Creating Creative Processes: A workshop demonstrating a methodological approach between the Sciences and the Arts

Carola Boehm
Department of Contemporary Arts
MMU Cheshire, Hassall Road
Alsager, ST7 2HL
+44 (0)161 247 5434
C.Boehm@mmu.ac.uk

ABSTRACT
There is a lack of 'explicit education' of different modes of creativity and different methodologies for initiating creative processes. The awareness of creative methodology is not only important for professionals in the creative arts (composers, performing artists and art practitioners) but also for developers of tools that support creative processes. This article discusses the background and context of the more general issues of creativity in higher education and then moves on how a hands-on workshop was developed specifically for the computer music / music technology related degrees enabling experiential learning of a wide variety of creative methodology. It discusses the pedagogical methodologies behind the workshop, the running of the workshop itself and examples of the specific exercises and the different contexts in which it has been integrated.

KEYWORDS
Creativity, creative pull applications, interfaces for creative contexts, creative and performing arts applications.

INTRODUCTION

In a time where the Government has (finally) caught on to the fact that money is to be made by being creative, and is providing funding for making "Britain the leader in the new creative economy"[1] we still seem to lack explicit education of different modes of creativity and different methodologies for initiating creative processes. We lack - what could be called rather tediously - "creativity appreciation", but more importantly, a deep understanding of how creative processes are initiated, developed, and learned. And this is valid both in the arts as well as the sciences, both in curricula geared to develop the future creators of digital tools for creative contexts as well as artists using these tools creatively. It is valid for curricula geared towards future music software developers as much as it is for future composers.

The Government's vision of "a Britain in ten years' time, where the local economies in our biggest cities are driven by creativity" is a major shift in governmental policy and is the beginning of an exciting brave creative new world. The government's Creative Industries Mapping Document [2] maps all industries that can be associated with the "creative professional" and it makes it clear that the vision is one were our industrialised economies of the future will only succeed if we manage to bring in processes that support creativity and the creative professional. And with it "the creative industries have moved from the fringes to the mainstream"[3].

And with the 2001 announcement of the government wanting to "see us putting creativity at the heart of education"[3] and a quite substantial financial incentive of 40 Million Pounds, suddenly "creative" workshops abound, new faculties, research centres and educational conferences are tagged with the word "creative", and the industry is stretching this term as far as it goes. We have reached a point where we want to see the term "creativity" being taken seriously. A new terminology is emerging, from "serious gaming" to "serious creativity", as for example here in Manchester Metropolitan University, where we have an "Institute for Serious Creativity"[4] . One can imagine (creatively) all the nuances that this title is - or possibly should not be - associated with.

But, just like the word "interdisciplinarity", we seem to discuss at length how important it is to be creative, but how to foster it, how to teach it, how to learn it, and how to evaluate it is often left in the vague. This is not surprising considering the fact that defining it seems to be a specific problem, and discussions are ongoing if the new financial incentives have possibly enlarged the meaning of this term beyond usefulness.[1] So when talking about how we foster creative students, Norman Jackson summarises what has been found in an engineering workshop: "What we can achieve (and is usually mis-labelled creativity) is a holistic approach to problems"[5]

[1] Consider the terms "problem solving skills", "decision making processes", "enquiry based learning".

Specifically in the creative arts, we seem to be able to rely on our image of always 'being in the creative' and this being (seemingly) sufficient for dealing with creative processes. "In these fields (visual and writing arts), originality is considered to be a sufficient condition for creativity, unlike other fields (such as engineering and design) where both originality and appropriateness are necessary."[6]

In the engineering sciences it is too often still considered an inappropriate word or a word being given lip-service. And although we contribute some of the biggest advancements in science and technology to a creative act (see for instance Simonton's work on Darwin and creativity [7]) the notion of creativity is a challenging notion in a engineering culture ingrained in utilising scientific principles for developing a single solution for a problem [8], and this has in turn made it the norm to keep creativity largely in the implicit. Nevertheless, it is increasingly being seen as important to introduce creative design methodology into the curriculum [9, 10] : "While the main requirement of engineering is not be creative but to be disciplined, engineers must employ both analytical/deductive (convergent) thinking and more inductive and divergent (imagine lots of possibilities) ways of thinking in their work. The design process requires judgment, creativity and discipline as well as technical skill." (Decker in [8])

In the arts, creativity is expected. But how to learn it, develop it and assess it, is a whole different matter. Often we learn the methods of creative individuals through a historic or contextual context, but when it comes to devising, composing, creating and other artistic processes, the educational methodology often used is one of being interlinked closely with the method used by the tutor or allowing a complete freedom of methodology but giving guidance for incremental improvement in the student's chosen methodology. Thus instead of learning a variety of methodologies in initiating creative processes, it often follows a culturally traditional notion of the subject's historic norm. Although seen as open and seen as allowing the development of the student's own specific style or voice, it does not support lateral thinking or going beyond patterns of working that have been the norm.

