consciousness. In this regard, the first phenomenon interprets the evolution of the scientific thought, and the other interprets beyond the scientific thought. (Blackbody radiation) Thus in Planck's terms concerning physical phenomenon, any single photon has a separate energy level and each colour of light has its own unique energy level. In this situation, a photon can transfer its energy to an electron, however it is not possible to increase or decrease the energy of that photon without changing its wavelength. The intensity of visible light can be increased or decreased only by changing the number of photons present. (http://www.play-hookey.com/optics/light_as_particle.html)

We are living in the world of unknown space, where everything seems visible; however, in this physical space the connection and interaction between bodies are real but how about the other side of this relationship?

Perhaps, there is a connection between this area of physics and consciousness but ongoing investigations attempt to reveal and suggest an appropriate answer to questions such as: *How* can we clarify the natural human, the body, the mind and their interaction with each other? *How* does our mind relate to our body and the physical world? Max Velmans challenges some of the hypotheses about consciousness, the human brain, the surrounding physical world and their correlation. (Velmans)

However, the purpose of this chapter was not opening a scientific panel, I discussed this in chapter 5, as an introduction, to guide the readers' notions, step by step, towards the last two chapters. Nevertheless, in this chapter, I tried to reveal the nature of energy through different interpretations, conduct an exploration of the physical body and enliven the hidden values in digital art format. Therefore, challenging new ideas and the use of new techniques have stimulated a new interpretation of the relationship between the spectator and the artwork they see. In fact, the exploitation of new technology has evoked a new way to explore why we are so curious to know our bodies, how it is possible to make OUR BODY interactive and what is really inside us, how we

can express the physical body and its interactivity in real and virtual space and what our energy consists of.

In this regard, in art, motion and awareness provide a pathway through our minds within our consciousness. This is the excellence of our body, which can be expressed by the power of digital processing. It gives us the opportunity to express movement and interactivity at levels of detail that are not possible with traditional palettes. Two layers of space exist, one is the visible world and the other is the invisible human consciousness. Thus, the world of digital art is a new way for artists to express their feelings through the virtual palette. To say that the computer is only an intelligent machine without any sensation it does not mean that it is incapable of conveying what the artist sees. Even if, one day, all computers feel the entire range of human senses this will not devalue any digital art creation. They could even make it easy and comfortable for digital artists to display their insight into the universe.

Despite some arguments about the lack of feeling in artistic work created by computer, there is no need for computers to 'feel' while artists are creating a piece of art. On the other hand, it is the artist's responsibility to display his/her inner feeling in any art form. In response to this, I broadened my viewpoints and had discussions with two different digital artists; Simon Biggs and John Toth. I opened the discussion by introducing the book *Shadows of the Mind* written by Penrose and focused on a particular section on which I was interested to hear their views. I aimed to provoke different comments concerning the production of any digital art and artistic values in these sorts of productions. Therefore, unlike the scientific and mathematical notions of artistic production that Penrose expressed, I wanted to draw my readers' attention to the significant point in the impression and expression of hidden values in art.

Appropriately, computers as a tool are just a material in the hands of an artist which helps them illustrate their inner feeling in a sophisticated way. Penrose tries to find a convenient answer to his viewpoint. He indicates that:

“Accepting that robot is not actually capable of feeling anything, might not a cleverly programmed computer be nevertheless capable of producing grate works of art?”(Penrose)

Then he adds that:

“This is a delicate question, it seems to me. The short answer, I believe, is simply ‘no’ –if only because the computer cannot possess the sensual qualities that are necessary in order to judge the good from the bad, or the superb from the merely competent”. (Penrose)

Simon Biggs sees Penrose as asking the wrong question and not looking at it from beholder’s view. In responding to his comment, he says:

“I think that Penrose asks the wrong question. He is associating art with the artefact and the idea that art is made by artists. He is not looking at it from a point of view that would put the primacy of ascription of art to the beholder. That is to say, if Derrida’s argument that the reading is the completion of the work then it follows that the status of a work as art is ascribed at the time of reading and not prior to that time.”(Moin Namini, "Online Interview")

The digital palette and program enables artists to draw and design pictures on a computer on a one to one ratio with a pen that is specifically made for the palette instead of drawing on paper. As we can see, however the traditional use of the palette and pen or any brushes has been changed by the variety of digital material available, but the way of producing a piece of art has the same value as any traditional product in a different style.

Biggs declares that “it does not matter how the work came to be made nor who or what made it. I have always thought that this approach is generous in

that it allows a person looking at a cloud or a tree to declare it a work of art (which seems reasonable to me)".(Moin Namini, "Online Interview") Then he adds, "although each of these things is the product of incredibly complex but, in their singularity, inconsequential natural processes. As such, these are works of art without authors. My own work with auto-generative text is similar to this."(Moin Namini, "Online Interview")

Thus, it is unfair to say that the value of art and the artist's imagination in producing a new form of art is missing in the production of digital art. The creation of artwork arises from artist's imagination and his/her perception of universe. Thus, when Kandinsky creates his expression in 'Impression III' (Figure1.4), Picasso creates his Guernica (Figure2.6) or when Van Gogh shows expresses the world around him by his impressions (Figure4.5) none of them devalued the work of Da Vinci and his Mona Lisa (Figure3.6) or Rembrandt's achievements in his work using light and darkness (Figure4.6).

Figure2.6- Pablo Ruiz Picasso, Guernica 1937 Oil on linen cloth, 349.3 x776, 6 cm. musée du Prado



An image of pain and brutality depicts the fascist bombing of the town Guernica in Spain (1937)

Figure3.6- The Mona Lisa by the famous Italian Renaissance artist Leonardo da Vinci



an oil painting on poplar wood. It measures 77cm by 53cm (30 inches by 21inches).

**Figure 4.6- Portrait of a Gentleman with a Tall Hat and Gloves. c. 1660.
Oil on canvas. The National Gallery of Art, Washington, DC, USA.**



The need for change has always been central to artists in any period in the history of art. Essentially, the world of challenge and development in industry and marketing has been the main reason for artists to enhance their creativity. Besides, the use of new techniques and the availability of digital technology has brought artists to challenge traditional stances and explore new positions in art. Digital artists in different fields of art are highly motivated to enhance their potential and create their ideas and imaginations in the virtual environment.

Therefore, the use of virtual palettes in comparison with traditional palettes may not reduce actual feeling and artistic values unlike Penrose's declaration, which sees the computer as a producer and compares it with human artists. He distinguishes different kinds of activity with two individual producers without acknowledging the computer as a tool used by a creator, the human artist. He says:

“I think that it would be generally accepted that the product of this sort of activity has not, as yet, been anything that could stand comparison with what can be achieved by moderately competent human artist.”
(Penrose)

John Toth credits a copy of digital production by quoting Walter Benjamin and opposes Penrose's statement about generating a piece of art work by computer and says:

“However, Walter Benjamin, writes in, ‘Art and the Mechanical Age of Reproduction’, that a copy of a digital file is exactly the same as the original. All the copies are originals. So the robot computer is generating original works of art.”

Then he analyses Martin Heidegger's opinion of the art and argues that, “he believed that the work of art was a setting forth of truth”. Though, he mentions that in some ways the artist or creator does really matter. Then he adds, “ It's what the viewer brings to and confers upon the work of art that speaks of truth”. (Moin Namini, "Online Interview")

Similarly, Biggs opens his argument by saying, “It does not matter whether robots or computers can or cannot make art”.(Moin Namini, "Online Interview") In fact, he gives his readers an intimate view of his values and establishes computer production as an art. He indicates that the major point is that a production input through such systems might be recognized as art. Thus, to him the values of art come first rather than the method of production, whether by computer, human artist or something else.

According to Biggs, the existence of wind or rain can be a system capable of creating an piece of art. Therefore, he explains that:

“Given that the wind or rain can be seen to be systems able to produce phenomena that might be considered to be art then I have no problem in suggesting that a robot could also facilitate such a thing.” (Moin Namini, "Online Interview")

Then he adds that:

“However, this does not mean that the robot has made art or is an artist. Personally I doubt that an artificial (human made) system will ever be complex enough to be able to be an artist (or fulfil any other particularly human activity). Nevertheless, I see no problem with accepting that a robot might produce something that someone could consider to be art.” (Moin Namini, "Online Interview")

Inevitably, this raises various questions such as: Is there really any difference between the human artist producing traditional art and the production of a computer or robot? How does Penrose exert the artist’s imagination through the process of creating a piece of art? Is the computer able to programme itself to create artwork? It seems that he is not quite convinced and does not lead into an argument that explains why “this sort of activity”, cannot be compared with what is been created by human artist. Most importantly, perhaps, Penrose should observe that: “Robot for the most part does not program itself and even if it does as is the case of ‘Artificial Intelligence’ an original programmer is

telling the robot how to act. A robot may also be thought of as an instrument that is controlled by the technician artist".(Moin Namini, "Online Interview")

Along the way, he argues that "the work expresses nothing because the computer itself feels nothing." (Penrose) In building his case, he develops a scientific theory that a computer's input has no feeling or soul. But, what are we talking about when we look at the way of creating a piece of work rather than limiting our inquiry to the content of the works? Penrose does not realize that this view is not about the way of production but rather the artistic values created by artist, whether or not he/she uses traditional tools or a digital palette.

This ties into the interrelationships between the mind, computers and digital artists who work in a virtual environment with their virtual palette, which is ignored by Penrose and needs to be analysed. A computer cannot generate a piece of artwork unless the computer artist inputs appropriate information and enlivens his/her imagination in order to create an innovative art form. Therefore, it is completely wrong to say that because the computer feels nothing, the product of this sort of activity lacks soul and artistic values.

Nevertheless, the exploration of the body, its energy and interactivity introduces new ways of seeing ourselves; Toth asserts that "art requires a certain freedom to choose". I have chosen the reality of the body as my case study to understand and experience its unified interaction with our inner values in the new form of digital art. I define my conception as a neophyte's belief in the work of established digital artists like Biggs and Toth who have been working for over ten years in this field.

This is the challenge between activity and interactivity which forms the analysis of the critical frameworks in the terms of the visual and digital but what is the thinking behind this? The important point is that the quantum physics of the human body influences and integrates with the space around the

body. We are full of energy and our environment is full of energy, thereby our physical existence and space interacts and expresses the body and its energy through the cells acting as sensors.

Our physical existence in non-physical dimensions reveals the levels of consciousness, which is linked deep into the inner energy, our aura^{xiii} and our perception. This is something that might tie this relationship to the reality of our body, “our aura is the energetic skin, which holds all our inner energy, bodies and outer body together and our chakras give us the possibility of self-awareness, personal growth, wisdom, new understanding which regulate the flow of universal energy into and out of the body. (And also open the door to the any kind of information and influence).”(Understanding the Human Energyfield)

This may open our minds to the reality of the interaction between the physical and the energetic structure. Indeed, interactivity between the physical and the energy bodies is a new pathway into the study of body, which links it to the new worlds of quantum theory and higher dimensions. Thus, the best way to have such an awareness is to see our body as a system of information, which connects our physical body with our energy system. This may invite my watchers inside my world and encourage them to watch the human virtual self-consciousness through their inner eyes too.

Thus, the effective use of a digital palette can promote our capability to see and exploit the human hidden values in virtual space. Such an environment raises various questions about our real nature and our perception of the universe and the physical world. Velmans states that, ‘given the way relations between consciousness, brain and physical world are commonly construed, the model poses many questions’. (Velmans) This may be subject to the input of our inner being and thoughts. Therefore, in the next chapter, I will focus on the consciousness as a higher-dimensional force that can, more broadly, affect all aspects of three-dimensional reality and not just the human energy field.

6.6 Conclusion

Despite the extraordinary resources available in the area of energy fields, the theoretical basis of the body and the level of consciousness based upon eastern philosophy is not completely supported by scientific evidence. However, a growing body of research with reference to the reality of the body and the existence of the universe in the era of modern physics opens a new path to the investigation and consideration of the world around us and the world within us. Therefore, given the experiences related in the last chapter, it is inevitable that science is only one of many modes of thinking, all of which are equally valid.

Nevertheless, the study of the body, the mind and consciousness continues to challenge modern physics with a wide variety of areas in research and development. In fact, there is an increasing number of scientists, physicists and philosophers who have indicated that evaluating the efficacy of body should be taken seriously by professionals in various research studies. Thus, the study of modern physics and quantum theory in chapter five enabled me to see another side of the body.

The existence of higher dimensions and the mystery of our universe also attracted me to the mind-expanding vision of consciousness and led me beyond the physical and towards the immaterial. Practicing controlled breathing and relaxation was an opportunity for me to understand that, as humans, we have the ability to use our consciousness to affect both our environment and ourselves, we can then be aware of the consciousness as an active force for change.

The major purpose of this chapter was also to determine the reality of energy and hidden values inside the human body. My own personal experiences have convinced me of the reality of the energy of the human body, which was the best place to start looking for answers to questions about consciousness.

Nevertheless, I expanded my awareness to know how we can control the flow of composed waves through the physical body. Moreover, the intention of this chapter was to bring up fresh ideas concerning the concept of the physical body and to empower my imagination, which is the subject of forthcoming chapter. Thus, in addition to practicing meditation, I have had positive experiences with digital art and have communicated my feelings through it to bring events into the virtual lives.

Consequently, I attained my potential to identify works of art and analysed the role of the consciousness and our being in visual art production. Our understanding of the concepts and contexts within visual arts cannot develop without practice and experience. I challenged various assumptions to expose fresh perspectives in the study of human body and visual arts. So I learnt values which provoked fresh thinking about the material and the immaterial and eventually extended my work from relaxation of the body to the correlation of multimedia with specific tonal meanings in the area of digital art in which science and visual art could fuse into one.

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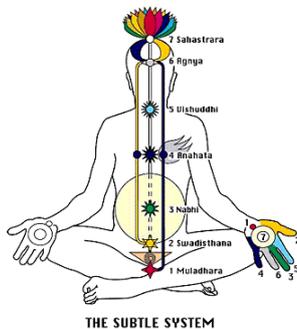
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Note

ⁱ **"Spinning Wheels of Light"**: (the translation of the Sanskrit word 'charka'). Are rooted in a **vertical power current** or energy hose (see picture) that interconnects and interpenetrates the aura and bodies. nourishes all the inner energy bodies as well as the outer matter body with life force.



See more in: <http://www.healpastlives.com/future/cure/crfield.htm#Chakras>

ⁱⁱ The most common form of meditation throughout the world is “mantra” meditation. “Mantra” is a use of any words or syllables. The most effective “mantra” is “OM”(universal mantra, that connect our souls with universe). Chant your mantra mentally or aloud; which ever is more relaxing to you. Listen to inner self. Instead of inner voice, your consciousness has to chant the mantra. The word ‘Om’ contains tremendous spiritual power. Meditating on the word ‘Om’ or continuous recitation of ‘Om’ can bring internal happiness and peace within an individual. In scientific terminology, the word ‘Om’ is not confined to any particular religion but represents the universal voice of the nature.

The word ‘Om’ is formed by the combination of three letters, A, U and M. One of the accepted description is that the alphabet ‘A’ represents the physical plane (physical body and the *pranic* body), the alphabet ‘U’ represents the mental plane (mind, intellect and ego) and the alphabet ‘M’ represents the higher spiritual planes (astral or causal planes) and represent pure conscious state of an individual.

In terms of consciousness, the letter ‘A’ is the first state of consciousness and represents awake (*jagrat*) state. The letter ‘U’ represents the dream state and the letter ‘M’, the third state of consciousness, represents the sleep (*sushupti*) state. The combination of all the three

states represent the word 'Om' which is called the fourth state or the 'Turiya' state of consciousness. This practice can help drive away all worldly thoughts from the mind and help in achieving a state of mental relaxation.

See more in:

http://www.hindustantimes.com/2004/Jun/18/5983_649266,004300140009.htm

<http://www.saranam.com/Rituals/om.asp>

<http://www.meditationsociety.com/week20.html>

ⁱⁱⁱ Pranayama, The literal meaning of Pranayama is Prana's ayam that is an extension of the Prana. The vital life force. 'Tasmin ati shwas prashwas yogati vichehdedah pranayamah'. That is, Pranayama is nothing but a retention of the Prana-the vital life-force breath through break in the rhythmic breathing. Prana is that vital life force which seems to be controlling every thing on this tangible earth, and exist as a thought in the world. In other words, the prana is related to the mind and mind is related to the brain and the brain is related to the soul (Atma) and the soul (Atma) is ultimately related to that eternal divine force called Paramatma. Thus the objective of Pranayama is to stimulate, communicate, regulate and control the vital life force that exist in the body.

See More in: <http://www.urday.com/pranayama.htm>

^{iv} **The first chakra** is Muladhara (the root chakra), located at the base of the spine. Red has the lowest vibration rate in the visible spectrum, thus it affects the most dense or material matter in our organisms. Muladhara affects and is most affected by the physical body. Nevertheless, it gives an awareness of eternal life and the divinity of individuals. The Muladhara chakra is responsible for the normal condition of the five senses, sex, and physical growth. The root chakra is associated with survival, stability, structure, manifestation, and patience.

The second chakra is named Svadhisthana and is located in the sacrum (lower abdomen). Energy wave fluctuations correspond to the color orange. The sacral chakra corresponds to the ether body. The sacral chakra is more complex than the root chakra. Muladhara absorbs electromagnetic fields from the earth (through the ground chakra) that are necessary for the physical body. Svadhisthana, which produces an internal energy, utilizes the prana of food matter, which it distributes along meridians to the organs of the physical body and to the other energetic centres and subtle bodies. The sacral chakra controls our energetic states. The health of our physical bodies depends on this chakra's activity. As the entire ether body, the sacral

chakra is important for our well-being and vitality, and is associated with abundance, pleasure, and the inspiration to create. Svadhisthana is responsible for prosperity, desire, sexuality, and accelerating the healing process.

The third chakra is Manipura (the solar plexus), located on the fifth lumbar (abdomen) vertebra. The chakra's energy corresponds to the energy of the color yellow. Manipura is related to the astral subtle body; through the solar plexus chakra, a connection between the chakra's system and astral body's energy and substance is kept. The solar plexus chakra controls our emotional states, and emotions are directly linked with our sense of well-being and health. Manipura governs personal power, self-worth, self-confidence, self-esteem, decision-making, metabolic energy, and insight.

The fourth major chakra is Anahata (the heart chakra). It is located on the fifth thoracic vertebra (on the chest). Anahata's energy color is green. It relates to the mental body. The heart chakra is the beginning to higher consciousness and spirit, and it keeps the balance between the three lower chakras and the three upper chakras. Anahata chakra helps in the mastery of language and poetry. As the mental body, its chakra determines mental creativity, logic, memory, velocity of the thought process, eagerness to philosophical and scientific knowledge, and self-control. It brings a balance of action and joy and promotes wisdom, intelligence, and inner strength. Anahata chakra affects our actions, behaviors, and thoughts, and keeps the balance within the physical body. **The fifth chakra** is Vishuddha, located on the first thoracic vertebra on the thyroid level (throat). The energy colour is blue. This chakra connects to the karmic body. The throat chakra brings knowledge, creativity, communication ability, purity, calmness, and mastery of the individual's entire self. At this level, an individual expresses the entire self and his or her ego verbally, and shows the inner-self to the outer world. Here, emotions may be expressed in forms such as painting, singing, or writing. The throat chakra controls and expresses both thoughts and emotions. The throat chakra gives energy to the voice and desire to express the individual self. Voice power shows the throat chakra's strength, whereas a weak voice shows the throat chakra's imbalance. Differences in the voice reflect the state of the moment: emotions, sexual arousal, love, or a thought state. It brightly shows the interconnection between chakras.

