

Creativity and design: an educational dilemma

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ABSTRACT: This paper explores the issue of creativity in design and considers its educational implications and in particular as it relates to assessment. The paper forms part of an ongoing Australian Learning and Teaching Council (ALTC) research project entitled *Assessing Creativity: Strategies and Tools to Support Teaching and Learning in Architecture and Design*, which rose from the 2008 ALTC Discipline Based Initiative (DBI) study into the architectural discipline across Australasia (Ostwald and Williams 2008a; 2008b). In the DBI study, Ostwald and Williams found that there is widespread confusion and disagreement surrounding assessment practices for design, in particular as they relate to creativity. The current study addresses this ambiguity and aims to arrive at a model of creativity and a set of strategies for assessing creativity in design education that may bridge theoretical and practical approaches to design creativity. This paper forms part of this process and reports on data collected during a symposium with Australian design academics and practitioners who met to discuss their perceptions and experiences of creativity and assessment of design students' creative works.

Conference theme: Design education

Keywords: design, creativity, assessment, architectural education

INTRODUCTION

During a recent symposium held in relation to the ALTC Project *Assessing Creativity: Strategies and Tools to Support Teaching and Learning in Architecture and Design*, one of the participants described design as a discipline 'where there is a *need* and an *expectation* to do things differently' (emphasis added). As explained by the participant, this refers to an embodied understanding of disciplinary requirements and a particular set of attitudes towards design developed through practice within the disciplinary field. The assertion points to the essential role of original and divergent thinking and practice; that is, the essential role of what is often described as creativity (Amabile et al. 1996; Casakin 2007; Elton 2006; Mayer 1999; Paulus & Nijstad 2003; Sternberg & Lubart 1999). Moreover, it suggests that understanding what constitutes originality and divergence within the field of design is an acquired knowledge that is beyond the reach of novice designers. This has vast consequences for design education and design educators. Firstly, it points to the necessity of acknowledging the critical role that creativity plays in design education; both as an educational outcome and as an educational tool. Secondly, it suggests a schism between design students and design educators/practitioners in their understanding of creativity as a domain specific requirement. Thirdly, it implies an inert, tacit and, to a degree, subjective understanding of design creativity; and understanding that may be beyond the realms of written curricula and course outlines. But, if this is so, how can students ensure learning and adopt successful learning strategies? How do students develop a clear understanding of the subject and its requirements?

If it is true that design is a discipline that requires and anticipates the production of new and different outcomes, or creative products, then this requirement and expectation must be translated into the educational sphere. It is, however, unclear exactly what creativity means in the context of education and the position and role it attains within design education. Answering the questions above and addressing the void within design education, a better understanding of what creativity means in relation to design more generally is required. This paper explores the issue of creativity in design and considers its educational implications and its role in assessment. The research presented here is founded upon an extensive literature review, as well as information gathered at the abovementioned symposium with leading design academics and practitioners. The paper is divided into three main parts: firstly, it considers the concept of creativity as it forms part of the design literature; secondly, it presents primary data that illustrates how creativity is perceived and theorised by design academics; and, thirdly, it explores some of the educational implications that result from what will be argued is a wide range of divergent opinions about the concept.

1. CREATIVITY AND DESIGN

McLaughlin (1993:43) states that:

[a]n implicit objective of much design activity is the development of a creative outcome. The highest achievements of most design disciplines are those products acknowledged to be creative.

Creativity is generally perceived as the *raison d'être* of design. Nonetheless, disciplinary research on the phenomenon of creativity and discussions of the concept are limited and engagement with the extensive body of

research on creativity that exists beyond the field of design is restricted. As a result of this, questions about the nature of creativity are rarely answered in any definite way and definitions of the concept tend to be vague and ambiguous.

