

Assessing Creativity in the Context of Architectural Design Education

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Abstract

In a study on architectural education in Australasia, Ostwald and Williams (2008a; 2008b) found that one of the most contentious issues facing architecture and design education is the assessment of creativity. The problem is not new, yet, despite ongoing criticism of the frameworks used to assess creativity in architecture and design, the assessment of students' creative work remains a vexed issue. Central to the problem of assessment is the lack of an unambiguous disciplinary definition of creativity. The concept of creativity has been understood in different and often conflicting ways, and across the design disciplines there is no shared understanding about creative processes and, in particular, how they apply to learning and teaching experiences. The paper briefly outlines the main problems related to assessing creativity before exploring the complexity embodied in the notion of "creativity" as it relates to design education. The research presented in this paper is derived from an extensive and critically framed literature review and forms part of an ongoing research project concerning the question of creativity within design education.

Keywords

Creativity; Assessment; Design Education

The constant and radical changes which are characteristic of the modern world makes it, as Dineen and Collins (2005: 44) observe, impossible

to base our future on the certainties of the past. Unable to define *what* we need to know, we have begun to focus on *how* we will need to know, on the flexibility and openness which characterises creative thinking. Creativity is now seen to be the wellspring of human adaptability and social development.

Creativity, often defined as the development of ideas or work that have the quality of being both useful and original (e.g. Amabile, Conti, Coon, Lazwby, & Herron, 1996; Elton, 2006; Mayer, 1999; Paulus & Nijstad, 2003; Sternberg & Lubart, 1999), plays an important role in the process of cultural reproduction, technological advancement, innovation and intervention (Runco, 2004). A significant force for innovation and change is design, of which creativity is considered a key element. Whereas other sciences are concerned with the analysis and description of existing realities, design is about the imagination and synthesising of new realities; that is, central to a designers' work is the search for novel and unexpected solutions to problems. Moreover, in contrast to the arts, design "is essentially guided by human purposes and is directed towards the fulfilment of intended functions" (Alexioua, Zamenopoulou, & Johnson, 2009: 623), accentuating the importance of meeting requirements and developing appropriate and influential solutions.

Design is often described as pertaining to "ill-defined" or "wicked" problems (e.g. Casakin, 2007; Rittel & Webber, 1984) that require creative solutions. As Casakin (2007: 22) explains, "the exploration of unfamiliar and unconventional design solutions requires creative skills [...] Creativity enables the talented designer to transcend conventional knowledge domain[s] so as to investigate new ideas and concepts which may lead to innovative solutions"; it enables the designer "to perceive a problem from unorthodox and innovative perspectives" (Casakin, 2007: 21). When conventions are challenged, design moves from routine solutions towards innovative, non-routine solutions. Though design activities encapsulate the spectrum from routine to non-routine design, the groundbreaking designs are those which possess innovative and creative qualities; that is,

design that changes the design variables in such a way that the results are solutions that were previously unknown (innovative design) or design that introduces new variables and that subsequently produces entirely new products (creative design) (Gero & Maher, 1993).

Judgement of design products will always, even at its most basic level of distinguishing routine from non-routine design, reflect a consideration of creativity. To be more precise, creativity is one of the requirements that design is being assessed against. However, despite the preliminary definitions of the concept, exactly what is meant by creativity remains unclear and definitions of the concept are in many respects vague and ambiguous. This situation has serious implications for design education wherein "creativity" is often a stated learning objective. This paper aims to initiate discussion about the concept of creativity as it relates to the design disciplines. It begins with a brief outline of some of the challenges facing design education in relation to assessing creativity. This is followed by a discussion of the concept of creativity as it relates to education and, more specifically, design education.

The problem of assessing creativity

In a study on architectural education in Australasia, Ostwald and Williams (2008a; 2008b) found widespread confusion and disagreement surrounding assessment practices for design. They identified three key problems related to creativity and design education: firstly, there is a lack of understanding of the pedagogical dimensions of creativity in architecture and design; secondly, there is a lack of appropriate strategies to understand where different levels of creativity occur and how they should be assessed; and, thirdly, there is a lack of appropriate models or tools to support the assessment of the creative component of design. These problems relate to a paradox embedded in contemporary design education; namely the contradiction between Australian universities' quality assurance protocols, which call for objective or transparent assessment of all students' work, and the complex, heuristic nature of design, which require evaluation that is inevitably subjective.

