

## **Module course: ‘A practical exploration of Creative Thinking Systems’ (A Creativity Fellowship Research Project: University of Brighton)**

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The purpose of this study was to design and implement a Module programme of Creative Thinking Systems (CTS) for second year students within the College of Arts & Humanities. In addition to convergent and divergent thinking techniques the students were also taught numerous dharana meditation practices, as an attentional mechanism to support creativity. A principle aim was to identify the most effective ‘Creative Thinking Systems – both discipline specific and cross disciplinary within the School of Art in order to enhance and evolve current BA teaching and learning practices. This study was conducted from 2009 to 2015. Six cohort groups, (n = 93) students completed the programme. Findings were collated from Likert scale questionnaires, module evaluation, assessment tasks and studio applications. Results suggest that the programme was beneficial in supporting creative idea generation across a broad spectrum of 12 disciplines. Dharana Meditation practices proved highly effective at alleviating stress and anxiety. These practices also heightened sensitivity and improved students attentional capacity.

**Keywords:** creativity; creative thinking; thinking skills, meditation; creativity-meditation connection, creative arts, higher education, curriculum development, student empowerment

### **Introduction**

The central component of the research project was the development of a College Options Programme provocatively titled “Training Your Mind: A Practical Exploration of Creative Thinking Systems”. The programme was validated by a Board of Studies in 2009.

A primary motivation for developing such a College Option course was to equip a diverse range of students from different specialisms with a toolbox of effective idea generating techniques. This incorporated Creative Thinking Systems and Meditation practices CTS/M. Such techniques can be called upon to enrich their creative endeavours and once mastered become valuable resources to assist in problem solving throughout adult life.

Dharana Meditation practices (yogic mindfulness / concentration techniques) were the principal meditation component of the course. Few research studies have explored the impact of mindfulness

meditation on artistic creativity in Higher Education. Jian Wei Lin and Li Jung Mai, (2016) examined the effect of Mindfulness Meditation intervention on academic performance. "Students with high meditation depth achieved better short term academic performance than those with low meditation depth."

Horan, (2009) study: *The Neuropsychological Connection Between Creativity and Meditation*, examined the impact on creativity from a variety of meditation strategies (mindfulness, concentrative and combined). Samyama, an ancient yogic attentional technique proved highly effective. "In sanyama, the contemplative consciously relinquishes the desire to acquire a solution while maintaining unfettered focus on surrendering the problem to be otherwise solved, subconsciously. This "desireless" intention allows problems to be viewed with clarity while unconscious processing is free to seek unique solutions."

Muktananda, (1977) states "According to the yogic tradition, one-pointed attention (ekagrata) induces a state of equilibrium to which mental perturbations eventually surrender, resulting in great inspiration." Intriguingly, Horan (2009) also suggests that "Creative thinking, viewed as a process that overcomes informational limitations in a useful manner, can be construed as a restricted form of meditation.

The Creative Fellowship research project also provided a fascinating opportunity to compare and contrast different approaches to creativity across a wide spectrum of disciplines in the College of Arts and Humanities. The (n = 93) students that completed the programme ranged from the following disciplines: Architecture; Digital Music; Fashion; Fine Art; Illustration; History of Art & Design; Painting; Photography; Printmaking; Textiles; Theatre & Visual Arts.

Alongside identifying how to implement, teach and deliver a Creative Thinking System Programme the research project's principal aims were to provide answers to the following questions:

- What are the benefits of including Systematic Creative Thinking Techniques into the BA (Hons) course curriculum?
- Can current BA (Hons) teaching and learning practices be enhanced through the findings of this project?
- How effective are creative thinking systems at stimulating student exploration, invention and innovation?
- How do creative thinking techniques expand perception and enhance creative output?
- Which specific creative thinking techniques were the most effective?
- How beneficial are specific Dharana Meditation practices at enhancing concentration, awareness and intuition.

The research project also relates to the University of Brighton's learning and teaching strategy

1. The project directly relates to Aim 1a (page 10) of the Learning and Teaching Strategy 2007-2010 i.e:  
"Research and development into ways of nurturing and harnessing creativity i.e. creative problem solving, original contributions to knowledge, practice and imaginative thinking."  
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“Further development of learning and teaching projects related to creativity across the University and partners.”

“Encourage and enhance creativity across the curriculum.”

2. Also relates to Aim 1a (page 8) of the Learning and Teaching Strategy 2007-2010 i.e “Support greater inter-disciplinary work by staff and students through innovation in course design and delivery, and the identification of new mechanisms and processes to support this.”

## Defining the key attributes of Creativity

Definitions of ‘Creativity’ are broad ranging. Kleiman, (2008) described creativity as the production of something in which notions of novelty and originality combine with notions of utility and value.

