

THE APPLICATION OF RESEARCH BASED KNOWLEDGE IN WORKSHOPS CONDUCTED TO EMBED A CREATIVE DIMENSION ACROSS A RANGE OF DISCIPLINES AND EDUCATIONAL LEVELS

Stuart Gluth^a, Ron Corso^b

^aCharles Darwin University, Darwin, Australia

^bUniversity of South Australia, Adelaide, Australia

Corresponding Author : stuart.gluth@cdu.edu.au

Abstract

Creativity is currently the ‘in’ word in education (and many other areas). This paper sets out the underlying theory behind a range of workshops that the authors have conducted to introduce a creative dimension into a variety of disciplines, where a creative dimension might be expected, but the resources, skills or approaches needed to do so are absent, or have been actively discouraged by historical attitudes, compliance or political and community expectations. There is a considerable and growing research base across the social, psychological, human factors and more recently, neurological and even genetic sciences available to support the application and embedding of creativity in educational structures. These are not only valuable to formulate effective structures and approaches to achieve this, but serve as the understanding and motivation for students to embrace these approaches, of increasing importance in ways of working in unprecedented and vastly different scenarios in a rapidly changing future. This research has established that creativity is not just the realm of the individual specialized and ‘gifted’ genius or only of practitioners in the arts, but is now understood to be community based, collaborative, cross-disciplinary, something we all have and can relearn. This research has also established that inhibitors are the main reason many of us have ‘lost’ this creative capacity. The paper further describes how the workshops the authors have conducted are aimed at recognizing these inhibitors, and using this underlying knowledge to provide the necessary insight, approaches and strategies to overcome them.

Keywords: Creativity, integration of theory and practice

1. Introduction

There has been a vast increase in the underlying understandings of what creativity is and how we can harness this knowledge in introducing a creative dimension across a wide range of disciplines in education, probably motivated by the rapidly accelerating rate of change in technology, ways of working, making and marketing, and access to information globally, in education and any number of other fields of activity. The authors have, for a number of years, been running workshops based on these newly available theoretical understandings across a wide range of specialist areas where a creative approach might be expected, but has been neglected or not been effectively taught. The lack of structure and approaches to enable the embedding of a creative principle in educational institutions is, in the authors’ experience, even though there

is awareness for the need for a creative core to their courses and programs, there is no understanding of how to make it happen or structure in place to enable it to take place. Nor is there an awareness of the approaches and ways of working that it takes to nurture a creative approach to the application of the specialist knowledge being taught.

This expectation is not being met because, among other reasons, course outlines, lecturer's statements, staff and student responses, limiting expectations of government and university regulations and over obedience with these regulations, still represents the outdated ideas of what creativity is. The imaginative process required to introduce a creative vision is generally lacking in university curricula that are focused on knowledge acquisition and experience that is predominantly predetermined. University programs are structured around achieving certain graduate qualities, such as 'Bodies of Knowledge' that usually predominate the curriculum requirements of disciplines other than design or the arts. This reinforces traditional education methodologies and practice based on knowledge acquisition and retention. In the authors' experience educators themselves recognize that existing approaches in university programs don't meet the requirements of a rapidly changing business environment, that creativity is not recognized as necessary, and that they need to go beyond traditional practice. They recognize that many areas of education beyond the arts and design need to embrace a pedagogy emphasizing the capacity to think critically, solve complex problems, take responsibility and innovate.

In our workshops, we present an alternative process that can provide the catalyst to allow knowledge to be applied in new and innovative ways Robinson (1998), Krislov and Volk (2014), Pink (2005), Czikszentmihalyi (1996), Farrell (2001), Sawyer (2006) and the IDEO model of 'educating for creativity' d.School Stanford (2014) among many others, emphasize collaboration, experiential learning and creative thinking. Preparing graduates for anticipated rapid change will demand flexibility of thought and ways of working of educators too, to enable them to approach and solve problems which don't exist yet and have no precedent or known answers emanating from past contexts.

Students will need to be able to participate in complex creative systems, rely on diverse collaborations and multiple levels based on knowledge rather than objects and communication of ideas across disciplines rather than making 'things'. The current static model of knowledge acquisition and retention will not produce the skills required to create knowledge linked to ideas (Sawyer, 2003).

There is a need to underpin all program structures to approach problems from many perspectives, challenge assumptions and combine diverse approaches and multiple points of view, explore 'not what is true but what *could be true*' (Datar, Garvin & Cullen, 2010), imaginatively frame questions and to have the ability to make perception shifts. They will need to produce graduates who can think about the relationship between all the parts and the whole and who can envisage the big picture and not be limited only to the expertise of their discipline, but imagine its relationship with everything else (Martin, 2010). These are ways of working normally associated with the arts and a design thinking methodology, but not usually not associated with schools outside of the arts and design which require a radical shift to teaching *for* creativity rather than *about* it (Kirby, 2006; Wladawsky-Berger, 2010).