In fact, it is not in the 'creative arts', but in business studies and design, where the explicit training and learning of how to support creative processes has been made most explicit. And this even more in a working place situation, rather than an educational setting. "Many organizations in the corporate world embrace and value the idea of creativity as a means of gaining competitive advantage and advancing profits. The for profit motive is a powerful motivator of creativity in the world of work. The utilitarian view of creativity would argue that students will be better prepared for life in the real world and will gain advantage in the employment market if they invest in recognizing and developing their own creativity. The humanistic view is that creativity as personal expression is a necessary and important value for society to nurture. Is there any reason why higher education cannot embrace both of these perspectives?" [11]

To move forward into this brave creative world, we will need to consider how creativity as such can be intentionally and explicitly integrated into the curriculum and consider how to put a focus for academic activities in teaching and professional development, as well as research in this subject area. The benefits should be applicable not only in the creative arts (composers, performing artists and art practitioners) but also by the developers of tools that support creative processes as well as any other professional working in the creative and cultural industries.

CREATIVITY, AN UNTOLD STORY?

The creative process is one of the most essential but until recently, has been one of the least addressed components of artistic activity within the whole of the creative and performative arts. According to Sternberg [12], until 2000 references to creativity over 25 years account for ca only 0.5% of articles.

To understand what creativity actually is, and how we utilize it is still an ill explored domain. Sternberg mentions that creativity is barely covered in psychology textbooks and university psychology departments rarely offer courses in creativity. Creativity is barely covered in any textbooks or university departments. Traditionally in higher education, concentration was rather on technique, history and theory.

In higher education, when there is a focus on a creative process, such as in music and/or music technology, and where taught as part of a single discipline, concentration was traditionally rather on technique or history and theory related to that discipline. Two models of creativity currently prevail:

a) 'improvisational mode'[2] preferred by arts students, composition students, etc and
b) 'restrictive mode', preferred in 'lab' research, field work, academic scholarship and industry initiatives.

Since 2000, one can perceive an accelerating increase of research into creativity and creative processes. In the UK, besides the increasing amount of literature, there are a rising number of events specifically facilitating and supporting a serious study of this ephemeral area, amongst which can be listed:

- the 2003 Higher Education Academy 3-day Expert workshop: "Facilitating creative thinking" with Caroline Bailie, Norman Jackson and other [13];
- the Imaginative Curriculum Network [14] which has existed since 2002,

[2] For a definition refer to 3. below

- the seminar series by the Institute for Capitalising on Creativity of St. Andrews University in 2006: "The Discipline of Creativity: Exploring the Paradox"; more specifically for the creative industries,
- the Creative Clusters conferences in various cities in the UK [15] and
- my own series of workshops centered around methodologies for initiating creative processes [16].

There is an increase in and acceptance of education research, an increase in inter-, cross-, multi-, trans-disciplinary studies and there is also an increase in acceptance of practice-based methodologies in Higher Education. All these developments support efforts to research into and develop creativity within the curriculum. Interdisciplinary programs and practice-based problem-solving approaches to learning and teaching specifically have the unique opportunity to initiate explorations of the origin and methodology of art production.

But it needs to be said, that despite the accelerating focus on creativity as an economic force and as an educational tool, there is still a lack of research into creative methodology, and specifically into how we humans initiate creative processes.

THE CREATIVE PROCESS

This situation is reflected in many music technology courses taught as part of different degrees at many universities, but also other disciplines that lie in the intersection of technology, science and art. To address this issue I developed in 2001 a small workshop, that has continually been held for postgraduates and undergraduates, and which has expanded into the Continual Professional Development sector. Originally being given within the three subject areas of Music, Computer Science and Electrical Engineering, the workshop has been invited to other disciplines such as Performing Arts, Stage Management, Dance, Mechanical Engineering, Business Studies and Drama.

As mentioned above, most individuals, through education and training, are used to only using the smallest number of creative methodologies. These are mostly improvisational modes[3] (see [17,18]) for musicians and restrictive modes for scientists/software engineers[4] (see [19, 20]).

Not allowing the methodology being part of the creative exploration of a creative process, individuals are left often unaware of the full diversity of creative methodologies. Change and development of methodology as part of a creative process thus happens only incrementally.

This narrow view in the "non-digital world" can be seen to be mirrored in the software tools, as they tend to ignore the full diversity of creative methodology possible. In deBono's words, this narrow view is actually the result of human's evolved cognitive processes, something which he calls being blocked by openness. [21, 22] That is to say, if the road seems wide open, and there is a narrow path off it, we tend to continue our journey on the wide open path. We are blocked from taking the narrow path by the openness of the wide road. In evolutionary terms, this ability to make patterns in order to maximize the efficiency of learning processes and actions based on these learning processes, has allowed us to function as well as we do: we can learn how to drive to work, and after having done it a few times, we do not have to consciously think about the directions anymore. Our mind/brain can then be used to process other things.

But the disadvantage of these established patterns is that we have to make a conscious effort to break them when we want to. For example, if we have always composed in a certain way, with a certain methodology, it is more likely that we will continue working in this methodology and change will only be introduced incrementally. The big shifts of thinking and doing are more unlikely. And although it does depend somewhat on personality if pre-established patterns are broken or kept, it is in generally easier to establish new patterns if there are experiences that can support this process. Kirkton [23] has coined this personality continuum as adaptor-innovator "which presumes two very different approaches to change. The adaptor prefers to improve things while working within the given paradigm or structure.(…) The adaptor reduces problems by improvement and greater efficiency. The innovator, however, prefers to do things differently, to challenge the paradigm or structure. (…) The innovator solves problems by breaking down patterns and doing things differently".[24]

Within the workshop, which was designed to address the above situation, little exercises are designed to create these new patters, new ways of initiating creative processes, creating experiences in doing something differently. This awareness, and confidence in using a

[3] I define the improvisational mode as being one in which the individual is "creating in the moment and in response to the stimulus of one's immediate environment"[17] resting on "a series of conventions or implicit rules"[18]. The conventions and rules tend to be a chosen by a decision making process before the compositional act is started, and often not considered part of a variable. Quite often, this choice is also preset in a context, i.e. an compositional assignment brief asking for a composition that integrates 12-tone or serialism as a methodology.

