

Eva Lutnæs

## Imagining the unknown

Responsible creativity for a better tomorrow

### **Abstract**

*This paper explores the scientific discourse on creativity in the field of design education, drawing upon 165 papers presented at the DRS//CUMULUS Oslo 2013 conference. The review shows creativity to be a key concept in the scientific discourse and identifies five story-lines that conceptualise creativity as a generic human capacity for which the field of design education eagerly claims responsibility. In the scientific discourse, the fostering of creativity is a leading motive when articulating reasons for design to gain terrain in general education. A multifaceted repertoire of strategies to solve design problems can drive new ideas or artefacts that contribute to both environmental protection and degradation, human aid or human-made disasters. I discuss how to frame the relevant educational content of creativity as part of a general education that empowers citizens to promote sustainability and meet global challenges ahead.*

*Keywords:* responsible creativity, design education, creative, assessment repertoire, general education.

### **Imagining the unknown**

Despite a growing number of climate-change mitigation policies, the annual emissions of greenhouse gases grew more quickly from 2000 to 2010 than in the three previous decades (IPCC, 2014, p. 6). The global mean temperature might rise to levels that cause a social and ecological collapse and we have not yet been up for the task of large-scale changes in our unsustainable ways of living. General education prepares students to step into the making and problem solving of tomorrow. David Orr (1992) describes the prerequisites to ecological literacy: “the study of environmental problems is an exercise in despair unless it is regarded as only a preface to the study, design and implementations of solutions” (Orr, 1992, p. 94). In order to act as responsible citizens, awareness of unsustainable consumerism and severe climate changes is crucial, but to evoke empowerment, students need to recognise their capacity to transform that reality. The declarative logic of natural science and the normative logic of design complement each other. Concerned with how things are, the natural sciences contribute to students’ awareness of environmental problems, but the capacity to transcend the known is the expertise of design. Design is concerned with how things ought to be (Simon, 1969). To create the sustainable future that does not yet exist, creative strategies that enable students to construct alternative modes of production, trade and consumption – to imagine the unknown – are a vital part of general education.

The *DRS//CUMULUS Oslo 2013 2nd International Conference for Design Education Researchers* aimed to explore the idea of design education as important for all citizens, a core component in general education to promote sustainability and meet global challenges for the future (Oslo and Akershus University College of Applied Sciences, 2012). The Chair of the conference, Liv Merete Nielsen, addressed the importance of a design-literate general public in the introduction of the conference proceedings:

For years we have promoted the idea that sustainable design solutions should include more than ‘professional’ designers; they should also include a general public as ‘conscious’ consumers and decision makers with responsibility for quality and longevity, as opposed to a “throw-away” society (Nielsen, 2013, p. i)

Nielsen promotes design education for all as a game changer for consumerism, enabling a bottom-up citizenry to be knowledgeable consumers demanding sustainable design solutions. Designers, policy makers, investors and consumers all make choices that will influence our future visual and material culture – the mitigation or continual growth of pollution and over-consumption. The results of human creativity take shape as both weapons and midwifery kits, machinery for rapid deforestation and plans to save imperilled bees. Creativity as a skill does not intrinsically imply support for the “*better tomorrow*” that Nielsen (2013, p. i) recommends as achievable by a design-literate general public. In this article, I draw upon 165 papers presented at the DRS//CUMULUS conference as samples to explore the scientific discourse in the field of design education in relation to the concept of creativity. The review situates creativity as a key concept in the scientific discourse of design education and identifies five different storylines about creativity. The second part of the article addresses the good practice challenges that Arts and Crafts teachers face when assessing creativity in the works of their students. The final section discusses how to frame the relevant educational content of creativity as part of a general education that empowers citizens to promote sustainability and meet the global challenges ahead.

### **Design education and creativity – a concept analysis on papers from DRS//CUMULUS**

With the strap line “Design Education from Kindergarten to PhD”, the conference gathered 278 delegates from 43 countries to explore the idea of design education as important for all. The organisers of the conference received 225 full papers. After a double-blind peer-review process, 165 papers were selected and included in the conference proceedings (Reitan et al., 2013). The papers total 2,330 pages and provide a vast database to explore the scientific discourses of design education in a transdisciplinary and international context anno 2013. I have conducted a brief concept analysis of how the field of design education frames ‘creativity/creative’ by exploring the diverse meanings applied to the concepts within the sample of 165 DRS//CUMULUS papers. The concept analysis derives from Soini and Birkeland’s (2014) approach when investigating the scientific discourse on the concept of ‘cultural sustainability’. They use storylines (Hajer, 1995, p. 56) as a semiotic tool to identify generative narratives used to give meaning to specific physical or social phenomena within a discourse (Hajer, 1995, p. 44). The discourse in my case refers to ideas, concepts and categorisations that are produced, reproduced and transformed in the practice of writing papers for a conference through which meaning is given to physical and social realities within the field of design education. Soini and Birkeland (2014, p. 215) describe storylines as a mechanism for creating and maintaining meaning that speaks to particular ways of constructing a problem. Given the broad scope of the conference, the DRS//CUMULUS papers use the concepts ‘creativity/creative’ in a wide variety of contexts and the authors put numerous different agendas in play. As an approach, storylines encompass the complexity of the scientific discourse on ‘creativity/creative’ and provide a semiotic tool to voice different narratives in the discourse.