Erica McWilliam has also documented that 'a concise definition of creativity within [university] policy documentation is conspicuously absent' (2007) and the results of our research in the examination of course outlines in the trial programs and course

workshops confirm this. Also absent are strategies or models for the teaching of creativity even though aspects of course outlines and set tasks expect a creative result and the majority of assessment is commonly based on a creative outcome. Student feedback from the trials corroborates this omission and teaching staff are also aware that this creative aspect needs to employ effective strategies be taught in a more meaningful way (University of South Australia, 2011a).

Because of this, applying knowledge other than in traditional ways that are seen to be 'tried and tested' is uncommon. de Bono states that 'Education is based on the safe assumption that one only has to go on collecting more and more information for it to sort itself into useful ideas' (1970). Perhaps this is because there is little understanding of the nature of creativity at any level. It appears commonly to be seen as a mysterious, or even magical 'gift' that some people have, and the rest don't! In the authors' own experience, this lack of understanding of the real nature of creativity is clearly demonstrated by the most common question we are asked 'how do we evaluate the creativity of an outcome?' Of course we don't; we evaluate the process.

In this, educational institutions commonly mimic many of the counterproductive characteristics of business organizations; regimentation, social conventionality, employability expectations, populist interference from government, obedience, rules, adherence to protocols, risk management, the expectation of predictable behavior and performance, with authoritative hierarchies of learning and assessment. We can see that the way these characteristics *inhibit* creativity is not well understood in such institutions.

The Robinson Report in the UK 'All Our Future: Creativity, Culture and Education' (1998), which argues that the future success for all organizations now lies in new approaches to developing the creative talents of employees, is beginning to have a significant impact in the way future curricula are being shaped to be more inclusive and relevant in terms of creative applications.

What research tells us about the nature of creativity that can inform us of how we should be including it in the application of specialist knowledge.

Historically, and still commonly, creativity is considered to be just the realm of the individual specialized and 'gifted' genius or only of practitioners in the arts. Paul Rand is quoted as having said that the most important thing in his designing is 'talent, and that's all intuition, and you can't teach that' (Maeda, 2000). In the Melbourne 'Age' newspaper in 2003, the then new director of the Australian Film, Television and Radio School, Malcolm Long, was quoted as saying that the school had a critical responsibility in 'identifying and supporting creative individuals' (Anon, 2003). This kind of statement presupposes that every individual out there is already creative - or not! - through some accident of fate or fortune or genetics, environment or weaning, and it implies that there's nothing you can do about it. All that can be done is to nurture the ones who somehow turned out to be creative.

Creativity, instead has been found to be collaborative (Czikszenmihalyi, 1996) and community based (Florida, 2002), about transference across disciplines and about communication, sharing ideas and making connections and it can be taught. It is what Erica McWilliam has called 'new' creativity as opposed to the 'old' individual God-given specialized one (McWilliam & Dawson, 2007).

Research conducted using brain imaging in order to begin to understand the neurological basis of design cognition[representing *creative* problem solving], has

found that ‘there is a more extensive neural network involved in the activity of understanding and resolving design tasks than the network involved in [ordinary or non-creative] problem-solving tasks’ and that in the creative problem solving tasks, ‘the problem and solution spaces co-influence or co-evolve with each other’ (Alexiou, Zamenopoulos & Johnson, 2009) This is also reflected in the nature of so called ‘wicked’ problems (Churchman, 1967; Rittel & Melvin, 1973; Buchanan, 1992), where the nature of the problem doesn’t emerge until the process of searching for an answer is undertaken. This research finds that the generation of alternative solutions is part of determining the nature of the problem, emphasizes the importance of collaboration in creative behavior, determines that creativity is essentially a social ability, and contributes to a better understanding of *social* cognition in creativity and the conditions that facilitate it.

In comparing the way that a human solves ‘creative’ problems with the way a computer solves problems, earlier neurological research has determined that ‘the *subjective* qualities accompanying our perception’, ‘and our mental activities, provide the necessary externality that sustains human creativity’ (Mogi & Tamori, 1997).

These understandings that creativity is an inherent human and social attribute should have a big influence on how we structure an enterprise to nurture and take advantage of an inclusive creative way of educating and how we teach it not as an add-on to specialist knowledge, but as an embedded quality for the application of knowledge in all specialist areas, and emphasize the essential collaborative and community character of creativity.