[4] I define a restrictive lab-based mode to be explorative approaches where the creator/developer manipulates a number of terminate variables under controlled conditions or where, such as in software engineering, there is a linear, sequential model of development [19, 20].

different pattern, should then allow us to move beyond preformed notions of methods and utilize different methodologies for the creative process.

THE CREATING-CREATIVE PROCESSES WORKSHOP

The workshop, consisting of a series of exercises that provide a brief experience with a wide variety of distinct forms of creative processes, uses only the simplest of utensils (paper, pencils, erasers, coloured pens, squared paper, pennies, sticks, and any everyday objects). The exercises are derived from the pedagogical methodologies of already established practitioners which have integrated a specific pedagogical approach to their teachings. Besides pedagogical methodologies I am aware from my own field (Music and Music Technology) I draw from workshops by Linda Weintraub (Modern/Emerging Art) [25, 26], Liz Lochhead (Poetry) [27, 28], Greg Missingham (Architecture) [29, 30] and Dymphna Callery's (Physical Theatre)[31].

The target audience of the workshop can be learners from different disciplines, both representing individuals who are 'being trained' to design creative technology applications, and others, who will, in the future, be the ones opting to use them within a creative context. For both these groups, creativity tends to be important for the working process itself and therefore it is found to be useful to go provide experiences and skills that go beyond the traditional norms of what types of creative processes are common and acceptable in their own field

The workshop has as an educational aim to demonstrate how many neglected alternative exist within the repertoire of human experience of artistic creation and to make individuals aware of the wide diversity of artistic methodology. Objective if that participants experience a greater critical awareness of

- the methodologies and techniques chosen to create something artistic
- the design of tools for creative productions
- the understanding of creative processes in us humans and
- the potential diversity of interaction between software tools and humans in the process of being creative.

To demonstrate how the workshop works, a series of exercises are described, categorized into 5 areas. In the shortest implementation of the workshop, a 2 hour-session, the exercises provide these brief experiences and are stand-alone exercises. In the longer versions of the workshop, where it has been integrated into a 3 – 6 week unit, these exercises stand at the beginning of a longer process of working through these methodologies in one's own artistic area.

Below following areas are described
Initiating the creative process through:

- Use of one's senses
- Use of one's imaginative self
- Use of collaborative processes
- Use of the physical body
- Use of hyper-reflectivity: thinking about thinking

Use of one's senses

One series of methods was inspired by the creative writing workshops by Liz Lochead, the Scottish poet and playwright, possibly best known for her stage version Bram Stoker's Dracula, but more recently for her published collection of poems "The Colour of Black and White: Poems 1984-2003" and Good Things (2006).

The exercises that were adapted from her workshop centred around the act of transferring sensual experiences to creative ones.

Exercise – Drawing on your five senses

This little exercise focuses the participant on developing an embodiment of an abstraction by actively projecting own sensual experiences onto the abstraction.

Exercise: Drawing on your five senses
Think of a few abstract nouns, such as hate, love, alienation, fear, trust, respect, etc. Chose one and write it in the middle of the page

Answer the following questions with replacing BLANK with your chosen word.

- What does **BLANK** look like?
- Does **BLANK** smell?
- The sound of **BLANK** is what?

- **BLANK** tastes like _____?
- What does **BLANK** feel like?
- What does BLANK say?

Re-arrange, throw one out and read out. BLANK can be left blank like a riddle, or expl. mentioned.

Results are – for instance:

Exercise: Drawing upon your five senses, Student A:
Marginalisation, it looks like a crying child, but has a lingering, musty smell. Marginalisation, it whispers secretively in your ear…..and feels like a prickly cactus all covered up in a muffling blanket. It tells you to go away.

The above exercise can have a playful fun variation, where participants are not allowed to put their chosen abstract noun into their final poem, thus creating a riddle. Surprisingly often can the group guess the abstract noun that has been 'embodied' in this way.

Exercise - Imaginative Persona: being somebody else through imaginative projection of sensual experiences

The workshop leader has prepared envelopes with each one card labeled with various roles in society such as: Baker, Composer, Homeless person, Traveler, Sailor,

Author, Joiner, Priest, etc. Everyone pulls one envelope without showing their role. Each individual has to actively imagine this person and answer following questions.

Exercise: Imaginative Persona (Senses)

Chose one of the personas and imagine being that person. Write about the following questions, describing what you feel (while imagining being that person) what you see, what is happening):

- Looking out of the window,
- What do you see, smell, hear?
- Looking around the room, inside?
- SHOCK!!! You remember something! What do you remember?
- You go out. Outside it is…?
- Anything, joining above lines, concluding, free association in order to have a sense of closure.

Take 1 minute to refine.