Koestler (1964), described creativity as a bisociation of previously unrelated information matrices or experience: “an act of liberation—the defeat of habit by originality.” (p. 96).

The first exercise that each cohort group undertakes is to map out different conceptual attributes and approaches to creativity. A Creativity Wall is produced, numerous definitions are written on different coloured sheets of A4 paper (as symbolic bricks) and placed on the walls of the seminar room. This broad spectrum of descriptions acts as a catalyst for further debate. Definitions gleaned from 6 student cohorts have helped to determine the scope of conceptual variations.

### Key attributes of creativity include:

#### ‘Attitude’ cluster

This nexus in the conceptual map incorporated attributes such as:

The cultivation of a nonconformist mind-set; challenging assumptions; being receptive to new ideas and making unlikely connections ( $1 + 1 = 3$ ) between previously unrelated concepts or processes.

Risk taking, play, delaying judgment and experiencing the unexpected were also deemed important in cultivating a ‘creative attitude’. As were building bridges between the rational and the illogical.

Re-patterning / developing unfamiliar patterns of thought helped counter ‘the continuity of neglect’ i.e. being set in your ways. Being receptive to Eureka / “a ha” moments was another essential attribute.

#### ‘Process’ cluster

This grouping included: Focused and divergent creative thinking; the combustion between intuition and experience; developing New Frames of Reference; serendipitous discovery and the role of Accident Formulas / Mistakism i.e. the glory of errors and mishaps. The enjoyment of making mistakes and the importance of making mistakes faster (as part of the creative learning process) was also acknowledged. Experimentation; improvisation; re-contextualization; the process of transformation and learning to look – exercises in perception were also highly valued attributes of the process cluster. In addition, explorations outside of your field, e.g. visiting other university departments and organizations in order to observe their processes, operations and ways of doing stuff were considered important.

#### ‘Artifact / product’ cluster

This consisted of aspects such as: The development of new forms, formats and applications which were imbued with ‘Novelty’ – the mysterious ‘Z factor’ of originality that had a perceived value, desirability, worth or usefulness.

**'Creativity as a way of being' cluster**

This related to: Strategies of being i.e. observing the characteristics of creative people from different domains. This included personal and professional fulfillment, recognition and industry profile. The significance of creative collaborations, the gestalt mind / hybrid mind, which is free of geographical constraints (facilitated by digital networks).

**'Skill sets' cluster**

This corresponded to the interlinking and cross-referencing of different personal or collaborative abilities, e.g. the hybridization and weaving between 10 different intelligences: 1. Linguistic, 2. Mathematical, 3. Visual, 4. Physical, 5. Musical, 6. Environmental, 7. Emotional, 8. Social, 9. Practical, 10. Spiritual.

There has been much published in the field of 'Creative Thinking'. Edward de Bono the originator of lateral thinking is widely acknowledged to be the leading international authority on the subject. He has also championed the specific teaching of thinking as a subject in schools.

De Bono has developed a range of 'deliberate thinking methods' - applications emphasizing thinking as a deliberate act rather than a reactive one. He has advanced applied psychology by making theories about creativity and perception into usable tools.

In 1969 de Bono founded the Cognitive Research Trust (CoRT). "CoRT is a package of 60 lessons for the teaching of Constructive thinking in schools from approximate age of 8 upwards. CoRT is now the most widely used course in the world for the direct teaching of thinking. Over 7 million students in over 30 countries including the U.K, the United States, Canada, Australia, Japan, Singapore, Venezuela and Ireland are using it. The CoRT Thinking Programme represents the most comprehensive approach to the teaching of thinking. It includes generative and creative thinking, operational and constructive thinking". CoRT (2010)

Edward de Bono's highly acclaimed "*Serious Creativity*" (1992) has become a key textbook on creativity. Various techniques from this publication were utilized in the College Option Programme.

Another influential figure in the field of Creative Thinking is Michael Michalko. He organized a team of NATO intelligence specialists and international academics in Frankfurt, Germany, to research, collect, and categorize all known inventive-thinking methods. These techniques were then successfully applied to various NATO military, political, and social problems. Michalko later utilized the creative-thinking techniques to solve problems for corporate clients. His influential book *Thinkertoys: A Handbook of Creative Thinking Techniques*, (2006) was also used as a key text in the formation of the College Option Programme.

Other authoritative figures that influenced the design and format of the Module programme include Stephen Ried, *How to think*, (2002), who works with both public and private sector organizations on thinking skills projects in Europe, USA and the Middle East. Bill Lucas who is the founding CEO of the Campaign for Learning. Mihaly Csizsentmihalyi author of *Creativity, flow and the psychology of discovery and invention*, (1996) and Robert W. Weisberg author of *Creativity. Understanding innovation in problem solving, science, and the arts*, (2006).