Recently, there have also been a number of research publications that have established a genetic relationship between mental illnesses such as bipolar and schizophrenia and creativity (Stefanssen et al., 2015). However, many commentators have pointed out that the majority of creative people do not suffer from these disorders. But, they do exhibit some characteristics in common, particularly the tendency to take risks and not be put off by social expectations and conformist behavior (Rothberg, 2015). Some research even reasons that these very dysfunctional conditions have not died out because they serve a useful creative function to the (small evolutionary?) group (Nichols, 2009).

One of the consistent approaches that many exponents of a creative approach have advocated which recognizes the need for time for the unconscious or intuitive thinking to be applied to a ‘creative’ or ‘wicked’ problem (Swan, 2002). Some recent research has established that this is important because the ‘valueless’ non-conscious mind is very effective in ‘ignoring’ many of the usual inhibitions to creativity discussed above (Ritter & Dijksterhuis, 2014).

2. Using the research in overcoming the inhibitors to creativity.

If the core of the knowledge society is innovation (Sawyer, 2003), how can we expect the research to contribute to prepare and retrain educators to build a creative dimension into their curriculum and teach it to students? What approaches *will* facilitate creative learning and understanding and how will this be evaluated and assessed to be most effective for students in the long term?

The authors have initiated and conducted a program to introduce an aspect of creative idea generation in a variety of courses to incorporate a range of specific creative thinking approaches within a structure that demonstrates understandings of the underlying nature of creativity and ways in which student’s ideas could be developed within their own discipline and applied in their own work.

We conducted a number of workshops that embodied the following approaches:

- Teaching with improvisation by responding to what happens rather than sticking to a planned procedure and outcome. Teaching for creativity within a student's specialization must involve a high level of spontaneity and unplanned flexibility so as to allow students to co-construct their knowledge in ways that are not always possible in a highly structured, directed classroom. The research suggests that a process where the teacher facilitates and guides the learning process to a series of outcomes building knowledge together heuristically in ways that are not always pre-determined and ways which model the approach we were encouraging the students to undertake and further, instills the underlying knowledge on which it is based,
- Creating an effective collaborative, learning environment based on unstructured group discussion that conveys to students the development of egalitarian cross-disciplinary teamwork. Many enterprising businesses work this way, and people almost never work in the isolated way that education assessment and study models personify,
- Recognition that the key learning attributes are ways of working, rather than accumulated specialized knowledge, which allows students to collectively build knowledge collaboratively through a process of enquiry reliant on identifying key questions and hypotheses. This recognizes that a set 'knowledge' of any specialization is immediately out of date, and that the 'skill' required is finding information from the vast amount available and utilizing the possibilities it encompasses creatively,
- Building the ability to think reflectively and externalize skills and in so doing gain an understanding of the thinking behind the thinking, from which students learn the art of structuring an argument and how to elaborate and apply their thinking process,
- Focus on the creation of new knowledge through processes based on prototyping, technical innovation, exploration of new procedures utilizing design thinking supported by Piaget's thoughts that learning and creating are fundamentally intertwined (Sawyer, 2003).
- These workshops have established that adopting these principles can be achieved by some of the following simple approaches:
 - Working collaboratively with other people and in teams across disciplines, cultures, socioeconomic levels, etc., where conversation, communication, finding ways of working together, assessment and considering how others see your work, is important so as to be exposed to different points of view,
 - Unblocking the associational, cultural, professional, emotional, social, language and other impediments to creative thinking by challenging assumptions or preconceived ideas, not taking things for granted, defining and recognition of assumptions in order to challenge them, accepting that *any* assumption or preconception can be challenged or reversed, leading to new possibilities,
 - Encouraging lots of ideas without critique, by withholding the judgment sense no matter their seeming craziness, silliness or inappropriateness (classic examples of inhibitors). The generation of a large volume of ideas without judging allows all ideas or possibilities an opportunity to be considered no matter how irrelevant they may initially appear,
 - Encouraging lots of different ideas, reinterpreting ideas, restructuring ideas into new configurations, comparing or substituting of things with similar or comparable

qualities, taking an existing idea from one situation, discipline or application and applying it to another different one, considering the opposite or negative of an idea, etc.,