The sixth chakra is named Ajna (the third eye chakra). It is located on the second cervical vertebra (on the neck), and on the forehead between the eyebrows (on the front, or medula plexus). The forehead location is called the Third Eye, and it is connected to the intuitive body. The energy colour is dark blue (indigo). Ajna is the centre of physical energy, and the transformer of universal energy or energetic information to the physical body and to other

chakras as well. Through the third eye chakra, a universal energy is channelled to the physical body. The chakra governs growth and coordination on the physical level, and it allows mastery in spiritual and emotional growth as well. Moreover, through Ajna chakra, we are able to open ourselves to the universal creative energy, or energetic information. The Ajna chakra perceives energetic information and commands where the information should proceed in the system. The Third Eye is a source of super consciousness (the unconscious sphere of consciousness), spiritual wisdom, clairvoyance, imagination, and intuitive insight. With a developed third eye, we may become perceivers of past, present, and future. The Third Eye is a place where the balance between mind, emotions, spirituality, and the physical body may be achieved in order to create, heal, and perceive universal and divine information. We may achieve and control our balance and awareness in a state of enlightenment; this is why thought can be creative and healing. Thus, through our imagination, wisdom, and creative abilities, we can lead ourselves to healthy, happy, and fulfilling lives. Openness to spirituality may significantly change our understanding of our inner selves and our connections with an outer world and other people. Through the third eye chakra, we may transform ourselves into spiritual beings and control our minds as spiritual masters do. The healthy chakra, with its highly developed intuition, leads to overall well-being and happiness.

Through the Ajna chakra, one reveals the divine within the self and reflects divinity within others. An opened and functional Third Eye chakra dissipates ego, duality and reveals the sense of oneness with the Universe and unity with the cosmic laws. Intuition, inner vision, insight, divine wisdom, spiritual and emotional growth come into reality in the Third Eye chakra. At the Ajna level, one may express theories, ideas, and ideologies.

The seventh major chakra is Sahasrara, located on the top of the head. The color is white. Through Sahasrara chakra, we receive universal cosmic energy and energetic information from God or the Divine Center. Sahasrara represents the highest aspect of the Self as a cosmic organism. It is linked to the Absolute body (the conclusion of the development of all seven subtle bodies of a cosmic organism), and it relates to the whole being. Sahasrara chakra is a center of psychic energy. The crown chakra is the most purified and evolved energy level in the bio-energy system, a balanced and perfected universal wisdom. The goal of a human is to improve one's own karma by living a "good" life, and a healthy Sahasrara chakra regulates human behavior and personal characteristics to live a life in accordance with karmic law. Sahasrara chakra is a centre of spirituality, refinement, and magnificence. Through the crown chakra, human spirit connects to Universal Spirit, and the spiritual being moves toward Universal Consciousness—the individual self is fully dissolved here. At the crownchakra

level, the cosmic self opens to the Source, unites with cosmic principles, and governs the entire universe within the body. The crown chakra is associated with universal knowledge and spiritual understanding. See more in:

“Health by Bio-Energy and Mind” & “21st Century's New Chakra Healing” By: Michael Nudel and Eva Nudel, Energy Healing Specialists
<http://www.bioenergy-services.com>

<http://altmedicine.allinfo-about.com/features/rootchakra.html>

^v Sabda brahman as mantra is identified with Om or Omakara, and Om, in turn, is identical with the primordial sound, which is none else than Param Siva. Om, thus, is viewed as the seed of all sounds, and so is the collective expression of all sonic sounds. As such Om is the primordial sound (para-vak). Since Om is identical with the Absolute, so it is the substratum or basis or ground of all that there is (Netra-tantra, vs. 129).

See more in:

http://www.theonet.dk/spirituality/spirit01-14/Brief_Outline_Tantrism_MLP.html

^{vi} In the world Mantra the Root man="to think" (in Greek "menos", Latin "mens") combines with the element tra, forming tool-world. Hence mantra is "tool for thinking", creating a mental picture. The sound brings forth its content into reality immediately. Speech can be contradicted or evaded, but Mantra is a power, it does not talk but acts. The forms of divine life break forth from the seer as vision, from the singer as song, manifesting the priestly power. The Mantra is a symbol which is never degraded into a mere object of temporary utility. It could effect cure, mental tensions, insanity, insomnia. It could attract, repel, strike, kill, enliven, enslave, teach, liberate.

The theory of mantra is very deep and is not meant for the laymen. Modern sciences have been working on the effects of various types of sound physics, chemistry, biology and psychoanalysis. There have been investigations into the idea of creative sound, the theory of vibration cast into the Vaikhari, Madhya, Pasyanti and Para forms of languages leading to concrete and the subtlest spiritual forms.

See more in:

<http://www.jainsamaj.org/literature/mantra.htm>

^{vii} A sanskrit word meaning ‘breath’. Prana is the vital energy, which keeps all living things alive. Also known as Chi.

Prana is neutral; its quality is energy without any quality, just pure energy. This pure energy can take on any quality without losing its pureness; just as by putting on clothes we associate with a style of dress, still we remain the same person.

Prana can be used to exhilarate meditation, sex, combat or healing. Prana gives vitality to the physical body and it also gives us the power to think. Prana is both physical and mental energy. Movement of thought in the mind arises from the movement of prana; and the movement of prana arises because of the movement of thought in consciousness. They thus form a cycle of mutual dependence, like waves and movement of currents in water.

See more in:

- "THE SUPREME YOGA", YOGA VASISTHA, TRANS: SWAMI VENKATESANANDA, second edition 1991, pg.313 5-78-14.

- <http://www.sannyasin.com/p.html>

^{viii} David Bohm, through his interpretation of quantum physics, developed the idea that our physical or explicate world is guided by an 'implicate' order and also a 'superimplicate' order, and he held that may be an infinite number of deeper implicate orders, each having both a matter aspect and a consciousness aspect.

^{ix} Biologist Rupert Sheldrake, for example, proposes that, beyond the fields known to science, there are various types of 'morphic fields', which, he says, are needed to explain how organisms grow from a seed or egg, how they maintain their form, and the origin of instinctual and selfconscious behaviour.

^x Astronomer Tom Van Flandern proposes that in addition to the light-carrying medium and gravity medium, there is an infinite number of other media spanning an infinite range of scales, and that even what to us are galaxies may be particles in a medium on a super-cosmic scale.

^{xi} The maximum energy, which can be radiated by an object, is called the blackbody radiation. A blackbody is a theoretical object, which are both a perfect absorber and emitter of radiation (i.e. emissivity = 1.0). A blackbody is a theoretical object. The radiation given off by a blackbody occurs in a wide range or spectrum of wavelengths and, based on careful measurements and quantum theory, Max Planck produced an equation to model the observed

blackbody radiation curve. His discovery is considered to be one of the most important in the field of quantum physics. Common usage refers to a source of infrared energy as a "blackbody" when its emissivity approaches 1.0 (usually $e = 0.99$ or better) and as a "Gray body" if it has lower emissivity. See more in:

<http://www.cosmicshell.com/~miranda/lab/BBradiation/BBradiation.html>

^{xii} Bio-energy can be explained as bio-electromagnetic energy surrounding us.

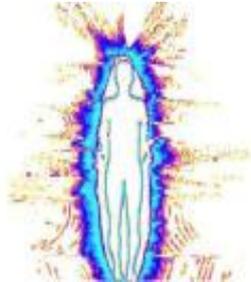
The bio-energy field of a human consists of subtle bodies with their energetic potentials, and which give strength and power to the biological field. Energetic potential depends on the conditions of physical and psychic health, and, perhaps, astrological factors. Many views and hypotheses about bio-energy exist nowadays, and some many researchers call it psi-energy. Special experiments in the laboratories enabled researchers to discover waves of energy emitted by humans. With mental activities the waves changed with speed of thought: the thought was followed by energy. Electric charges in the human's head change on different levels of consciousness. The electric field of a human is the unity of positive (+) and negative (-) electric zones. In order to be healthy, the energetic balance must be maintained in the bio-energy system.

You may hear about terms of positive and negative energy in bio-energy healing. The term of bio-positive energy means pure healing energy coming from God. Positive energy flows freely in energy systems bringing vitality and health. Whereas definition of bio-negative energy is trapped, disharmonious, stale, or stagnant energy that blocking pathways and prevent vital energy from freely flowing in energy systems. Negative energy brings imbalances into energetic systems, and it is connected to illnesses and emotional trauma.

See more in: http://www.bioenergy-services.com/Review_newage.htm

^{xiii} **Aura: Skin of Inner Energy Bodies:** Our Aura surrounds the outer physical body in all directions (as shown in the picture). It extends both internally and externally. It interacts with everything around us. It reacts to our every thought, word, feeling, choice, and action instantly. It is electromagnetic and interpenetrates our physical body with energy. Our aura is the holographic, energy matrix for our physical (matter) body.

The Analysis of Conceptual Values in Visual Arts



See more in: <http://www.healpastlives.com/future/cure/crfield.htm#Chakras>

Chapter7:

Collaborative Performing Art and Multimedia (CPAM)

7.1 Introduction

Recent advances in digital technology have a potential role in the area of visual arts. More importantly, the practice of digital art using multimedia has provided many examples of the successful application of computer technology in art and communication between artists and across disciplines. These examples can be seen prominently in movie productsⁱ and performance.

For instance, ‘Space’ and ‘ICA’ are remarkable examples of the “relationship between music, technology and movement, (that) evokes emotional thoughts and memories in the spectator, Optik work together through a technique that can be described as an ‘energy field’ reaches out to its audience through movement, image and sound”. Barry Edwards’sⁱⁱ live performances explore the new artistic and theatrical possibilities for performers and their audience by creating new ways of performance by using computers that allow simultaneous communication between performers in different countries.([Optik@Ica](#))

In principal, Edwards' 'nonverbal' performance has provided a comfortable area where the audience can communicate and feel they are part of the performance. The expressive atmosphere of such an area creates a special environment where the room is enveloped in images and sound. The mysterious images, in colours of purple and green are projected from behind or above and reflected off the screen, making the audience feel they are within the image as beams of light travel from the projection unit to the screen. That is why the relationship of performers' to each other; moving, running and being unexpectedly present among the audience, has provoked such strong opinions. (Figure 1.7, 2.7 and 3.7)

Optik is only one example of many such events happening around the world everyday, which reflect a combination of life experience and methods of artistic creation. Perhaps most of them intend to exhibit the exploration of how computers interpret reality through virtual space. As an artist, I am always looking for ways to cross boundaries and make my painting more active in digital art creations. Nevertheless, with respect to Design Studio III level III, which is the title of a module in the field of painting in the Faculty of Art in Iranian universities, I would like to develop and facilitate the actual production of digital imagery, virtual reality, and the context itself.

However, this endeavour needs to be explored, analysed and criticised in order to organize the innovative programme in this module in combination with other possibilities in art. Moreover, the terms 'creativity' and 'creative teaching and learning' considered in Chapter One are key issues for the application of new methods in digital art education and the case study which I have chosen.

Figure1.7. Optik Performed in the UK for the first time since 1996 at the ICA on 1, 2 & 3 October 2002 with their new work stream

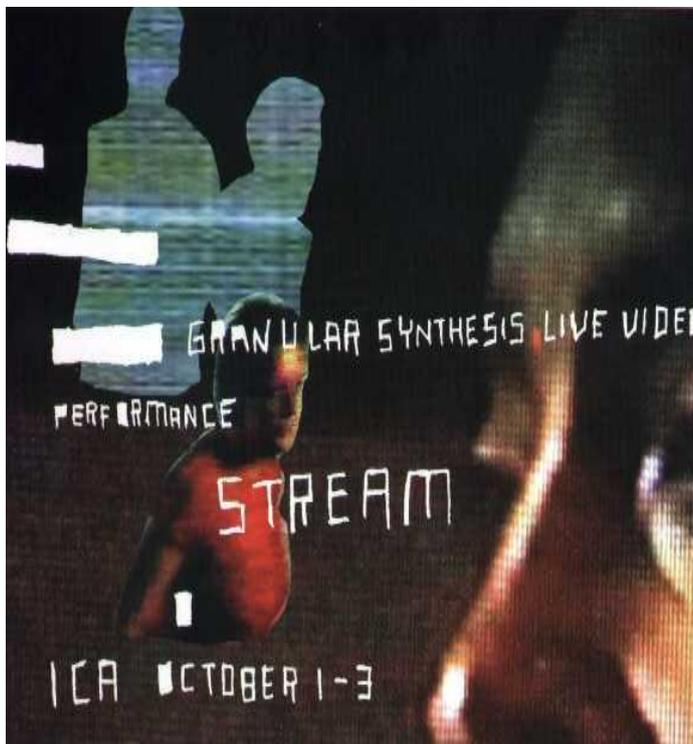


Figure2.7- Space London February 2004



Figure3.7- Space London, February2004



In this part of the study, I have focused on developing an interactive programme in performing art in which digital painting has had a role. I did my best to look at every aspect of this project in an insightful and progressive way in order to create a short project as an example for this creative programme, in which I link myself with the digital world.

Experiencing the interactive model in digital art offers students a better understanding of the best possible format for certain multimedia projects and the ability to create an independent project. Nevertheless, it will be interesting to see how well these advances fulfil the model of creative learning. For example, universities such as those in Arizona are at the stage where they “produce deeper understanding of the content through the development of skills that are readily transferable to life and work”. (Faculty Stakeholders Group)

7.2 Creating a storyboard as a first step towards the creation of a multimedia project

“Not everything you face in life can be changed, but you can change nothing until you have faced it”. (Unknown)

I exhibited my digital art and printmaking in the UK in the winter of 2002, an exhibition of art that had changed my view on what constitutes art. Holding such an exhibition in Brunel University led me to the next step which was the idea of crossing the boundaries between art and science. However, I knew that any multimedia project would be a complex program, which required proper planning so I drew up a plan to develop the conception of the project.

The first thing I needed to do was to decide upon my objectives and to establish a goal. This process helped me to compile appropriate content and

organize other information that would be used. When everything was gathered together I planned a storyboard and outlined the structure of the project. The most important step of the project was to create a storyboard which took some time at the start but saved a lot of time later in the project when I discussed it with experts who made valuable suggestions throughout the editing process towards developing a creative programme in performing art. The storyboard was a visual display of the slides divided into various sections. Each section was represented by the image (slides, video clips, etc.) best suited to the slides. For example, I used images as sample models in creating digital art for performing art. Indeed, these images could draw the readers' attention to the latest development in multimedia production and performing art, which is a new pathway to build up my storyboard. (Figure4.7, 5.7and 6.7)

Figure.4.7 The Use of computer in a creative performing art

See more in: <http://web.cfa.arizona.edu/digitalarts/theatre/index.php>



Figure 5.7 3D Model of stage design. Peter Beudert

See in: <http://web.cfa.arizona.edu/digitalarts/theatre/index.php>

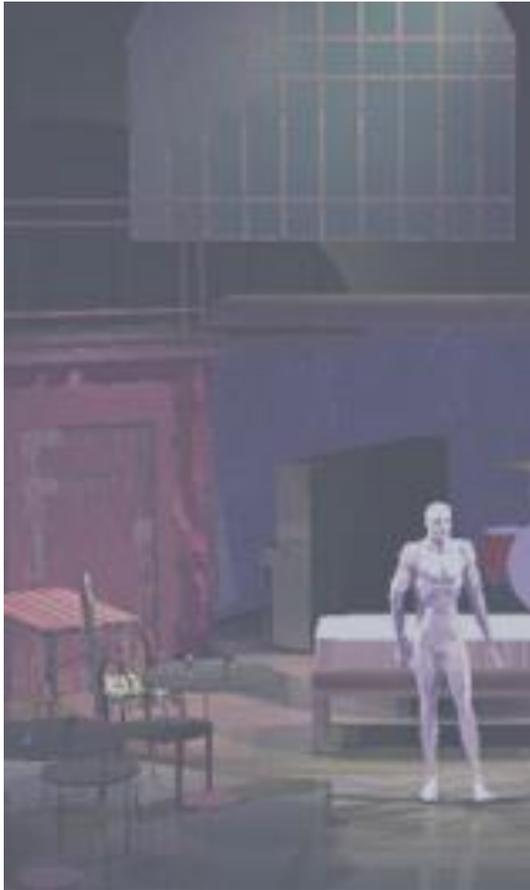


Figure6.7 The use of 3-D imaging for theatrical production

See in: <http://web.cfa.arizona.edu/digitalarts/theatre/index.php>



The idea to explore the concept of digital art in relation to multimedia grew and I considered the possibility of challenging digital technology and analysing models of virtual performance that could provide a framework for students in the area of multimedia and the performing arts. However, questions concerning the actual effort required to develop and support growth in the digital arts and the role of integrating different art forms are important so I had to decide how I would deal with these integrative issues.

Recent research has paid a lot of attention to developing the role of digital technology in education but the possibilities of this technology has not been sufficiently recognised and developed. Nevertheless, the intention of my final project was to develop a virtual exploration of artistic expression in an integrative framework which could be aimed at live performance integration with virtual multimedia. Therefore, exhibiting a visual performance became the scenario of workspace in a virtual space to illustrate the priority of using digital painting in combination with a multidimensional space to create a new dimension in the performing arts, painting and multimedia.

7.3 The context of objective storyboard in CPAM project

The reason that I am so enthusiastic about this particular project is because of the capability of digital technology in the process of digital art which can benefit both art and digital art technology. From my own personal experience in developing an innovative method in digital art, I have come to see the importance of creating educational software, which will enable students to explore their own projects using an advanced level of digital technology. To make this happen, the project had to discuss, develop, write and programme an appropriate software application, which was not undertaken as part of this thesis, but such a development would need to address these key questions:

- What kind of software development is needed?

- What would it do? For example changing colour and mixing it with movement. These are generally called ‘requirements’ by software developers.
- How will the software function? This is concerned with implementing the requirements as a computer programme.

o **Software development and its capability**

This will create a space in which students can create their unique work area and palette, which will enable them to design a virtual space to match their project. For example, a virtual theatre studio would produce digital sound effects, colour effects and sensor responses to changing colours, music, sound, and also moving images that could be a combination of motion capture and digital video.

o **Function/Objectives of software function**

Students have the opportunity to challenge approaches, create their own personal views and modify them through practical and creative activity in a wide range of relevant areas. These kinds of activities make them:

- Incorporate new media into their existing curriculum
- Foster new types of learning and sharing of information
- Build and enhance their personal practice within new media studies

o **Sequence of images and/or video clips**

This storyboard is produced based on a visual display of the script divided into sections, where each section is represented by an appropriate image (slides, video clips, etc.) for that piece. This project will represent the innovative idea of using new techniques which are used by students (Fine Art/ Performing art, Multimedia) involved in media production to help them build up their imagination and give them the skills to investigate new topics. This is

important because it allows students to see which visuals fit best and which still need to be made,

- o **Timing for visual images (how long each will last)**

This is a sample project to show how it will work, so it could be up to 15 minutes video workshop by the end.

- o **Plans for transitions**

To develop a personal, critical approach to digital art

To design a virtual scenario based on personal concept.

To understand the framework of new media and interaction

- o **Titles and Credits**

The title could be anything based on student projects but related to the theme that has been selected

- o **EXTRA NOTES on sound track and sound effects**

What kind of sounds need to be created /recorded?

Sound can be taken from Persian music and changed into the digital effect to create a composition compatible with the created project. It may also include background music or sounds that need to be recorded.