The first phase of the concept analysis was a thorough word search on ‘creativ’ across the conference proceedings, designed to investigate how frequently the concepts ‘creative’ and ‘creativity’ appeared in the papers. I used Adobe Reader, searched through the 2,330 pages with the keyword ‘creativ’, and registered all the papers that make use of the concepts ‘creativity’ and/or ‘creative’ in the text and title in every session. The term ‘text’ here refers to the abstract and/or main body. I have not included the concepts if present in the acknowledgements or bibliographies of the 165 papers. The conference proceedings divide into four volumes and ten different sessions. Table 1, below, displays the results:

DRS//CUMULUS SESSION	PAPERS IN SESSION	CREATIVITY and/or CREATIVE IN TEXT	CREATIVITY and/or CREATIVE IN TITLE	VOLUME/PAGES
Introductions	3	3	0	Introductions/p. i-viii
Design Curriculum	19	17	0	Vol. 1/p. 2-250
Assessment	8	6	3	Vol. 1/p. 252-355
Internationalisation of design education	5	4	1	Vol. 1/p. 357-427
Philosophy of design education	18	15	1	Vol. 1, 2/p. 431-665
Design knowledge	17	10		Vol. 2/p. 667-905
Research informed design education – Design education informing research	18	14	1	Vol. 2,3/p. 907-1155
Multidisciplinary design education	18	14	2	Vol. 3/p. 1157-1418
Challenges in design education methods	31	24	2	Vol. 3, 4/p. 1420-1864
Design education for non-designers	26	22	6	Vol. 4/p. 1867-2248
E-learning	5	2	0	Vol. 4/p. 2250-2330
<b>TOTAL</b>	<b>165</b>	<b>128</b>	<b>16</b>	<b>2330</b>

*Table 1.* The use of the words ‘creativity’ and/or ‘creative’ across the 165 papers of the DRS//CUMULUS Oslo 2013 conference proceedings.

Conducting the word search on ‘creativ’, I found that  $\frac{3}{4}$  of the DRS//CUMULUS papers contained the concepts ‘creativity’ and/or ‘creative’ and that they appeared in 10% of the titles. The frequent use of the concepts ‘creativity’ and ‘creative’ within the DRS//CUMULUS papers situates creativity as a key aspect in the scientific discourses of design education. The terms ‘creativity’ and/or ‘creative’ feature in all the three texts in the introductions to the conference proceedings. In some papers, the concepts are keywords, extensively defined and used on nearly every page of the paper; in others, the concepts appear once. However modest the discussion is, the authors have contributed to the discourse on creativity in the context of design education. In the second phase of the concept analysis, I reviewed the scientific discourse sampled by the conference proceedings, searching for generative narratives – storylines – on what creativity is in the context of design education. Given the vast amount of text, the abstracts have been key to navigating through the proceedings and I have primarily focused my analysis on the papers in which creativity is a key aspect of the discussion. A more detailed analysis of all 128 papers that include the concepts ‘creativity’ and/or ‘creative’ could yield additional storylines and further nuances to those I have identified in this study.

### Storylines on creativity identified in the DRS//CUMULUS conference proceedings:

1. **Creativity is the core of design as a discipline.** This storyline is a statement by the authors Pillan, Maiocchi, & Radeta (2013, p. 618). Their statement gains strong support from the frequent use of the concepts ‘creativity’ and/or ‘creative’ that I found across the conference proceedings. In his introduction to the conference proceedings, Michael Tovey (2013), convenor of the DSR Design Pedagogy Special Interest Group, upholds creativity as the most fundamental quality that design students need in order to enter the community of practice of professional design.
2. **Creativity is not an ability exclusively for the field of design or design education.** Raffaella Perrone (2013, p. 1684) quotes Boden’s definition of the concept: “Creativity is the

ability to come up with ideas or artefacts that are new, surprising and valuable” (Boden, 2004, p. 1). Boden understands creativity as an aspect of human intelligence in general that enters virtually every aspect of life. Grace Schlitt (2013) further explicates the broad application of creativity: “By definition, creativity is the ability to transcend traditional ideas, rules, patterns and relationships, and to make meaningful new ideas, forms, methods, and interpretations” (Schlitt, 2013, p. 1356).

3. **Creativity means newness and expediency.** Perrone (2013) and Schlitt (2013) stress that the new idea or artefact must be meaningful or valuable. Innovative design is a unique solution that creatively satisfies a problem (Vande Zande, 2013, p. 2187). The newness derives from transcending the traditional or conventional in a surprising way; knowledge of prior solutions is deemed vital. Creativity is based on knowledge of previous work and the ability to see connections and relationships where others have not (Zhang, 2013, p. 418).
4. **Creativity is as a skill that people can learn.** Several papers explore how design education might cultivate creativity by describing exercises, activities and techniques across a span of education contexts, from kindergarten to design students (Zhang, 2013; Pillan, Maiocchi, & Radeta, 2013; Schlitt 2013; Kwon & Yang, 2013; Perrone, 2013; Taboada & Coombs, 2013; Yalcin, 2013; Canina, Coccioni, Anselmi, & Palmieri, 2013; Ingalls Vanada, 2013; Rinnert & Coorey, 2013; Seevinck & Lenigas, 2013; Vande Zande, 2013). A shared storyline across the interdisciplinary papers addresses creativity as learnable, and the idea that design education provides specific methods of generic value to adopt that cultivate creativity across sectors.
5. **Creativity advances economic competitiveness.** Several papers identify learning and managing creativity techniques as a prerequisite to innovation. Zhang (2013) describes a method to improve Chinese design students’ creativity as a means to change the current situation of ‘Made in China’ to ‘Created in China’. Canina and her co-authors (2013, p. 1909) suggest a creativity-training plan for companies as a key to succeed in the market. Preparing students for success in the globalised world economy is a goal of the *Partnership for 21<sup>st</sup> Century Skills* (2015). Several papers discuss the value of design education for enhancing creativity as a key 21<sup>st</sup>-century skill (Kim, Kwek, Meltzer, & Wong, 2013, p. 86; Rinnert & Coorey, 2013, p. 2135; Vande Zande, 2013, p. 2186; Wright, Wrigley, & Bucolo, 2013, p. 2217; Wright, Davis, & Bucolo 2013, p. 2231).