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Horan, (2009) argues that the practice of meditation as an attentional mechanism, supports creativity. *The Vigyana Bhairava Tantra*, is an ancient Indian yogic text, believed to have been written about one thousand years ago in Kashmir. This text has been written as a practical manual and lists over 112 attentional practices called dharanas, that assist the meditation process through mindfulness and concentration techniques. Swami Nischalananda Saraswati, the director of the Mandala Yoga Ashram in Wales taught Simon Emery numerous practices from this text (during various courses at the ashram). Swami Nischalananda Saraswati's translation of *The Vigyana Bhairava Tantra* also incorporates 58 new practices, which have been developed for the contemporary high-tech and high speed lifestyle. Many of the dharana meditations taught to the students originate from this text. *Insights into reality – The tantric teachings of the vigyana bhairava tantra*, Swami Nischalananda Saraswati, (2011).

## Methods

This study was completed using qualitative analysis such as the participants 'evidence of study' to collate personal experiences along with Likert scale questionnaires and module evaluations.

## Participants

Participants were undergraduate 2nd year students (n = 99) from 12 different disciplines within the College of Arts and Humanities. There were (n= 41) males and (n= 58) females who completed the programme from 2009-2015. The average group size per year was (n= 16).

## Procedure

The College Option Module: AX290 "Training Your Mind – A Practical Exploration of Creative Thinking Systems" took place, once a week on Tuesdays for 3 hours and was delivered over a 10 week period from October to January (2009-2015).

The weekly module sessions commenced with pranayama (yogic breathing techniques) and Dharana Meditation practice. This helped to provide a clear mental space, a beneficial starting point for the creative thinking techniques. The students were taught one or two new techniques each week. Depending on the method being explored, the group (n 16 to 20) students either worked in groups of four, in pairs or individually.

Twelve specific creative thinking systems were covered during the programme.

1. Concept Harvesting (developed by Read, S. 2002)
2. Exploring New Frames of Reference (developed by Read, S. 2002)
3. Playing with Connections (Lucas, B. 2001)

4. Provocation: Random Word Exercise (de Bono, E. 1992)
5. Sur/petition instead of (Com)petition (de Bono, E. 1995)
6. The Concept Fan (de Bono, E. 1992)
7. Capturing the Interest (Lucas, B. 2001)
8. The Six Thinking Hats (de Bono, E. 1992)
9. Water Logic (de Bono, E. 1992)
10. The Four Quarters of the Brain (Lucas, B. 2001)
11. The Idea Box (Michalko, M. 2006)
12. S.C.A.M.P.E.R (Osborn, A and Eberle, B.)

Having explored the twelve Creative Thinking Systems and various Dharana Meditation practices the students were required to submit the following Assessment Tasks

2000-3000 word essay

(Format: PDF document) which incorporates:

1. A personalized account which documents the application of the CTSs and Dharana Meditation practices to their creative process / studio work
2. Completion of a specific artwork or assignment that utilized the Creative Thinking Systems in its production. (Evidenced by Photographic documentation)
3. A critical analysis of previous creative thinking
4. Outline of intent for evolving own creativity
5. Appendix for worksheets and other notes that document CTS exploration

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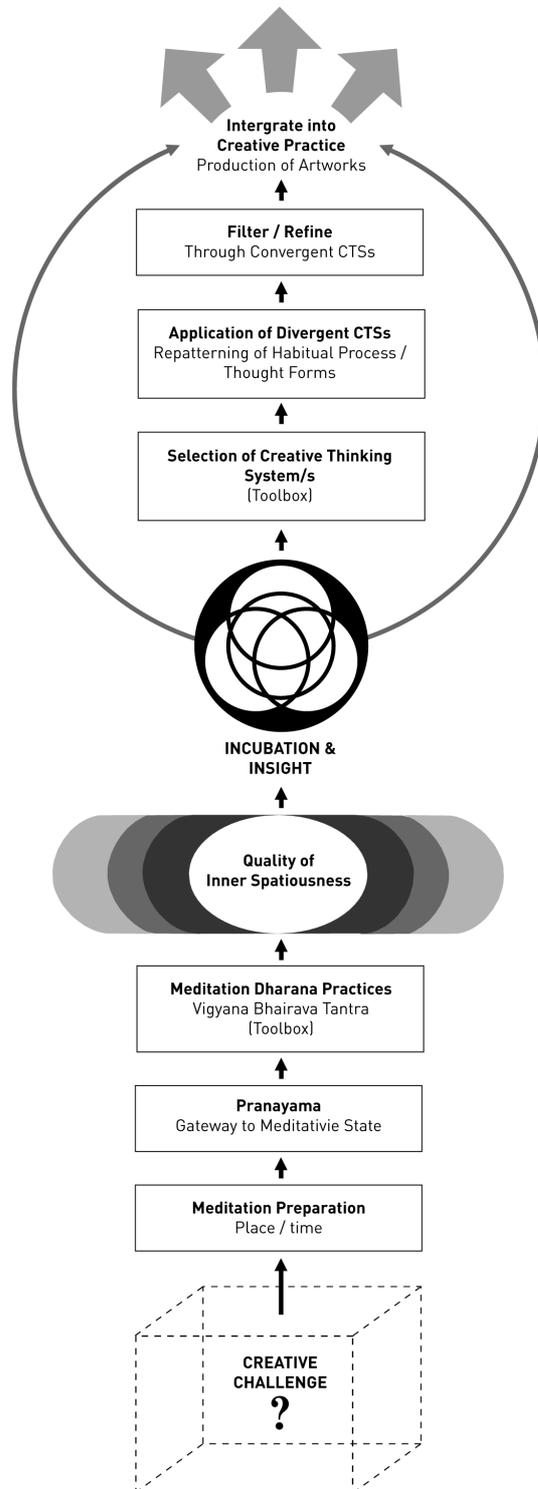