- Encouraging originality; personal interpretations, playfulness, having fun, risk taking and using humor and absurdity, using other senses such as smell, music, movement, dreams, examining ideas or processes that didn't lead anywhere and using mistakes to change thinking or ways of looking at the problem by using 'wrong' ideas or 'errors' as a springboard for the generation of new ideas,
- Elaboration; embellishing ideas, analogous and metaphoric thinking,
- Intuition; putting ideas into the mind, stirring them and allowing plenty of time for responses from the unconscious.
- Reflection, thinking critically about ideas and approaches
- Self evaluation and peer evaluation, not relying on expectations of how the teacher will assess the ideas, but taking into account the tasks and processes students have determined for themselves
- Examining and identification things that inhibit creativity such as fear of making mistakes, the need to be right, the need to have an expected answer, the need to follow a predetermined process, the expectation that a process needs to lead to a solution, the need to follow a set routine (the idea that ideas only come at certain times and certain places, for instance in class or at school), using only logical, analytical, routine or judgmental thinking – and challenging and overcoming them,
- Beginning with very simple uncomplicated tasks so that students develop confidence, and gain positive experiences of the process and have effective ways of working modeled for them, before slowly adding complexity as students' capabilities and self assurance develop for the appropriate level,
- Embedding the processes in the relevant disciplines specialist knowledge, not as an add-on, as our experience has shown us that treating it as an unrelated strand will not be successful.

While student outcomes of the workshops were measurably more diverse and innovative, course evaluation instruments, focus groups and such for these trials also indicated there was still a high expectation teacher directed, individually assessed and predetermined outcomes, evidently artificially influenced by course outlines and compliance, perhaps even over compliance, with university rules.

Students became engaged in applying their knowledge creatively, motivating and making sense of the acquisition of that knowledge, some conveying that for the 'first time' their tertiary education experience made sense in terms of its relevance and context.

'The course instilled great knowledge which I know I will continue using through my course and my work life' (University of South Australia, 2011b)

These approaches allow students take control of their own learning, not rely on predetermined responses or follow a prescribed process. They are genuinely excited when they realize they can work things out for themselves to enhance their current practice. They demonstrate how creativity can be applied to their specializations through specific examples and projects of their own choice. By continually reflecting

on this approach, they add a creative dimension which reflects the reality of their professional practice, realizing it's insufficient to just replicate the knowledge and skills of a discipline.

'The course has pushed my thoughts and allowed me to think "I can" instead of worrying about doing something...just to do it' (University of South Australia, 2011c).

'I was so used to following structures within assignments . . . making your own expectations and structure for yourself became more important than anything else, opening my mind to new ways of thinking....putting more faith back into yourself' (University of South Australia, 2011c).

Students are able to apply their knowledge innovatively and flexibly and demonstrate understandings of broader principles and deeper learning, and appreciate that they 'learn how to learn' not fixed and predetermined knowledge and methods.

'[The course]focused more on learning rather than grades and made the topics interesting' (University of South Australia, 2011d).

'The teachers methods of teaching are very interactive and encourage students to participate with the learning process' (University of South Australia, 2011d).

These workshops have identified the need to move from traditional models of delivery to design thinking models where students develop the capacity to apply their knowledge and direct their own learning in ways that reflect the decision making demands that industry will need to build a greater reliance on creativity and innovation. It has identified attributes to reshape the institutional culture to develop understandings of principles and pedagogy in order to achieve relevant, structured and scalable innovative practice, in partnership with industry to seek opportunities, and develop new ideas that change core organizational structures and philosophy. They demonstrate the need to encourage consideration of the big picture, holistic approaches to the way problems are diagnosed, understanding the way specific specializations and approaches can be utilized more innovatively, and to encourage staff and students to be less risk averse, take initiatives, accept greater responsibility and to explore new ideas and ways of working This may serve as a model for other enterprises that plan to survive a creative approach to an unknowable future.