The most common definition suggests that creativity relates to the development of ideas or work that has the quality of being both useful and original (Elton 2006; Mayer 1999; Paulus & Nijstad; Sterberg & Lubart 1999). Creativity is often linked to an idea about something different, something that challenges the status quo, or something that expands and breaks conventional ideas and boundaries. However, difference is not in itself enough; the original idea or work must also make sense within a particular context, it must maintain a level of appropriateness and usefulness. This understanding of creativity emphasises the balance between form and function, novelty and appropriateness, which guide most design efforts. Design is about the conceptualisation, communication and proposition of new realities, as well as about the search for solutions that, ultimately, fulfil intended functions. As such, design brings together the imaginative elements of the arts and the analytical and descriptive elements of the sciences (Alexioua, Zamenopoulou & Johnson 2009); it embodies the idea of creativity as the fusion of present realities (appropriateness) and future possibilities (originality).

Despite this preliminary definition of creativity, there remains much confusion about what creativity really means. For example, when speaking about creativity, are we speaking about creativity as an abstract phenomenon or as a practical reality? Are we speaking about it as a conscious, rational act or a sub-conscious or un-conscious consequence of practice? Are we referring to particular processes, to products with certain characteristics, or to particular traits and abilities held by individuals and/or groups?

These questions are touched upon but left largely unanswered in the design literature. Rather than critically and directly engaging with the concept of creativity, creativity is considered indirectly through an analysis of design problems, design processes and design products. Different perspectives are proposed, each of which are dependent on the authors' emphasis on design methodology (e.g. Dorst 1997), the design product (e.g. Kim et al. 2007; McLaughlin 1993), the designer (e.g. Casakin & Kreidler 2005a, 2005b; Christiaans 1992; Coyne 1997; Coyne & Snodgrass 1991; Durling 2003; Koloder & Wills 1996; Kreidler & Casakin 2009a, 2009b; Leon 1964; Meneely & Portillo 2005), the design process (e.g. Akin & Akin 1996; Cross 1997a, 1997b, 2000; Cross & Clayburn Cross 1995; Demirkan & Hasirci 2009; Garvin 1964; Hasirci & Demirkan 2007; Hertz 1992; Kim et al. 2007; Kim et al. 2005; Korth 2000), or the use of knowledge based systems (e.g. Gero & Maher 1993b; Mitchell 1993; Roseman & Gero 1993). Creativity has been described as 'an absolute, inheriting in the nature of particular kinds of processes' and as an 'essentially relativistic in emphasizing that [it] is recognizable only within a particular context' (Logan & Smithers 1993:40). It has been portrayed as a rational problem solving process (Simon 1992 [1967]) and as a reflective practice (Schön 1983, 1987). It has been described as the result of descriptive, linear problem-solving processes (Archer 1965; Elton 2006; Howard, Culley & Dekonick 2008) and as the result of processes in which problems and solutions, sub-problems and sub-solutions co-evolve (Akin & Akin 1996; Cross 2000; Demirkan & Hasirci 2009; Hasirci & Demirkan 2007; Hertz 1992; Korth 2000). Some authors emphasise the personal, inert and/or learnt skills of the designer, including representational skills, intuition, ability to work at different levels of abstraction and conceptual thinking skills (e.g. Cross 2000; Hasirci & Demirkan 2007; Milton & Hughes 2005; Mitchell 1993; Yamacli, Ozen & Tokman 2006). Yet others focus on the outcome of design processes as creative, emphasising the variables of novelty, utility and social value (e.g. Gero & Maher 1993a; McLaughlin 1993).

2. A MULTIPLICITY OF OPINIONS

In June 2010, following Human Ethics approval, the authors invited 22 senior design academics (see Table 1) to a symposium on defining and assessing creativity in design. Increasingly aware of the theoretical complexity outlined above, an underpinning goal of the symposium was to uncover whether a similar divergence and multiplicity of opinions would be displayed in practice, as suggested by design academics' perceptions, opinions and ideas about creativity.

The academics were asked to consider five questions about creativity and assessment, and to present a short position statement on the topic. As the speakers were all experts, ethics approval was sought to name participants under certain conditions as part of the reporting and analysis process. The five questions were:

1. What is 'creativity'?
2. How does creativity present itself in your discipline?
3. What role does creativity play in design?
4. What makes a person's actions or the products of their actions creative?
5. Can creativity be assessed and, if so, how?