Technically these work by detecting sound with a number of microphones, which are carried by the dancers or actors/actresses. It then makes chooses the pictures according to the sound and transforms those by changing the colour, adding effects, changing the lighting and the real body to whichever digital image, after discussion, is decided to be the best. However, I prefer to have the option of changing the colour of light picked up by the sensors and

transforming the original movement from the physical body to the captured image in the background and dissolved.



o **IDEA**

The idea of CPAM (Collaborative Performing Art and Multimedia) is to engage in activities and projects that aim to improve the working and learning environment for students in Digital Art (DA). This includes promoting activities that build up a student's creativity in DA and use new technology to create a personal virtual project concerned with practical and creative activity in Fine Art interacting with multimedia and the performing arts.

CPAM is intended to encourage students to pursue DA as a self-directed project, explore ways of working with new technology, deal with concepts and thereby to enhance the learning environment.

o **Note**

In the beginning I tried to make a very short movie with no technical equipment just to convey my idea of the kind of movement and type of movie I intended should be created. (Figure7.7, 8.7) The example of a body gesturing is intended to describe the reality of body and its movement with no additional attraction to make the audience concentrate on the body and the excellence of energy which I love to demonstrate and concentrate on the priority of viewing a moving object in a virtual environment. (Figure9.7, 10.7)

In summary the project would result in the images extracted from a short movie lasting for a few minutes.

This is an example of the additional process of taking a frame from a video which has been created in different palette. So it is possible to enliven the image and mix it in a multimedia or multidimensional workspace to do extra work in this area instead of working with a simple shape like a cube or 2D dimensional shape.

Figure7.7 The Sample of Raw Video frame



Figure8.7. The Sample of Raw Video Frame



Figure 9.7. Mixing digital captured image into multidimensional space

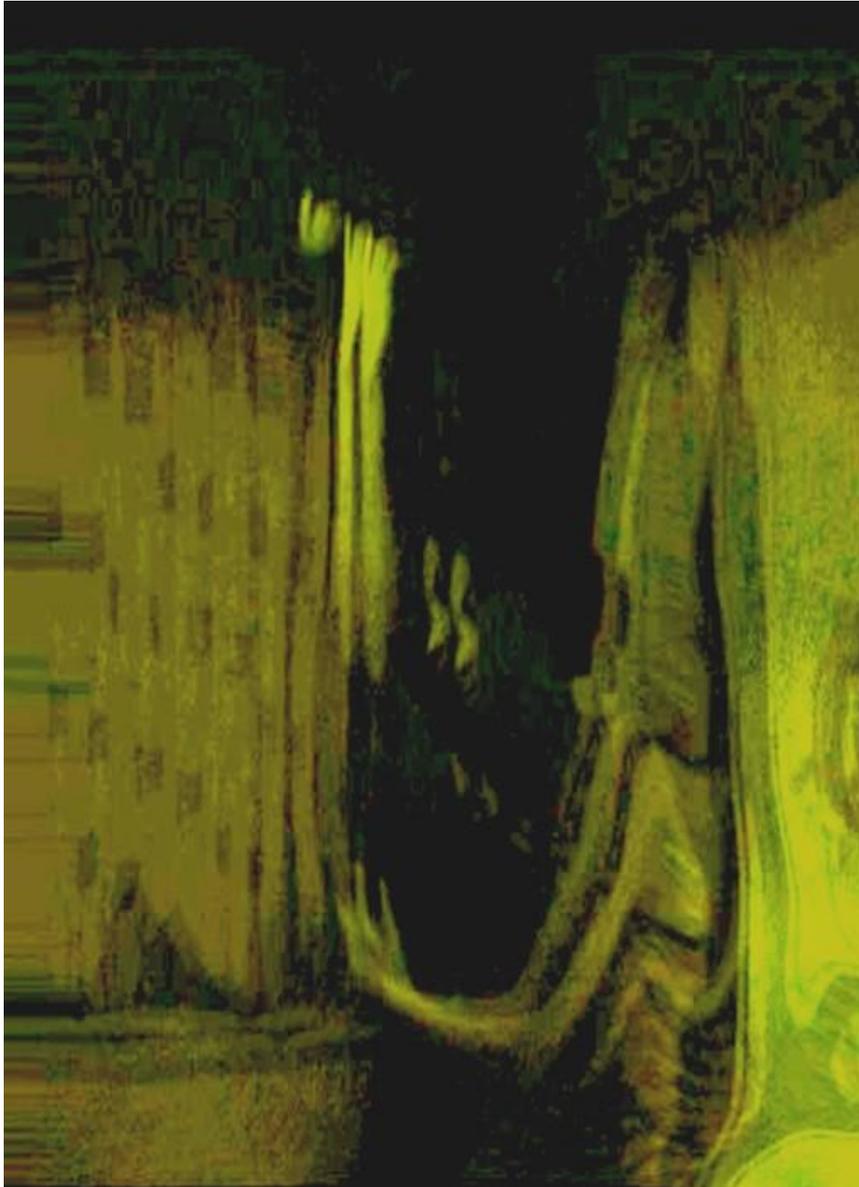


Figure 10.7. Converting Digital Captured Image in Multimedia Workspace



o **The examples suggested in the note:**

The idea of making a movie and using it to explore a personal project could benefit from the software application that would be made for this particular project.

o **Subject**

This could be briefly defined as the creation of a project based on body movement and captured on video that affects the way in which an artist views technical and compatible devices in art, which could create the most expression.

The palm of the human hand may be considered a perfect part of our body because it contains the entire energy of the person. Hands possess an innate expressiveness that can show movement, direction, emotion, and point towards other forms of expression. They can also act as a mirror image of life. The energy of our hands lends a huge contribution to the expressive qualities found in sound, moving images, colours or any combination of these things. 3Dmax+motion Capture+ video editing provides the opportunity to change the audience's notion of the hand, the body and virtual moving images to focus on the inner eye and from there to the invisible energy forms.

o **The Process of collaborating with other media**

The computer programme integrates digital painting, multimedia and the performing arts and includes multidimensional space in relation to digital imaging, painting, drawing and digital video art. The studio projects would focus on integrating a variety of visual arts with digital imaging, digital media and any other compatible virtual workspace.

Such an integrative computer programme would also be compatible with interactive digital space, digital audio and live or video performance. In fact such an enlivening experience would enable closer collaboration and connections between artists and media art in digital theatre art practice.

The aim is to find a new way for the student to practice paying particular attention to what has already been done in this area, for example Arizona University which has been creating projects in different areas of digital art such as designing the light and space for creating a piece in a theatre studio. These examples use the capability of 3Ddimension in creating a simple workspace for working and creating original projects. (Figure4.7, 5.7, 6.7)

This project used digital tools to create an evolutionary frame. In such an area, the ideal space of communication is not the screen, but the physical space where the person interacts. Beyond that, I was looking for a better understanding of how technology can be integrated into the learning process. In this regard the following key questions were addressed:

What are the benefits of students working collaboratively?

What impact will computers and other related devices have on the qualitative aspects of their work?

Will using new techniques help their creativity?

How does digital technology encourage them to develop their capability in innovative artwork?

How does the use of computers deepen a student's use of alternative methods of working?

Can the challenge of new ideas be more effectively integrated into the structure of creative learning?

As an educator and artist I took up the challenge of using new technology as an effective process in art. Therefore, positive answers to these questions

could have a potential role in the use of new methods in collaborative art. In fact, interactive digital arts practice can address the needs of educational diversity with appropriate teaching and learning criteria in visual art practice.

7.4 The arts of novelty: the collaborative arts in digital format

“The advent of digital technology is leading to widespread changes in moving image production”. (Besser) This development has had a potential role in the fusion of visual arts. Therefore, visual art subjects can offer interpretations of a new form of art within the collaborative arts. In this respect John Antoine Labadie described digital arts as a “set of ‘0’'s and ‘1’'s which have been used to encode data into files that can contain, for example, text, audio or visual information”. He also states that “digital imaging is simply another way to communicate visually and artistically and perhaps the one of means to carry us into brave new worlds in the arts”(Labadie)

Ultimately, using new technology and combining it with various elements of digital technology enables artists to interact with a variety of media, including text, video, audio and animation to produce a final product. Therefore, the new diversity in visual arts offers artists a collection of visual information, which becomes the source of significant pedagogical tools for their own and the students’ development.

Potentially, this experience in arts and digital technology is intended to equip students with a broad range of knowledge and skills in multimedia design, including digital video and sound, computer graphics, performance and digital music. Consequently, this research attempts to provide students with an opportunity to challenge a variety of approaches, to formulate their personal views and to modify them through practical and creative activity in a wide

range of relevant areas. According to Labadie, Associate Professor of Art Department in The University of North Carolina in Pembroke, the question is not ‘What do we do about digital?’ Perhaps it could be better phrased as, ‘How can digital be incorporated into what we already do?’

New thinking in the area of digital art could change the students’ ideas, give them a deeper perception and enable them to think creatively to find an appropriate answer for the question of ‘how’ and also to produce innovative artwork. However, in chapter one I opened a discussion concerning the nature of creativity itself but it would be interesting to note here again that ‘novelty’ and the demand for being creative has had a significant role in the students’ development, especially in the field of digital art because there is still a variety of fresh ideas in this field that need to be investigated. But, how can we achieve new approaches in such a collaborative domain and how can we empower the students’ consciousness in a creative way?

Digital technology provides a potential environment in which to create a variety of artwork using multiple media in order to observe the world around us. The positive aspect of this development has provided us with an opportunity to focus on activity and research based on experience and achieving new approaches as artists. In this situation, the idea of creativity and interactive art practice may remain exemplary for all our efforts in the digital domain which, in conjunction with this, represents new educational values.

So far, I have intentionally posed many questions that point towards different research directions. However, it is not the aim of this thesis to answer or cover all of them but rather to give a personal response to these directions. The process of interactive digital art opens up a new window in the study of collaborative digital art concentrating on the body and its energy in virtual space.

Hence, the main object in this chapter has been to create self discovery rooted in the physics of consciousness which is different from the physics of a machine and also to integrate all the information in order to produce the intended software programme. I responded to these challenges by drawing together questions concerning the reality of our mind, our consciousness and the sensory experience of our being in virtual space. It was also illustrative to observe invisible colours in combination with physical movement in two layers of space around our body.

In order to do this, I visualised all the colours I wanted to use and tried to understand the deeper emotions and sensations in my art by introducing a simultaneous presentation of painting, performance, sound and video editing. This type of imaginative creation has been implemented as a computer system and I used it as a valuable tool to meet the challenge that creativity posed. I focused my design on the Design Studio III, Level III to reveal and achieve in digital and visual art what is not possible in the traditional model. So my exploration both deepened my own insight and brought me nearer to the truth of the self. Nevertheless, the experience of video editing led me to appreciate the essential connectedness of quantum theory and how it is integrated with eastern observations of the self, the universe and what it is telling us about ourselves as quantum system.

7.5 Personal experience: creating an innovative multimedia project

“Change your thoughts and you change your world”. (Vincent Peale)

Body, mind and spirit are created together, in harmony, and in unity. My observation has revealed to me that I am the one who wants to experience this harmony continuously and to understand the reality of being human. Hence, I

tried to open a new perspective in the study of the human body by trying to understand who we think we are, although, we need to find ways to illustrate human body, which show the impression that every experience makes on the mind. However, by enlightening ourselves we can identify ourselves with our inner eyes; this discovery of ourselves as being more than just a body and a mind became the main intention of my final project.

The study of my multimedia project started with short video clips representing the physical movement of the human body. (Figure11.7) I aimed to navigate inside the body to find out more about the hidden values and energy fields to exhibit the connection between the human body as a system of information which is surrounded by the universe. Hence, through meditation lessons I found that human energy systems bring vitality and liveliness into organisms. I realized that I had to illustrate the feeling of Pranayama through the use of breathing techniques in order to bring myself to a higher level of focus, endurance and flexibility.

I was so interested in portraying the reality of the energy body inside the physical existence and it was exciting to take up a fresh set of ideas by adding extra dimensions and using them to do different things generated completely from four-dimensional physics. It also gave me a new angle to the meaning of space, which I could generate from the higher dimensional models. Therefore, I was eager to explore the experience of this idea and enliven the theory of energy fields in modern physics and bio energy fields.

I began to illustrate the change of energy fields around the body with the motion of hands and their influence on the physical body. It expressed what I was feeling when I looked at the human body and all I could see were its edges. However, after that I could see another world, which freed my mind to go in the direction I wanted it to. That was a moment that reminded me of a nice thought of Mahatma Ghandhi, “Be the change you want to see the

world.” The question that arose from this quote was whether the imagery of the physical body would interpret the inward sensation and expression of the entire body. Answering this question required truthful consideration and certain intellectual structures to create such a project, and the aim of this particular project was not just to investigate the usefulness of using computer and multimedia devices. It was a challenge to illustrate that the human mind can contemplate nothing greater than the study of body beyond the figurative movement towards the new approaches in art. Essentially, visual and performing art students could be given opportunities to renew their skills and build up their project with the use of the proposed software programme.

In this way I clarified the most interesting side of human nature in line with visual information and any further understanding of the world that we may develop, I also attempted to widen my ability to feel the human energy field and grasp its vitality to see if I could interpret phenomenal consciousness. In this way, I drew my interest and exaggerated the power of thought focussing on my consciousness related to my physical environment. However, many of these patterns characterized the values of the body in order to focus on human awareness, but, in doing this, I applied it both to my imagery and knowledge throughout the research which ended in a visual experience combined with my digital exploration.

The progress of my storyboard offered me a fresh approach to loop advanced new features into the new editing system since the opportunity of using the new editing system, combined with advanced art technology established my final project as a leap forward in visual and performing art production on PCs and Macintosh computers. Therefore, creating such a project through the editing process provided me with a convenient virtual area in which to make use of the project window, audio and video data. It also enhanced my experience in creating a specification for a software development project.

However, the most important experience in this model project was the composition and harmony of the colours I used to convey the richness of conceptual meaning in every single motion. I wanted to articulate something new and different which would introduce the audience to the harmony of colour and see the sound of my images as an invisible reality of human consciousness. In order to attain enlightenment, I decided to repeat the images to remind my audience of the reality of being human beyond their present and actual moving states.

On the whole, it was an interactive journey in science, art and technology which led to the exploration of modern physics and its relationship with art. I have argued for the new model of consciousness, which attempts to give my audience an entirely different perspective, one from which I was capable of seeing my own purpose in life and myself as part of the universe. This perspective was also one from which I could come to understand the meaning of human existence and to understand the hidden values in being human and in the material universe.

7.5.1 Quantum theory and Eastern self-awareness

“A human being is a part of the whole, called by us Universe, a part limited in time and space. He experiences himself, his thoughts and feelings as something separated from the rest—a kind of optical delusion of his consciousness. This delusion is a kind of prison, restricting us to our personal desires and to affection for a few persons nearest to us. Our task must be to free from this prison by widening our circle of compassion to embrace all living creatures and the whole nature in its beauty”. (Einstein)

In the above quotation, Einstein invites his readers to widen the circle of their consciousness and embrace nature in its beauty. I decided to portray his expression in a new form of movement of the physical body, previously

referred to in the theory of quantum physics described in chapter five, which reveals evidence of truth and a new view of the universe within higher dimensional physics. Therefore, the illustration of the harmonic motion from the hands to the head and through the rest of the body was the spiritual navigation of body and space linked to new sensations in virtual space.

As a result of this, I was also inspired by eastern mysticism where mind and matter become inseparable at their roots. In fact, at this stage, the subject and the object become the same at a higher level of perception. However, the scientists who are the masters of matter reiterate those statements from the opposite direction. In fact, to them matter needs their minds to exist and its external existence is intimately related to their internal world. It means that the fusion of subject and object as revealed by the mind penetrating into the sub-atomic world reminds us of the claims by eastern mystics. (Mind and Matter - Two Sides of the Same Coin?) For example, Will Keepin quotes Bohm and says that “he came to believe that material and informational processes are inextricably intertwined together in all things . . . Yet at a deeper level [matter and consciousness] are actually inseparable and interwoven”.(Keepin)

I do not intend to support or disregard either of them, so I tried to analyse each of them as a separate chapter. In both situations I found the same issue but in a different format; both groups, the master of the mind and the master of matter, try to establish themselves as masters of consciousness in universe. Based on the last two chapters, a number of scientific models and reviews of artistic work have revealed that meaning and purpose arises from realms beyond the physical. Thus, I came to realize the answer to the question of how we align ourselves with the non-physical aspect of reality to create the most efficient combination.

In Einstein's quote, space-time offers a platform from which modern science is learning about the true nature of the universe. Hence, the human mind represents an angle of being that can function beyond space-time. In fact, the physical body is the end point of a process that starts beyond space-time while the process of breath control in this study showed the navigation of human's consciousness throughout nature. In the Sufi tradition and eastern self-awareness, the body is like a musical instrument which can be tuned by our levels of spirituality and experience what is beyond the dimensions of time and space. Therefore, my work was a new journey through different angles in order to enhance the spiritual idea of our reality. So, rather than concentrate on CPAM and software development, I decided to contemplate the need for spectators to understand the relationship between the inner and the outer, and between thought and action. Therefore, the need for this kind of spiritual education meets the truth of our being which is a brilliant position from which to appreciate the realization of who we are. Considering all the different perspectives, and understanding the spiritual through physical metaphors is useful, as words expose the physical and criticize the reality of consciousness which bridges the gap between the spiritual world and practical life. (Kabir)

7.5.2 The language of metaphor in the world of information

The significant influence of both physics and the philosophy of eastern mysticism was a new journey for me in which I used metaphor as a language for showing the way to connect the actual physics of the human body and its spiritual implications. The study of eastern mysticism and the philosophy of our conscious self in this chapter built the framework to show how, through the marriage of modern physics and our culture, the human being becomes the value of this unique relationship. The unique pattern of this relationship between mind and matter represents an extensive vision of truth as an issue of one whole and inseparable evident thing in universe.

Thus the main focus of this particular experience was on a multimedia project that concentrated on a clear understanding of Persian mysticism. In that instance, the notion of mysticism gave rise to an original research paradigm that referred to the use of Persian metaphor in this project. As a result, using the language of metaphor as an expressive challenge allowed me to integrate both the theory and practice of emphatic digital art. Appropriately, it also interpreted my idea of building a model that led me to see the other side of human body. Consequently, I found that the use of metaphors help individuals understand a new phenomenon and use it as an essential tool for analysis. For example, the term “Jahaan-e- Manaviⁱⁱⁱ” as once described by Molavi^{iv} in Persian literature means to comprehend the spiritual meaning of the universe, which has been appropriated by philosophers and scientists who are struggling with a variety of different perspectives concerning a new world view and an immaterial universe. (Figure 11-7 and 12-7)

Nevertheless, I used metaphor as a symbol to transfer the metonymic meanings of words extended for the development of the human mind. So metaphor became the means by which I came to know the human being in the light of different contexts to use something to indicate something else. It seems that words are a kind of information, which represent a “technology of explicitness” and their power rests in the capacity to translate “immediate sense experience into vocal symbols” thereby allowing, “the entire world [to] be evoked and retrieved at any instant”. (MacLuhan, Understanding Media, the Extensions of Man, Firstreading) For this reason, when I refer to particular instances in this discussion it is with a view to making points which describe the way in which the computer’s production exhibits the new dimension of technical realisation. This means that in the sense of the artistic and symbolic impact of metaphors, the scenario of human movement manifests a new level of imagery and styles through the various array of digital technologies. (See Figure 13.7)

Although it seems to me that, as an initial starting point, it offered a way to explore the artistic formation of projects in issues aligned with their link in other domains, clearly, such types of investigation can develop new means and forms of cultural reproduction. Perhaps, Marshall McLuhan (1964) was intensely aware of that fact when he stated, “All media are active metaphors in their power to translate experience into new forms”. (MacLuhan, Understanding Media: The Extensions of Man)

However, the concept of modern physics restricts itself to space-time but this model projects the experience of the mystic notion of the human body and extends its understanding beyond the boundaries of space and time in an effective way. Alternatively, this expanded scientific concept could then be used to develop a bridge between some key Sufi beliefs and practices, we address the challenge of how science could incorporate these other realms.