REFERENCES

- I. Alexiou, K., Zamenopoulos, T. & Johnson, J. H., 2009. Exploring the Neurological Basis of Design Cognition using Brain Imaging: Some Preliminary Results. *Design Studies*, 30, pp. 623–47.
- II. Anon. 2003. *Melbourne 'Age'*. Newspaper.
- III. Buchanan, R., 1992. Wicked Problems in Design Thinking. *Design Issues*, 8(2), pp. 5-21.
- IV. Churchman, C. W., 1967. Wicked Problems. *Management Science*, 14(4), pp. B141-B142.
- V. Czikszenmihalyi, M., 1996. *Creativity: Flow and the Psychology of Discovery and Invention*. New York: Harper Collins.
- VI. Datar, S., Garvin, D. & Cullen, P., 2010. *Rethinking the MBA: Business Education at a Crossroads*. Boston: Harvard Business School Press.
- VII. de Bono, E., 1970. *Lateral Thinking: Creativity Step by Step*. London: Penguin, p. 9.
- VIII. d.School Stanford. 2014. *Our Point of View*. Institute of Design, Stanford University USA. Available from Institute of Design at Stanford Website: <dschool.stanford.edu/our-point-of-view/> [Accessed: December 1, 2014]
- IX. Farrell, L., 2001. The 'New Wordorder': Workplace Education and the Textual Practice of Economic Globalization. *Pedagogy Culture and Society*, 9(1), pp. 57-75.
- X. Florida, R., 2002. *The Rise of the Creative Class: And How It's Transforming Work, Leisure, Community and Everyday Life*. New York: Basic Books.
- XI. Kirby, D., 2006. International Entrepreneurship Education, Issues and Newness. In Fayolle, A. (ed.) *Entrepreneurship Education: Can Business Schools Meet the Challenge?* Cheltenham: Edward Elgar.
- XII. Krislov, M. & Volk, S. S., 2014. *College is Still for Creating Citizens: The Chronicle of Higher Education*. Available from: <http://chronicle.com/article/College-Is-Still-for-Creating/145759> [Accessed: April, 12, 2014]
- XIII. Maeda, J., 2000. *Maeda @ Media*. New York: Rizzoli.
- XIV. Martin, R., 2010. *Demonstrating the Value of Design: Between*, 3rd edn, Sydney: Billy Blue College of Design.
- XV. McWilliam, E., 2007. *Is Creativity Teachable? Conceptualising the Creativity/Pedagogy Relationship in Higher Education*. Available from: <http://elgg.net/ericam/weblog/155777.html>
- XVI. McWilliam, E. & Dawson, S., 2007. *Teaching for Creativity: Towards Sustainable and Replicable Pedagogical Practice*. Proceedings of 'Enhancing Higher Education Theory and Scholarship' Higher Education Research and Development Society of Australia (HERDSA) 30th Annual Conference, Adelaide.
- XVII. Mogi, K. & Tamori, Y., 1997. *Creativity and the Neural Basis of Qualia*. Proceedings of the Mind II Conference, Dublin Ireland, pp. 5-9.
- XVIII. Nichols, C., 2009. Is There an Evolutionary Advantage of Schizophrenia. *Personality and Individual Differences*, 46, pp. 832-838.

- XIX. Pink, D., 2005. *A Whole New Mind*. New York: Riverhead Books.
- XX. Rittel, H. W. J. & Melvin M. W., 1973. Dilemmas in a General Theory of Planning. *Policy Sciences*, 4, pp. 155–169.
- XXI. Ritter, S. M. & Dijksterhuis, A., 2014. Creativity—The Unconscious Foundations of the Incubation Period. *Frontiers of Human Neuroscience*, 8, p. 215.
- XXII. Robinson, K., 1998. *All our Futures: Creativity, Culture and Education (The Robinson Report)*. London, National Advisory Committee on Creative and Cultural Education.
- XXIII. Rothberg, A., 2015. *New Study Claims to Find Genetic Link between Creativity and Mental Illness*. Available from: <http://www.theguardian.com/science/2015/jun/08/new-study-claims-to-find-genetic-link-between-creativity-and-mental-illness> [Accessed: June 09, 2015]
- XXIV. Sawyer, R. K., 2003. Emergence in Creativity and Development. In Sawyer, R. K., Steiner, V. J., Moran, S., Sternberg, R., Feldman, D. H., Csikszentmihalyi, C. & Nakamura, J. (eds.) *Creativity and Development*. New York: Oxford.
- XXV. Sawyer, R. K., 2006. *Explaining Creativity: The Science of Human Innovation*. New York: Oxford University Press.
- XXVI. Stefanssen, K. et al., 2015. Polygenic Risk Scores for Schizophrenia and Bipolar Disorder Predict Creativity. *Nature Neuroscience*, 18(7), pp. 953–955.
- XXVII. Stoneham, A. C. S. & Coughtrey, A. E., 2009. The Role of Schizotypy and Creativity in a Group Problem–Solving Task. *Personality and Individual Differences*, 46, pp. 827–831.
- XXVIII. Swan, C., 2002. Action Research and the Practice of Design. *Design Issues*, 18(1), pp. 49–61.
- XXIX. University of South Australia. 2011a. *'Ingenium' Creative Idea Framework Trial Feedback*.
- XXX. University of South Australia. 2011b. *Course Evaluation Instrument*.
- XXXI. University of South Australia. 2011c. *Framework Trial Feedback*.
- XXXII. University of South Australia. 2011d. *Student Evaluation of Teaching, Study Period 7*.
- XXXIII. Wladawsky-Berger, I., 2010. *Business Management and Critical Thinking*. Available from Irving Wladawsky-Berger Blog: <http://blog.irvingwb.com/blog/2010/03/business-management-and-holistic-critical-thinking.htm>