In response to the demands of objectivity and transparency, there has been a growing regional trend to develop marking criteria for design and to adopt a complex combination of quality assurance and assessment protocols to provide a level of objectivity. However, there is a clear distrust within the discipline of this trend and it has often led to further problems. The student participants in Ostwald and Williams' (2008a) study, for example, argued that over-defined learning and assessment outcomes 'stifles' their opportunities to be creative and that teachers fail to recognise their creative efforts. But, where such protocols are not in place students express high levels of stress surrounding the assessment of their creative works (Bachman & Bachman, 2006; Ostwald & Williams, 2008a, 2008b) and they experience difficulties in identifying aspired learning outcomes, further causing frustration and dissatisfaction.

The problem facing design education is therefore twofold: it is a legal/administrative problem (how can we assess creativity in a way that meets national standards for quality assurance?), and a pedagogical problem (how do we assure that students receive appropriate and useful feedback, and how do we ensure a common understanding between students and staff with regards to assessment criteria of creative works?). These problems are at the core of the research project of which this paper forms part.¹ Whilst the project as a whole will address the problems and propose solutions, the paper explores the conceptual issue underpinning the problems; namely, the questions of what creativity means in relation to education and, more specifically, design education. The purpose of the paper is not to solve the problems of assessment, but instead to initiate a discussion about creativity as it relates to design education.

¹ The research project, *Assessing Creativity: Strategies and Tools to Support Teaching and Learning in Architecture and Design*, is funded by the Australian Learning and Teaching Council (ALTC). The project aims to create a conceptual framework for understanding creativity and to generate a set of shared terms and concepts that can be used when assessing the creative component of students' work. The project is set to finish at the end of 2011.

Creativity and education

During the latter half of the 20th century there was an upsurge in research into creativity and, in response, training to support creativity took a new direction. Calls for educational forms of teaching that could encourage creativity were repeatedly made, propagating ongoing discussion about whether or not creativity is a trait of a few individuals and whether or not it can be taught, promoted or fostered (Cropley, 1997: 83). At this point of time, creativity was generally held to be the trait of particularly gifted children. This notion of creativity as a “gift” can be traced back to Immanuel Kant (1724-1804) and the so-called romantic model of creativity. The Kantian notion of creativity portrays the creative individual as someone who possesses “an extraordinary innate ‘gift’ that is beyond the grasp of mere mortals” (Cowdroy & Williams, 2006: 100). It is a later version of the romantic idea first posited by Plato, who saw creativity as a result of divine inspiration, a process of unfettered and undisciplined “agonised” searching (musing). The romantic belief of creativity as something that lies beyond the rational conscious and that rational deliberation interferes with creative processes (Sawyer, 2006: 15) suggests that creativity is an innate (or divine) force that cannot be promoted or fostered; creativity, as divine inspiration, is the result of an artists’ undisciplined and unfettered agonised searching (Cowdroy & Williams, 2006; McIntyre, 2008).

In 1963, in an emotional plea to reconsider current practices of educating “the gifted child”, E. Paul Torrance (1981[1963]: 6) argued that gifted children had been regarded as “mysterious, beyond human understanding, evil and unrighteous”. He proclaimed that, as a result of an “unwillingness to accept a realistically complex picture of the human mind and personality” (Torrance, 1981 [1963]: 7), gifted children had suffered. During the time of Torrance’s writing, a common perception of gifted children was that they held superior potential and should therefore be able to look after themselves; gifted children were seen to “already have more than others” and questions were therefore made as to why society should “be concerned about giving them more” (Torrance, 1981 [1963]: 6). Torrance responded to this belief by proposing that the very complexity of the human mind and the respect for human values demand that education and guidance make room for both convergent and divergent thinking, discipline and creative behaviour. In fact, “order, discipline, organization, guidance, purpose, and direction are necessary, even for creative behaviour, and are not incompatible with creativity” as long as “order, discipline, and organization [... are] flexible enough to permit change and to allow one thing to lead to another” (Torrance, 1981 [1963]: 17).

The level of understanding of creativity and giftedness has changed significantly since Torrance’s research was first published. The idea that children should be able to develop their potentialities to the fullest has gradually transformed educational practices to emphasise the role of creativity, both as a *tool for learning* and as a *desired educational outcome* (in terms of enhanced creative ability and performance) (see also Plucker, 2002). Educators have moved away from a narrow view of creativity as a trait of particularly gifted children, to emphasising the psychological aspects of creativity that are present, at least as potentials, in everyone. Despite this conceptual change, the combined issues of creativity and education remain contested. A general view is that the modern school system, with its focus on conformity, may discourage students’ curiosity, ingenuity and, ultimately, creativity, and that pressure to conform and to satisfy prescribed standards present obstacles for creative personalities to unfold and develop (Chamorro-Premuzic, 2006). However, as was noted by Guilford as early as 1950, education has a role to play in relation to creativity (Guilford, 1950). Of importance to the development of creativity are knowledge, experience and readiness for ideas (Cunliffe, 2008; Pederson & Burton, 2009), all of which can be expanded through education. Education provides opportunities for students to engage in creative activity and learn about creative endeavours; it broadens their knowledge base and experience, subsequently enhancing their chances of creative success.