Figure 11.7 Using the language of metaphors as a tool in Persian literature to analyse the spiritual meaning of the universe

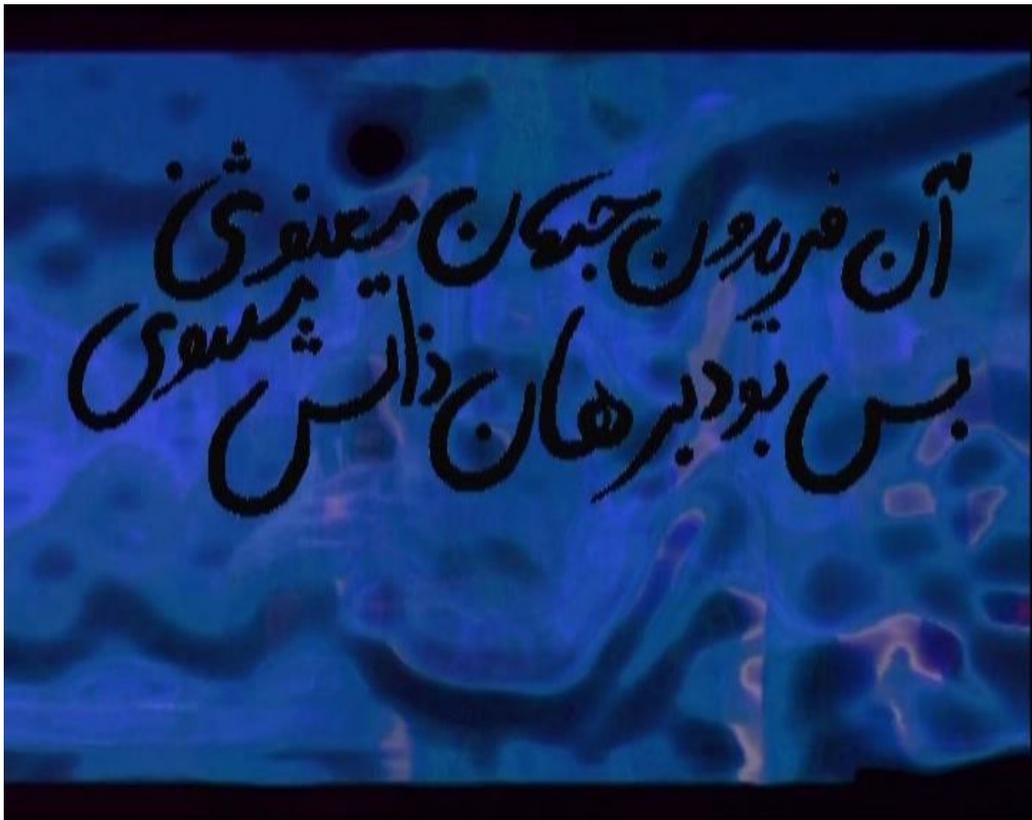


Figure 12.7 The combination of metaphors and digital multimedia-interpretation of Molavi Rumi about universe

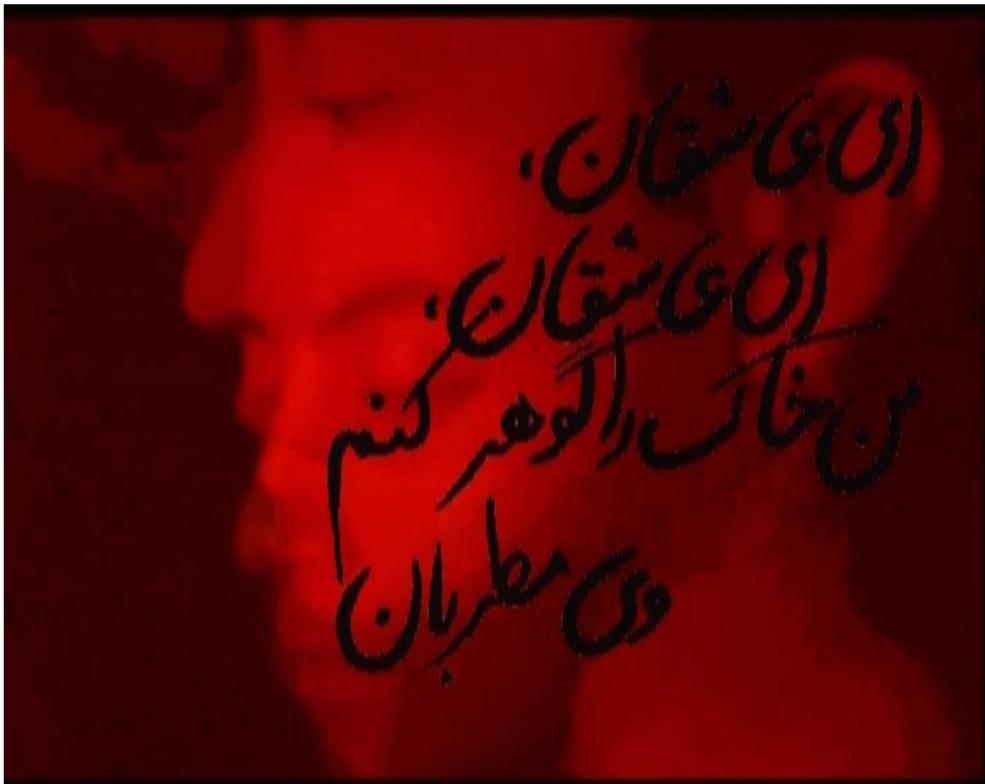


Figure 13.7 the new imagery of human movement and digital technologies



7.5.3 The antiquity of Persian art and Sufi music in new format



The experience of enlightenment and the unity of knowledge in Sufism was the passage to interrelate with “an isolated individual self in order to identify him or herself with the ultimate reality”.(Ibrahim) Similarly, Persian art has a unique body of myth and legend which occupies a central place in a society which embraces mysticism and expresses the artistic capabilities that unite with Sufi music. Besides the conceptual meaning of Persian thought and passion is the imagery of spiritual vision as can be seen in the history of Persian art and literature which demonstrates that visual art artists strived to create valuable pieces of art in these regards. (Figure14.7) Therefore, Persian music cannot be isolated from Persian literature and art. (Figure15.7)

In Iran, Sufis use Daff^v during their Zikr (spiritual chanting) (Figure16.7). Accordingly, I found that Persian music was a powerful tool in demonstrating

a better understanding of how energy focuses us into positive activity. On the other hand, the expression of Daff as a spiritual instrument encouraged me to use its traditional form, but to mix it, make additions and recreate it in a digital format. This experience became the source of the creation process, which represented an aspect of us that could function beyond space-time and could thus be a major mystery in modern science. Therefore, “the closer we examine this development, the more extraordinary does it appear”.(Rabbani) While, each stage lighted up a concept beyond the limitations of matter and the existence of spectrums, sounds could be a virtual object in the immaterial world. That was the idea, which made me wonder whether we could hear the reverberation of Daff beyond our material existence.

As Sufism is “in harmony with all that exists” (Helminski), I tried to visualise the harmony of the universe in both the material and immaterial worlds interrelated with the upper spiritual dimensions. I also aimed to illustrate the echo and the reverberation of virtual background sounds and thereby the relationship between the introspection, rhythm and music in Persian mysticism. For that reason, my imagination drew me to the vision of our being beyond space-time. The manifestation of this exploration revealed how music and rhythmic motion compliment one another to elevate the state of mind and soul to the upper spiritual dimensions.

Figure14 .7. Barbad Playing Music to Khusraw Attributed to Mirza 'Ali. Persian, 16th century

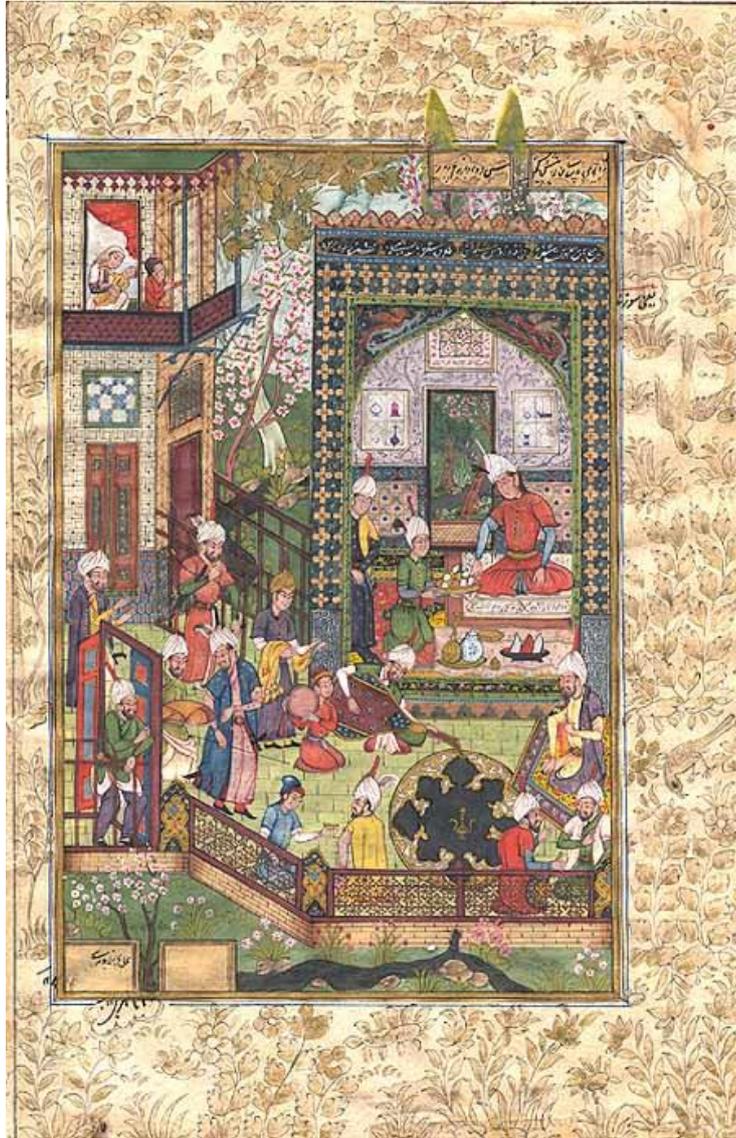


Figure15.7. Barbad Playing Music to Khusraw (detail) Stuart Cary Welch: *Persian Painting*, <http://www.kairarecords.com>



Figure.16.7. Daff and Spiritual Chanting



7.6 CPAM: Ability to create interactive models in digital art

The advantage of a digital environment is that it illustrates a new view of the real world more effectively than traditional two-dimensional drawings. An interactive digital model introduced in CPAM can be used in collaborative projects such as digital printmaking, performance and multimedia projects. Visual and performing art students and even multimedia departments can use the suggested software programme as a visualization tool for use in a variety of educational purposes. On the other hand, regarding the practical

exploration of the 'Body, Energy and Interactivity' project revealed that CPAM would enable us to re-evaluate our findings in this particular case study. (Figure19.7) The development of such a programme can use new workspaces to support the marriage of art, innovative functions and new technology with a creative environment. It may also create a virtual palette with a separate work area for each step of the production process that helps students to bring out the best in their personal project.

On the whole, I realized that by mixing and matching software and applications in order to create different products, it is possible to develop individual software in order to cater for the student's imagination and faster and more effective achievement. This piece of work lets spectators see the project as an intensive data field consisting of sound, images, video or other effects that can be coordinated and developed in other software applications. Therefore, the basis of this work was to illustrate a model project with an entire spread of data, which gave me the opportunity to work out both virtual and visual compositions and multimedia feedback together.

It was extremely important to gain a good result in this art process, because I aimed to preview the output of the developing programme application. It was also important to find the best way of displaying the conceptual meaning of this project in order to impress spectators. For that reason, the combination of painting, video and film editing in this project was not just to create a nice piece of art, but to show cultural identity, the conception of colours and artistic expression in some kind of conceptual art based on intangible thought in Persian art and literature. While the ethereal thought rooted in Persian literature and brought to life in art has broadened our entire cultural dimension it is also important to widen the inner vision of the viewers. Consequently, I aimed to widen the scope of my digital art as a tool to reuse and reprocess the inner roots of Persian literature and to bring Persian cultural identity to life in

a new form of art, thereby to examine the vitality of harmony, colour and form in the human spectrum.

However, despite the capability of various video and film editing software in using effects and filters, I found that most of the work spaces were nearly the same. Here I have to confess that the mixing and editing process was very complicated when I decided to change any effect or create a piece based on my storyboard, which was intended for translation into programming languages and foreseeable applications unified for CPAM. In order to develop this particular project, I needed to create, change, add to or mix different palettes and applications to make a new scene and finally to render the entire project, which sometimes used more than thirty effects that had to be rendered in or out in order to make a new feature.

The composition of colour in relation to form was the basic point in my experience in order to capture the new idea of human motion. In order to examine and explore the function of colour, frequencies and human motion at the same time, I had to test and find the best matches based on CPAM and software development. In this regard, I linked the scientific concept of colour to the human aura, which is not within current scientific thinking. I found that the centre of the human body, the crucial part of our being was the process of breathing, the lungs delivering and taking away oxygen to create a balance between the brain and physical body. So I centred images to focus and show the balance of form, colour and harmony together and as an individual.

Physically, a colour perceived by the brain is determined by the wavelength of light reflected. The spectrum of colour ranges from ultraviolet on the short end of the spectrum to infrared on the long end of the spectrum. Humans can see the range of colours between, but not including, these two extremes. Thus, it was important to clarify how, “to determine the physical values which characterize a standard human observer’s perception of its colour, then to

calculate corresponding *R*, *G*, and *B* values for a display device with known primary colours”.(Walker) This explains the techniques and contains the functions we can use to create devices and develop a programme focusing on the spectrum and frequencies brought to life by human motion.

The reason that I chose tonality and a variety of colours from red to purple was to exhibit human chakras and the level of consciousness. I wanted to show the movement of pure expression inside the physical body and the fluidity of colours through my hands so I started with red, the colour of the earth to show that we are still dependent on the earth and that our senses are connected to the material world. “At this level human being tries to accept all the reality around it. Exchanging red to orange raise human into the layer of personal power. This layer is focusing on human spine. In this layer of consciousness human body makes itself ready to know the reality of mind when it change from orange to yellow this is the power of mind and emotion. In this layer the stomach opens a window to the heart. Raising our consciousness open our mind to the green garden of body heart. When it rises to the throat the colour will then change to blue. This is the layer when we can see ourselves professionally. And the next is the creative source of all universal knowledge”.

For that reason, the suggested software programme development allows users to make high quality digital art and using the latest technology and tools may help the student to create something visually spectacular. The purpose of this particular part of this chapter is to introduce a unique vision of the object made into a final image with an intuitive rendering technique in a virtual performance area. In fact, as an innovative programme it could provide an interactive outline for the student in the creation of their final project. Although the study of body in this particular case study attempts to model a new software development programme, further study will progress the

marriage of technology and art in a digital format in both visual and performing arts.

This interactive programme will be inspired by multiple techniques to create interesting and abstract methods of painting. It can also be compatible with a wide variety of parameters including the number of cameras, their positions in the real space, background colours (see figure 17.7), textures (see figure 18.7), and sensors in motion capture techniques. Significantly, the ability to control these parameters in real space will enhance the student's ability to create unique abstract images with multiple views in a variety of styles that will be designed as an individual project (See figure 19.7). As a result, CPAM intends to create a software development platform that supports its content to enable the composition of music and colour based on human motion, the editing studio will make this unique application available to students and researchers. The beneficiaries of this project will be developers including games, film, animation and television. The use of C++, OpenGL and other graphic programming languages aim to fuse the wider use of digital tools and devices, rendering methods and interactive techniques for creating abstract images based on existing 3D modelling. The study of the body in this particular case study attempts to model a new software development programme for further study and progress the marriage of technology and art in a digital format both in visual and performing art.

Figure17.7. The texture created by using the original model as a background

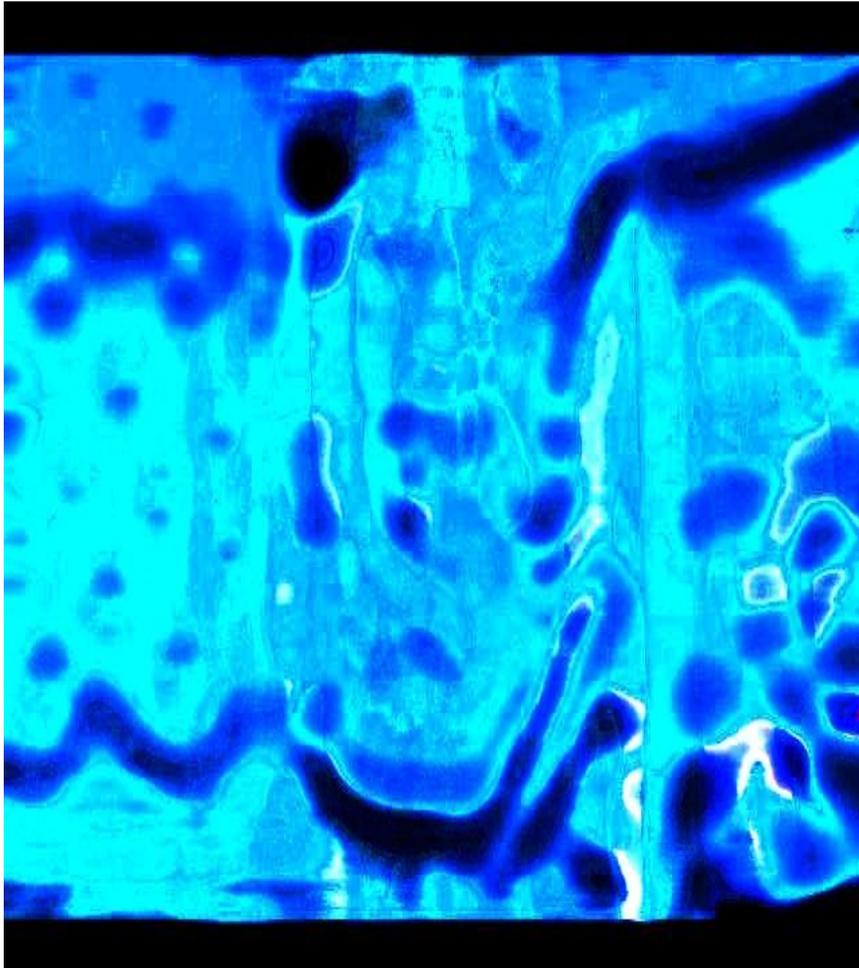


Figure 18.7. A texture example of interactively created using a digital palette captured by an original clip