Figure 1.

Application of Module techniques to studio based Creative Arts project assignments

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 Example student final project outcomes & CTS/M methods used / learning experiences
 

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Project	Creative Discipline & Description	Student, Technique used and Learning Experiences
1	<p><b>Programme of Study:</b> Photography</p> <p><b>Project:</b> 94 prints on the theme of the fragility of life, memory and photography</p>	<p>Techniques: S.C.A.M.P.E.R &amp; Idea Box</p> <p>AG: <i>'SCAMPER &amp; Idea Box are by far the two techniques that I found "fitted" me, no flow charts but lists and tables. I found it really useful, the way it is quite structured, yet allowed my mind to flow and think with a freedom, yet keeping some semblance of order in the process.'</i></p> <p>Technique: Meditation / yogic practices</p> <p>AG: <i>'I switched off the usual perfection aspiring side of my practice and decided to allow myself to implement my yogic practice, to allow my eyes to soft focus, to work within, what I can only describe as another level of consciousness. I found myself throwing developer at the exposed print, shaking it, allowing it to roll over the paper. I also painted areas, giving 100% of my attention to my practice, not allowing myself to think of anything else. It was an amazing experience, it felt like I was in a trance, I was content, calm and completely absorbed in the picture and my endeavors. I was completely in, yet out with the zone, I have never experienced anything like this before and I feel it opened up a channel to a new level of creativity.'</i></p> <p>AG: <i>'Furthermore, at home I feel that implementation of these techniques has now resulted in a better relationship with my children. I am no longer the stressed out mum I was before, no longer am I resenting the time I spend with them as time I could be doing my coursework and vice versa. I now have time for all (well most) elements of my life. Yes, I m still me but I think I've improved a little.'</i></p>
2	<p><b>Programme of Study:</b></p> <p>Textiles with Business Studies</p> <p><b>Project:</b> Development of different weave structures</p>	<p>Technique: Idea Box</p> <p>RC: <i>'I used the Idea Box technique to explore different warp yarns, colours, patterns and weave structures and generate random ideas that inspired me. It worked really well and I ended up creating extremely bold and colourful samples that I otherwise could never have dreamed of designing if it weren't for the help of this technique.'</i></p> <p>Technique: Meditation / yogic practices</p> <p>RC: <i>'Another way I will utilise concepts form Training Your Mind is through the Yogic meditations and practices. While I was sceptical at first as to how these would really benefit me, I have definitely found myself craving the peace and serenity experienced when meditating more often than I'd have predicted.'</i></p> <p>General reflection. Module experience</p> <p>RC: <i>'Most inspiringly though is the notion that "artistic creativity is actually often not creative at all". This has truly opened my eyes and revolutionized the way I see my creative methods, enabling me to understand the importance of creative, lateral thinking. Now that I have seen this I can truly appreciate the need to always keep your creativity fresh and new to inspire more innovative ideas, so among others, that is the key idea I will be taking from these inspiring sessions.'</i></p>