Again, this is an exercise, where through the use of senses, an imagined projected alternative reality is developed through the use of memories of sensing the world.

Use of one's imaginative self

Similar to the last exercise described, the following exercise is a further explorations of the imaginative self. But as the last exercises used the projected sensual experiences, this one uses an invented biography, based on an unfulfilled desire.

Exercise – Imaginative Self (desire)

The exercise is sourced from the contemporary art workshops of Linda Weintraub [32] (Oberlin Henry R. Luce Professor in the Emerging Arts, New York), and many of her own exercises are integrated into the workshop. Her pedagogical practice integrates the "the intractably avant-garde and explores the manner in which (…) art works necessitate innovative pedagogical strategies."

A very simple exercise using one's own unfulfilled self is the following one:

Exercise: Imaginative Self (desire)

Make/draw/play something that represents / fulfils a personal desire (e.g. order, freedom, adventure). The representation can be abstract or objectified.

Weintraub has categorized the crafting of an artistic self into four activities: a) disclosing biography, b) inventing biography, c) transcending biography and d) epitomizing biography. Thus the creation of a self-portrait can take on many alternatives, from the real-self, the imagined-self to the cliché'd and caricatured self.

Use of collaborative processes

Weintraub in her book "Making contemporary Art" has several pedagogical methods that work with collaborative teams of two, which are not always supposed to work "together" but rather against each other. This "subversion" in its most extreme form can be very fun for students to explore, although often the link to work in the real world is not so clear. It is helpful to point out that many art artifacts are products of some form of collaboration, and that some form of what Weintraub called "subversion" always takes place, albeit implicitly. Specifically in music production, this paradigm is well understood, where often the sound-engineer, who until recent history has had no explicit and official role in the creative direction of an music production process, but has traditionally has had a very substantial influence in the final artistic product. This happened with exactly the same methodology as is practiced in the exercise below:

Exercise – Collaboration and Subversion

Exercise: Collaboration and Subversion (Master/Slave)

- "Partner up with the person to your right"
- "Decide who will be master who will be slave (Really think of this as master and slave,)"
- "Master will try to force slave to do what he wants"
- "Slave will try to force some of his creativity onto the process without disobeying"
- Master should dictate actions and instructions
- Slave should execute them trying to introduce his own creativity without disobeying master

Use of the physical body

The most recent addition of exercises are derived from Dymphna Callery's workshops and her methods used for Physical Theatre. She uses mainly physical exercises that explore creative theories, "liberating the imagination"[33] through the use of the body, making the creative process able to be experienced physically.

Exercise – Collaboration (Action – Reaction)

Exercise: Action-Reaction

- Stand opposite each other. Do not speak, there is no dialogue. First person creates a short gesture with a definite beginning and end. The next person reacts immediately and spontaneously (no thinking allowed, it has to be spontaneous). First person re-reacts. And so on.
- Change partners and repeat.
- Pure play, improvisation with personality through spontaneous gestures, playing off the other person.

This is a close a methodology as it gets to musical free jazz improvisation. But the practice of this, allows the gestural (musical and physical gestures) to be explored and its spontaneous application to be practiced. In both cases, the beginning and the end of a gesture is practiced to be clear and transparent, and the non-verbal communication is developed.

Exercise – Collaboration (One-to-Many)

Exercise: Collaboration (One-to-Many)

- Through a leader and the group, the creation of an imaginary scene is practiced as a group task.
- Work without words. Select one neutral object. Hand it to the "leader" who will improvise a scene with it, the object taking on a specific real-life function (broom, paddle, gun, flower, etc). The group has to immediately react to this and create a fitting scene around this. Once this scene is "finished", the leader hands the object to a new person, who creates a new scene with it.
- Non-verbal communication and clarity of gesture. Collaborative imaginative work. The group as one entity.

As above exercise, this is pure improvisation, with the difference that a whole group has to suddenly react as one entity in creating a world around the leader's initiated scene.

OTHER EXERCISES

These are just a few of the examples that give a taster of the exercises used to give brief experiences. The workshop usually starts with much simpler introductory exercises, such as the famous circle exercise in which participants are invited to first draw a circle, which consecutively is shown to the whole group. Then participants are asked to draw an angry circle. The showing of these examples demonstrated that through the use of appropriate tools/processes or methodologies, our preformed views of our world can be broken. Whereas the first circle looks similar on all pages, the second one, the angry circle, has sparked off many alternative representations of the same concept. Through the use of an non-normative adjective "angry", the preformed traditional perceptions of an object, which potentially is inhibiting our creative potential, can be overcome.

From these simple exercises, to one which practice the working together (or working against), the exercises become increasingly complex, including exercises focusing on "different design tactics achieving simultaneity of multiple meaning, for dealing with many ideas at once" as proposed by Greg Missingham's [34] pedagogical practices around architectural design. His sophisticated complex methods include "contiguous field", "multiple exposure", "hierarchic assignment", "suggestive ambiguity", amongst others.

This process for collecting methodologies for 'creating creative processes' is an ongoing process and it is planned to continue to collaborate with more individuals from different disciplines. Presently headings of some of the exercises are: "Breaking preformed views of our world", "Using your destructive inclinations", "Introducing subjectivity through verbal communication", "Working with many ideas at once", "Symmetry and Repetition, "The unfulfilled self", "Master / Slave", "Directed Chance", "Democracy", "Imaginative Persona", "Division of Labour", "Multiple Exposure and Palimpsests", "Governing Metaphor", "Layering and Sequencing", "Suggestive Ambiguity", "Scoping an Audience", "Choosing a mission".