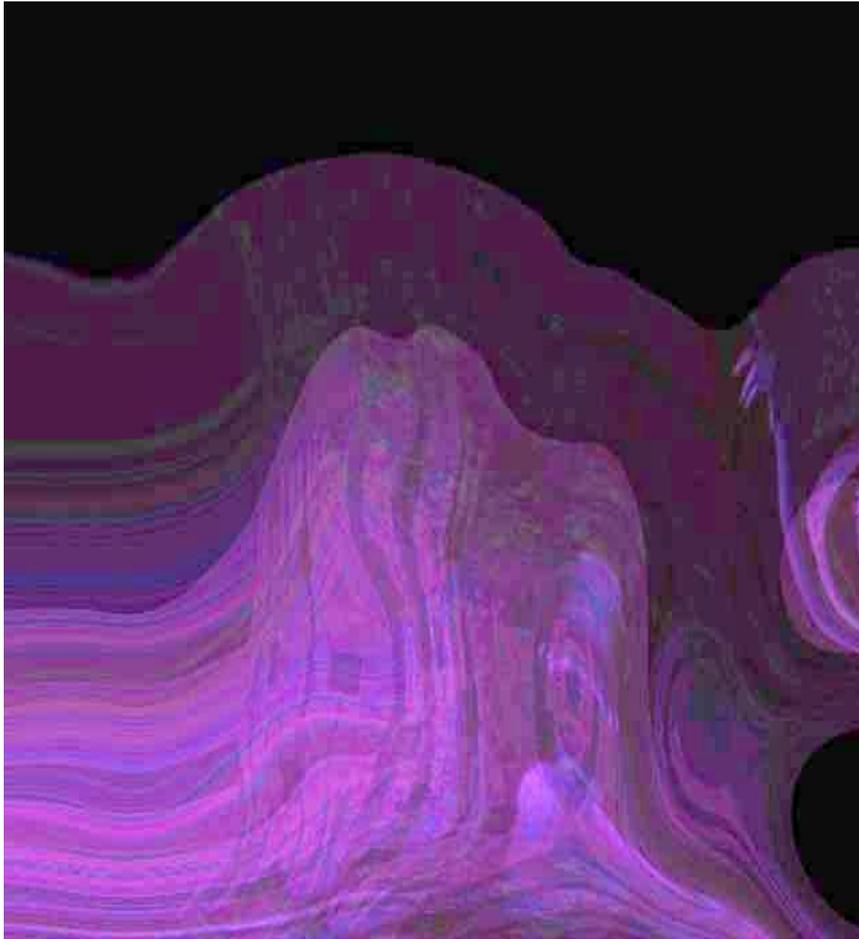
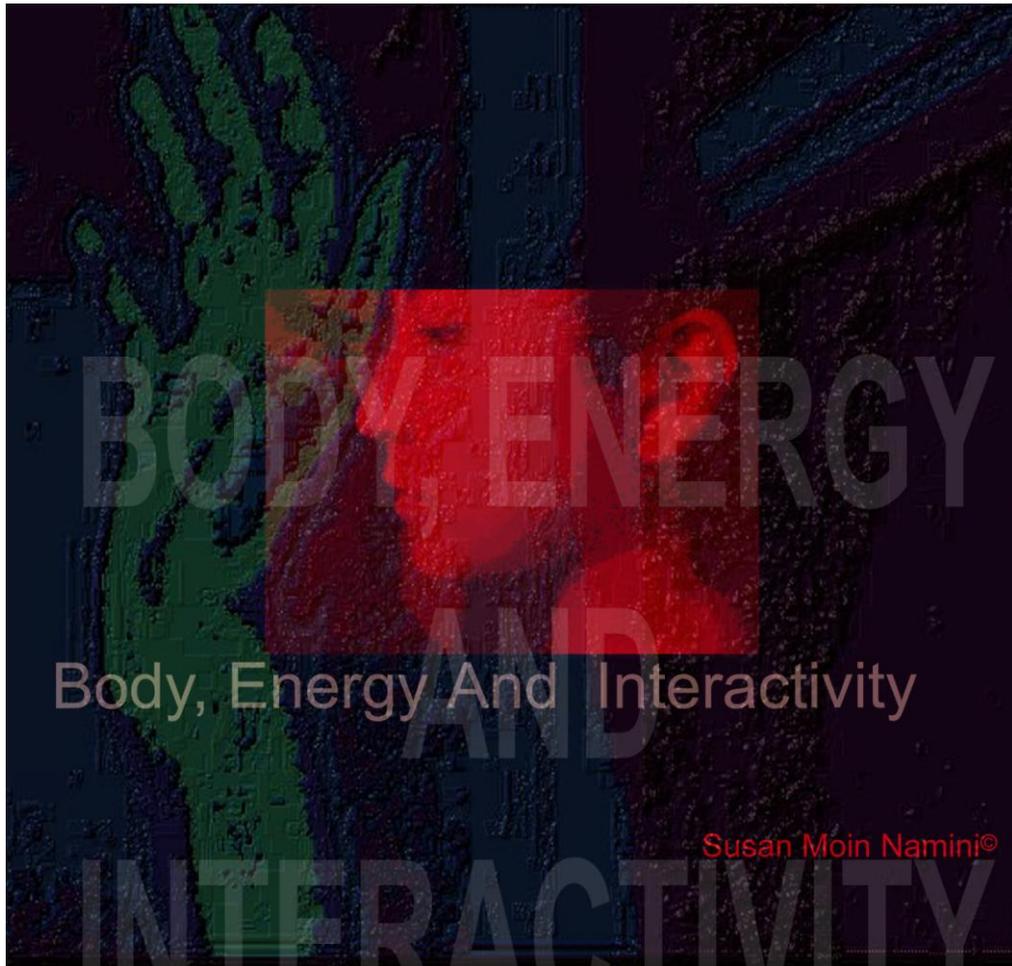


Figure.19.7. Front cover DVD for Project Two



Who We Think We Are- The Study of Body beyond physical existence

7.7 Conclusion

This chapter has been the process of exploration in my creative art work. It unwraps various questions in an ongoing process as an evolving qualitative research method and a snapshot a step further beyond the current knowledge and skills. Digital exploitation has provided the computer with the means to illustrate what is happening within space. Thus, we are on the way to a greater understanding of the process and methods of evaluation although our role is to facilitate and support the process of performance and rethink interactive teaching and learning.

Multimedia technology offers performers and visual artists an extraordinary opportunity to plan interactive learning atmospheres. It is also possible to offer students a better way of revealing their compositions, designing and creating experiments, and exploring artistic collaborations. It is more important than ever to understand how to create and develop an effective programme which is supported by multimedia.

The aim of introducing such a software application is to bring in students and to provide a framework for a simple project but with more detail available for further creativity. Essentially, it will be an area that requires the student to maintain an overall view of the physical body and bring hidden values to life. In this way, interactive digital art allows the student to develop their idea at a pace suited to their individual needs when learning and practicing in this new area. In this research, a storyboard has been developed to allow students and artists to experiment with multi dimensional viewing through an efficient interface to adjust colour and lighting information, drawing techniques, and also control the multi-perspective camera in a motion capture scene. The example of innovative media-art project in this chapter focuses on a particular kind of digital art that attempted to create innovative environments. It also opens the door to significant new approaches to media analysis. More

importantly, the combination of multimedia technology and the analysis of the possibilities of virtual space may put the viewer in a position which will make this study a valuable resource to both teachers and students.

From this I tried to present a view on how interaction in digital media can become our everyday practice and how changes in art can change our ideas in reality. It is important to realize how the computer gives artists an insight into the concepts and processes that help them to create interactive multimedia in a digital environment. At this stage it is possible to maintain that technology may not completely change the way fine art is taught but that it will provide a range of useful tools with which educators and students can take risks and embrace opportunities to integrate computers into their teaching and artworks by:

- Rethinking the digital art
- Creating a model for interactive computer projects
- Proceeding technology for a creative project
- Directing collaborative digital painting and performing arts in a new way

Consequently, the progression of my perceived knowledge and the creation of my final project in this chapter represent a platform for making the connections between traditional art and art created by collaboration of the visual and performing arts focusing on digital art. The study of the human body in this chapter links our physical body to the new worlds of information and the reality of multi dimensional space. Thus, not only our theoretical interest, but also technological progress requires that we study and understand quantum information processing and the reality beyond that. Projects like the one described in this chapter are educational models, which can be developed for further studies.

Nevertheless, my aim in this chapter is to identify the validity of such a programme, and show its diversity, in the hope that it will become a serious object of study. I intended to bring digital painting, sound and video to the visual and performing arts and explain how a new theory of interactivity would affect learning environments. However, because of actual deadline in writing my thesis I had no time to develop this software.

Clearly additional resources and innovative structures will be required to facilitate preparation, upholding, and harmonized action so, we must work harder to stay with technology. No doubt this programme will be a useful resource for students engaging with the integration of art, science and technology. Thus, we can expand the structure of software development, either for our own use or for the use of others.

Consequently, I have tried to show through the examples and discussions that innovation in this particular programme can reveal a wide-angle view towards the visual and performing arts in a collaborative environment. I have also suggested that this theory needs to be revisited so it can be used in a wider variety of actions:

- To introduce the variety of joint projects between different departments,
- To enhance the use of virtual space rather than using the traditional visual and performing arts,
- To develop the student's capability to create individual virtual space,
- To build up a close relationship between disciplines in the arts.

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Note

ⁱ See more in: <http://whatisthematrix.warnerbros.com/>

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As a practitioner-researcher in the discipline of dance, drama and performing arts, Edwards researches and produces original works for live performance. He is founder and director of the performance group Optik (www.optik.tv) and one of the UK's most experienced experimental performance practitioners. He presented his first performance at the inaugural season of the Brighton Combination Arts Lab in 1968 and subsequently has directed four companies and over thirty original works for performance. His work has been performed in over twenty countries worldwide and he trains performers in his techniques and gives lectures on his compositional approaches at major international centres for experimental and innovative arts practice. Edwards was the first UK practitioner to present work (the performance takingbreath), give lectures and take training sessions at the SKC Belgrade in October 2001, and the first English practitioner to takes performances to Berlin's Tacheles.

See more in: <http://www.brunel.ac.uk/depts/pfa/Staff/barryedwards.htm>

ⁱⁱⁱ In Persian Means: Immaterial Universe

^{iv} Jalal-e-Din Mohammad Molavi Rumi was born in 1207 A.D. at Balkh in the north-eastern provinces of Persia (present day Afghanistan). His father Baha al-Din was a renowned religious scholar. Under his patronage, Rumi received his early education from Syed Burhan-al-Din. When his age was about 18 years, the family (after several migrations) finally settled at Qonya and at the age of 25, Rumi was sent to Aleppo (present day Syria) for advanced education and later to Damascus. Rumi continued with his education till he was 40 years old, although on his father's death Rumi succeeded him as a professor in the famous Madrasah at

Qonya at the age of about 24 years. He received his mystical training first at the hands of Syed Burhan al-Din and later he was trained by Shams-e Tabrizi. He became famous for his mystical insight, his religious knowledge and as a Persian poet. He used to teach a large number of pupils at his Madrasah and also founded the famous Molavi Order in *Tasawwof* (Sufism). He died in 1273 A.D. at Qonya (present day Turkey), which subsequently became a sacred place for dancing dervishes of the Molavi Order.

See more in: http://www.iranchamber.com/literature/jrumi/molana_rumi.php

^v Its Pahlavi (Persian ancient language) name is dap and Daff is arabicized of dap. Some pictures of dap have been found in the paintings to be painted before the birth of Christ. The presence of Persian dap in the stonecutting of Bisotun is really wonderful. (The monuments of Bisotun are situated 25 kilometres from Kermanshah city.) Also there is a kind of square frame drum in the stonecutting of Tagh-e-Bostan (famous monument located 5 kilometers northeast from Kermanshah city). It is said that Nowruz (the first day of the Persian New Year and the national festival of Persia) and other festive occasions have been accompanied by dap in the period of Sassanian (224 A.D. - 651 A.D.). In this period dap has been played in order to accompany khosravani songs.

The presence of the word Daff in the poems of many Persian poets shows the importance of this instrument. For example Hafiz, very famous Persian poet and the shining star of the rich Persian literature has applied the word Daff in his works ten times. His famous verse that includes the word Daff is:

I, who nights, with the Daff and the chang, have dashed down the path of piety,
I, suddenly, bring my head to the path! What a tale this is!

See more in:

<http://www.donbak.co.uk/Articles/DafTheSpiritualFrameDrum.htm>

Appendix 1

Implication for Enhanced Teaching and Learning: Two Glorious Periods in the History of England from Higher Education to Art Education

How has caused England developed the quality of its Higher Education since the 12th century? I want to discuss the history of higher education in England, focusing on the history of Art universities since the 18th century and look at two different areas within this subject; the first is briefly to delineate the establishing of the first universities and their movement since 12th century and the second, the reformation which represented a most glorious period in the history of England since the 18th century.

1. 1 The Challenges in Higher Education in the 12th Century

The 12th century in Western Europe was a blossoming of civilization. By the end of the 11th century, Western Europe had made extraordinary developments in social organization, technology and education. The people who inhabited Western Europe showed tremendous energy and willingness to experiment with new ideas in religion, politics, and economics. Defending one's land was more important than education at that time and the aristocrats spent their time learning how to fight rather than studying. Since few people had the time or the money to study, the level of education and mathematical knowledge of the populace dropped still further and numbers in schools were very much reduced. (Connor and Robertson).

Efforts to establish general schools made by church in Scotland were a new pathway towards the improvement of higher education in the history of Britain during the 12th century. However, these schools started taking poor people rather than the aristocracy, which was the beginning of educational development. The number of schools increased gradually and public demands for better education improved the level of knowledge among scholars, and education was no longer restricted to the aristocracy.

By the end of the 12th century there were signs of a widespread progress across Europe. For instance, suburbs began to appear around older cities and hundreds of new villages sprang up. European society was becoming more diverse and life was beginning to be more comfortable, in terms of intellectual history, this period has come to be characterized as the 12th Century Renaissance (Kreis, The History Guide, Lectures on Ancient and Medieval European History, Lecture 24: The Medieval World View).

1. 2 The Establishment Of The First Universities Since The 12th Century

Universities were a product of the great intellectual revival of the 12th century” (Curtis). Without doubt, the university was the significant development of the Middle Ages and were usually begun through a royal or church scheme or through migrations of students from other universities. Medieval universities often had many thousands of students and played an important role in public affairs (Owen).

Curtis says that the earliest university was Salerno, but as this remained mainly a medical school, it had little influence upon the growth of the university in the country. In his 1948 study, he states that schools were attached to certain

cathedrals before the foundation of universities, however many of these schools lacked organization and continuity. Feiling notes that the church was utilized “both by Rome and Laity, in the development of its machinery and legislation, and was full of misused endowment”(Feiling).

The 12th century was both original and energetic. In this way, it was perhaps similar to the Golden Ages of Greece and Rome(Kreis, The History Guide, Lectures on Ancient and Meddieval European History, Lecture 26: The 12th Century Renaissance). Thousands of students, who were ambitious and enthusiastic for knowledge, travelled Europe at the end of the century. They studied every aspect of knowledge and all the available texts in Western Europe. They tried to obtain new sources of information by travelling to Greece, Constantinople and Spain in order to understand Greek science and philosophy, manuscripts, Arabic, mathematics and medicine from the Muslims of Islamic civilization. Gradually they became organized groups and were known as comprising students from particular locations, gradually diminished in power”(Owen). These scholars renewed western knowledge and started to think about basic scientific problems and students began to assemble in cities where a master could be found.

The great universities of the late 12th century, Oxford, Paris and Bologna came from this development; they were run by the students and operated with the support of the church. In Bologna, the university specialized in law and medicine; Paris specialized in theology and the liberal arts(Kreis, The History Guide, Lectures on Ancient and Meddieval European History, Lecture24: The Medieval World View). Oxford, which was modelled after Paris, was founded in 1249 and became the third great university of the Middle Ages. However, all of these universities were run along rigid rules which students had to follow, for example, an instructor was forbidden to depart from the prepared text. In fact, they had to read the text just as it had been approved. (Carnesale).

This was a creative age, and another source of intellectual and political advance was through the church. For example, Henry II banned English students from attending the University of Paris in 1167 (Connor and Robertson) so “the scholars who migrated from University of Paris, because of conflicts between England and France, eventually set up a new stadium general at Oxford” (Curtis). Little by little, “Oxford had imperceptibly become a university, and by John’s time it was a cosmopolitan university town”(Feiling). Curtis reports the following incident:

The system of academic degrees began towards the close of the 12th century. We have seen that the universities were associations either of masters or students, and that in the north-western universities it consisted of the members of the masters guild(Curtis).

The book *History of Education in Britain* explains that the origin of Cambridge is generally attributed to a quarrel between the scholars and towns folk of Oxford in 1209, which resulted in the migration of a large body of Oxford scholars to Cambridge which was the reason for establishing Cambridge University, which was a small university in comparison with Oxford but in the 15th century the reputation of Cambridge was much improved and the “course of English Education was profoundly influenced by the twin movements of the Renaissance”(Curtis). By the end of 16th century schools settled down to a narrow, formal, and academic outlook which was out of contact with the growing demands of the age. Cambridge and Oxford were then the only possible alternatives and these two rapidly grew into universities worthy of admiration.

The establishment of Oxford University provided an opportunity to improve the level of education amongst deprived people at that time. Education began to improve during the 13th and 14th centuries and people of the lower social classes got the chance to gain a good education with the opening of more schools in local areas. In addition, new challenges in England’s educational reformation made universities to enhance their existing courses as well as increasing the number of

new courses in universities, such as Algorism, Ptolemaic Astronomy, Perspective, Proportion, Measurement of Surfaces. (Connor and Robertson).

The educational system in universities developed a form of dialogue between the students and the teachers, the rigid rules were relaxed and the learning environment became more flexible. Students began to communicate more with their teachers and they also learnt to ask questions, then answered them from memory. These practice evolved into the provision of private lessons mostly in mathematics, accounting and book keeping which led to the establishment of private schools and colleges in addition to existing universities. This advancement became increasingly visible by the 17th century and this, in turn, broadened the outlook of established universities in England.

1-3 Between The Two Renaissance

The enlightenment of new ideas in the 14th and 15th century in Italy and France opened a new window to the history of England. The early modern period did inspire some people to a greater faith in the ability of human beings to control and appropriate the earth (Muhlberge). A group of intellectuals, known as 'humanists', argued that they were worshipping God more appropriately than priests and monks. In truth, some of them claimed that humans were like God with a share of his creative power. The painter, the architect, the musician, and the scholar, by exercising their intellectual powers, tried to achieve some of the honour, breadth of spirit, and creativity of the ancient Greeks and Romans, to recreate their successes and go beyond them. In doing so, a number of social and political philosophers emerged. This then brought many changes to Europe and was a powerful force in persuading Europeans to promote traditional ideas. (Brians).

Indeed, it was thriving time for Europe, many old ideas were reformed and new explorations and developments in art and literature were undertaken. But how did new ideas form new beliefs in England during the period between the 14th and 16th centuries? How did the reformation influence England? What was its impact on educational system? What was the next challenge in England in the late 16th century? How were the newest ideas shaped? How did the political and economical reformation influence education and art after the 16th century in Europe and more precisely in England?