The idea that creativity can be fostered and promoted rests on the proposition that, by providing a favourable environment and appropriate learning conditions, the characteristics underpinning creativity can be developed (Cropley, 1997: 83). Accordingly, when speaking about creativity in relation to education, a holistic approach to creativity is required. This means that the romantic idea of creativity must be replaced by a rationalist model, which emphasises creativity as being

“generated by the conscious, deliberating, intelligent, rational mind” (Sawyer, 2006: 25).² As Cropley (1997: 107) concludes in his discussion of how to foster creativity in the classroom:

[w]hat is needed is an approach in which all aspects of teaching and learning adhere to basic principles for fostering creativity. These involve [...] not only intellectual, but also personal, motivational, emotional, and social aspects of creativity [...] children need contact with complexity, ambiguity, puzzling experiences, uncertainty, and imperfection.

In recent years there has been a move away from the traditional teacher-centred approach to learning towards a student-centred approach that emphasises problem-based learning and enquiry-based curricula, this change being particularly evident at the university level.

It is today commonly held that a curriculum that makes the students responsible for their own learning process will encourage creativity. In contrast to traditional teaching methods, where the instructor is responsible for teaching and the student for learning, in the student-centred approach teachers should serve as “facilitators of learning” and support the students in their endeavour (Elton, 2006: 131). As Lindström (2006) maintains, creative ability is developed through investigative work and inventiveness. In the educational context, investigative work refers to the use of assignments that allow students to explore central themes in the domain over extended periods of time. Inventiveness, on the other hand, concerns the need to emphasise process as well as product, and to provide opportunities for research, experimentation and revision. This last point addresses the role of the teacher, who, as Lindström (2006) argues, must be sensitive to students’ signals of creative behaviour, such as being adventurous and willing to take risk. The teacher must show appreciation and approval of the students’ courage. Moreover, the teacher must encourage students to integrate production with perception and reflection, to engage in self-assessment and to be open to feedback from teachers and peers. The question of self-assessment refers to the need for *criticality* (Elton, 2006); for learning to be possible and creativity to be encouraged, it has to be accompanied by the ability to separate bad ideas from good ones, to assess process, performance and end product, and be open for critique from others. The question of criticality and self-assessment indicate a social, interactive aspect of creativity. An important part of creativity is evaluation; through self-assessment and review, the creative idea moves through stages towards the final product.

Creativity and design education

In contrast to other disciplines, the very essence of architectural and design education is project-based, or problem-based, learning.³ It does not seek a single correct answer, but instead encourages students to make speculative and exploratory propositions that reflect their competence and knowledge of the field. This teaching strategy is conducive to creative thinking, which, as stated above, is the *raison d’être* of architecture and design. However, there is an inherent paradox within the traditional teaching models of design. While the traditional model seeks to promote and encourage creativity, the very paradigm on which it is founded defies critical and empirical examination, teaching and assessment.

The traditional teaching methods in architecture and design, including the one-to-one master-apprentice teaching style, the *Beaux-Arts* “neo-classical” teaching method and the Bauhaus “modernist” educational approach, reflect the romantic notion of creativity: the apprentice model of vocational education is founded upon the idea that creativity is a gift, it is innate and cannot be taught; the studio model is based upon the assumption that creativity can be taught in larger

² The rationalist model of creativity can also be traced back to ancient Greece; more specifically, to the writings of Aristotle who emphasised that conscious work, rationality and deliberation is required in order to complete creative inspiration. In Aristotle’s view, creativity was potentially more humdrum than previously anticipated and it included the creation of uncomplicated or predictable objects. It was, however, first during the English Renaissance that the romantic idea of special talent or unusual ability, a manifestations of an outside spirit, was seriously challenged. This epoch valued reason above all, and the emerging rationalist model emphasised reason, knowledge, training and education as essential to creativity.