The responses received illustrate a diverse range of opinions about, and understandings of, creativity and the assessment of creativity. The main approaches proposed by the symposium participants will be outlined in the remainder of this section.

Firstly, there was a clear divergence between those taking a largely pragmatic stance on the topic and those who adopted a theoretical approach. The pragmatists based their responses on their experience as designers and/or teachers, and presented statements that related directly to students' creative abilities, considering questions such as: what is it; how is it presented; can it be fostered and, if so, how; and how can it be assessed? Similar questions also underpinned the theorists' approaches, however, rather than basing their statements on the practical aspects of

teaching courses that contain creative dimensions, they based their answer on cognitive and psychological theories of creativity.

Geoff Clark was one of those who took a largely pragmatic approach to creativity. His response to the question 'what is creativity?' illustrates how he places his understanding of the topic upon his practice background. He argued that:

creativity is fairly complex, but I think it starts with, in terms of architectural design, the identification of the necessities or constraints of the problem [...] creativity for me is the recognition of the opportunities that lie between those necessities and constraints.

According to Clark, creativity presents itself through the development of built responses to design problems that successfully address what any project 'must', 'could' and 'should' do. This practical approach to creativity is contrasted by the theoretical response of Susan Savage who argued that creativity is

the result of interaction/s of various parts of the brain resulting in a productive type of thinking.

Her theoretical definition of creativity as a cognitive activity is largely founded upon neuroscientific research on the topic. She argued that creativity is essential to architecture; it represents a particular way of thinking that allows designers to handle (critically) a diverse range of variables and to order, reorder and prioritise these according to schemas that identify value and appropriateness. 'Creativity' is, according to Savage, the quality that allows a designer to imagine the possibilities, play around with these possibilities through recoding and decoding, reconfigure and align the various parts that relate to a problem thereby producing something of value. However, although Savage compares what she calls 'creative thinking' with 'design thinking', this definition of creativity places the phenomenon beyond the practical activities of architecture and design. As she explained: '[w]e don't know the cause of creativity; we don't know what 'makes' a person creative.' Hence, when considering the questions, she concluded that:

it [is] to not worry about the creativity thing, but to worry about the artefacts and the contribution of the knowledge to the discipline.

The implied rejection of 'creativity' in this quote was echoed by two other symposium participants. Brit Andresen argued that '[c]reativity is an unstable term' that has been 'hijacked' by academic and commercial sectors and 'pressed into the service of reductive thinking.' According to Andresen, there is a need to withdraw back to the discipline and consider the ways it is being used. In fact, she argued, 'you could even throw the term out' and from within the discipline work up a new alternative, subsequently creating an understanding of the disciplinary foundation of the concept. Similarly, Clare Newton explained that she tries to avoid using the word 'creativity', replacing it with concepts such as (wicked) problem-solving, reinvention, reinterpretation, lateral thinking, divergent thinking, flexible thinking, fluid intelligence, conceptual blending, hybrid thinking, and innovation. These alternative words draw the concept of creativity back to cognitive theory. It places the individual at the centre of a creative process leading to creative products or innovations. Newton argues that a so-called 'Eureka moment' is present in any creative process and that it occurs after 'really intense immersion and reflection' around a problem. The idea of a 'Eureka moment' or a 'creative leap' was also highlighted by Richard Tucker who argued that

[c]reativity is a two stage process, it's the first production and second development of ideas, where production is the initiating activities a designer undertakes to inform or inspire ideas. The differentiation of design from creativity is not straightforward, a simplification can be discussed in the following terms: cognitive psychology has defined design activities as problem-solving, where the problem is ill-defined and open-ended. Creativity in this design process is often characterised by the occurrence of a significant event, a creative leap, Clare's Eureka moment. So the most challengingly, it is often only in retrospect that the designer is able to identify a creative leap, and that identification is often unreliable.