- 3      **Programme of Study:**  
Printmaking  
**Project:** Prints for 2nd Year Exhibition
- General reflection. Module experience  
RC: *'In conclusion although I didn't find all the creative thinking techniques valuable I found a fair few very good, and made me think in a different way. This has changed my creative thinking practice. Even the creative thinking techniques that weren't completely successful were beneficial as they made me look at creativity from a different angle. Overall though I found the meditation practice the most beneficial. I am integrating this into my everyday life. As well as attending meditation sessions at the Buddhists centre. This class has really opened my eyes to the benefits of meditation, and the calming and thinking technique it has taught me I hope to continue with in my life, not only in the creative practice, but also in my everyday existence.'*
- Technique: Idea Box  
RC: *'The idea of this technique is not to think about the connections, just do. Therefore once I made up the initial table I randomly selected an option from each column and pasted them together. This resulted in some strange and interesting results. Not always making perfect sense but it enabled me to think of my ideas in different ways and come up with interesting connections and ideas.'*
- Here are some Connections the ideas box came up with:
1. Monoprinted Repeated imagery > Put onto acetate > expose with varnish sugar lift > Photoshop > Panorama Section > Print in Frame
  2. Drawn mark > Redraw each result > Have all results next to each other > Installation (round View)
  3. Etched Mark > Print till ink runs out > Frottaged etched plate > Varnish > Multiple Print Piece
  4. Print till ink runs out > Final piece of step 1 > use of colours screenprint > overlay > multiple print
- 4      **Programme of Study:**  
Digital Music & Sound Arts  
**Project:** Sound Design for an animation
- Technique: Frames of Reference  
RW: *'I really liked the Frames of Reference CTS because it got me to look at the ways in which I work, analysing the conditions in which I approach creativity, rather than what I am actually creating.'*
- Changes to usual creative practice:
- Took a lot of breaks instead of working for long periods of time, in these breaks I utilised the meditation techniques.
  - Didn't use caffeine
  - Worked early in the morning
  - Got my housemates opinions and worked with their feedback
  - Wrote the piece using software and an number of instruments
  - Showed other emotions in my work'
- Technique: Meditation / yogic practices  
RW: *'The yogic meditation practices I have found to be very beneficial so far and it is something that I will be exploring further outside of university. I used these exercises continuously throughout my project; I would begin with fifteen minutes of meditation before starting, then take breaks every hour or so and do another fifteen minutes.'*

- 5      **Programme of Study:** Painting  
**Project:** Paintings and drawings which utilised uncontrived marks (process facilitated by dharana meditation practices)
- Technique: Meditation / yogic practices  
BB: *'The most important and applicable aspect of this course for me has been the yogic and meditative practises. These have allowed me to develop a new level of mindfulness in both my practical and creative thought process. I suffer a great deal with stress, and the meditations I've learnt have and will continue to help me cope with ideas and focus my creative thinking.'*
- General reflection. Module experience  
BB: *'Though I have found the yogic meditation practises to have more of a direct impact on my work and creative thinking, several of the creative thinking systems have been useful in other ways. Using the Exploring New Frames of Reference, and The Four Quarters of the Brain exercises have helped me to analyse in depth my creative thinking. The initial part of the Sur/petition instead of (Com)petition exercise was a useful in developing a little confidence in what I'm doing in my work- and helping me identify what it is I am actually exploring. Finally I used Idea Box to think of new ways of approaching preparatory work to painting such as drawing.'*
- BB: *'This course has been eye opening and has taught me a lot about the way I work. It made me realise that there are other ways of approaching my creative process, and in doing this I can develop my work further. The techniques have been very interesting to learn and though not directly relevant to the way I work, I will certainly look to them in future if I am feeling uninspired or have a block. What I will take from this course and continue to apply in general and to my work is the meditative practise. This benefits so many aspects of life, and each feed into one another. Applying meditation to work was something I never would have considered, though it is opening up new opportunities in my painting that are resulting in exciting developments.'*
- 6      **Programme of Study:** Illustration  
**Project:** Drawing project on the theme of Cause and Effect
- Technique: The Idea Box  
EJ: *'I used this thinking system to do a project on cause and effect. I wanted to incorporate an element of chance into the project and I feel as though this process lends itself well to this idea as you can randomly choose the variations on your parameters. I came up with a table where the parameters were the outcome, the medium, what will produce the random element (a dice, a random number generator, a coin flip etc.), the mark making (a scribble, draw north, draw east, draw a circle etc.) and the time frame I will work to (one hour every day, ten minutes every hour for 6 hours, start again every 5 minutes). In the end I decided to do a series of ten drawings. I allocated each medium a number from one to eight and each way of mark making a number similarly. I then randomly preselected sixty numbers for each drawing, thirty for the media and thirty for the mark making and decided to spend ten minutes on each drawing.'*
- 7      **Programme of Study:**  
Fashion with Business Studies  
**Project:** Collaboration garment design
- General reflection. Module experience  
FT: *'The training your mind module has been interesting, infomative, and helpful to me in a number of ways. Initially it was fascinating to discover psychological aspects of my subject but it has also been of practical benefit in that it has allowed me to explore projects in ways I might not ordinarily have considered, giving me the confidence to tackle themes from a completely different angle, leading to ideas I might not have arrived at.'*