³ The word “problem“ is used in this context to refer to wide range of situations, some of which may be framed as opportunities, open-investigations, or as “wicked” or “ill-defined” settings.”

groups, though only by long and direct association with a talented patron; and, the competency-based teaching models of vocational education reflect a reproduction model of creativity which suggest that creativity can be taught *en masse* but only by reproduction of the work of past masters (Cowdroy & de Graaff, 2005; Cowdroy & Williams, 2006). Whereas these models emphasise different stages of the design process (schematisation and execution), they do not focus on the imaginative conceptualisation, which, according to Cowdroy and de Graaff (2005: 511), is “the highest level of creative ability”. This is problematic as “conceptualisation is of the essence of creativity [...] if it is neither taught nor assessed, then it must be accepted that creative ability as a whole is neither taught nor assessed” (Cowdroy & de Graaff, 2005: 511).

This conclusion rests upon a particular hierarchical definition of creativity that emphasises the cognitive processes underpinning creative works. The definition presented by Cowdroy and de Graaff (2005) is developed further by Cowdroy and Williams (2006) in the article, *Assessing creativity in the creative arts*. They argue that there are three “agreed” types of creative ability, each representing a progressive stage in the movement from initial idea to realised work. The three hierarchical stages are conceptualisation, schematisation and actualisation, each of which require a particular type of memory (emotional, declarative, and procedural) and thinking skills (imaginative, originality; recollection, orientation, extrapolation, planning, innovation, inventiveness; and, development of abilities to accommodate innovations and inventions). Creative abilities, they argue, require

combinations of particular types of memory, particular types of thinking skills and particular crafting skills. At the schematization and actualization stages, the thinking and behavioural aspects could be considered separate. At the conceptualization stage, however, only thinking is clearly involved [...] high-level creativity involves progression from conceptualization to schematization to actualization, and [...] a decision (commitment) must be made (perhaps unconsciously) in order to progress from one stage to the next stage, and a further decision on how to maintain continuity of the originating idea must also be made (Cowdroy & Williams 2006: 107).

Cowdroy and Williams (2006) identify the connecting thinking points as “facilitative thinking” and they conclude that this form of thinking is intentional and directional and, as such, represent a strategic thinking behaviour.

This definition of creative ability proposes a framework within which teaching, learning and assessment strategies can be developed. The definition, set within a cognitive psychological framework and “tracking the psychological processes of inspiration and complex decision-making” (Cowdroy & Williams 2006: 97), represents an innovative approach to creative design education. It illustrates the importance of the creative process as an object for teaching an assessment, and it moves beyond the generic definition of creativity according to the descriptors “originality” and “appropriateness”. Understanding, teaching and assessing design creativity require a definition of creativity that transcends these descriptive nouns; whereas it allows judgement of creative products, it is problematic when considering other aspects of creativity, in particularly the creative process.

Although definitions of the creative (design) process exist, there is no consensus within the design disciplines as to what creativity really is and exactly what is being taught as creativity remains unclear. The romantic model of creativity and individualist approaches that perceive creativity as spontaneous, unconscious or as an inner spirit retain their influence on conventional understandings of the concept, despite scientific evidence that reject such notions as inaccurate or misleading. Lacking a clear disciplinary definition of the concept of creativity, these, as well as other myths and popular stereotypes, further complicate an already complex field. As stated earlier in this paper, exactly what constitutes creativity—as an object for teaching and assessment—remains vague, and a lack of stated, recognised standards suggests that the teaching and judgement of design creativity inevitably relies on the instructor’s subjective understanding of creativity. This, in turn, may potentially diminish transparency and consistency in teaching and assessment practices, and students may find themselves confused as to the requirements of their creative tasks.

The design process is a dual procedure that involves two continuous dimensions; namely *problem solving*, wherein the process begins with a set goal, and *concept generation*, wherein the process

begins even when the goal is absent (Yukari, 2009). Creativity has often been defined as a process of problem solving, but, as is suggested by the parallel process of concept generation, there is more to the process than this. Creativity and creative processes are as much about *problem definition* as they are about problem solving. This is identified by Sternberg and Lubart (1993) who argue that there are three insight processes that may lead to creative thinking, namely (a) *selective encoding* (noticing what is potentially relevant to understand and solve problems), (b) *selective comparison* (relating new and old information), and (c) *selective combination* (correlating appropriately connected information). These processes require knowledge and familiarity of the relevant field and domain.