Tucker's definition produces a conceptual dualism: on the one hand, it suggests creativity as a rational process consisting of the mutually dependent processes of production and development, whilst it on the other hand suggests an abstract, unconscious process or event (the creative leap). The presence of an inexplicable factor such as the 'creative leap' is embedded in many of the responses, though most of the participants emphasise the rational, conscious process leading up to this 'leap' and the real, practical nature of its outcomes. Des Smit, for example, argued that a creative person operates 'between the measurable and the unmeasurable'. Creativity occurs at the point 'where they [the measurable and the unmeasurable] click together.' Smith, much like Clark quoted previously, emphasises the need to identify the requirements and possibilities of a given situation, defining creativity as:

the intellectual and intuitive area where one senses the connections between the requirements and the possibilities of the situation, and with this one is able to embody the positive qualities of these connections within a production, whereby a new clarity is given to the situation touched by these requirements.

However, in contrast to Clark's highly pragmatic approach, Smith proposes a philosophical approach to creativity, which draws on the romantic ideas of creativity as something external to the individual. Citing Joseph Campbell, he argues that:

the creative spirit ranges out there in the universe[;] it happens everywhere and sometimes we check into it [...] aesthetic creativity is really proffering something, which I'm sure most of you have felt it, when you draw something which is 'on the money', you feel like it was sort of there anyway, you kind of uncovered it.

Similarly, Mirjana Lozanovska argued that creativity is drawn from a tension between the rational and the irrational. She proposed that the physical reality to which architecture relates ensures that the rational wins. However, it is when

a level of the 'irrational is preserved in the very fine product' that it can be called creative. Such work will 'suspend our disbelief in the ideal'; it 'touches our own creative impulses about something more than us.' Both Smith and Lozanovska speak of an 'intuitive' element to creativity and make reference to Plato's theory about the ideal world of which everything is nothing but a reflection. This externalisation of creativity proposes a philosophical basis on which the inexplicable elements of creativity may be based. However, its relevance within contemporary education is potentially problematic.

An alternative approach that also speaks of the measurable and unmeasurable aspects of creativity was presented by Suzie Attiwill who proposed that creativity is the production of new things or new arrangements of things. The notion of 'new arrangements of things' reflects the stance adopted by Attiwill's colleague, Andrea Mina, who argued that creativity is ultimately about reordering what already exists. Accordingly, it proposes a relational variable to which all creations can be compared; that is, creativity is embedded in difference. Attiwill proposed that creativity is identified through the distance between what has been created/produced and what already exists, arguing that:

this idea of the production of difference is really important to thinking about creativity, and um, it's sort of this measurable and unmeasurable aspect of it, with difference. Because you can have difference, which is actually difference from some things, so it can be measured, because it's just you know, a distance from something that already exists. But to have difference which is difference kind of in itself, is not measurable [...] this idea of if it is kind of about difference, then there's this idea of the relational and the contingent here.

The relational or contingent perspective of creativity draws the discussion away from its abstract, philosophical stance to a more practical, contextualised position. Attiwill focuses on the creative product, though she mentions the process leading to creative, or different, products by emphasising the need for 'continuous experimentation with the world of things', subsequently re-stating the role of the social, cultural and physical milieu in which creative acts take place. These social and contingent elements of creativity were emphasised by a number of participants. Louise Wallis, for example, argued that creativity relates to

the act to create a novel, a new idea or a product that's deemed a valuable contribution within the intended field, and judged so by its peers.

Wallis' definition reflects the contextualist approach to creativity as supported by psychologists such as Theresa Amabile (1983, 1996) and Mihaly Csikszentmihalyi (1988, 1996, 1999). It emphasises the role of the social and cultural context and of peer evaluation or judgement of creative outputs (ideas or products). This position was also supported by Harry Margalit who proposed a definition of creativity that emphasised imagination and social validation, arguing that 'creativity is the socially validation of imagination.' He explained this further in his written response to the symposium questions, where he noted that:

[t]o be creative is not only to imagine, describe or fabricate something new or unprecedented. Creativity implies that a social good attaches to the new thing, so that its qualities are recognised in relation to their uniqueness as well as their utility, insight, aesthetic value etc. Thus to be creative is to show a capacity that is socially admired or respected.