- 8           **Programme of Study:** Interior Architecture  
**Project:** Community barge design
- Technique: Water Logic  
 JG: *'Water logic helped to uncover some of the hidden issues by clearly sourcing the problems. This way I could easily solve the matters in question. For example with lack of skill sets I resolved this by suggesting a skill exchange day – students would show each other certain skills that they have and visa versa.'*
- General reflection. Module experience  
 JG: *'I used the techniques I learnt from each session and applied them to the project I was currently in the process of at the time. PROJECT BRIEF: Design a barge to be part of a community existence on water. I found each creative thinking system to be of use, either towards the project I was working on or towards my course in general.'*
- JG: *'Meditation and these techniques towards creative thinking are something I wish to carry with me into the future. It has been an interesting and enlightening experience. Not only have these strategies helped me to develop further in my course, they have also opened my eyes to other people's courses and their different ways of approaching their projects by using these strategies. It showed me the range of subjects they can be applied to, to help with an array of problems.'*
- 9           **Programme of Study:** Dance & Visual Culture  
**Project:** Performance piece: Jack in the Box
- Technique: Meditation / yogic practices  
 BA: *'With the application of various meditation and visualisation techniques I have found that I can focus on one task at a time, rather than thinking about everything I have to do all at once, which can be overbearing. Posture and breathing techniques have been invaluable in terms of making the process of producing work less physically impacting.'*
- 10          **Programme of Study:** Music and Visual Arts  
**Project:** Contrast Video
- Technique: Capturing the Interest  
 LC-S: *'I looked at the proposition whereby I would make one of my "Contrast videos" every week. They are experimental films in which I combine contrasting sonic and visual material in order to create a video that is striking because of its structural sensory contradiction. I examined the "plus" aspects of this method (creative momentum, continuous production), as well as the "minus" ones (more work, quantity over quality), but the most inspiring points came out when considering the "interesting" aspects. It allowed me to look at the problem in a fresh way that excluded terms like "good" or "bad", and to notice facets that I would not have noticed: a self-discipline strategy, added value, the delay of judgment, the form of a series...'*
- General reflection. Module experience  
 LC-S: *'The module has led me to realize that creativity is not to be taken for granted nor envisaged as something that cannot be affected. It has helped me face short-term and long-term creative blocks, and has stimulated my thinking around creativity as a concept and as a personal process. Furthermore the practice of meditation, Dharana and Pranayama fostered my focus on personal growth and heightened my ability to keep in touch with my inner desires and issues.'*

## Results

In reviewing the Likert scale results from the CTS questionnaire, it was possible to rank the different creative thinking systems from the most successful to the least effective. This was achieved by combining the two highest categories on the Likert scale i.e. 'Excellent' and 'Very Useful' for each creative thinking technique.

### Ranking of the Twelve Creative Thinking Systems

Rank	Creative Thinking System	Combined Percentages ( 'Excellent & 'Very Useful'
1st	Idea Box	47% & 29% Total = 76%
2nd	S.C.A.M.P.E.R	46% & 26% Total = 72 %
3rd	The Four Quarters of the Brain	28% & 43% Total = 71 %
4th	Exploring New Frames of Reference	26% & 35% Total = 61%
5th	Sur/petition Instead of (Com)petition	31% & 27% Total = 58%
6th	Playing with Connections	25% & 33% Total = 58%
7th	Six Thinking Hats	26% & 26% Total = 52%
8th	Water Logic	23% & 26% Total = 49%
9th	Provocation: Random Word Exercise	13% & 34% Total = 47%
10th	Concept Fan	13% & 31% Total = 44%
11th	Capturing the Interest	10% & 31% Total = 41%
12th	Concept Harvesting	11% & 29% Total = 40%

The second questionnaire asked the student groups to evaluate the Dharana Meditation component of the Module. This resulted in the following findings:

- 78% found that the Dharana Meditation practices improved their concentration
- 96% found the practices useful in aiding creative idea generation
- 47% (very effective) and 34% (effective) found that the Dharana Meditations helped them to relax, de-stress and alleviate anxiety.
- 42% (very effective) and 38% (effective) found the practices developed inner stillness and peace
- 95% would like the opportunity to experience further Meditation techniques as part of their creative / personal development at the University of Brighton.

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## Discussion and implications

The results provide empirical evidence that the inclusion of the Module programme within the BA (Hons) course curriculum has demonstratively empowered student creativity. In addition the meditation component has proven to be a beneficial intervention to alleviate stress and anxiety (two key barriers to the realisation of creative potential).

Incorporating two specific toolboxes of techniques (CTSs and Meditation practices) has provided a novel teaching framework for innovative curriculum development and course design. The two distinct 'toolboxes' when dovetailed together in a structured programme encourage creative risk taking, whilst enhancing wellbeing both psychologically and physiologically. Furthermore the results indicate improvements in concentration and attention, along with heightened sensitivity and awareness – integral qualities for aspiring students of the Creative Arts.