Although, the main theme in England's history during the 14th and 15th centuries was war, as Skip Knox argues in his collected lectures, during the years between 1337 and 1400s, England was in the grip of the hundred years war but these centuries also saw repeated wars with Scotland and Wales, and a civil conflict known as the Wars of the Roses. This was a struggle between the houses of Lancaster and York, both were descendants of Edward , for the crown. The badge of the Lancastrians was a red rose, while the Yorkists' symbol was a white rose, hence the name of the war. It was a true civil war because practically every noble family took stand either as Yorkists or Lancastrians. (<http://www.stud.u-szeged.hu/Molnar.Gergely>)

The wars created tremendous pressures on the government's financial and administrative structures and the king had to raise sums of money far in excess of his own traditional royal income and then distribute that income effectively to carry on the war. However, the war of the roses was a long, drawn out period of civil war in Britain that lasted 30 years from 1455 to 1485 but the great socio-economic theme of the age was the changing relations between nobility and the commoners. In 1450 the war with France was going very badly indeed. The king of England was Henry VI, son of the great Henry V, the victor at Agincourt, but the son had proved to be a great disappointment. He was weak-willed and weak-witted and suffered bouts of insanity rendering him completely incompetent. His

uncles ruled England in his place. Queen Margaret of Anjou was also an important figure, she was married to Henry by the terms of the Treaty of Paris, originally meant to unite the crowns of France and England, back in the heady days when it seemed England had won the Hundred Years War. Those days were long gone, but England now had a French queen. Henry V had gone to great lengths to make sure that his conquests would become permanent, and had parcelled out power among his comrades, mainly the Dukes of Bedford and Somerset who botched the job. They lost not only everything good King Harry had won but more besides. In that fateful year they managed to lose Normandy and Gascony, which the English had held since the 1100s. After over a century of war with France, England was left with only the port town of Calais. In trying to save what they had lost, they taxed the country mercilessly and managed to disrupt trade into the bargain.

Despite the war between France and England, which caused many difficulties for both countries, this time was an age of innovation in religious thought and humanity. For example, Oxford and Cambridge became intellectual centres developing the English language rather than French which was the language used at court in that period (Skip Knox).

“Though the intellectual movement called ‘The Enlightenment’ is usually associated with the 18th century, its roots in fact go back much further.”(Brians). “At the end of the fifteenth century and the beginning of the sixteenth, the Renaissance belief in the ‘perfectibility of man’ made people less content with things as they were, and more interested in improving them in the here and now”(The Reformation). Christian humanists applied the new style of scholarship to the study of the scriptures in their original languages (The Sixteen Century). They began to translate the Bible into English, which began to evolve rapidly. Schools were more numerous than ever, and it was estimated that half the people

could read (Isil). The sixteenth century in Europe was a time of extraordinary change, and it saw revolutions in almost every aspect of life.

'Renaissance', perfectly describes the intellectual and economic changes that occurred in Europe between the 14th and 16th centuries. Most importantly, the Renaissance was an age in which artistic, social, scientific, and political thought turned in new directions. The rediscovery of the learning of the ancient world, the printing press, and the other forces that came together to create the Renaissance also affected the Church. An obvious result of the Reformation was the division of Western Christendom into Protestant and Catholic areas. Another result was the development of national churches; these strengthened the growth of modern national states, just as, earlier, growing national consciousness had facilitated the development of the Reformation. Finally, the Reformation introduced much fundamental change in thought and political organization to develop the modern world(Reformation, General Information)

The Renaissance in Italy was spreading north, its arrival in England heralded a flourishing time for England's history. Scientific advances and technological developments changed the nature of society and influenced scholars and their understanding of life. Gutenberg's invention of the printing press in 1445 changed the lives of people in Europe and, eventually, all over the world. The printing press allowed the Renaissance to spread because it made new ideas available to a much larger audience. More books were written and copied and more people had access to different books and they were cheaper than before.

The invention of the modern printing technique(Davis) resulted in the development of education in Europe. The emerging printing techniques increased the number of translated books and the enthusiastic expression of new ideas caused a long-lasting impression on the minds of the people. As the demand for books grew, the book trade began to flourish throughout Europe, and industries

related to it, such as papermaking, thrived. The result of all of this was that the general population was more literate and the economy was stronger. The new interest in secular life led to beliefs about education and society that came from Greece and Rome. However, during the Middle Ages, the church guided scholars to learn and to read Greek and ancient Latin, but humanists rediscovered writings on scientific matters, government, language, philosophy, and the development of all forms of art during the Renaissance.

The Scientific Revolution gave the western world the impression that the human mind was progressing toward some ultimate end. The western intellectual tradition now included a firm belief in the idea of human progress, that is, that man's history was a progressive unfolding of man's capacity for perfectibility. From this point on, man the believer, was now joined by man the knower. It was man's destiny to both know the world, and create that world(Kreis, Lecture 7, the Medieval Synthesis and the Secularization of Human Knowledge: The Scientific Revolution, 1642-1730).

The 17th century was characterised by wars of religion. Protestants and Catholics challenged people for attending the wrong church, or for not attending at all and all publications, whether pamphlet or scholarly volumes, were subject to prior censorship by both church and state, often working hand in hand. Organizations, which tried to challenge the twin authorities of church and state, were banned. There had been plenty of intolerance and dogma in the Middle Ages, but the emergence of the modern state made its tyranny much more efficient and powerful.

By the end of the 17th century a remarkable reformation had gradually been introduced among the cardinals, down through the priests and monks. The Reformation also gave added momentum to the expansion of popular education. Classical learning was more widespread and classical studies had become a

central part of advanced education in the 17th and 18th centuries. However, criticism of the grammar-schools became more frequent in the 17th century, but had little effect upon existing institutions. Curtis, declares that in the 18th century an important movement had begun for the better organization of studies. He reminds his readers that it was an astounding period in history, and explains that, “at the top was culture which has had a few equals in its polish and refinement...” (Curtis1968, p121).

Several years later England faced another reformation, because the old mechanism was faltering under each new overseas acquisition or economic crisis at home. Many had lost faith in the institutions, which had carried them over the reformation and two revolutions (Feiling, p683). The standards of both social and official life were completely changed and it is better to say another Renaissance was happening. Charles Dickens wrote that “it was the best of times, it was the worst of times,” about the eighteenth century. According to Curtis, “the cold formality of the religion of the Established Church, and the deterioration in morals and manners of all classes of the community occurred in early 18th century” (Curtis1968, p121). An important movement had begun for the better organization of studies and on the other “the manners, morals and life, of the submerged classes caused the modern student conflicting feeling of pity and disgust” (Curtis1968, p122).

In the second quarter of the century, some intellectuals looked to England as a better model for the future. By the mid 18th century even the churchmen became more educated and broadened their knowledge beyond religious studies. In the later third of the 18th century, the spirit of Humanism spread with the wave of "Modern learning". So newer exploitation was developed in architecture, sculpture, music etc. (Chapter 1: The Period of Renaissance and Reformation (1416-1600)).

1.4 The Advances In Art And Art Education In The History Of England

In the Middle Ages, the Christian church had control in the fields of art, science and letters. As a popular secular movement, the Renaissance helped to promote a spirit of uniqueness. Reformation also had a significant effect on art. Throughout the Middle Ages, Christian art had flourished and at the beginning of the 16th century, the Popes were patrons of art and architecture. Even after Reformation, the Popes continued to patronize art, and many of the Catholic countries imitated similar art forms. Paintings of the Renaissance period demonstrate the application of humanistic ideals learned from the ancients. In works from the Middle Ages, saints and Biblical figures are arranged in unnatural, geometric groups, and backgrounds are nothing more than washes of gold.

The 17th century examined physical reality, while the 18th century examined the mind. Fantasies, reveries, ideas, and ideals of all kinds are embedded in the diverse images of this period. Soon after Europe entered the Modern Age, the art of modern printing was discovered. Due to this, the education broadened, and very soon modern learning reached every corner of Europe(Chapter 1: The Period of Renaissance and Reformation (1416-1600)). Thus, the development of modern education faced England with great changes and brought a newfound freedom in art and the educational system.

Consequently, courses such as science, philosophy, history, and literature in the beginning of the 18th century influenced art and played an important role in social change and became more refined, more delicate, more intellectual, more emotional, and more secular. Until the middle of the century, the walls of the Foundling Hospital supplied a limited venue for artists to exhibit their works, and the Vauxhall pleasure gardens provided another audience. The artists themselves founded the Society of Artists in 1760, which began to hold annual exhibitions

open to the public, and in 1768 a breakaway group of artists from this society obtained royal approval for a Royal Academy, which provided not only annual exhibitions, but also a school of art(18th Century, England).

The Discovery of Painting(Pears) is a careful study of why the English came to produce, sell, collect, and revere paintings in the 18th century. It is an important part of the larger story of the European conception of painting in the late 17th and 18th century. In this book, Pears indicates how and why the interest of art develops in England from 1680-1768, while before the eighteenth century, the English were largely uninterested in painting; but in the decades that followed they became Europe's most assiduous collectors.

“In truth, in many respects the art of the 18th century was the art of France. As the Bourbons rose to power after 1650, the language, manners, customs, and styles of France increasingly shaped those of the rest of Europe. Led by Louis XIV, who remodelled Paris into the grandest European capital, successive French kings lent their names to the decorative arts that spanned the century, and French artists set the styles that the rest of Europe followed”.

Although France led the way in fashion, style, manners, language, and art, Italy, Germany, and England all produced artists of originality and importance. Beyond this, Italy's art, both contemporary and ancient, became a passion for Europe in general, and for the English in particular. England, which had imported so many of its artists in the previous century, saw its native artists gain a significant place in the history of 18th century art. In 1789 the French rose up against their king. France, the cultural capital of 18th century Europe, witnessed during these years the last great flowering of art for the upper classes, which, in its determination to increase the demands for change. France, the cultural capital of 18th century Europe, witnessed during these years the last great flowering of art for the upper

classes, which, in its determination to maintain the status quo, increased the demands for change.

Furthermore, this astounding century symbolized a magnificent period in the history of England. In particular, the great changes were in art, music, natural science, philosophy, discovery, and invention as Curtis says:

Finally, the philanthropic and humanitarian movements prepared the way and were in turn fostered by a new out burst of religious fervour both inside and out side the Established church, and laid out the foundation of social reforms and educational progress of next century (Curtis1968, p122).

The book *A History of British Painting* explains that in England, there was no Catholic art; indeed there was very little religious art in the centuries that followed the English Reformation. The writer argues that by the middle of eighteenth century, the year of victory, 1759, there was a growing popularity in art specially fitted for the landed gentry, and the more successful manufacturs and merchants of England and Scotland(Short). In 18th century England, a painting was an aristocratic possession, and there were no middle class or public picture galleries. The first art effort in England sprang from a middle class love for their own folk and their own homes and was extensive enough to be called 'a school'. There after, "an academy of design, formed in 1760, was another proof of growing interest in art"(Short1953, p137).

Meanwhile, in 1760, a similar movement was taking place in the rooms of the society for the Encouragement of Arts Manufactures, and commerce in the Strand. The result of the exhibition of modern painting in that room was the foundation of the 'Royal Academy' in 1768. Hogarth's picture of students working a round a nude model which hangs in the Diploma Gallery, Burlington House, is testimony to the fact that the Royal Academy, as a teaching institution,

is in direct descent from the school at 'Peter's court, against Tom's coffee-house in St. Martin's Lane', which Hogarth founded. From the life-school in St. Martin's Lane, it was possible to expand into a professional academy, not only for the education of painters but for the display of their work. Reynolds, Gainsborough and other painters of promise associated themselves with the veteran Hogarth and the venture in St Martin's Lane was converted into a Society of Artists. In 1768, certain members of the society secured George III's consent to a Royal Academy upon the French model.

Years later King George III constituted the existing Royal Academy, with Reynolds as the first president. Joshua Reynolds, born in 1723, was the son of a cultivated Devonshire Schoolmaster. Joshua showed an early talent for portrait painting and at eighteen he was sent to London and apprenticed to Thomas Hudson, another Devonshire man. Reynolds moved as an equal among the statesmen and literary figures of his age, his friends included Burke, Sheridan, Johnson, Goldsmith, and Garrick. As his versatility earned him their friendship and regard, so it fitted him to lead an art movement of major importance.

"Lots of attempts had been made in the latter half of the 18th century to open the universities to those who were not members of the French Revolution and the Napoleonic was turned man's mind in other century"(Curtis1968,p447-448). However, Reform was in the air, but it did not stop at the improvements affected in every aspect of university life, which was subjected to severe criticism. For example, "the Oxford movement came out of the University's revived life in the first years of the 19th century"(Feiling1966, p890).

Similarly, "the Liverpool Academy was founded in 1810, following a society of Artists established in 1769. The Academy burgeoned into an active school of painters about 1848, the time of the pre-Raphaelite revival. W. L. Windus has been mentioned" (Short1953, p206). It must be remembered that, "from the

turning point of the war in 1812 Britain was conducted to victory, peace, and massive reform, by one and the same government until 1827, not without reproach, but at least with a moderation which no other country could match” (Short 1953, p803). As it can be seen, 19th century was an age, which began with the progressive movement in England as Feiling reported the following:

“Even during the necessities of war, reform sprayed over the survivals, which had become abuses... there had been reform too at the universities, Oxford and Cambridge both organizing their examination system soon after 1800” (Feiling 1966, p797).

Then he adds that, “seven years ending with the great Reform bill, determined the character of 19th century Britain and its role in the world” (Feiling 1966, p812). In those days and until the end of the first quarter of 19th century, Oxford and Cambridge were the only two English universities. Soon after, those who were interested in the sciences, technical education and other points of view, turned their attention to the establishment of new universities. Accordingly, in 1825 the University of London was founded as Curtis notes, “the University was appointed by the Government in 1837, and included in its membership Dr. Thomas Arnold of Rugby, who later became one of the foremost critics of the University, and Michael Faraday the distinguished Scientist”. Then he modifies his point to say, “the former was responsible for framing the Curriculum in arts” (Curtis 1968, p423). Consequently, the foundation stone of London University was laid in 1827. According to Curtis, by October of the following year, “the new institutions started its life; and classes were formed in arts, law, and medicine” (Curtis 1968, p422). This led to a demand, for provision of new colleges and universities.

In the meantime, the growth of trade and resulted in a growing interest in promoting art in industry in England. These were the elements which somehow

came together in a progressive movement. In truth, the co-operation between industry and the technical colleges was an important factor in the development of technical education in the past. Fiona MacCarthy states:

“In 1835, Mr. Ewart’s select committee had been formed ‘to inquire into the best means of extending a knowledge of the arts and the principles of design among the people (especially the manufacturing population) of the country’”(MacCarthy).

He confirms that, “in 1837, normal school of design established at Somerest House (later to develop into Royal College of Art)”(MacCarthy 1979, p113). Meanwhile, after 1850, changing social and economic conditions altered the whole outlook. Curtis argues that the Great Exhibition of 1851 was a victory for British industry. Then he adds this thought:

“This led to a demand for provision of scientific and technical instruction for work people”(MacCarthy1979, p492).

In the face of this, “in 1852 the Normal School of Design became the Department of Practical Art in the Board of Trade, and following year Science Division was added; and soon after, its name was changed to that of the Science and Art Department of Board of Trade”(MacCarthy1979, p 493).

Thus, “as a consequence of the increasing demand for scientific and technical education, University colleges developed in some of the larger town in England and Wales”

(MacCarthy1979, p433). Feiling reports:

“Since 1870, many modern universities are made and opened”
(Feiling1966, p972).

Hence, in 1877, the first move towards reform came from a convocation in order to strengthen the connection between the university and its affiliated colleges,

This was indeed an age of particular movement for reform, which indicated a most splendid period in the history of England. Curtis states:

“The head quarters of the University of London in the Imperial institute were set in the midst of a large collection of institutions for higher education, which had been administered by the science and Art Department. When the latter came to an end under the Board of Graduation Act of 1899” (Curtis1968, p428).

“The Royal college of Music, the Royal School of Art Needlework...”(Curtis1968, p428) were also founded in this period. Similarly, in Oxford and Cambridge, an important movement had begun for the better organization of studies. The most important influence at Oxford in the second quarter of the 19th century was the Tractarian or Oxford movement which was responsible for giving the English church a new direction and for transforming it from the deadness into which it had fallen to a great living, spiritual force. This was also a period of expansion and building reconstruction which was continued up to next century.

A new activity came in with the new century, “the Arts and Crafts proceeded straight forwardly and calmly”(MacCarthy1979, p35) whilst, the beginning of the 20th century saw new problems confronting the ancient universities, “the reforms brought about by the Act of 1854 and 1856 bore fruit in the new life and vigour in university life and studies”(Curtis1968, p457). Thus, “a new activity came in with the new century, however, before further changes could be effected, the First World War broke out in 1914 and the idea of a royal commission was dropped for the time being”(Curtis1968, p 461).

Meanwhile, “during the First World War a great many painters went overseas”(Curtis,1968, p274). It must also be said that, “the Board of Trade and the board of Education which had combined to consider and approve the Scheme,

had been postponed by war” (MacCarthy1979, p46). Eventually, the war ended on 11 November 1918. A World War had brought into being a mechanized world, for higher quality and quantity has already been drawn to the technical education. As MacCarthy confirms:

“For once the war was over, there were signs that the campaign for improved design in industry was beginning to be taken slightly seriously by the government and even by industry itself” (MacCarthy1979, p46).

Curtis says that, “technological education must be conceived in terms of a combined course of work training and academic studies; and also allotted to academic studies” (Curtis1968, pp506-507). This necessitated the co-operation of technological colleges of the region. In effect, “in 1920, this at first meant attempting to bring the training at the Royal College of Art into line with industrial requirements”(MacCarthy1979, p46). At that time, there was a demand for higher quality in the universities, especially, in the older universities such as Oxford and Cambridge. On the other hand, “all universities anticipated a period of expansion after the war” (Curtis1968, p465).

As we have seen, “existing artistic and aesthetic revolutions date back at least to the sixties of the last century and not in one art, but in all the arts, Impressionism in painting had obvious analogies in the music of Debussy and the poetry of the symbolists. But the artistic revolution since 1914 differs from the earlier anxiety for change” (Short1953, p268). What distinguishes the post-war development is an industrial movement which was expanding in life, art and education. As Short indicates, “world war had brought into being a mechanized world, in which many of the human values were lost” (Short1953, p275). It should, however, be remembered that, between the First World War (1914-1918), and also, in the years following the Second World War (1945-1950), much time was devoted to industrial art.

Anthony Emery initiated the Oxford University Scheme in the mid forties for the encouragement of contemporary British art. The immediate result was a serious art educational movement in existing and other Oxford colleges in line with the modernist art movement. To this period, in 1930, also, belongs the founding of the “society of Industrial Art Education published by Industrial Art Committee of FBI, recommending that regional colleges should be established and the Royal College of Art reorganized” (MacCarthy1979, p116). In fact, this meant attempting to bring the training at the Royal College of Art in to line with industrial requirements, MacCarthy adds that, eventually, in 1934, the Memorandum on Art Education, with particular reference to the Royal College of Art, was sent by the DIA to the Board of Education.

Three years later, in 1937, the Report on Advanced Art Education in London published by the Hambleton committee recommended that, ‘a new orientation should be given to the Royal College’ (MacCarthy1979, p117). Therefore, if we highlight the relationship between universities and industry over the years following the World Wars, we will find that one of the main factors was the forming and expansion of another revolution in British art and Education. This was just one example of many collaborative arts and industrial opportunities bringing art universities and industry together, in order to assist with the development of art education and providing quality and creative education for all.

A decade later, “the Arts council of Great Britain developed from the war-time organization known as C.E.M.A. (Council for the Encouragement of Music and Arts), and it received a royal charter on 9th August 1946. It aimed to provide the public with increasing opportunities to enjoy art and encouraged artists to practice to the highest standard in music, drama and plastic and graphic arts. The Council also helped symphony orchestras to give concerts in industrial areas, arranged exhibitions in the visual arts, and sponsored a large number of dramatic ventures”(Curtis1968, p490).