Margalit was only one of many participants who emphasised the idea of creativity as something that is socially significant and a high social good. This contextualised approach indicates a set of prerequisites to creative performance: firstly, it suggests an issue of mastery; you have to be able to master a field in order to be creative within it. This refers to both knowledge and analytical skills; the individual's ability to be creative depends on their understanding of present conditions and realities and their ability to identify the opportunities and constraints therein. As Margalit explains in the following statement, reflecting Attiwill's idea about the creation of difference, 'if you're going to be create something different, [you need to know] what exists now?' Moreover, there is a need for an understanding of the social, cultural, economic and political fields in which one acts. The creative output will be judged by a particular audience, and an awareness of the audience and the rules and boundaries that guide their judgements is required. Creativity occurs by challenging or bending these rules and boundaries, yet there is a need to retain a connection to the field and maintain a balance between convergence and divergence. This brings the idea of creativity back to the most common definition of creativity within the design literature; namely, creativity as the production of ideas or artefacts that are novel, yet appropriate. However, it moves away from the conventional emphasis placed upon the creative product and includes consideration of the person driving the creative act, the creative process, and the environment in which creativity occurs.

A similar perspective was proposed by Antony Radford. Radford argued that the key characteristic of creativity is 'a combination of novelty and value.' He emphasised the need to have both, arguing that 'novelty by itself is not enough'. These characteristics refer to the creative product, however he also emphasised the role of the creative person, process and situation, proposing that:

'the act of creating can refer to product, person, process and situation [...] The creative person involves a state of mind, the creative process involves play, exploration, openness [...] The creative situation, I've got relaxed but purposeful, it needs both of those to be creative, I don't think anyone's creative under too much pressure [...] [creativity relates to] this notion of being aware of the rules, being aware of specific patterns, but not following them.

A consequence of the emphasis placed on the rules and boundaries guiding creative practice suggest that creativity is domain specific. The question about the domain specificity or generality of creativity was brought to the table by various participants, including Barbara de la Harpe who argued that:

there is a generic level of creativity. So if you abstract it [...] it's [about] problem solving and critical thinking. But like every other attribute, they only take meaning in the context in which they are developed, 'cause there's no vacuous context.

Similarly, Kees Dorst argued that:

[w]hat you see is that [creativity] plays out differently on different levels of expertise [...] We also see that between the disciplines of design and architecture, it's professionalised differently, it takes different shapes, people do different things.

According to Dorst's assertion, creativity varies between domains and disciplines, as well as between levels of expertise. This argument is mirrored by the idea about mastery discussed previously; if creativity is a reflection of an individual's understandings and experiences, then her or his creative efforts would be expressed differently depending on her or his level of expertise. This proposition provides support to the education of creative disciplines; it suggests the relevance of education in the promotion and development of individual's creative potential. Moreover, it suggests creativity as characterised by levels of attainment whereby the creative work—in terms of process *and* product—will vary according to educational levels, and it justifies an expectation of heightened creative performance throughout students' educational journeys. The idea of levels of creativity was expressed by many of the participants in their use of concepts such as 'little c' and 'big C' creativity, the 'petit mal of creativity' and 'grand forms of creativity.' There was a general consensus amongst the participants that different expectations and requirements are placed upon first year students and students in their final stages of their degree, and that there is an expectation of creative advancement throughout courses as well as full degrees.

The concern about mastery and about levels of attainment yet again draws the notion of creativity back to the individual; to the creative agent. It suggests creativity as a personal trait, an ability, which can be fostered and developed. This ability is associated with an extensive list of attributes, including: imagination, originality, risk taking and struggle, exploration, playfulness, classification, order, inventiveness, problem solving, critical thinking, the capacity to transfer (communicate) thought, inspiration and perspiration, crafting and drafting skills, abstract thinking, naivety, passion and motivation. Although only a few participants directly stated the role of innate personal traits, almost all of the participants made reference to personality traits or skills that are required when producing creative work.