6. CONCLUSION

As De Bono as stated, often when we start in a creative process we do not know where to start to generate a new idea but we do know the context around which this creative process is supposed to take place. Our thinking is so driven by existing methods and processes and the norms, that quite often the knowledge and experience of known methodologies drags us repeatedly back to these methods, these established tracks. Creativity is reduced to how to integrate uniqueness within a chosen root, a chosen methodology. Thus we keep on being dragged back, and only accidents, glitches, or (as De Bono says) Humour allows us to break away from this notion of being blocked by openness. De Bono names his tool for breaking out of these normative thinking processes "lateral thinking". Within the arts, I believe the experiencing of examples of different artistic methodologies allows us to do a similar thing within the artistic process. It allows us to create many paths that we could take.

In my experience, this workshop has been so successful, as participants have felt this opening of paths to them in their creative activities.

Having given these workshops mainly in HE and CPD, funding as now been acquired to explore the benefits of such a workshop in more detail. A collaboratively funded project between Manchester Metropolitan and Wolverhampton University will investigate the benefits for the integration into the first year student experience.

Only if we integrate creativity explicitly into the HE curriculum and in the research agenda of our research centres will we be able to understand and consequently fulfil the big vision of a new creative economy.[35]

ACKNOWLEDGEMENTS

Funding for projects connected to this work were thankfully received from CELT Wolverhampton University and the Capability fund of MMU Cheshire, Contemporary Arts.

APPENDIX: LIST OF WORKSHOPS GIVEN

1. HEA Annual Conference "Transforming the student experience", Harrogate, 2008.
2. HCI 2008, Liverpool.
3. Queen Mary University, Edinburgh, 2008.
4. Queen Mary University, Edinburgh, 2007.
5. Manchester Metropolitan University, 2008.
6. Workshop at the School Conference, SPPAL, Wolverhampton University, February 2008
7. The Institute for Capitalising on Creativity, Workshop Seminar Series "The Discipline of Creativity: Exploring the Paradox", St Andrews, 2006.

REFERENCES

1. Department for Culture, Media and Sports. (2008), Creative Britain: New Talents for the New Economy,http://www.culture.gov.uk/reference_library/publications/3572.aspx. Last accessed: 15/1/2009.
2. Department for Culture, Media and Sports. (2001), Creative Industries Mapping Document http://www.culture.gov.uk/reference_library/publications/4632.aspx Last Accessed: 03/02/09.
3. Smith, C. (2001), Foreword to the Creative Industries Mapping Document, Department for Culture, Media and Sports. http://www.culture.gov.uk/reference_library/publications/4632.aspx Last Accessed: 03/02/09.
4. Centre for Serious Creativity & Constructive Thinking (2009), Manchester Metropolitan University, DeBono Foundation, http://www.debonofoundation.co.uk/index.php Last accessed: 2/2/2009.
5. Jackson, N. (2007), 'Creativity in Engineering Education Working Paper' in Disciplinary perspectives on creativity in Higher Education. Higher Education Academy Engineering Subject Centre http://www.palatine.ac.uk/themes/imagincurric/ Last accessed 03/02/09. (5).
6. Amabile, T.M. (1998). ,How to kill creativity' in Harvard Business Review 76 (5).
7. Simonton, D.K. (1999). Origins of genius: Darwinian perspectives on creativity. Oxford University Press.
8. See Jackson, N. and others (2004), "Creativity: Can it be Taught and Caught?" in Notes of an imaginative curriculum creative exchange at Indiana University-Purdue University, Indianapolis (USA) Wednesday, March 24, 2004.
9. National Academy of Engineering (2005). Educating the engineer of 2020 : adapting engineering education to the new century. National Academies Press.
10. Jackson, N. (2007), 'Creativity in Engineering Education Working Paper' in Disciplinary perspectives on creativity in Higher Education. Higher Education Academy Engineering Subject Centre http://www.palatine.ac.uk/themes/imagincurric/ Last accessed 03/02/09.
11. See Jackson, N. and others (2004), 'Creativity: Can it be Taught and Caught?' in Notes of an imaginative curriculum creative exchange at Indiana University-Purdue University Indianapolis (USA) Wednesday, March 24, 2004. (Conclusion, 13).
12. Sternberg, R. J. (ed) (1999). Handbook of Creativity, Cambridge University Press.
13. Higher Education Academy 3-day Expert workshop (2003), Facilitating creative thinking, with Caroline Bailie, Norman Jackson and other http://www.heacademy.ac.uk/3271.htm Last accessed 23/01/2007.
14. Imaginative Curriculum Network (2002-) http://www.palatine.ac.uk/themes/imagincurric/
15. Creative Clusters conferences (2003 -) http://www.creativeclusters.com/
16. Workshop held at Glasgow University (2001- 2006), Queen Margaret University (2005 – 2007), Wolverhampton University (2008), HEA Harrogate (2008), MMU Cheshire (2008), etc
17. 'Improvisation' in Wikipedia, http://en.wikipedia.org/wiki/Improvisation Last accessed 2/8/09.
18. 'Improvisation' in Nettl, B. et al. "Improvisation." In Grove Music Online. Oxford Music Online, http://www.oxfordmusiconline.com/subscriber/article/grove/music/13738 Last accessed 2/8/09.
19. McBreen, P. (1996,1999), Creativity in Software Development, Software Craftsmanship Inc. at http://www.mcbreen.ab.ca/papers/CreativityPaper.html Last accessed 2/8/09.
20. Glass, R. (1995), Software Creativity, Prentice Hall.
21. De Bono, E. (1998), Six Thinking Hats, 4th edition 1998. (Introduction)
22. De Bono, E. (1992), Serious Creativity: Using the Power of Lateral Thinking to Create New Ideas.
23. Kirton, M. J. (I976) ,Adaptors and Innovators: A Description of a Measure.' in the Journal of Applied Psychology, 61, (622-629).