These assumptions suggest that when teaching and assessing design creativity, it is necessary to consider, not only the final product, but equally the creative process leading up to it. The definition of creativity as the production of original and useful work emphasises the tangible outputs of creativity, but fails to consider the creative process, the creative person and the creative environment. Whereas the process and product are of main concern to design educators, attention should also be paid to the creative person (personality traits, intuition, intelligence, values, personal attributes, intrinsic motivation, experience and skills) and the creative environment (external motivation, social dynamics, pressure on the creative process or on creative individuals). The four aspects (person, process, product and press) have often been considered independently in the literature. However, as Margaret Portillo (1996) argues in her study of implicit theories of creativity in beginning design students, these four are interconnected. Portillo defines creativity as a multidimensional construct involving person, process, product and place (environment/ press). She argues that an understanding of the creative person and how personal factor intercedes with the three other aspects of creativity is essential to understanding creativity. Understanding creativity requires an understanding of cognitive characteristics as they relate to the creative process (aesthetic taste, imagination, integration and intellectuality, decisional skills and flexibility), motivational attitudes as they relate to the creative product (goal-orientation and seeking recognition for creative work), and personality traits as they relate to place (being unorthodox, challenging societal norms).

Portillo's theory can be classified as a confluence theory of creativity. Confluence approaches form part of what is often referred to as contextualist approaches to creativity, distinct from the individualist approaches characteristic of much of the psychological work on creativity. The contextualist approaches to creativity emerged during the 1980s when a group of psychologists turned to other social sciences such as sociology, anthropology and history with the aim of expanding the notion of creativity. They moved beyond the psychological emphasis on the individual and considered how creativity, creative abilities, creative processes and creative products reflect an interactive engagement between the individual and the social environment. In contrast to other contextualist approaches that emphasise the manipulation of environmental variables to increase creative production, confluence approaches perceive the sociocultural milieu as only one of many variables that form part of the concept of creativity. An example of such a theory is Mihaly Csikszentmihalyi's (1988; 1996; 1999) system theory. Csikszentmihalyi argues that:

[i]f creativity is to retain a useful meaning, it must refer to a process that results in an idea or product that is recognized and adopted by others. Originality, freshness of perception, divergent-thinking ability are all well and good in their own right, as desirable personal traits. But without some form of public recognition they do not constitute creativity (Csikszentmihalyi 1999: 314).

Creativity is a phenomenon constructed through the interaction between producer and audience; that is, creativity is the product of "social systems making judgements about individuals' products" (Csikszentmihalyi 1999: 314).

Central to Csikszentmihalyi's theory are the concepts of domain and field. These concepts refer to two salient aspects of the environment within which individuals operate; namely, the cultural, or symbolic, aspect (domain) and the social aspect (field). Creativity occurs when an individual makes a change to the symbolic system and when this change is adopted by the social organisation of the domain (the field). That is, creativity as a product occurs "at the intersection where individuals, domains, and fields interact" (Csikszentmihalyi 1999: 314). Csikszentmihalyi summarises the system view of creativity as follows:

For creativity to occur, a set of rules and practices must be transmitted from the domain to the individual. The individual must then produce a novel variation in the content of the domain. The variation then must be selected by the field for inclusion in the domain (1999: 315).

Csikszentmihalyi's system perspective maintains an emphasis on the contribution of the person to the creative process through an emphasis on cognitive processes, personality traits and motivation. It also identifies how these personal characteristics are insufficient (perhaps not even necessary) and that beyond the rules of the domain and the options of the field creativity cannot exist.

Csikszentmihalyi's theory represents only one example of many confluence theories that can help bring light on the question of creativity and establish a framework for teaching design creativity. It suggests that, although individual traits such as self-esteem, tolerance for ambiguity, risk-taking and willingness to persevere are linked to creative production (Gallagher, 1994: 175), more tangible factors which may be developed, improved and assessed are also part of creative performances. Moreover, Csikszentmihalyi's theory identifies the protracted nature of creative thinking and, accordingly, provides a framework for assessment in which creativity requirements reflect the educational stage of design students. This pragmatic definition of creativity is important to design education. As Jeffries (2007: 487) contends, the outcome of a design education is, ideally,

that students produce historically original work; ultimately, designs that are fresh and new to the domain. Pragmatically though, in terms of educational development, there is a hierarchy of attainment: achieved personal originality first then build towards historical originality with educational progression.

Conclusion

As previously identified, further research is required into the concept of creativity, the teaching of creativity and the subsequent assessment of students' creative outcomes. Creativity is a focus of design education and it is a stated learning outcome of the discipline. Accordingly, the need to confront the issue of creativity, including the challenge of defining it and developing strategies to facilitate its development, is a priority.

The above discussion illustrates how academics are only starting to fully appreciate the complexity of the concept of creativity. It has become apparent in recent research that creativity cannot be dismissed as being simply an innate capacity which happens, despite intentions and purposes. The evidence presented above identifies that creativity can be enhanced through effective teaching and learning strategies and their supportive assessment frameworks. The task in the coming years is to enhance the development of such teaching and assessment practices through the application of research-lead teaching.

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