Meanwhile, at the same time, “the Royal College of Art, which developed from the Normal School of Design and was established in 1890, was completely reorganized as a National College in 1946. It had been diverted from the original purpose of its foundation and had concentrated on the training of students and teachers on the training of students of the fine arts” (Curtis1968, p511). Indeed, it can be said that, side by side with the development of education, social and economic changes have progressed at a rapid rate.

One of the reasons, which led to an increasing number of changes is the development of computer in this period of history. At that time, in the 20th century, England faced another movement, the influence of which has affected people’s every day life. The development of the computer, in 1946, proved there was certain inevitability that technology will progress and become increasingly complex.

In the second quarter of the 20th century, the computer had a profound effect on everyday life. In addition, universities had entered upon a period of expansion, as Curtis mentions that, “such rapid development demanded great increases of teaching staffs”. And then he adds that, “the general public was becoming more interested in education”(Curtis1968, p615) so there was a steady growth in the number of full time-students. Therefore, in addition to the changes already taking place in some universities and colleges, the Report recommends the establishment of many new universities, in the next ten years.

Moreover, “the large number of recommendations in regard to institutions for technical education constituted an important factor in the educational revolution, which led to the expansion of technology in the universities and the encouragement of colleges outside the universities. At that time, many technological colleges changed to the universities, for example, “in 1967, Royal College of Art given University status (as a result of Robbins report on Higher

Education, 1963)” (MacCarthy 1979, p128). Beyond this, the Diploma in Art and Design, the equivalent of a university degree, was introduced in forty colleges in England and Wales”(MacCarthy1979, p110).

The early 1970's were a period of re-awakening, in which, the whole mood of the movement for reform of education altered in universities. Over the next thirty years English history reached another age of reformation, which has broadened since 1966 with the development of word processor.

The educational enhancement grew among people who desired to improve their knowledge and gain a better life. The movement in England in the early modern period was influenced by to the industrial revolution, especially from the late 16th century. The first part of the study analysed internal population movements, their causes, level, nature and impact. People in the pre-industrial period were immobile; they were born and died in the same place. However, the changing social situation in England caused them move to the city for better opportunities between 1550-1750. These internal population movements were highly significant; firstly, they precipitated the enormous growth of London, which in turn engendered other important changes, including changes in life, attitude and education international communication and deeper knowledge. Secondly, this changing way of life brought opportunities to develop England's educational system and more universities were founded.

Consequently, the industrial revolution in the 16th century and the arrival of the modern age during the second revolution in the 18th century changed the way that people thought and made churches accept its significance and the value of humanity. As can be seen, the revolution changed the political and social scene in the period of reformation, which caused division in the church. As a result of the Reformation, Western Christendom was divided into Protestant and Catholic areas. Another result was the development of national churches; these

strengthened the growth of modern national states just as, earlier, a growing national consciousness had facilitated the development of the Reformation. Finally, the Reformation introduced much radical change in thinking and in religious and political organizations and thus began many of the trends that are taken to characterize the modern world(Reformation, General Information).

Changing social attitudes and the progression of thinking about humanity heralded a significant revolution in England's history; the perception of art as an important aspect in life. The widespread development in art and art education put England in the position where the church had no more control over it. The beliefs of freedom brought to life the nature of art forms, developed outside the churches, and dealt with secular rather than with religious subjects. The 18th century was an avenue towards enhanced teaching and learning to create a form of art, which communicated more with industries and economical development and was no longer restricted to religious sculpture, painting and stained glass windows.

In the 21st century, the rise and rise of the Internet is the proof of this revolution. However, thirty years ago, no one could have anticipated this happening, as Ridley states that “the men who fought in the wars of the Roses could not foresee that their children would witness the protestant Reformation, and that their grand children would not applaud the victories of English seamen over the Spaniards at Cadiz and in the Caribbean. Nor can we today foresee the events, which will confront our children and grandchildren in the twenty- first century” (Ridley).

As a whole, the 21st century has changed our entire life and turned it into a challenging opportunity that can help individuals focus on lessons to be learned from the past, and on how they can be put into practice in the future in order to enhance the teaching and learning environment. However, the invention of computers and use of new technology has created a new way of seeing the world and, more importantly, it has facilitated new approaches in teaching and learning.

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Appendix1: 'Implication For Enhanced Teaching And Learning' –Two Glorious Periods In The History Of England From Higher Education To Art Education

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Appendix2

The Creation of the New System in the British Universities after the 1960s

The 20th century was characterised by a focus of attention on the nature of society and the economy. In particular, technical change and the growing complexity of work processes have been united with a marked increase in the skills level of the work force. This general expansion was reflected very different pattern of industries, also, after the middle of the century, the pattern of economic development changed fundamentally and this, in turn, was reflected in the expansion of education. Britain saw the greatest increase of all over this period, followed by an extensive improvement in British universities. It is fair to say that universities are essential to economic success even if they do not guarantee it, universities are facing a challenging time but it is also a time of great opportunity.

In assessing the history of the reorganisation of England's universities, it is necessary to trace its origins. As a specific area of study, it is relatively new, it grew mainly out of the changes in the 1960s, particularly the upheavals of 1968 with the attendant demands for relevant instruction leading to a brief in the strength of innovation in industry. As such, in its early years, the history of universities tended to be inspirational and it can be said that universities were facing an optimistic future, and the period marks a new stage in the planning and development of British universities.

The ideas which underpin the renewal in British universities were intensified whereas, the 20th century Britain was characterized as a contracting society because of its transformation from the position of a dominant imperial power and it is important to note the expansion of its system of production. Overall,

then, the century saw a fundamental shift in the relative importance of different occupational classes. It is clear that this shift in the occupational structure was closely linked to the changing structure of industry. But while the changing structure is one of the major factors accounting for the rise in the skills level, this has been accentuated by the very rapid and widespread technological change that swept British industry from the early 1980s. As A.H.Halsey notes in his book:

“Similarly, we must note that in addition to the growth of Britain as a Productive enterprise, there were profound twentieth century changes in the reproductive system” (Halsey 2000,p8).

It really is extraordinarily difficult to know where to start with this but it can be argued that in questioning how did the new system extended to British universities and what the reason was the upheavals of that period, we need to explore deeply around the subject. The idea of planning the development of British universities mainly arose from the first issue of the universities Quarterly published in 1946, at the end of the Second World War.

As the first article, by Ernest Simon states, “the universities were highly regarded by Government and their objectives seemed to match in every way the aspirations of the nation”(Shattock). He adds in his article that, the UGC (University Grant Committee), was reformed and made into a more professional body to manage the university transformation required, and CVCP (The Committee of Vice Chancellors and Principals), committed themselves to playing their own part in the co-operative planning of the whole university system, and perhaps even more important, ‘to devise methods of working to ensure the complete fulfilment of their common task’.

To quote Shatock’s book, “one important step towards the creation of a university‘system’ was the interest in the 1950s in the university admission process”. He then adds that “this arose partly from the statistical arguments for further expansion of student numbers based on the expansion of post war

Births and the increasing demand for entry to universities” (Shattock). Nevertheless, it must be said that, the twentieth century has been the first in which further and higher education have become recognized as a democratic right of citizenship. Expansion has accordingly been the reformists watch word, and tertiary systems have gradually moved from a highly restricted binary organization along mainly class and sex lines” (Halsey 2000, p.222).

The writer of the book *The Creation of a University System* says: “In Britain, continued education beyond school has been through two main sectors, ‘higher education’ in the universities and ‘further education’ in the technical colleges and teacher training colleges. The relationships between these sectors and particularly the respective roles institutions within them have been far from clear. ‘Higher education’, defined as work of university standards both in technology and research, has been a significant and integral part of technical colleges for many years.

Indeed the quality and growth of this work in CATS (the Colleges of Advanced Technology), after their designation as such in 1956, led to the recommendation of the Robbins committee Report that they should in general become technological universities, and this was accepted at once by the Government in October 1963”. Following the post-war concern for the need for technical education, the government, after much deliberation, decided to establish eight (later ten) colleges of advanced technology in England and Wales. These were to concentrate on technological higher education, offering a new degree level award (the Diploma of Technology). (qtd.in Venables,pp16-29).

One of the driving forces behind the establishment of such technological colleges was the need, confirmed by the Robbins Committee, to find more places for the growing number of 18 year olds and to increase the age participation rate to be more comparable with other industrialized countries. Another initiative was the desire to open higher education to wider range of

students. Despite this act, the writer argues that their shift to the grant list of UGC in April 1965 did not, however, denude the technical college sector of advanced courses and research.

The CNAAC was established by Royal Charter in 1964. Its history has been extensively documented by Silver (1990) and need not be duplicated here, but because the development of the polytechnics was bound up with the CNAAC, some of the features of its work and their implications for the polytechnic policy need to be recorded. CNAAC's brief covered the United Kingdom, unlike for example BEC and TEC, so in this respect the development of the polytechnics in England and Wales was closely bound up with that of central institutions in Scotland and the singular polytechnic in Northern Ireland.

The CNAAC embodied the elements of partnership and processes established by the NCTA. Its membership was drawn largely from the institutions and it developed a new form of peer review, increasingly recognizing the role of institutions in partnership arrangements. It created a system of 'accreditation' of institutions and eventually, facilitated the granting of degree awarding powers to its major institutions in the 1992 Further and Higher Education Act. When the polytechnics came into being they faced the need to establish a credible range of higher education courses at degree level, so that, from their inception, the development of the polytechnics was intrinsically linked to that of the CNAAC. The growth of CNAAC degree work was one of the remarkable achievements of the polytechnics in the ensuing years.

In all these developments, the relationship between the polytechnics and the council was ambivalent. The CNAAC was a mechanism that had facilitated the development of degree level work in a way that had not hitherto been possible. It had supported the development of the research degree and promoted research in polytechnics. The overlap continues, and the CNAAC (Council for National Academic Awards), is committed to its growth, and adds, " in short, during the period following the Robbins Report, very sharp

contrasts developed: for the colleges of education a continuing relationship with the universities but no transference; for the technical colleges the transference of CATS to join the universities, but no new relationships with the universities for the remaining colleges” (Shattock1996,p.160).

Furthermore, while the importance of renovation followed by a marked change of policy and attitude towards the universities, new as well as old, was justly stressed for the public sector, the CNAA was marked as a massive experiment after being establishing in 1964 with remarkable speed. In fact “the CNAA being granted a charter within a very much shorter time than that required for new universities”. Its charter confers the power to grant degrees, and the higher degrees of MA, MSc and PhD have already been announced” (Shattock)163). All in all, then, the significance of the change must be judged against the background of the need for expansion in higher education. The question here is, if there was no university system in Britain before World War II, as Simon notes in his article, what was the main reason for the progressive change in universities after World War II. We must first identify the causes and consequences of these changes in the character of society itself.

The changing structure of industry, was a good excuse for a many of the changes which have occurred in different sectors in post war Britain leading to a massive transformation in government policy. There is no doubt that in many ways the development of the universities in Britain was due to two causes, firstly, as a result of the impact of technological advances on economic growth which include greater access to education and secondly, the proportion of age groups which has been increasing rapidly. The writer of *The Creation of a University System* points to the reality that “ the universities have rather suddenly aware that the number of young person fit for and wanting a university education is likely to increase on a considerable scale during the next ten years”(Simon) qtd., p.122-131).

Indeed, the so-called 'bulge' in births immediately after the war, and the increasing number of age groups, which have been continuing their education, was a good incentive for such an evaluation. Shattock confirms "the history of student numbers at the universities of England and Wales in the last 50 years can teach us important lessons"(Shattock)47). He then points to Figure 1.Appx2 in which, the proportion of age groups wishing to enter university between 1911 and 1971 are compared. This very rapid increase was an astonishing and most encouraging achievement. According to this figure, the proportion of age groups increased by 1967 and it is shown as a peak year.

In the meantime, the writer notes that the number who might wish for entry to the university would be more than doubled by 1967. However, it depends on the demand for graduates, and on action by the Ministry of Education ..."(Shattock)48). (Table1, Appx2), compares these demands for an increase in the total size of the British higher education, which was not unaware of the American and German experience. In spite of its diversity, Shattock quotes to Shil's article (Observations on the American University, p95-106) that "American higher education could be said to have a 'unity' because it was influenced 'by the common tradition of American culture'. It was possible, to talk about a university system because it was accepted that universities had different functions, however, he believed that American universities had weaknesses, particularly in undergraduate teaching, and in the danger of a freer, less tidy, more adaptable, and much less cautious university system.

At the root of this difference, therefore, lay the decentralised nature of the American university system as compared to UGC's centralised control of the universities in Britain". Then he adds, "When Simon retired from the chairmanship of the Quarterly's editorial board in 1960, the motion in the House of Lords led to the establishment of the Robbins Committee. He moved the motion on 11 May 1960 but died in October, two months before the Government responded formally to announcement the formation of the Committee."(Shattock)7).

Therefore, as respecting the need for growth and greater social disinterest, the Robbins Report of 1963 represented a decisive moment for British higher education. Eventually, in 1963, the Robbins Committee clarified higher education for their purpose as follows:

“In the main we have concentrated on the universities (whose charters empower them to grant degrees) in Britain and those colleges, within the purview of Ministry of Education and the Scottish Education Department, that provide courses for the education and training of teachers or systematic courses of further education beyond the advanced level of the General Certificate of Education in Scotland, beyond the higher grade of the Scottish Certificate of Education or beyond the Ordinary National Certificate or its equivalent.”
(Robbins1963,para.6)

Regarding this, Pratt quotes that one of the powerful forces behind the establishment of the polytechnics was the need, confirmed by the Robbins Committee, to provide more places for 18 year olds, as their numbers grew, and to increase participation rate to be more comparable with other industrialized countries. Another driving force was the desire to open higher education to wide range of students. A.H.Halsey argues convincingly “the definition is further elucidated by a consideration of further education which covered, in addition to the CATs, the advanced work undertaken at a great number of technical and commercial colleges and school of art, but it excludes the initial stage of much professional and other education provided in such colleges”(Halsey,2000, p.223). The Robbins Report had an important role for expansion and upgrading the university position and as Halsey mentions, “the Robbins report heralded accelerated growth in higher education” (Halsey2000, p.227).

Meanwhile, the government increasingly needed to effect change in the direction and management of higher education. The ideal of the 1960s was

that education should develop individual potential was joined by demands for economically useful skills relevant to industry. Thus, a great deal of public attention was paid to the development of new subjects to evaluate the system in that period. Robbins recommended that the majority of the expansion should be within the university system regarding ‘a large university population contained by the total provision for higher education and nation’s interest’.

His decision influenced the speed with which the Government, facing a General Election, accepted the main Robbins recommendations for expansion and upgrading the CATs to university status in 1992. According to Shattock, this ‘overnight’ event, shows how important the report was which could shape a university system with a plan for growth over nearly 20 years (Shattock) which is why he used the word like ‘overnight’ to indicate the circumstance of the British universities.

Little by little, the need to link to the world of work made it necessary for colleges to achieve a broader and more flexible base than just a university system. The book *Creation of a University System* explains how the thought of innovation and the sense of experiment were found important by other authors like David Risman, who talks about that in his article. Nevertheless, he found that in America the best quality of undergraduate work is livelier and more innovative than what he had seen in Britain. The writer argues that he found the more vibrant, ‘can do’ style of expansionism in America, compelling evidence of the limitations of the more disciplined, more planned approach to expansion adopted in Britain in the 1960s(Shattock).

The sequence of events can be shown in a particularly striking form by concentrating our attention in the first instance on the two separate official policies in the mid 1960s, which resulted in the establishment of the polytechnics. According to John Pratt, “the first was the ‘binary policy’, enunciated in April 1965; the second was the ‘polytechnic policy’ itself,

embodied in a white paper in 1966". Then he adds, " The Binary Policy formed the basis of planning in higher education from 1965 until 1992, under the government of both the main parties(Pratt).

However, "the polytechnic policy was the means by which the binary policy was fulfilled. But although these policies were obviously interrelated, the one did not impose the other". The binary policy formed the basis of planning in higher education from 1965 until 1992, under governments of both the main parties. The strongest statement of this policy is in the speech at the (old)Woolwich Polytechnic in April 1965 by Anthony Croslands, the Secretary of State for Education, which started the academic world. That such a radical speech was made is remarkable. (Pratt)

Crosland's speech disclosed the Robbins Plan, in which "he recommended that the regional colleges or the colleges of education might be upgraded to university status to take up the expansion some time in the late 1970s" (Shattock1996, pp.9-10). It was a welcome beginning, but, nevertheless it was only the beginning, and it became clear that the debate and the formation of the polytechnics was an attempt to establish new universities.

Thus, "the speech was followed by a white paper in 1966, setting out the Government's intention to establish 28 polytechnics as the leading institutions of the non university sector"(Pratt). Meanwhile, a look at this sector of the intellectual life lets us turn to look more closely at the British universities. As regards the increase in technology, the universities of Britain have done an outstanding job after the 1960s. In many industrial countries, non-university institutions were founded or combined into a separate sector with distinctive policy aim, for example, The title 'polytechnic' was not itself new. It had been used by a number of existing institutions starting with the Regent Street Polytechnic at the end of the 19th century.

According to the writer of “The Polytechnic Experiment”, “ ‘the new polytechnics’ were, designated by the Government in order to have distinctive aims and functions outlined in the White Paper,” (see Table2Appx2). Pratt notes that:

“The White Paper set out to address not only the problem of expanding the system of Higher Education outside the universities, but also attempted to maintain the historic Links between non-advanced work and higher education in this sector. He then adds, “the first of these 30 polytechnics were designated in September 1968 others followed steadily, with the final two in 1973”.(Pratt)

The change to a Conservative government in 1970 made surprisingly little difference to the policy. Margaret Thatcher who became Secretary of State stressed the need for polytechnics to remain distinct from universities and to contribute to the expansion of higher education. However, there were significant developments in store in the White Paper, which Thatcher produced in 1972 entitled (misleading) Education: A Framework for Expansion. As Pratt states:

“The 1972 White Paper did not propose major changes to the polytechnic policy itself. The binary system would remain, and there would be expansion in both the university and non-university sectors. Indeed the polytechnic sector appeared to become the larger part of system ‘The major part of the 1981 total [of 750,000 places in higher education in Great Britain] must be provided by the polytechnics’.” (Pratt1997, p.19)

As the polytechnics developed in the increasing constrained environment that the 1972 White Paper described, these competitive pressures were heightened, it expressed the view that students should be given skills and knowledge ‘related more directly to the decisions which will face them in their careers’. Quote to Waldegrave, (1982) Speech at Bristol Branch of the Association of Polytechnic Teachers, “By the early 1980s, a minister could say:

‘Government, industry and higher education must work together to match the output of qualified personnel with industry’s need.’” As can be seen, (Table 3, Appx2) shows the date of designation and summarizes the constituent colleges of these institutions.

Alongside that, more than half the polytechnics (Pratt) 1997, p.17) proposed in the 1966 White Paper incorporated colleges of art. According to Pratt, it was not a suggestion that met with universal approval in the colleges and it was against the majority opinion and advice of the NCDAD (National Council for Diploma in Art and Design). The NCDAD, was established in 1961 to review submission for the new Diploma in Art and Design (DIPAD) and to validate suitable courses of the 87 colleges which initially submitted proposals, only 29 eventually succeeded in gaining approval to run the DIPAD from NCDAD and ministry (A Shwin, 1975), most of these were to be incorporated into the polytechnics.

