2084 - BRAVE CREATIVE WORLD:
CREATIVITY IN THE COMPUTER MUSIC CURRICULUM

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ABSTRACT

This paper discusses examples for an '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 considers the background and context of the more general issues of creativity in higher education and then moves on to how a hands-on workshop was developed specifically for computer music / music technology related degrees enabling experiential learning of a wide variety of creative methodology. It explores the pedagogical methodologies behind the workshop, the running of the workshop itself, providing examples of specific exercises.

1. 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 need an 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 towards developing 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] 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 an engineering culture ingrained in utilising scientific

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[1] Consider the related terms "problem solving skills", "decision making processes", "enquiry based learning", "lateral thinking", "entrepreneurship", "innovation", "divergent thinking".

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 to 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 judgement, creativity and discipline as well as technical skill." (Decker in [8]) In the arts, creativity is expected to be an intrinsic part of a natural process, 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 perspective, thus when it comes to acts of devising, composing, creating and other artistic processes, the educational methodology often used is one of drawing from the expertly used methods of the tutor or one of allowing a complete freedom of methodology while giving guidance for incremental improvements in the student's chosen methodology. Thus we miss the opportunity to learn a variety of methodologies in initiating creative processes; the processes learned often follow 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' cause is a powerful motivator for supporting creativity explicitly 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 to the creative arts (composers, performing artists and art practitioners) but also to developers of tools that support creative processes as well as any other professional working in the creative and cultural industries.

2. 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. Circumstantial evidence seems to indicate that 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,

- 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-, transdisciplinary studies and there is also an increase in acceptance of

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[2] For a definition refer to 3. below

practice-based methodologies in Higher Education. All these developments support efforts to research into and develop creativity within the curriculum. Specifically interdisciplinary programs and practice- based problem-solving approaches have the unique opportunity to initiate explorations of the origin and methodology of art production.

However, despite the accelerating focus on creativity as an economic force and as an educational tool, there is still a lack of sufficient research into creative methodology, and specifically into how we humans initiate creative processes.

3. 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. In 2001 I developed a small workshop to address this issue, and it has continually been held for postgraduates and undergraduates, and which has expanded into the Continual Professional Development (CPD) 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

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[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, for instance 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].

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 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. (…) (He) reduces problems by improvement and greater efficiency. The innovator, however, prefers to do things differently, to challenge the paradigm or structure. (…) (He) 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 different pattern, should then allow us to move more easily beyond preformed notions of methods and utilize different methodologies for the creative process.

4. THE CREATING-CREATIVE PROCESSES WORKSHOP

The workshop I developed consists of a series of exercises that provide a brief experience with a wide variety of distinct forms of creative processes. It 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 from my own field and experience (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 the educational aim of demonstrating 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 is for participants experience a greater critical awareness of

- the diverse 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 below, categorized into 4 areas. In the shortest implementation of the workshop, a 2 hour session, the exercises provide brief experiences and are stand-alone exercises. In the longer version 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

4.1. 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 which were adapted from her workshops centred on the act of transferring sensual experiences to creative ones.

4.4.1. Exercise – Drawing on your five senses

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

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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 by 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 explicitly
mentioned.
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Results are – for instance: Example Student A:

Marginalisation, it looks like a crying child,
but has a lingering, musty smell. Marginalisa-
tion, it whispers secretively in your
ear.....and feels like a prickly cactus all cov-
ered up in a muffling blanket. It tells you to
go away.
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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 is the group able to guess the abstract noun that has been 'embodied' in this way.

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

In this next exercise the workshop leader has prepared envelopes with each card labelled with various roles within society such as: Baker, Composer, Homeless person, Traveller, 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.

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Exercise: Imaginative Persona (Senses)

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

- Looking out of the window. What do you see?
- 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 . . . .?
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─  <Anything, joining above lines, concluding,
   free  association  in  order  to  have  a
   sense of closure.>

Take 1 minute to refine.
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Again, this is an exercise, where by employing one's senses, an imagined and projected alternative reality is developed through making use of personal memories of sensing the world.

4.2. Use of One's Imaginative Self

The following methods are sourced from the contemporary art workshops Linda Weintraub (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."

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.[32] 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.

4.2.1. Exercise – Imaginative Self (desire)

This small exercise is an exploration of an imaginative self. But as the last exercises used the projected sensual experiences, this one uses an invented biography, based on an unfulfilled desire.

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Exercise: Imaginative Self (desire)

Make/draw/play something that represents / ful-
fills a personal desire (e.g. order, freedom,
adventure). The representation can be abstract
or objectified.
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4.3. Use of Collaborative Processes

In her book "Making Contemporary Art" Weintraub describes several pedagogical methods that work with collaborative teams of two, teams in which individuals are not always supposed to "work together" but rather "work against each other" with intentional undermining of the other person's goal. 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 works of art 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 until recent history the sound-engineer has seldom had an explicit and official role in the creative direction of a music production process, but nev-ertheless he has always had a very substantial influence over the final artistic product. This often happened by using similar a methodology as is practiced in the exercise below:

1.4.4. Exercise – Collaboration and Subversion

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Exercise: Collaboration and Subversion (Mas-
ter/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 these while trying to
   introduce  his  own  creativity  without
   disobeying master
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4.4. Use of the physical body

The most recent addition of exercises to the workshop is 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 through the use of the body [33], making the creative process able to be experienced physically.

4.3.1. Exercise – Collaboration (Action – Reaction)

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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 spon-
  taneously (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.
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This is as close a methodology as it gets to 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.

4.3.2. Exercise – Collaboration (One-to-Many)

As above exercise, the following is one of pure improvisation, albeit with the difference that a whole group

has to suddenly react as one entity in creating a world around the leader's initiated scene.

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Exercise: Collaboration (One-to-Many)
• Select one neutral object.
• Appoint one leader. The leader will work with
  the rest of the group. Ask everyone to work
  without words.
• Hand it to the "leader" who will improvise a
  scene, 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.
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Through a leader reacting with a group, the creation of an imaginary scene is practiced as a collaborative task. This exercise practices non—verbal communication and emphasizes clarity of gesture, as well as imaginative teamwork. Teamwork is key, the group should ideally act as one entity, and will do so with increasing practice.

The opposite of subversion is practice here, every single person of the team is working towards the same aim while exploring skills of utilising non-verbal, gestural communication.

5. OTHER EXERCISES

These are just a few of the examples that give a taster of the exercises used in the workshop. 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. Participants are then asked to draw an angry circle. The results demonstrate 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 non-normative use of an adjective ("angry"), the preformed traditional perceptions of an object, which potentially is inhibiting our creative potential, can be overcome.

From these simple exercises, to those which practice the working together and 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 has stated, often when we begin 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 'gravitates' us back to these methods, these established tracks. Creativity is reduced to how to integrate uniqueness within a chosen route, 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'. Years ago De Bono coined the term of this process for breaking out of normative thinking processes: "lateral thinking". Within the arts, I believe the experiencing of different artistic methodologies allows us to do a similar thing within the artistic process. It allows participants to experience an opening of different paths for their creative activities.

Having given these workshops mainly in HE (Higher Education) and CPD (Continual Professional Development), 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]

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