The five storylines situate creativity as a generic human capacity for which the field of design education eagerly claims responsibility. Across the interdisciplinary papers from the DRS//CUMULUS conference, creativity is embraced as a skill to learn and several papers promote the value of techniques derived from the design process of problem solving as generic methods to cultivate creativity. In the initial word search, I found that the session “Design education for non-designers” had the most frequent use of ‘creativity/creative’ in titles: authors of six papers (out of 26) regard ‘creativity/creative’ to be such an important aspect of their discussion that they included it in the title. The concepts appeared in 22 of the papers in the session. Given the title of the session, the frequency indicates that creativity constructs a widespread narrative in the scientific discourse when legitimising the value of design education to non-designers. Vande Zande’s (2013) paper in that session offers a significant example because it concludes thus: “one of the most effective ways to get support is to educate business leaders that creativity and innovation are important aspects of design education and it is giving them what they ask for in our society and future workforce” (Vande Zande, 2013, p. 2193). The fostering of creativity surfaces as a leading motive in the scientific discourse when articulating reasons for design to gain terrain in general education. The fostering of creativity necessitates learning, but in my paper for the DRS//CUMULUS conference (Lutnæs, 2013) I described an alarming lacuna in the assessment repertoire of Norwegian Art and Crafts teachers; one of the subject’s main concepts, creativity, is only weakly linked between learning and assessment. The teachers struggle to find words to describe what makes students’ design creative. There is nothing to the concept when I dig beneath the surface and it ends up being an inherent ability that the subject allows students to

make use of, not something specific to learn and expand through Art and Crafts classes. In order to claim responsibility for this generic human capacity in general education, the Art and Crafts teachers' educational deficit with regard to creativity makes it an area to advance substantially.

### **Teachers' educational criticism – the public face of connoisseurship**

The assessment of students' work is an act of connoisseurship and educational criticism, qualities that Elliot Eisner (2002) distinguishes between in his book *The Arts and the Creation of Mind*. Connoisseurship is a process that can be carried out in solitude and without uttering a word. Educational criticism is the task of making public what one has experienced as a connoisseur and requires words (Eisner, 2002, p. 187). As the silent act of connoisseurship can be elusive as empirical material, I have studied the "public face" (Eisner, 1991, p. 85) of connoisseurship, educational criticism. More specifically, I observed teachers when negotiating students' final grades and interviewed them regarding their assessment practice. I chose to do fieldwork amongst two teams of good practice Art and Crafts teachers. The concept of 'good practice' refers to profiled, educated, experienced and admired teachers. My agenda as a researcher was to explore what teachers valued after ten years of compulsory education in the subject Art and Crafts and to discuss the content that their assessment practice facilitated.

The grade given in the subject Art and Crafts equates with grades given in subjects such as English, Science and Norwegian in the certificate awarded to all students when they leave their ten-year compulsory schooling. The grades that the teachers make use of range from 1 to 6, with 1 the lowest grade and 6 the highest. The current curriculum, "Knowledge promotion" (Kunnskapsdepartementet, 2006), provides learning objectives but does not state expected levels of achievement, as is done, for example, in Sweden and England. The development of assessment criteria that echo the complexity of the main subject areas of visual communication, design, art and architecture is part of each teacher's professional responsibility. The fieldwork was limited to the negotiation of the final grade, summing up the students' achievements after ten years of compulsory education in the subject Art and Crafts. I was in the midst of the teachers' assessment practice for nearly two months, attending their meetings, listening to their negotiations, conducting interviews and collecting the assessment tools they used. This combination of methodology was chosen to document thoroughly the challenges and dilemmas of assessment in the subject, and the vocabulary and strategies teachers draw on to solve them.

### ***Negation of meaning***

I analysed the teachers' assessment repertoire as locally negotiated regimes of competence, drawing upon Etienne Wenger's (1998) theory on the negotiation of meaning. Wenger makes a distinction between the repertoire the members of a community of practice have produced and the repertoire they have adopted (Wenger, 1998, p. 83). When assessing the work of their students, the teachers can draw upon the history of their profession, and thereby adopt earlier solution strategies and concepts used as descriptors of quality. They also have their own history of negotiations to reuse as a repertoire when they face similar dilemmas of assessment (e.g. what grade should they give products they suspect to be finished by a parent or to products half-finished because of a long period of truancy?). These histories of interpretation create shared points of reference, but, as Wenger states, "they do not impose meaning" (Wenger, 1998, p. 83). As a resource for the negotiation of meaning, the repertoire remains inherently ambiguous; ambiguity is a condition of negotiability. The teachers negotiate which part of history to make "newly meaningful" (Wenger, 1998, p. 137) when assessing students' work within their local school context and current national curricula. By choosing a good practice approach, I conducted my fieldwork amongst the connoisseurs, educated art and

crafts teachers who know the repertoire. Their way of solving dilemmas of assessment document the profession's capability, because the locally negotiated regime of competence reflects the repertoire available for adoption. In this paper, I revisit the fieldwork with the scope limited to the assessment of creativity.

### **Assessment of creativity in the subject Art and Crafts**

When they negotiated the students' final grades in the subject Art and Crafts, all the teachers valued craftsmanship. They expected the technical conventions explained in class to be repeated in the objects made by their students. However, it was not sufficient to demonstrate excellent craftsmanship by copying an idea of the teacher or fellow students. In order to achieve the highest grades, the students were expected to develop their own, original designs, to add their own creative twist to the objects in question. As I analysed the teachers' assessment repertoire, a distinction became apparent. They all had a well-functioning linguistic repertoire related to the assessment of technical performance but struggled to find words to describe what made students' designs original or creative. Their struggle is an indicator of an assessment repertoire that can cause the teacher problems when providing criticism. How can the teachers promote creativity if they lack words to identify achievements? Creativity and originality surface as assessment criteria in both the assignments and the rubrics used by the teachers to document their assessment of students' work. These concepts appear as a prioritised aspect of students' work in the subject Art and Crafts. In the following sections, I will describe two cases from the fieldwork and discuss the challenges good practice teachers face.

### ***School B - Creativity as the unpredictable element of surprise***

In a group interview, a team of three teachers started an extensive discussion when I asked them to describe what they put value on concerning the assessment criteria for creativity in their assignment on contemporary art. The teacher who first answered linked the assessment of creativity to the subjective preferences of each teacher. Creativity depended on what the teachers liked, identified as "exciting and resilient" (Lutnæs, 2011, p. 186). This descriptor makes quite an unpredictable compass for the students and I continued by asking the teachers how they explain the assessment of creativity to their students. Another teacher stated that creativity is about creating the new, to create something that is new to you. With this approach, creativity depends on the students' earlier achievements. Two seemingly identical works would be given different grades, a low score to the student who just replicated a previous success and a high score to the student who freshly unpacked the same concept.