Moreover, it had its own qualification as well as a distinctive culture, often at loggerheads with that of the technical colleges. He says the rapid development of courses in the polytechnics was increasingly in areas and in forms which challenged the original CNAA in business studies, combined studies (science), mechanical engineering, social science, town planning and combined studies. New subject panels were established as the science and technology areas, accommodation and related services. The polytechnic policy helped to speed up major unrest in some of the colleges, which had implications not just for art education, but for the inclusion of art and design in polytechnics and, in the end, assisted its achievement of international status. “Some technical colleges had schools or departments of art within them. About 8,000 students were studying at advanced level, most for a National Diploma. The Royal College of art was centrally funded and from 1967 awarded degrees. Art education also took place in teacher training colleges, thus changing was already taking place in art education when the polytechnic policy was established” (Pratt)126). In 1960 the NACAE (The

National Advisory Council on Art Education), set up in 1959 under the chairmanship of Sir William Coldstream, Student and Staff of the Honsey college of Art (1969), issued its first report advising the replacement of the existing National Diploma by the Diploma in Art and Design. The proposed Diploma was to offer art and design in a broad general context of designated areas, where the National Diploma was vocationally adjusted, calling for the pursuit of chosen closely defined studio activity. Conceived as a 'liberal education in art' of first degree standard, the new diploma would set higher academic standards and include the compulsory study of the literary humanities, especially art history. The new diploma was to be degree equivalent (the universities still retained their stranglehold on the title 'degree', as they had with the Diploma in Technology); academic respectability was built in through enhanced requirements for entry, complementary studies. Therefore, Britain has had an expeditious record of successful development of its investment in higher education through fluctuating economic future, as Halsey mentions in his book. Connected to this, change was already happening in art education when the polytechnics policy was the fact of that.

Beyond this, the creation of the polytechnics had further implications for art education. As Pratt describes, it led to both NCDAD and CNAAB to consider the uncomfortable combination of the diploma courses in art with degree courses in polytechnics, which then became a BA course. Social and economic changes progressed at a rapid rate alongside the development of education, and had to be taken into account when considering plans for the extension of education in the future. It is, therefore, more useful to distinguish that some courses were approved by CNAAB in this period at British universities.

Hence, the need was recognized for close co-operation to deal with the development of degree courses containing an art and design element and with the possibility of DIPAD courses with a significant technological content and

courses broadened swiftly in the 1970s. Incidentally, it is important, too, to understand that the processes of CNA A and the activities of new polytechnics also began to make changes. Whilst most polytechnic courses were similar to the university sector, some polytechnics developed more innovative courses. At this respect, Pratt indicates “The polytechnics began to develop degree courses in subjects that they had not previously offered, and courses with distinctive characteristics.” He indicates that among those was the emergence of courses which brought graduate status to vocational areas of college work, expanding intellectual activity into new fields and into Paraprofessional fields”(Pratt)110), the development of business law courses, social science and humanities were also extended besides the art courses.

By this time, major policy was changed elsewhere in the education system, and it happened at the time when the policy was remarkably vigorous. However, the inclusion of art education into polytechnics was expected to have educational conclusions, although the debate concerning the purpose of art education was to continue during the 1980s. Nevertheless, it must be noted that, “Bethel, director of Leicester Polytechnic, who proposed an individual ‘institutional committee’ for each institution designed as having achieved ‘mature status’ to act on behalf of CNA A and to replace review visits. (David Bathel, *The Polytechnic Experiment*, p.221). He envisaged the development of multidisciplinary courses, particularly DIP HE and Bed with art and design components, and modular and performing arts courses, which would break down the NCDAD concept of chief studies, and ‘main’ areas”(Pratt)128).

The polytechnics faced the evolution of degree courses in subjects that had not previously offered, and courses with distinctive characteristics. In 1972 both the CNA A and the DIPAD, explored the possibility of a merger. Eventually, “the result of the merger was the translation of the DIPAD into a degree with honours. But in the following year, 1975-76, 157 CNA A students exchanged their DIPAD for a BA. Degree (Pratt 1997, p.127).

To quote Allen (1982) in the book, *The Polytechnic Experiment*, polytechnics, 'have of course set up degrees reflecting the administrative structure and historical work of the establishment.' He adds that they offered greater opportunity for multidisciplinary and, in performing arts, had refused single honours degrees in favour of 'some combination of the performing arts.' After all, from year to year, when the courses became the CNA A degree, the polytechnic enrolment had risen to nearly 60 percent of total in 1976. Meanwhile, 19 of the 34 polytechnics offered fine art degree courses and several others offered options on other programmes 24 offered design degree; 13 offered degrees in music or the performing arts, with others again including these subjects within modular or interdisciplinary schemes"(Pratt)128).

Pratt indicates, "the ideals of the 1960s that education should develop individual potential were augmented by demands for economically useful skills and industrial relevance". Among these, was the advent of courses as he states the 1972 White Paper expressed the view that students should be given skills and knowledge, related more directly to the decisions which will face them in their careers"(Pratt) 21). Thus, the process of the CNA A and the activities of the new polytechnics began to make changes. The polytechnics began to develop degree in subjects that they had not previously offered and brought to graduate status vocational areas of the colleges' work, expanding intellectual activity into new fields and into Para-professional fields.(Pratt)110).

To quote Jones in 1973, despite the 1972 White paper, " the criteria of validation for the bulk of polytechnics disciplines of industrial, commercial and social acceptability and utility were different from and inimical to fine art" (Pratt)128). Link to this, Fine arts students were observed to graduate without the transferable skills that would benefit them in future careers. As Pratt states that, "NAB (1985) proposed 'that the nature, structure and balance of higher education provision in the arts programme area need to be

broadened'. It would not just be specialist fine art, but more general, leading to a broad understanding of visual and applied arts, which would place greater emphasis on transferable of interdisciplinary approaches and credit transfer"(Pratt)129).

Although, according to the book, *The Polytechnic Experiment*, this was realized by only a few that the nature of fine arts degrees was questioned as being too focused by considering students as potential professional artists with a 'narrow preoccupation with "gallery art"'; but "Allen in 1982 reported that fine art continued to sit uneasily within frameworks designed for academic study, particularly in the context of research degrees, and the possibility of creating a distinctive research award to cover outstanding achievement in the creative arts exercised the CNAAs Committee for ART and Design in 1980" (Pratt1997,pp.128-129).

The book *Twentieth Century British Social Trends* explains that, similarly, "in this period colleges of advanced technology were given university characters, seven new universities were found in England..." The writer argues "the number of students grew considerably during the years between the early 1900s and the late 1990's which the figure for the UK was one in three"(Halsey and Webb). He notes that, "Robbins set targets for 1973 of 219000 university students, 12200 teacher-trainees in (renamed) colleges of education, and 51000 in technical colleges on advanced courses. These targets were reached by 1970 and surpassed by over 40000 in the case of the technical colleges. Between 1963 and 1970/71 the total student population in full-time higher education doubled to 457000".

(Table4Appx2) shows, putting together all full time higher education students in universities and public sector institutions from the UK and abroad the numbers rose from 457000 in 1970/71 to 1131000 in 1997/98. Beyond these, higher education-full time students: by origin, sex, and age, 1970/71-97/98,UK (000s)Robbins also presented the growth of higher education to

1962 in terms of percentages of the age group, for those entering full time higher education courses they are given in Table5Appx2, and for 1970-97 in Figure 2. The growth of full time higher education is shown to be sevenfold from 1900 to 1962.

It appears that, Britain has had an accelerating record of fruitful formation in higher education as a consequence of modern society. In truth, universities are essential to economic success even if they do not guarantee it. A time of great challenges can also be a time of great opportunity. Thus, according to Shattock, a look at this small sector of intellectual life immediately reveals, “the authority of the modern work place is increasingly based on claims to technical competence, linked to education. Therefore, education is also a substitute for deference in the workplace, and for the usual routines of production and distribution of goods and services. Those routines are being challenged by new technology, by other societies” (Shattock)214).

Incidentally, “British universities and polytechnics can help create that new relationship between learning and society, or they can resist it. History will make its own judgement of the part that institutions of higher education will play in the post-secondary education of British society, and will be an unforgiving one “(Shattock).223). Our purpose in this paper is to fill in some of the significant detail, including the acceleration of growth in the last decades of the twentieth century till now, the changing balance of the curriculum, the social composition of students, and the multiplication of colleges and universities. This can be seen from data from 1993/94 figures include former polytechnics an HE colleges which became universities as a result of the Further and Higher Education Act 1992 ” (Halsey2000,p.34).

The fact is that for the period from 1970 to 1996 the total enrolment rose, and that is a good reason for advancing evidence of expansion in the number of students in British universities. But this paper does not intend to hold a debate about the shift of the slowed down of the student body. Thus, for our purpose, the term ‘development in higher education’ is taken to refer to evidence of the

most dramatic recent rises of changes in a world in which lifelong education is increasingly important. Equally, the number of students has certainly increased since Robbins; but during the last 30 years the proportions of students and the variety of institutions had different rates. One general point arising from this discussion from Robbins that is from 1962 to 1996, the number of university students continued to rise.

However, the advance in 1972 to 1973 moved backwards after 1981. A.H.Halsey, describes that “there was absolute numerical decline in the universities from 1985 when economic slump gave way to boom, from which point growth accelerated each year to 1996 with a dramatic leap, at least nominally, in 1992 when the polytechnics were allowed to become universities”(Halsey2000, p.235). He indicates that the expansion rates of the late 1960s and early 1970s were recaptured in the closing year of the century. The general picture of reorganisation is shown in (Table6Appx2) for the period from 1970 to 1996.

The question here is why did this expansion continue and even become the first priority of all political parties? A.H.Halsey argues, “The answer is not complete. Both economic fortunes and political pressure moved in the late 1980s. A restructuring of the economy with movement towards integration with continental Europe had educational consequences. The quest for competitive advantage impelled renewed educational expansion” (Halsey2000,p.245).

Therefore, it could not be an exaggeration to say that international comparisons, during the repositioning of the economy were a good excuse for renewal and development in educational demand. Notably, now it is at least possible to ask questions about the ‘sort of culture’, which will win higher education domination. Thus, according to the research of Jonathan Clerk, the enfant terrible Oxford historian, to many of the universities, the highest form of academic quality. Christopher Price points to this reality that “university

values ought to dominate the sector and encapsulate the true ‘idea’ of the university”. (Christopher Price1992)

Alongside that, polytechnics also combine the higher education system with different and just as genuine notions of quality. They have proved that it is possible to achieve financial growth without any substantial reduction in the quality of the learning process. Foremost, “Having work under a succession of financial regimes which encouraged expansion, they have found it possible, by co-ordinating the management of the four elements of their business, finance, academic programmes, human resources and the buildings at their disposal, to enable far more students than ever before to graduate. It has given Britain an extremely important supply of skilled manpower and, as a result, they have come to take an optimistic view of educability of human nature”(Price).244).

The Robbins Report indicated that “by 1988/89, including part-timers in universities, the Open University, the polytechnics and other colleges offering advanced courses, it was 964,000”(Halsey1995,p.91). In the book *Decline of Donnish Domination*, Crosland debates that “the universities were not in a position to give the government what it needed at that time... the urgent need was for an expansion of polytechnic-style rather than university-style higher education”. He then adds “the best results will be achieved by developing higher education along polytechnic lines wherever practicable” (Halsey1995,p.112).

“Putting together, by the late 1990’s there were about five million students in tertiary education. The Prime Minister, Tony Blair, promised at the 1997 Labour party conference that, ‘we will lift the cap on student numbers and set a target for an extra 500000 people in higher and further education by 2002’. The story, in short, is of expansion in both sectors together with a growing invasion after the Robbins Report (Robbins) of further by higher education”(A.H.Halsey, Webb, Josephine p.223). “Yet by standards officially

accepted for the twenty-first century the growth has to be described as restricted, by 1997 the Dearing Committee(Dearing).1997) was forecasting that more than half of today's school leavers will experience higher education at some time in their lives"(Halsey and Webb)227). Now, at the beginning of the twenty first century it must be noted what measures are required for the improvement of such education, having special regard to all endowments, and 'at what rate should we increase our output of technology?

In reminding us of the effectiveness of the attempts to improve English universities over the past century and a half, it is clear that the most vital single difference between the universities, on the one hand, and the polytechnics and colleges of educations, on the other, is that there is so much less money for research. Perhaps the essence of the work of a university could be summed up as 'teaching in an atmosphere of research'. British universities seem ready to change, but in the immediate future that means not only better, purer and more efficient universities but better methods to broaden the quality of teaching in university is anticipated in the history of universities.

Figure 1, Appen2: Full time University Students in England and Wales

Sources: 1911 to 1954: University Grants Committee.

1955 to 1971: Based on estimates of the population aged 18,19,and 20 made by professor Lancelot Hogben on the basis of Life Table, 1950-52 prepared by D.W. Taylor.

Note: the UGC normally gives the academic year, e.g., 1910-11, which includes three months of 1910 and nine months of 1911. For the sake of simplicity in this article proposed to use the later year in each case, e.g., 1911.

Table1, Appx 2: Increase in Total Size of the Universities

	INCREASED PERCENTAGE OF FULL-TIME STUDENTS	TIME TAKEN TO ACHIEVE THE INCREASE
After World War I	75	2 years
After World War II	64	2-3 years
1955-1965	50	10 years

in the British Universities after the 1960s

Table 2,Appx: The 30 Polytechnics

DATE OF DESIGNATION	POLYTECHNIC	CONSTITUENT COLLEGE	COLLEGE OF EDUCATION MERGER	UNIVERSITY TITLE
January-April	Hatfield Sheffield Sunderland Leicester	1 technical 1 technical 1 art 1 technical 1 art 1 technical 1 art	2 colleges 1 colleges 1 colleges (most ITT ceased)	Hertfordshire Sheffield Sunderland De Montfort
September 1969	Bristol Newcastle Portsmouth Wolverhampton	1 technical 1 commerce 1 art 1 technical 1 commerce 1 art 1 technical 1 art 1 technical 1 art	2 colleges 2 colleges 1 college 2 colleges+ 1 technical teacher education	West of England Northumbria Portsmouth Wolverhampton
January 1970	Kingston Manchester Plymouth (later Polytechnic South West) North Staffordshire Leeds Lanchester (later Coventry)	1 technical 1 art 1 technical 1 commerce 1 art 1 technical 2 technical 1 art 1 technical 1 art 1 commerce 2 technical 1 art	1 college 1 college+ 1 other+ 1 merged college late 1 college (ITT ceased) 1 college	Kinston Manchester Metropolitan Plymouth North Staffordshire Leeds Metropolitan Coventry
Later 1970	Glamorgan Oxford Teesside Liverpool Trent (later Nottingham) South Bank City of London Central London Tames North East London (later East London) Brighton Huddersfield Birmingham	1 technical 1 technical 1 technical 1 technical 1 specialist 1 art 1 commerce 1 technical 1 art 2 technical 2 specialist 2 technical 1 specialist 1 technical 1 specialist 1 technical 1 specialist 3 technical (1 included art) 1 technical 1 art 1 technical Advanced work in city+ 1 commerce	1 college 1 college 1 college 2 colleges+1 merged college, later 1 college 1 college 1 college (+1 FE later) 1 college 4 colleges	Glamorgan Oxford Brookes Teesside Liverpool John Nottingham Trent South bank London Guildhall Westminster Greenwich East London Brighton Huddersfield Central England
1971	North London	1 art	3 colleges	North London
1973	Middlesex Lancashire	2 technical 2 technical 1 art 1 FE college	2 colleges 2 colleges	Middle sex Central Lancashire

Table 3, Appx2: Subsequent polytechnic designation

POST AMALGAMATIONS	LATER AMALGAMATIONS	UNIVERSITY TITLE
2 education, 1 technology, 1 art, 1 commerce, 1 National	1 technical	Humberside
1 educational, 1 technology	ITT ceased 1 art and technology	Bournemouth Anglia Polytechnic
1 educational, 1 technical None	1 CHE, 1 FE, 2 specialist	Thames Valley

in the British Universities after the 1960s

Table4, Appx2: Higher education-full time students: by origin, sex, and age, 1970/71-97/98,UK (000s)

STUDENTS	MALES UK 1970/71	UK 1980-1990	GB 1990/91	GB 1995/96
Full time students by origin from the UK				
Universities	128.3	145.1	142.4	
-Undergraduate	182.0			
-Postgraduate	23.9	20.7	21.6	
Public sector higher education	30.7			
Total full-time UK students	102.0	11.9	172.6	
From abroad	252.2			
Total full- time students	254.2	277.7	336.6	
	464.9			
	20.0	40.7	48.6	
	77.8			
	274.2	318.4	385.2	
Full time students by age or under	542.7			
19-20				
21-24				
25 or over				
	28.7	50.3}	198.7	
	69.1			
	99.0	117.8}		
	180.9			
	104.6	95.6	115.5	
	173.0			
	42.0	54.5	71.0	
	119.6			

Notes: 1- Origin is of fee-Paying students expect for European Community students domiciled outside the UK whofrom 1980/81 are changed home rates but are included with students from abroad. 2-In 1980 measurement by age changed from 31 December to 31 August.

GB 1997/98	FEMALE UK 1970/71	UK 1980/81	GB 1990/91	GB 1995/96	GB 1997/98
186.6	57.0	96.2	116.7	173.2	192.8
29.0	8.0	11.3	15.5	25.3	26.4
242.3	113.1	96.4	171.3	276.8	290.0
454.9	178.2	203.9	303.5	475.3	509.2
87.6	4.4	12.6	29.2	61.3	76.1
545.5	182.6	216.5	332.7	536.6	585.3
77.8	30.4	41.6}	186.2	74.1	88.3
186.2	82.3	89.7}		189.3	206.2
166.9	44.5	53.5	90.7	158.5	165.0
114.7	23.3	31.5	64.3	114.8	125.9

Source: Social Trends, no.16, Table 3.12. Figures from 1990/91 from Dearing Report and DfEE.

Table 5, Appx2: Percentage of age group entering full time higher education

YEAR	UNIVERSITY	TEACHER TRAINING	FURTHER EDUCATION	ALL FULL TIME HIGHER EDUCATION
1900	0.8	0.4	-	1.2
1924	1.5	1.0	0.2	2.7
1938	1.7	0.7	0.3	2.7
1954	3.2	2.0	0.6	5.8
1955	3.4	2.0	0.7	6.1
1956	3.5	2.1	0.8	6.4
1957	3.9	2.2	0.9	7.0
1958	4.1	2.4	1.2	7.7
1959	4.2	2.8	1.3	8.3
1960	4.1	2.7	1.5	8.3
1961	4.1	2.5	1.7	8.3
1962	4.0	2.5	2.0	8.5

Note: For 1970-97see Figure 2

Figure 2, Appx2: Higher education age participation index (API), GB Institutions, 1972-95

Source: DFEE.

in the British Universities after the 1960s

Table 6, Annex 2: Expansion of higher education by type of establishment, sex and mode of attendance, 1970/71-95/96, UK

UNIVERSITIES			POLYTECHNICS AND COLLEGES- THE '1992 UNIVERSITIES'			
	1970/71	1989/90	1995/96	1970/71-1989/90-1970/71	1989/90	
1995/96				89/90	95/96	
(000S)	(000S)	(000S)	RISE (%)	RISE (%)	(000S)	(000S)
(000S)						
Full-time	167	200	499	20	150	170
Men	94					
Women	68	151	465	122	308	169
	124					
Part-time	18	31	158	72	510	159
Men	85					
Women	6	23	185	283	804	103
	82					

Notes: From 1993/94 figures include polytechnics and HE colleges which became universities as a result of the Further and Higher Education Act 1992.

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