24. Balchin, T. & Jackson, N. (2008), Developing Student's Creativity: importance of creativity styles, Brunel University at http://www.palatine.ac.uk/themes/imagincurric/ Last accessed 03/02/09.(5).
25. Weintraub, L. (2003), Making Contemporary Art, How today's artists think and work. Thames and Hudson.
26. Workshop by Weintraub, L. (2002). 'Workshop', Shared Visions Conference, Brighton.
27. Workshop by Lochhead, L. (2006). 'Creative Writing Workshop', University of Glasgow.
28. Lochhead, L. (2003), The Colour of Black and White: Poems 1984-2003., Polygon.
29. Missingham, G. (2006), 'Lattice Not Trees In The Black Forest: Too Many Ways of Dealing With Too Many Ideas, Systematically?', in The 8th Symposium on Systems Research in the Arts: Music, Environmental Design and the Choreography of Space, Baden-Baden.
30. Missingham, G. (2006), Working with many ideas at once, The University of Melbourne, Melbourne, Australia.
31. Callery, D. (2002), Through the Body. Routledge.
32. Weintraub, L. (2003).
33. As above.
34. Missingham (2006).

Department for Culture, Media and Sports. (2008).

BIBLIOGRAPHY

Abra, J. (1997), The Motives for Creative Work, Hampton Press Cresskill, New Jersey.

Amabile, T.M. (1998). ,How to kill creativity' in Harvard Business Review 76.

Balchin, T. & Jackson, N. (2008), Developing Student's Creativity: importance of creativity styles, Brunel University at http://www.palatine.ac.uk/themes/imagincurric/ Last accessed 03/02/09.

Bens, I. (2000), Facilitating with Ease, Jossey Bass.

Bowden, J. (1998), Marton, F., The University of Learning: Beyond Quality and Competence in Higher Education, Kogan Page Ltd., London.

Callery, D. (2002), Through the Body. Routledge.

Cameron, J. & Bryan, M. (1992), The Artist's Way: A Spiritual Path to Higher Creativity.

Cameron, J. (2007), The Complete Artist's Way: Creativity as a Spiritual Practice.

Csikszentmihalyi, M. (1996), Creativity: Flow and the Psychology of Discovery and Invention.

De Bono, E. (1990), Lateral Thinking: A Textbook of Creativity.

De Bono, E. (1998), Six Thinking Hats, 4th edition.

De Bono, E. (1992), Serious Creativity: Using the Power of Lateral Thinking to Create New Ideas.

Eno, B. & Schmidt, P. (1979), Oblique Strategies.

Department for Culture, Media and Sports. (2008), Creative Britain: New Talents for the New Economy,http://www.culture.gov.uk/reference_library/publications/3572.aspx. Last accessed: 15/1/2009.

Department for Culture, Media and Sports. (2001), Creative Industries Mapping Document http://www.culture.gov.uk/reference_library/publications/4632.aspx Last Accessed: 03/02/09.

Dewulf, S. and Baillie, C. (1999), CASE:How to foster creativity, London: DfEE.

Glass, R. (1995), Software Creativity, Prentice Hall.

Jackson, N. (2004), Notes of an imaginative curriculum creative exchange at Indiana University-Purdue University, Indianapolis (USA) Wednesday, March 24, 2004

Jackson, N. (2002 -), Imaginative Curriculum Network (2002-) http://www.palatine.ac.uk/themes/imagincurric/ Last accessed 03/02/09.

Jackson, N. (2007) and the Imaginative Curriculum Network, How Can Creativity be Taught? Personal Accounts of Teaching to Promote Students' Creativity, http://www.palatine.ac.uk/files/1012.pdf. Last accessed 03/02/09.

Jackson, N. (2004), 'Creativity in Engineering Education Working Paper' in Disciplinary perspectives on creativity in Higher Education. Higher Education Academy Engineering Subject Centre http://www.palatine.ac.uk/themes/imagincurric/ Last accessed 03/02/09.

Kirton, M. J. (I976) ,Adaptors and Innovators: A Description of a Measure.' in the Journal of Applied Psychology, 61, (622-629).

Mau, B. (1989), Incomplete Manifesto.

Michalko, M. (2001), Cracking Creativity: The Secrets of Creative Genius.

Missingham, G. (2006), 'Lattice Not Trees In The Black Forest: Too Many Ways of Dealing With Too Many Ideas, Systematically?', in The 8th Symposium on Systems Research in the Arts: Music, Environmental Design and the Choreography of Space, Baden-Baden.