My next step as a moderator of the discussion was to reactivate the teachers' preferences as a compass when assessing creativity by asking what would happen if a student made something "new to him or her" and the teacher did not like the design. The third of the teachers participating in the group interview replied, "You do not even need to like it, but you could be surprised" (Lutnæs, 2011, p. 187). The moment of surprise as an important aspect of creativity was supported by another teacher, who gave examples from art history of works that had surprised in their time. He explained that new, surprising artworks arise as a result of previous artworks; it is a twist, a response to history. He continued by saying, "If you have that skill, then you are creative" (Lutnæs 2011, p. 188). I remarked that it is demanding for students in tenth grade to reach this level of performance. The teachers agreed and returned to their "creative for you as an individual" path, but as their discussion evolved, they ended up downplaying this as relevant assessment evidence; they claimed to assess the students' products as they are, and not by comparing them to the students' previous design processes.

In summary, creativity emerges as a volatile concept in their assessment repertoire, an unpredictable element of surprise. The teachers were not able to identify a robust set of de-

scriptors they could agree upon related to creativity in their joint assignment on contemporary art. Given this absence, creativity seems more like a buzzword, an ornament on the subject's public façade rather than the public face of Art and Crafts teachers' connoisseurship.

### ***School A - Originality in works of students***

At the other school I visited as a researcher, a teacher used the word 'originality' when assessing objects in wood. In an individual interview, she told me that assessment of originality is limited to the varieties within the class and the school, not the whole world. It is not regarded as original if students copy an idea they have seen in the previous year's exhibition or one of the teacher's examples. To assess whether students' works are original or not, one needs in-depth knowledge about what happened during a project. This criterion makes the students' teacher the sole connoisseur. The teacher is the only one who knows what design solutions she or he made available in class as examples, not to speak of which one of the students originated an idea first.

One need not be an Art and Crafts teacher for long to discover how ideas percolate amongst a group of students, especially the ideas that are appraised by a teacher in class. Sharing ideas could be seen as a sign of a sound and dynamic setting for learning, but, because the impending assessment values unique and independent ideas as proof of originality, it could be recognised as a problem. The students tend to hide their sketches or to make sure that the teachers keep track of whom to reward as the originator and whom to mark down as the copycats. The teacher revealed doubts about the relevance of assessing originality in students' work; when she appraises an idea of a student, it usually turns out that the student has seen a similar object elsewhere. Then, she said, the idea is not as original as first anticipated, and continued, "Maybe it is stupid to put as much value on originality as we do. Most things are already thought of ... What is the good in always expecting works to be original? Maybe we should return to the practice where students replicated the teacher's models?" (Lutnæs 2011, p. 197). The teacher drew my attention to the students' works on the wall behind us and stated that all of them were slight variations of the same design – a design developed by the teacher. The students had redesigned the teacher's model and her doubts about expectations of originality were most reasonable.

### **A weak link between learning an assessment.**

The assessment of creativity in the teachers' assessment repertoire is linked to the assessment of the final object. In the interviews, the words 'creativity' and 'originality' are used interchangeably, directed towards the *outcome of making*, not the *process of innovative problem solving*. Seemingly, they look at an object made by a student and ask, "Is this creative? Does this object convey proof of an independent design solution?" Michl (2002) challenges the idea amongst design students that it is best not to be inspired by others:

It is a fact that all designers, the outstanding ones as much as the mediocre or inferior ones, always build on, modify and continue the work of other designers, and that no one can avoid doing precisely this. (Michl, 2002, p. 12)

Michl presents 'redesign' as a more appropriate notion for the practice of designing to underline the collective and evolutionary dimensions of designing. Originality is a utopian aim for students at lower secondary school, who are most likely making a first attempt to create within whatever specific field of art and design the teacher has introduced them to. Still, what concerns me more is that the striving for originality obscures what students could learn by exploring prior objects and professional art and design practices. The ideal to create a product

uninfluenced by others is counterproductive to learning. Michl illustrates this by a striking example:

If a student makes his own originality his goal, he will try, logically and naturally enough, to defend his own individual artistic “innocence” against what he sees as harmful external influence. This leads to a fundamental hostility to learning – because learning always implies being influenced by others and acquiring other people’s solutions and approaches (Michl, 2002, p. 12).

Michl (2002) shows how the ideal of originality makes teachers’ instruction difficult. In my fieldwork amongst Art and Crafts teachers, I found that the period of awaiting assessment further restrains teachers in the first phase of a project. With assessment criteria such as originality and creativity, the teachers find themselves caught in an educational trap: If they aid the students, they could end up assessing their own ideas. Without help, some of the students would not proceed from the drawing board to the making of objects. This dilemma is acknowledged by the teachers in my fieldwork as part of their daily life. True to a tradition that the initial idea should come from the students, their strategy is to keep back and try to get students started by asking questions. If they have to provide ideas and a student makes a product based on exactly the same idea, the consequences take the form of a lower grade. It is regarded as unfair to assess such a product, based on the idea of a teacher, on the same level as a product based on an idea developed exclusively by a student. In the first phase of a project, the teachers are sidelined, patiently waiting for original ideas to pop up amongst the students. Then they can re-enter the scene and aid the students in the realisation of their ideas. As mentioned earlier, when it comes to craftsmanship, in a narrow understanding, as skills to make ideas real, the students are expected to reuse the technical conventions developed by earlier generations of makers. Strategies of construction and the use of tools to manipulate and transform materials into the intended object are free to copy. The ideal of originality is preserved in form and content. Originality is the assessment evidence of creativity, and seems to be something that just happens or does not. Some students come up with spontaneous and unique design solutions that fit the teacher’s specifications; others remain frustrated and have to ask for the teacher’s help, which, from previous experience, they know will lower their grade.