The emphasis placed, directly or indirectly, upon the role of the individual does not necessarily suggest that the symposium participants supported a romantic notion of creativity; wherein creativity is considered a special trait of a selected few. Conversely, most of the participants emphasised the person in relation to other aspects, such as situation or environment, product and process. One of the most clearly articulated statements in this regard was framed by Sandra Kaji-O'Grady:

the proverbial elephant in the room is the nature versus nurture division, the renaissance notion of being born under the sign of Saturn that was mentioned earlier, [which] sees creativity as an innate and compelling force of character that is fated by birth. Yet the question of aptitude and innate creativity is [...] at odds with an educational program which teaches creativity, and yet, [...] we've all experienced the limits of creativity teaching, everyone of us would have had a student where we think 'nothing is going to elicit the creative synapse in our discipline.' [...] So there is this question of whether creativity is something that comes to us and we foster, or whether it is something that can be overlayed through our educational programs [...] if we think about our creative aptitude in relationships to professional success, I'd say a very small part of it. Individual's family, economic, social class, attendance at high status architecture schools, apprenticeships with Master Architects, these things are much more accurate predictors of success in the profession.

Despite the presence of 'the person' in the participants' responses, it was only Kaji-O'Grady who directly addressed the role of nurturing environments. It poses an important element when discussing creativity in relation to design education, as it emphasises the need to acknowledge the experience and understanding of creative work that students bring with them when first starting their education. The educational dilemma posed by Kaji-O'Grady with regards to aptitude also highlights a sensitive issue; namely the recognition that some people do have greater creative talent than others (independent of whether this is a result of nature or nurture). This very fact became an element of great discussion later in the symposium, when a discussion rose about the presence of 'the person' as an item for assessment within the creative disciplines. Responding to a presentation that suggested that within architecture, design and art, students are assessed according to process, product and person, the participants expressed surprise at, and objection to, the presence of the 'person'. Those who found it controversial reflected an understanding of 'the person' as referring to 'innate talent' or 'born gifts', which, as identified by Kaji-O'Grady, is at odds with educational programs and assessment. However, 'the person' could refer to the student as a subject for learning, and assessment of 'the person' means assessment of the student's learning. The confusion that arose about the role of the person in assessment indicates the uncertainty that surrounds the question of creativity and creative ability. But what educational implications does this disciplinary confusion – as well as the multiple understandings of creativity proposed by the symposium participants' perceptions of the concept – impose?

3. EDUCATIONAL IMPLICATIONS

It is evident that the diverse opinions and theories that exist on the matter of creativity may cause a level of ambiguity. This ambiguity may potentially be strengthened by further complexity on the matter caused by opinions and ideas about the creativity held by students and embedded in the bureaucratic structures to which educators relate. The multiplicity of ideas is, however, not the major problem. Greater concerns are posed by the lack of a clear

understanding about the role of creativity and an unambiguous statement about the meaning of the term as it is used within particular courses or at particular institutions. For the students, the lack of clarity causes enhanced stress and frustration. This is particularly evident in relation to the assessment of students' (creative) work, as identified by Ostwald and Williams (2008a, 2008b). Ostwald and Williams found that the lack of defined learning and assessment outcomes as they relate to 'creativity' lead to high levels of stress and that the difficulties experienced in relation to identifying aspired learning outcomes causes frustration and dissatisfaction.

The confusion and disagreement that exist in relation to creativity and the assessment of creativity in design education is also problematic in relation to the increased demands of objectivity and transparency. There is a paradox embedded in contemporary design education; namely the contradiction between 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 at some level. 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. These do not, however, generally respond to the issue of creativity, which often remains an unarticulated subject of assessment.

CONCLUSION

Assessing and teaching creativity first requires an understanding of what creativity is. Moreover, it requires a demystification of the concept and a clear articulation of what it entails. Only when this is in place can students engage with the concept and the creative tasks they have been set; to critically participate in a process of self- and peer-assessment and learn through such formative assessment processes. As with any other aspects of learning that are subject to assessment, students must have the opportunity to familiarise themselves with the particular (discipline-specific) concepts they relate to. This does not suggest the need for a simplistic definition of the concept; indeed, any efforts at defining the concept of creativity as it relates to the discipline of design must acknowledge the complexity at stake.