In relation to teaching and learning in higher education, the six year project has been a rare opportunity to study approaches to creativity from a diverse range of twelve disciplines. The students were encouraged (via CTS methods) to share and discuss their specific creative practice and processes (in pairs or small groups of four or six). Surprisingly such inter-disciplinary collaboration is still quite rare in the art school environment, too often courses run in isolation to each other. Restricted by ridged module descriptors that do not encourage interdisciplinary collaboration. The CTS framework provides the freedom, structure, time and a convivial learning environment for such interaction to happen.

The informal module prerequisite of commencing the course with 'An open mind and a willingness to explore' was supported by observing the change in the participating group's energy and dynamic. This was witnessed as the students made the transition from the meditative practices (qualities of stillness, silence and inner focus) to the buzz and excitement of exploring new thinking methods via group interaction, discussion and discovery.

### Insights specific to the Creative Thinking System component

Approaches that combine concepts of creativity in HE into course designs are still quite rare (McWilliam & Dawson, 2008; Zhou, 2012). What emerges from this research is that the intervention of the CTS/M techniques has proven to be an effective learning strategy to improve creative idea generation. Helping to broaden perception whilst providing multiple ways to break habitual thinking patterns.

The CTS/M programme facilitated creative risk taking (nothing ventured, nothing gained) through interposing concepts such as chance, mistakism (i.e enjoying making mistakes in order to progress), serendipity (discovery & recognizing value / potential application), play (delaying judgement), artistic freedom, attitude, mind-set and lifestyle.

The most effective CTS, as evidenced in the Likert scale questionnaire and Assessment Tasks was the 'Idea Box'. This is a powerful technique that enables the student to explore a huge array of creative combinations. The students used the following process:

1. Specify your challenge
2. Select between five and 10 parameters (parameter here refers to characteristic, factor, variable or aspect)
3. List variations for each parameter. The number of parameters and variations will determine the Idea Box's complexity. e.g: a box with ten parameters, each of which has ten variations, produces 10 billion potential combinations.
4. Explore different combinations by selecting one or more from each column and then combining them into entirely new forms. By examining various combinations you can generate a wealth of intriguing possibilities.

Music, Textile, Architecture and Printmaking students particularly favoured this method. Once the Idea Box parameters and variables have been defined, numerous patterns emerge. Resulting in ideas and concepts that would be difficult to arrive at through conventional techniques such as brainstorming. The adaptability of the Idea Box is also a contributing factor e.g. solutions gleaned from one Idea Box can be inputted into another. The number of parameters and variables can be altered / tailored to specific aspects of a creative problem.

An example of how the Idea Box was used to formulate a solution to a project assignment is shown below. A student from Digital Music utilized the Idea Box in the creation of a sound design for an animation. The composition had no vocals, a 4/4 time signature, a tempo of 120, it was designed in the studio, using a stereo mix with the main instruments being piano and string.

VOCALS	TIME SIGNATURE	TEMPO	WHERE SHALL I WORK	LEAD INSTRUMENTS	HOW SHALL I MIX	TYPE OF MOVING IMAGE
African Male	3/4	70-89	At Home	Piano and Guitar	Mono	Film
English Female	4/4	90-109	In the Studio	Organ and Brass	Stereo	Visual Art
American Female	5/4	110-129	In the Library	Piano and Strings	Binaural	Claymation
Mixed Choir		130-149	At the Beach	Lead Synth and Pads	5:1	Animation
No Vocals		150-169	On the Train	Percussion	9:1	
English Male		170-189		Wind and String		

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The CTS: S.C.A.M.P.E.R was rated the second most effective technique. The S.C.A.M.P.E.R method incorporates a checklist of 66 provocative idea-spurring questions. The numerous questions relate to the following mnemonic:

- S**ubstitute something
- C**ombine it with something else
- A**dapt something to it
- M**odify or **M**agnify it
- P**ut it to some other use
- E**liminate something
- R**everse or **R**earrange it

To use SCAMPER the students used the following process:

1. Isolate the challenge or subject you want to think about
2. Ask SCAMPER questions about each step of the challenge or subject and see what new ideas emerge.

The success of this technique is due to its holistic scope i.e. all bases covered. The ease at which this method can be incorporated into a student's individual working process, was an additional supportive factor in its second place rating.

The 'Four Quarters of the Brain' CTS was also ranked highly by the students. This was somewhat surprising as it differs from the other techniques, through its psychological and analytical approach. The students were given a diagram devised by Bill Lucas that illustrates the four quarters of the brain. In brief, this equates to the following:

1. Top Left: Logical, analytical, mathematical, problem solver, fact focused.
2. Bottom Left: Controlled, conservative, planner, organizer, administrative, processed focused.
3. Top Right: Imaginative, synthesizer, artistic, big picture, theoretical, fantasy focused.
4. Bottom Right: Interpersonal, emotional, musical, spiritual, talker, feeling focused.