This approach makes creativity something you possess, an inherent ability the subject allows you to make use of, not something to learn and expand through Art and Crafts classes. The assessment evidence, which the teacher values as creativity, is not a continuum of a learning process planned by the teacher. Framing creativity as independent ideas produces a weak link between learning and assessment. The teachers wait for unique ideas to surface in the students’ sketches, while the students, caught in a culture that disparages sharing, protect their ideas and their artistic innocence from the repertoire of generations of makers within the fields of art and design. The assessment evidence, independence, is counterproductive to learning and reveals an urgent need for reframing the concept of creativity. A catalyst for change would be a shift from the emphasis on the *outcome of making*, framed as “unique” design solutions, to the emphasis on the actual act of making, *the process of innovative problem solving*. In my view, a multifaceted repertoire of strategies to solve design problems is the relevant educational content of creativity. These repertoires do not evolve from teachers handing out white sheets of paper and a strategy of patient waiting for “original” ideas; it requires teachers that claim an active role as cultivators of creativity – teachers who teach specific tools to adopt in the act of making. The focal point in the subsequent assessment would be on how the students utilise the learned repertoire in the process of problem solving.



### **Repertoires available for adoption**

The assessment repertoire of teachers sets the direction for desired learning outcomes and paves the way for the skills, identity and ambitions that general education seeks on behalf of future generations. The DRS//CUMULUS-paper “Wicked Futures” (Hooper, Welch, & Wright, 2013) addresses how an educational environment that requires considerable amounts of assessment tends to favour convergent thinking over creativity, and divergence as creativity is difficult to assess fairly. The assessment repertoire of good practice art and crafts teachers in my study confirms this distinction. In terms of creativity as an unpredictable element of surprise, the students at School B hardly got a fair assessment, but expectations of craftsmanship were well defined and subject to clear rules, framed as ‘tame’ problems (Coyné, 2005). Hooper, Welch, & Wright (2013) argue that the big issues that will dominate students’ adult lives are “wicked problems”, like the complex problem of refuturing our world (Fry, 2009). To face what Hooper, Welch, & Wright (2013) refer to as the “perfect storm” of climate change, the development of a repertoire that assesses creativity fairly is a leverage point (Meadows & Wright, 2008). The assessment repertoire makes a vast footprint on the education of future citizens, and makes it an area to cultivate accordingly.

Locally negotiated regimes of competence reflect the repertoire available for adoption, and the development of a repertoire to teach and assess creativity implies the joint responsibility of both classroom teachers and researchers. The Swedish professor Lars Lindström (2006) approaches the challenge of assessing creativity in an exemplary manner by the questions he asks in the article “Creativity: What Is It? Can You Assess It? Can It Be Taught?” The article is based on a research project (Lindström, 1999) that identified four dimensions of creative ability, and developed and tested a rubric describing levels of performance related to four process criteria: investigative work, inventiveness, the ability to use models and the capacity for self-assessment. In the article, Lindström takes the research project one step further by giving advice on how the four dimensions of creative ability can be taught, thus making the crucial link between learning and assessment that is weak when it comes to creativity, as seen in my studies (Lutnæs, 2011, 2013). Further links are made by other research projects (Gardner, 1996; Atkinson, 2001; Kimbell, 2005; Lindström, 2005; Borg, 2008; Kreitler & Casakin, 2009). A multifaceted repertoire of strategies to solve design problems can drive new ideas or artefacts that contribute to both environmental protection and degradation, human aid or human-made disasters. Considering the socio-ecological transition ahead, what would make a relevant framing of creativity as part of a general education that empowers citizens to promote sustainability and meet global challenges for the future?

### **Framing creativity as part of general education**

Comprising the scientific discourse in the DRS//CUMULUS conference proceedings, creativity is defined as the ability to make valuable and meaningful new ideas based on knowledge of previous work. Still, what makes an idea valuable and to whom is it meaningful? In the second phase of the concept analysis, I identified five different storylines in the scientific discourse on creativity in the field of design education. Storyline 5, “Creativity advances economic competitiveness”, relies on a recognition of creativity as one of the main driving forces of economic development. New ideas, forms and methods are judged meaningful in terms of business. In this, creativity strengthens just one out of three mutually reinforcing pillars of sustainable development (United Nations, 2002), namely, economic development, at the expense of social development and environmental protection. The creativity of designers has to pair up with other concepts to transform conditions of unsustainability. In the final phase of the concept analysis, I searched the DRS//CUMULUS papers for options.

Wright, Davis and Bucolo (2013) pair ‘creative’ with the concept ‘citizen’ in their paper on the value of design education in the knowledge economy. The authors do not define

the idea of ‘creative citizen’, however. In the introduction to the paper, the concept of ‘citizen’ is linked to the *Partnership for 21st Century Skills* and the ability to thrive in the global skills race to ensure economic competitiveness. In response to the motivation of the research study, one of the survey respondents voiced concern about prioritising the economy as a goal of design education given the compelling need to change our thinking fundamentally, at both a local and global level. “The Earth is finite yet we continue to plunder and trash it at an increasing rate” (Wright, Davis, & Bucolo, 2013, p. 2238). The survey respondent sees design thinking as a key to changing our worldviews and mitigating ecological change, not as a way to sell more stuff. When the authors propose recommendations for the future development of design education programs in Queensland, the focus is on design’s value in building innovative, adaptive and resilient communities. Their creative citizen remains an agent for economic competitiveness, however, because concerns for the environment and social inequities are not made explicit.

Boehnert (2013) stresses the link between ecological literacy and design as she upholds systemic understanding, ecological knowledge and critical skills as foundations of responsible design. Mateus-Berr and her co-authors (2013) address responsible design in their paper on the social responsibility of designers and criticise the way that established design strategies reinforce global capitalist desires and create desire for new products. The authors argue that designers have played a considerable role in shaping today’s consumerist culture by providing their skills and talents (Mateus-Berr et al., 2013, p. 433), and they call for a shift of focus in which design does not refer to the shaping of consumable items but to the creation of structures that aim at improving quality of life. Sevaldson (2013) describes systems-oriented design as an approach to deal with complexity as a designer to reach solutions that combine ethical issues with sustainability, economy, new technology and social and cultural considerations. Ingalls Vanada (2013) makes big picture thinking a central issue in her paper on how to educate tomorrow’s change makers and problem solvers. With a view towards fostering deep, connected, and independent thinkers, she balances creativity with practical wisdom and the ability to think critically.