In relation to education, it is important to emphasise the scaled nature of creative performance and its progressive nature. Students are not expected to produce grand levels of creativity as exhibited by the masters of their discipline. Conversely, within the constraints of their ability, they should be expected to produce exceptional acts that show richness of imagination founded in knowledge, combined with an understanding and respect of relevant fields, domains, requirements and boundaries. The various approaches of the design literature and the divergent understandings forwarded by the design academics who participated in the symposium should, and can, be synthesised into a multifaceted conceptualisation of design creativity, which acknowledges and positions creativity relative to conventional stereotypes and academic theory. Based on discussions in the literature and the conceptualisations forwarded by the design academics, it can be argued that creativity is not solely an outcome of a linear problem-solving process, nor is it the result of individual's skills and abilities seen in isolation. Rather, creativity results from an ongoing process of negotiation and transformation of problems and sub-problems, solutions and sub-solutions. This process is framed by the experiences, knowledge, skills and personalities brought to the problem by an individual or a group of individual, as well as by the context in which the problem is placed and to which it responds. Accordingly, understanding creativity as it relates to design and design education requires acknowledgement of process *and* product, as well as the social and individual aspects that guide these. Adopting such a multifaceted approach and educating students about the complexity of 'creativity' as a concept, as a phenomenon and as practice, may go some way to resolve the ambiguity that exist in relation to creativity in design, and, subsequently, positively inform design education and practice.

It is not the purpose of the project on which this paper is based to arrive at a final conclusion on what creativity is in relation to design or how creativity forms part of design processes. It is acknowledged that there may not be one single answer to these questions, and any attempts at defining creativity in design have to be aware of the level of variation that exists within the discipline itself. The idea about a multifaceted approach to creativity may, however, provide an umbrella under which more specific understandings and definitions related to the various sub-disciplines can be proposed. The project will continue to explore the concept of creativity in design education, with further interviews and focus groups with design academics and students to begin in September this year. The project ultimately aims to create a conceptual framework for understanding creativity, and to generate a set of shared terms and concepts and propose a set of best practice models that can be used when assessing the creative component of design students' work.

Table 1: Symposium participants

Name	Position	Affiliation
Brit Andresen	Professor	The University of Queensland; School of Architecture
Suzie Attiwill	Associate Professor	RMIT University; School of Architecture and Design
Deirdre Barron	Associate Professor	Swinburne University of Technology; Faculty of Design
Geoffrey Clark	Senior Lecturer	The University of Tasmania; School of Architecture and Design
Ian Clayton	Lecturer	The University of Tasmania; School of Architecture and Design

Kees Dorst	Professor	UTS; Faculty of Design, Architecture and Building
Barbara de la Harpe	Associate Professor	RMIT University; College of Design and Social Context
Jonathan Holmes	Professor	The University of Tasmania; School of Art
Amantha Imber	Founder	Inventium
Sandra Kaji-O'Grady	Professor	The University of Sydney; Faculty of Architecture, Design and Planning
Mirjana Lozanovska	Senior Lecturer	Deakin University; School of Architecture and Building
Harry Margalit	Associate Professor	UNSW; Faculty of Built Environment
Andrea Mina	Associate Professor	RMIT University; School of Architecture and Design
Shane Murray	Professor	Monash University; Department of Architecture
Clare Newton	Senior Lecturer	The University of Melbourne; Faculty of Architecture and Urban Design
Antony Radford	Professor	The University of Adelaide; School of Architecture, Landscape and Urban Design
Susan Savage	Professor	Queensland University of Technology; Faculty of Built Environment and Engineering
Des Smith	Professor	Deakin University; School of Architecture and Building
Mark Taylor	Associate Professor	Queensland University of Technology; Faculty of Built Environment and Engineering
Richard Tucker	Senior Lecturer	Deakin University; School of Architecture and Building
Robyn Tudor	Director of Learning and Teaching Enhancement	UNSW; College of Fine Arts
Louise Wallis	Lecturer	The University of Tasmania; School of Architecture and Design

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