National Academy of Engineering (2005). Educating the engineer of 2020 : adapting engineering education to the new century. National Academies Press.

Patterson, J. & Boehm, C. (2001), ,CIRCUS for Beginners', in Boehm, Garcia and Schuter (eds.), CIRCUS 2001 - New Synergies in Digital Creativity. Proceedings of the Conference for Content Integrated Research in Creative User Systems. p. 182 – 193,

University of Glasgow, Glasgow.

Simonton, D.K. (1999). Origins of genius: Darwinian perspectives on creativity. Oxford University Press.

Sternberg, R. J. (ed) (1999), Handbook of Creativity, Cambridge University Press.

Tharp, T. (2008), The Creative Habit: Learn It and Use It for Life

Wareham, T. (2008), Creative Graduates: Enhancing teaching-research links in the creative arts, Palatine.

Weintraub, L. (2003), Making Contemporary Art, How today's artists think and work. Thames and Hudson.

REFERENCES

[1] Department for Culture, Media and Sports. (2008), *Creative Britain: New Talents for the New Economy*,http://www.culture.gov.uk/reference_library/publications/3572.aspx. Last accessed: 15/1/2009.

[2] Department for Culture, Media and Sports. (2001), *Creative Industries Mapping Document* http://www.culture.gov.uk/reference_library/publications/4632.aspx Last Accessed: 03/02/09.

[3] Smith, C. (2001), *Foreword to the Creative Industries Mapping Document*, Department for Culture, Media and Sports. http://www.culture.gov.uk/reference_library/publications/4632.aspx Last Accessed: 03/02/09.

[4] Centre for Serious Creativity & Constructive Thinking (2009), Manchester Metropolitan University, DeBono Foundation, http://www.debonofoundation.co.uk/index.php Last accessed: 2/2/2009.

[5] Jackson, N. (2007), 'Creativity in Engineering Education Working Paper' in *Disciplinary perspectives on creativity in Higher Education. Higher Education Academy Engineering Subject Centre* http://www.palatine.ac.uk/themes/imagincurric/ Last accessed 03/02/09. (5).

[6] Amabile, T.M. (1998). ,How to kill creativity' in *Harvard Business Review 76* (5).

[7] Simonton, D.K. (1999). *Origins of genius: Darwinian perspectives on creativity*. Oxford University Press.

[8] See Jackson, N. and others (2004), "Creativity: Can it be Taught and Caught?" in *Notes of an imaginative curriculum creative exchange at Indiana University-Purdue University*, Indianapolis (USA) Wednesday, March 24, 2004.

[9] National Academy of Engineering (2005). *Educating the engineer of 2020 : adapting engineering education to the new century*. National Academies Press.

[10] Jackson, N. (2007), 'Creativity in Engineering Education Working Paper' in *Disciplinary perspectives on creativity in Higher Education. Higher Education Academy Engineering Subject Centre* http://www.palatine.ac.uk/themes/imagincurric/ Last accessed 03/02/09.

[11] See Jackson, N. and others (2004), 'Creativity: Can it be Taught and Caught?' in *Notes of an imaginative curriculum creative exchange at Indiana University-Purdue University Indianapolis (USA) Wednesday, March 24, 2004.* (Conclusion, 13).

[12] Sternberg, R. J. (ed) (1999). *Handbook of Creativity*, Cambridge University Press.

[13] Higher Education Academy 3-day Expert workshop (2003), *Facilitating creative thinking*, with Caroline Bailie, Norman Jackson and other http://www.heacademy.ac.uk/3271.htm Last accessed 23/01/2007.

[14] Imaginative Curriculum Network (2002-) http://www.palatine.ac.uk/themes/imagincurric/

[15] Creative Clusters conferences (2003 -) http://www.creativeclusters.com/

[16] Workshop held at Glasgow University (2001- 2006), Queen Margaret University (2005 – 2007), Wolverhampton University (2008), HEA Harrogate (2008), MMU Cheshire (2008), etc

[17] 'Improvisation' in Wikipedia, http://en.wikipedia.org/wiki/Improvisation Last accessed 2/8/09.

[18] 'Improvisation' in Nettl, B. et al. "Improvisation." In *Grove Music Online. Oxford Music Online*, http://www.oxfordmusiconline.com/subscriber/article/grove/music/13738 Last accessed 2/8/09.

[19] McBreen, P. (1996,1999), *Creativity in Software Development*, Software Craftsmanship Inc. at http://www.mcbreen.ab.ca/papers/CreativityPaper.html Last accessed 2/8/09.

[20] Glass, R. (1995), *Software Creativity*, Prentice Hall.

[21] De Bono, E. (1998), *Six Thinking Hats*, 4th edition 1998. (Introduction)

[22] De Bono, E. (1992), *Serious Creativity: Using the Power of Lateral Thinking to Create New Ideas*.

[23] Kirton, M. J. (I976) ,Adaptors and Innovators: A Description of a Measure.' in the *Journal of Applied Psychology, 61*, (622-629).

[24] Balchin, T. & Jackson, N. (2008), *Developing Student's Creativity: importance of creativity styles*, Brunel University at http://www.palatine.ac.uk/themes/imagincurric/ Last accessed 03/02/09.(5).

[25] Weintraub, L. (2003), Making Contemporary Art, How today's artists think and work. Thames and Hudson.