Boehnert, Mateus-Berr, Sevaldson and Ingalls Vanada’s shared agenda is to make responsibility for and concern about the wider social and environmental impacts of design solutions an imperative when judging new ideas as meaningful or valuable. Drawing upon Vande Zande’s (2013) conceptualisation of innovative design as unique solutions that creatively satisfy a problem, the ethics of designers derive from the problems they choose to solve. Cultivating creativity as part of general education can empower destruction just as much as transitions towards more sustainable modes of production, trade and consumption. In *Creativity in Schools: Tensions and Dilemmas*, Craft (2005) states that, “Promoting children’s creativity in the context of wider ethical dimensions of our existence is not an optional extra” (Craft, 2005, p. 149). She refers to the alarming findings of the GoodWork project (Fischmann, 2004) on how young workers assert themselves as the ultimate judges of the ethics of their work and espouse a dubious brand of moral freedom. The interconnectedness to the natural world and other humans is lost when individual aspirations determine the appropriateness of ideas and actions.

### **Cultivating responsible creativity**

Craft (2005, p. 150) makes use of the notion of ‘responsible creativity’ in describing the GoodWork project’s concern with human creativity and its agenda of supporting the evolution of thoughtful, responsible creativity among aspiring young people. Craft argues that the fostering of creativity in its ethical context is applicable to all young people if we are to expect of them responsible actions as citizens, both at home and at work. Adopting Craft’s notion of responsible creativity as part of a general education that empowers citizens to promote sus-

tainability and meet global challenges yields implications for both teaching and the subsequent assessment of students' process of innovative problem solving. In cultivating responsible creativity, teachers have to consider the ethical potential when choosing the problems for students to solve. It makes a vast difference whether students are asked to design desirable products to increase sales or to design useful, lasting products to improve quality of life or to mitigate pollution. In class, a core part of the teacher's role would be to draw the students' attention to the wider social and environmental impacts of design and engage them in critical scrutiny of their own and their classmates' ideas. The teacher should expect the students to connect to the world beyond their white sheets of paper and explore new modes of production, trade and consumption, based on real-world knowledge. The key to assessing their design process as valuable and meaningful is how the alternatives they propose satisfy real-world problems responsibly and towards a better tomorrow.

**Eva Lutnæs**

Postdoc, PhD

Faculty of Technology, Art and Design

Oslo and Akershus University College of Applied Sciences

Email address: [Eva.Lutnas@hioa.no](mailto:Eva.Lutnas@hioa.no)

## References

- Atkinson, D. (2001). Assessment in Educational Practice: Forming Pedagogised Identities in the Art Curriculum. *International Journal of Art & Design Education* 20(1), 96-108. doi: 10.1111/1468-5949.00254
- Boden, M. A. (2004). *The creative mind. Myths and mechanism*. 2nd edition. London and New York: Routledge.
- Boehnert, J. (2013). Ecological Literacy in Design Education: A Foundation for Sustainable Design. In Reitan, J. B., Lloyd, P., Bohemia, E., Nielsen, L. M., Digranes, I. & Lutnæs, E. (Eds.), *Design Learning for Tomorrow. Design Education from Kindergarten to PhD. Proceedings from the 2nd International Conference for Design Education Researchers vol. 1.* (pp. 442-457). Oslo: ABM-media
- Borg, K. (2008). Kreativitet eller problemlösning – vad bedömer vi i slöjden?. In *Slöjda för livet om pedagogisk slöjd*, edited by Kajsa Borg, and Lars Lindström, 199–210. Stockholm: Lärarförbundets förlag.
- Canina, M., Coccioni, E., Anselmi, L. & Palmieri, S. (2013). Designing a creativity training plan for companies. In Reitan, J. B., Lloyd, P., Bohemia, E., Nielsen, L. M., Digranes, I. & Lutnæs, E. (Eds.), *Design Learning for Tomorrow. Design Education from Kindergarten to PhD. Proceedings from the 2nd International Conference for Design Education Researchers vol. 4.* (pp. 1907-1923). Oslo: ABM-media.
- Coyne, R. (2005). Wicked problems revisited. *Design Studies*, 26(1), 5–17. doi: 10.1016/j.destud.2004.06.005
- Craft, A. (2005). *Creativity in Schools. Tensions and Dilemmas*. London: Routledge. doi: 10.4324/9780203357965
- Eisner, E. W. (1991). *The Enlightened Eye: Qualitative Inquiry and the Enhancement of Educational Practice*. New York, N.Y.: Macmillan Publ. Co.
- Eisner, E. W. (2002). *The Arts and the Creation of Mind*. New Haven: Yale University Press.
- Fischmann, W., B. Solomon, D. Greenspan, H. Gardner. (2004). *Making Good. How Young People Cope with Moral Dilemmas at Work*. Cambridge: Harvard University Press.
- Fry, T. (2009). *Design futuring: sustainability, ethics and new practice*. Sydney: UNSW Press.
- Gardner, H. (1996). The Assessment of Student Learning in the Arts. In D. Boughton, E. W. Eisner, and J. Ligtvoet (Eds.), *Evaluating and Assessing the Visual Arts in Education: International Perspectives*, (p.131-155). New York: Teachers College Press.
- Hajer, M. (1995). *The Politics of Environmental Discourse*. Oxford: Oxford University Press.
- Hooper, L., S. F. Welch & N. Wright. (2013). Wicked Futures: metadesign, resilience and transformative classrooms. In Reitan, J. B., Lloyd, P., Bohemia, E., Nielsen, L. M., Digranes, I. & Lutnæs, E. (Eds.), *Design Learning for Tomorrow. Design Education from Kindergarten to PhD. Proceedings from the 2nd International Conference for Design Education Researchers vol. 3.* (pp. 1269-1281). Oslo: ABM-media.
- Ingalls Vanada, D. (2013). Practically Creative: The Role of Design Thinking as an Improved Paradigm for 21st Century Art Education. In Reitan, J. B., Lloyd, P., Bohemia, E., Nielsen, L. M., Digranes, I. & Lutnæs, E. (Eds.), *Design Learning for Tomorrow. Design Education from Kindergarten to PhD. Proceedings from the 2nd International Conference for Design Education Researchers vol. 4.* (pp. 2048-2063). Oslo: ABM-media.
- IPCC, (2014). *Climate Change 2014. Mitigation of Climate Change. Summary for Policymakers*. Retrived January 15, 2015, from <http://mitigation2014.org/report/summary-for-policy-makers>
- Kim, J., S. H. D. Kwek, C. Meltzer, P. Wong. (2013). Classroom Architect: Integrating Design Thinking and Math. In Reitan, J. B., Lloyd, P., Bohemia, E., Nielsen, L. M., Digranes, I. & Lutnæs, E. (Eds.), *Design Learning for Tomorrow. Design Education from Kindergarten to PhD. Proceedings from the 2nd International Conference for Design Education Researchers vol.1.* (pp. 1282-1297). Oslo: ABM-media.
- Kimbell, R. (2005). Assessing Design Innovation. In L. Lindström (ed.), *Technology Education in New Perspectives: Research, Assessment and Curriculum Development*, (p. 17-35). Stockholm: Stockholm Institute of Education Press (HLS).
- Kreitler, S. & Casakin, H. (2009). Self-perceived Creativity. The Perspective of Design. *European Journal of Psychological Assessment*, 25(3), 194-203. doi: 10.1027/1015-5759.25.3.194
- Kunnskapsdepartementet. (2006). *Læreplanverket for Kunnskapsløftet*. Midlertidig utg. juni 2006. Oslo: Utdanningsdirektoratet.