The students were required to spend some time reflecting on their unique characteristics. They were asked to map out their strengths and weaknesses in relation to the Four Quarters of the Brain diagram. Following this, they then analyzed their creative process by answering a range of questions such as: What are your weaknesses? What inspires you? What are your main influences? Etc. This method encouraged students to address – head on, issues that are often ignored or perceived as weaknesses, such as 'knowledge gaps'. Once identified, new strategies were evolved to overcome such barriers to creativity.

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### Insights specific to the Meditation component

The cohort groups needed time for the transformative aspect of the dharana meditations to take effect. Meditation has been referred to as 'Slow Magic' – the journey into 'Inner Spaciousness'. As the students became more proficient they were able to access the qualities of the meditative state quicker. Over time, fidgeting and poor posture alignment were reduced. Students learnt how to align the spine by stacking the joints to create a balanced meditative pose (the definition being "Sthiram sukham asanam" – a position which is comfortable and steady. Patajali, *Yoga Sutras*, 400 AD).

During tutorial sessions three main obstacles to creativity emerged. 1. Inhibition – fear of being wrong. 2. Fear of making mistakes (which prevents risk taking). 3. Anxiety & stress.

During the class sessions and in the Assessment Tasks students regularly articulated how appreciative they were at receiving meditative techniques to alleviate anxiety and stress. For many, this was a contributing factor for selecting this Options programme in their second year of undergraduate study.

The CTS/Meditation programme also incorporated seminars that discussed maxims such as: 'Embracing your fears in order to grow and the discarding of the mental comfort blanket of habitual practice. Tackling such barriers head on improved confidence, self belief and motivation.

The various cohort feedback reveals that different students achieved varying degrees of 'Meditation depth'. The inclusion of specific questionnaires similar to the 'Cognitive and Affective mindfulness Scale-Revized (CAMS-R) (Feldman, Hayes, Kumar, Greeson, & Laurenceau, 2007) is recommended to gauge the MD of future cohorts undertaking the programme.

What has emerged from this research is that there is a direct 'Sensitivity Link' between creativity and meditation – as corroborated by the participants, this reflects findings from previous studies: Meditation's heightened sensitivity and transcendent attentional capacity appears to (among other factors) broaden creativity and enhance sensitivity toward quality in artists (Wrycza, 1982). Horan (2009) reported that visual sensitivity is enhanced by meditation and that meditation training variously improves creative incubation and illumination *via transcendence* and *integration*. Wallace (1926) also argued that meditation practices offer attention management strategies for enhancing the incubation and insight phases of creativity.

Dharana meditation practices create inner spaciousness for the mysterious processes of intuition, creative imagination and inspiration to manifest (creative incubation). This was achieved by Dharanas that prune back invasive thought forms in order to 'still the chattering monkey of the mind'.

Fletcher (2001) stated that: "*Inspiration originally meant receiving a breath of divinity. In modern parlance psychoanalysts refer to it as "a moment of insight" and behaviourists "an act of intuition"; most of us rely on the metaphoric "bolt from the blue"... An unnerving sensation that, rather than us making something happen, something is happening to us.*"

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## Conclusion

This module programme can be utilized as a framework to assist academic staff and curriculum developers that wish to make courses more creative. The numerous techniques can be incorporated into existing modules as stand alone workshops or tailored more specifically to individual student needs as an effective learning resource.

The questionnaire results, Assessment Tasks and Module Evaluations reveal that most students enjoyed the CTS/M programme. The course provided pluralistic customizable CTS/M toolkits that enhanced student creative problem solving ability. This culminated in the production of a range of completed artistic project assignments, specific to students from 12 distinct disciplines.

Although running for six years, the CTS/M programme is still in its evolutionary phase. Each year additional CTS/M techniques and resources are collated and added to the course archive. In time, this has the potential to evolve into a comprehensive degree programme in Creative Thinking.

Future research could expand the scope of the study to explore the effect of the CTS/M programme on long term HE performance e.g Summative Assessments through to final degree attainment. In addition further studies could investigate and focus more specifically on the teaching of 'Creative Risk Taking'.

## Funding

This project was funded through a Creativity Fellowship Research Award (University of Brighton)

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His creative practice spans many different genres, including graphic design, illustration, book design, corporate branding, typography, font design and printmaking (a fusion of screen printing, collographs, mono prints and digital processes).

Simon Emery is also a qualified Yoga / Meditation teacher (British Wheel of Yoga / Life Centre 2008)

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