[26] Workshop by Weintraub, L. (2002). 'Workshop', *Shared Visions Conference, Brighton*.

[27] Workshop by Lochhead, L. (2006). 'Creative Writing Workshop', University of Glasgow.

[28] Lochhead, L. (2003), *The Colour of Black and White: Poems 1984-2003*., Polygon.

[29] Missingham, G. (2006), 'Lattice Not Trees In The Black Forest: Too Many Ways of Dealing With Too Many Ideas, Systematically?', in *The 8th Symposium on Systems Research in the Arts: Music, Environmental Design and the Choreography of Space*, Baden-Baden.

[30] Missingham, G. (2006), *Working with many ideas at once*, The University of Melbourne, Melbourne, Australia.

[31] Callery, D. (2002), *Through the Body*. Routledge.

[32] Weintraub, L. (2003).

[33] As above.

[34] Missingham (2006).
[35] Department for Culture, Media and Sports. (2008).

BIBLIOGRAPHY

Abra, J. (1997), *The Motives for Creative Work*, Hampton Press Cresskill, New Jersey.

Amabile, T.M. (1998). ‚How to kill creativity' in *Harvard Business Review 76*.

Balchin, T. & Jackson, N. (2008), *Developing Student's Creativity: importance of creativity styles,* Brunel University at http://www.palatine.ac.uk/themes/imagincurric/ Last accessed 03/02/09.

Bens, I. (2000), *Facilitating with Ease*, Jossey Bass.

Bowden, J. (1998), Marton, F., *The University of Learning: Beyond Quality and Competence in Higher Education*, Kogan Page Ltd., London.

Callery, D. (2002), *Through the Body*. Routledge.

Cameron, J. & Bryan, M. (1992), *The Artist's Way: A Spiritual Path to Higher Creativity.*

Cameron, J. (2007), *The Complete Artist's Way: Creativity as a Spiritual Practice*.

Csikszentmihalyi, M. (1996), *Creativity: Flow and the Psychology of Discovery and Invention*.

De Bono, E. (1990), *Lateral Thinking: A Textbook of Creativity*.

De Bono, E. (1998), *Six Thinking Hats*, 4th edition.

De Bono, E. (1992), *Serious Creativity: Using the Power of Lateral Thinking to Create New Ideas*.

Eno, B. & Schmidt, P. (1979), *Oblique Strategies*.

Department for Culture, Media and Sports. (2008), *Creative Britain: New Talents for the New Economy*,http://www.culture.gov.uk/reference_library/publications/3572.aspx. Last accessed: 15/1/2009.

Department for Culture, Media and Sports. (2001), *Creative Industries Mapping Document* http://www.culture.gov.uk/reference_library/publications/4632.aspx Last Accessed: 03/02/09.

Dewulf, S. and Baillie, C. (1999), CASE:How to foster creativity, London: DfEE.

Glass, R. (1995), *Software Creativity*, Prentice Hall.

Jackson, N. (2004), *Notes of an imaginative curriculum creative exchange at Indiana University-Purdue University*, Indianapolis (USA) Wednesday, March 24, 2004

Jackson, N. (2002 -), Imaginative Curriculum Network (2002-) http://www.palatine.ac.uk/themes/imagincurric/ Last accessed 03/02/09.

Jackson, N. (2007) and the Imaginative Curriculum Network, *How Can Creativity be Taught? Personal Accounts of Teaching to Promote Students' Creativity*, http://www.palatine.ac.uk/files/1012.pdf. Last accessed 03/02/09.

Jackson, N. (2004), 'Creativity in Engineering Education Working Paper' in *Disciplinary perspectives on creativity in Higher Education. Higher Education Academy Engineering Subject Centre* http://www.palatine.ac.uk/themes/imagincurric/ Last accessed 03/02/09.

Kirton, M. J. (I976) ‚Adaptors and Innovators: A Description of a Measure.' in the *Journal of Applied Psychology, 61,* (622-629).

Mau, B. (1989), *Incomplete Manifesto*.

Michalko, M. (2001), *Cracking Creativity: The Secrets of Creative Genius*.

Missingham, G. (2006), 'Lattice Not Trees In The Black Forest: Too Many Ways of Dealing With Too Many Ideas, Systematically?', in *The 8th Symposium on Systems Research in the Arts: Music, Environmental Design and the Choreography of Space*, Baden-Baden.

National Academy of Engineering (2005). *Educating the engineer of 2020 : adapting engineering education to the new century*. National Academies Press.

Patterson, J. & Boehm, C. (2001), ‚CIRCUS for Beginners', in Boehm, Garcia and Schuter (eds.), *CIRCUS 2001 - New Synergies in Digital Creativity. Proceedings of the Conference for Content Integrated Research in Creative User Systems.* p. 182 – 193, University of Glasgow, Glasgow.

Simonton, D.K. (1999). *Origins of genius: Darwinian perspectives on creativity*. Oxford University Press.

Sternberg, R. J. (ed) (1999), *Handbook of Creativity*, Cambridge University Press.

Tharp, T. (2008), *The Creative Habit: Learn It and Use It for Life*

Wareham, T. (2008), *Creative Graduates: Enhancing teaching-research links in the creative arts*, Palatine.

Weintraub, L. (2003), Making Contemporary Art, How today's artists think and work. Thames and Hudson.