- Kwon, D. E., & S. H. Yang. (2013). An effect of multidisciplinary design education: creative problem solving in collaborative design process. In Reitan, J. B., Lloyd, P., Bohemia, E., Nielsen, L. M., Digranes, I. & Lutnæs, E. (Eds.), *Design Learning for Tomorrow. Design Education from Kindergarten to PhD. Proceedings from the 2nd International Conference for Design Education Researchers vol. 3.* (pp. 85-100). Oslo: ABM-media.
- Lindström, L., Ulriksson, L. & Elsner, C. (1999). Portföljvärdering av elevers skapande i bild, Utvärdering av skolan 1998 avseende läroplanernas mål. Stockholm: Skolverket.
- Lindström, L. (2005). Novice or Expert? Conceptions of Competence in Metalwork. In L. Lindström (ed.) *Technology Education in New Perspectives: Research, Assessment and Curriculum Development*, (p. 61-83). Stockholm: Stockholm Institute of Education Press (HLS).
- Lindström, L. (2006). Creativity: What Is It? Can You Assess It? Can It Be Taught?. *The International Journal of Art & Design Education*, 25(1), 53-66. doi: 10.1111/j.1476-8070.2006.00468.x
- Lutnæs, E. (2011). Standpunktvrdering i grunnskolefaget Kunst og håndverk. Læreres forhandlingsrepertoar. CON-TEXT, Avhandling; 52. Arkitektur- og designhøgskolen i Oslo.
- Lutnæs, E. (2013). Creativity in the subject Art and Crafts: the weak link between learning and assessment. In Reitan, J. B., Lloyd, P., Bohemia, E., Nielsen, L. M., Digranes, I. & Lutnæs, E. (Eds.), *Design Learning for Tomorrow. Design Education from Kindergarten to PhD. Proceedings from the 2nd International Conference for Design Education Researchers vol. 1.* (pp. 317-329). Oslo: ABM-media.
- Nielsen, L. M. (2013). Design Learning for Tomorrow – Design Education from Kindergarten to PhD. In Reitan, J. B., Lloyd, P., Bohemia, E., Nielsen, L. M., Digranes, I. & Lutnæs, E. (Eds.), *Design Learning for Tomorrow. Design Education from Kindergarten to PhD. Proceedings from the 2nd International Conference for Design Education Researchers vol. 1-4.* (pp. i-iii). Oslo: ABM-media.
- Mateus-Berr, R., Boukhari N., Burger, F., Finckenstein, A., Gesell, T., Gomez, M. ... Verocai, J. (2013). Social Design. In Reitan, J. B., Lloyd, P., Bohemia, E., Nielsen, L. M., Digranes, I. & Lutnæs, E. (Eds.), *Design Learning for Tomorrow. Design Education from Kindergarten to PhD. Proceedings from the 2nd International Conference for Design Education Researchers vol. 1.* (pp. 431-441). Oslo: ABM-media.
- Meadows, D. H. & Wright, D. (2008). *Thinking in systems: a primer*. White River Junction, Vermont: Chelsea Green Publishing.
- Michl, J. (2002). "On Seeing Design as Redesign: An Exploration of a Neglected Problem in Design Education". *Scandinavian Journal of Design History*, 12(1), 7-23.
- Oslo and Akershus University College of Applied Sciences. (2012). *DRS // CUMULUS Oslo 2013 The 2nd International Conference for Design Education Researchers*. Retrieved Mar 3, 2015, from <http://www.hioa.no/eng/Om-HiOA/Fakultet-for-teknologi-kunst-og-design-TKD/DRS-CUMULUS-Oslo-2013>
- Orr, D. W. (1992). *Ecological literacy: education and the transition to a postmodern world*. Albany: State University of New York Press
- Partnership for 21<sup>st</sup> Century Skills. (2015). *From Aspiration to Alarm Bell*. Retrived April 20, 2015, from <http://www.p21.org/about-us/our-history>
- Perrone, R. (2013). Relating creativity, fantasy, invention and imagination: studying collective models of creative collaboration from Kindergarten to University Degrees. In Reitan, J. B., Lloyd, P., Bohemia, E., Nielsen, L. M., Digranes, I. & Lutnæs, E. (Eds.), *Design Learning for Tomorrow. Design Education from Kindergarten to PhD. Proceedings from the 2nd International Conference for Design Education Researchers vol. 3.* (pp. 1680-1693). Oslo: ABM-media.
- Pillan, M., Maiocchi, M., & Radetatovey, M. (2013). Teaching Constraints, Learning Creativity: Leveraging the Guided Distractions. In Reitan, J. B., Lloyd, P., Bohemia, E., Nielsen, L. M., Digranes, I. & Lutnæs, E. (Eds.), *Design Learning for Tomorrow. Design Education from Kindergarten to PhD. Proceedings from the 2nd International Conference for Design Education Researchers vol. 2.* (pp. 607-620). Oslo: ABM-media.
- Reitan, J. B., Lloyd, P., Bohemia, E., Nielsen, L. M., Digranes, I. & Lutnæs, E. (Eds.). (2013). *Design Learning for Tomorrow. Design Education from Kindergarten to PhD. Proceedings from the 2nd International Conference for Design Education Researchers vol. 1-4.* Oslo: ABM-media.

- Rinnert, G. C. & Coorey, J. (2013). Introducing high school students to design and creative thinking in a teaching lab environment. In Reitan, J. B., Lloyd, P., Bohemia, E., Nielsen, L. M., Digranes, I. & Lutnæs, E. (Eds.), *Design Learning for Tomorrow. Design Education from Kindergarten to PhD. Proceedings from the 2nd International Conference for Design Education Researchers vol. 4.* (pp. 2134-2144). Oslo: ABM-media.
- Schlitt, G. (2013). Cultivating creativity: documenting the journey. In Reitan, J. B., Lloyd, P., Bohemia, E., Nielsen, L. M., Digranes, I. & Lutnæs, E. (Eds.), *Design Learning for Tomorrow. Design Education from Kindergarten to PhD. Proceedings from the 2nd International Conference for Design Education Researchers vol. 3.* (pp. 1354-1368). Oslo: ABM-media.
- Seevinck, J. & Lenigas, T. (2013). Rock Paper Scissors: Reflective Practices for design process in the landscape architecture novice. In Reitan, J. B., Lloyd, P., Bohemia, E., Nielsen, L. M., Digranes, I. & Lutnæs, E. (Eds.), *Design Learning for Tomorrow. Design Education from Kindergarten to PhD. Proceedings from the 2nd International Conference for Design Education Researchers vol. 4.* (pp. 2145-2159). Oslo: ABM-media
- Sevaldson, B. (2013). Systems Oriented Design: The emergence and development of a designerly approach to address complexity. In Reitan, J. B., Lloyd, P., Bohemia, E., Nielsen, L. M., Digranes, I. & Lutnæs, E. (Eds.), *Design Learning for Tomorrow. Design Education from Kindergarten to PhD. Proceedings from the 2nd International Conference for Design Education Researchers vol. 4.* (pp. 1765-1786). Oslo: ABM-media.
- Simon, H. A. (1969). *The sciences of the artificial* (Vol. 136). Cambridge, Mass: M.I.T
- Soini, K. & Birkeland, I. (2014). Exploring the scientific discourse on cultural sustainability. *Geoforum*, 51, 213-223. doi: 10.1016/j.geoforum.2013.12.001
- Taboada, M. & Coombs, G. (2013). Liminal moments: designing, thinking and learning. In Reitan, J. B., Lloyd, P., Bohemia, E., Nielsen, L. M., Digranes, I. & Lutnæs, E. (Eds.), *Design Learning for Tomorrow. Design Education from Kindergarten to PhD. Proceedings from the 2nd International Conference for Design Education Researchers vol. 4.* (pp. 1806-1818). Oslo: ABM-media.
- Tovey, M. (2013). Design Pedagogy Special Interest Group of DRS. In Reitan, J. B., Lloyd, P., Bohemia, E., Nielsen, L. M., Digranes, I. & Lutnæs, E. (Eds.), *Design Learning for Tomorrow. Design Education from Kindergarten to PhD. Proceedings from the 2nd International Conference for Design Education Researchers vol. 1-4.* (pp. iv-vi). Oslo: ABM-media.
- United Nations. (2002). *The Johannesburg Declaration on Sustainable Development, 4 September 2002.* Retrieved February 18, 2015, from <http://www.un-documents.net/jburgdec.htm>
- Vande Zande, R. (2013). K-12 Design Education, Creativity, and The Corporate World. In Reitan, J. B., Lloyd, P., Bohemia, E., Nielsen, L. M., Digranes, I. & Lutnæs, E. (Eds.), *Design Learning for Tomorrow. Design Education from Kindergarten to PhD. Proceedings from the 2nd International Conference for Design Education Researchers vol. 4.* (pp. 2185-2195). Oslo: ABM-media.
- Wenger, E. (1998). *Communities of Practice: Learning, Meaning, and Identity.* Cambridge: Cambridge University Press. doi: 10.1017/CBO9780511803932
- Wright, N. Davis, R. & Bucolo, S. (2013). The creative citizen: Understanding the value of design education programs in the knowledge economy. In Reitan, J. B., Lloyd, P., Bohemia, E., Nielsen, L. M., Digranes, I. & Lutnæs, E. (Eds.), *Design Learning for Tomorrow. Design Education from Kindergarten to PhD. Proceedings from the 2nd International Conference for Design Education Researchers vol. 4.* (pp. 2230-2248). Oslo: ABM-media.
- Wright, N. Wrigley, C. & Bucolo, S. (2013). A methodological approach to modelling design led innovation across secondary education: An Australian case study. In In Reitan, J. B., Lloyd, P., Bohemia, E., Nielsen, L. M., Digranes, I. & Lutnæs, E. (Eds.), *Design Learning for Tomorrow. Design Education from Kindergarten to PhD. Proceedings from the 2nd International Conference for Design Education Researchers vol. 4.* (pp. 2212-2229). Oslo: ABM-media.
- Yalkin, M. (2013). Constructing design knowledge built up on the kindergarten education. In Reitan, J. B., Lloyd, P., Bohemia, E., Nielsen, L. M., Digranes, I. & Lutnæs, E. (Eds.), *Design Learning for Tomorrow. Design Education from Kindergarten to PhD. Proceedings from the 2nd International Conference for Design Education Researchers vol. 4.* (pp. 1856-1864). Oslo: ABM-media.

Zhang, Y. (2013). A New Way To Improve Design Students' Creativity - Based on Thinking Style. In Reitan, J. B., Lloyd, P., Bohemia, E., Nielsen, L. M., Digranes, I. & Lutnæs, E. (Eds.), *Design Learning for Tomorrow. Design Education from Kindergarten to PhD. Proceedings from the 2nd International Conference for Design Education Researchers vol. 1.* (pp. 417-427). Oslo: ABM-media.