



Booklet of
the 2nd International Conference for
Design Education Researchers

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**Design Learning for Tomorrow –
Design Education from Kindergarten to PhD**

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Introductions

Design Learning for Tomorrow – Design Education from Kindergarten to PhD

Many thanks to the Design Research Society (DRS) and Cumulus for giving the Oslo and Akershus University College of Applied Sciences the confidence to chair and organise this 2nd international conference for design education researchers in Oslo May 14–17, 2013. Researchers from more than 74 universities have undertaken a rigorous double blind review process used to select papers for inclusion in these conference proceedings. We received 225 full papers and of these 165 were selected and included in the conference proceedings and presented at the conference. Thanks to all, and a special thank to professor Peter Lloyd of the Open University, who served as chair of the scientific review committee and to dr. Janne Reitan of the Oslo and Akershus University College of Applied Sciences who chaired the committee with him.

The 2nd international conference for design education researchers in Oslo May 14–17, 2013 on the theme of ‘Design learning for tomorrow – Design education from Kindergarten to PhD’ received an overwhelming response. This is gratifying for us, the organisers, as we see design in a broad interdisciplinary perspective in support for a *better tomorrow*. 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.

This is also the reason why we as the conference hosts have chosen to focus on design education from Kindergarten to PhD. This perspective was put forward as a contrast to most design education conferences where there is either a focus on design education for professionals or general education for children and non-designers. In the call the conference papers we have argued for a longitudinal perspective on design education where the education of professional designers is seen in *relation* to general education of a people. This is becoming increasingly relevant as more and more decisions are being made on the basis of visual representation. With this conference we have the ambition to see education at many different levels in securing a sustainable future for the design of everyday life solutions. For that we need qualified and reflective decision makers with a consciousness for quality of design and solutions.

Why are these issues of concern for Norwegian researchers in this field? The answer goes back to the 1960 National Curriculum for primary and lower secondary schools in Norway, when art and crafts were merged into one subject. Currently this subject includes art, architecture, design and visual communication. No other Nordic–or European–country seems to have developed a model similar to this and today we see

the benefit of this merger where design is at the core of the subject for youngsters – building upon the best from art and the best from craft to become creative problem solvers and critical consumers. I am looking forward to the day when UNESCO, or other organisations with responsibility for funding research, recognise that we need more research and knowledge on what impact design education from Kindergarten to PhD have on consumer habits and sustainable development at large. I hope that such projects are not far away. Politicians have far too long been told that advanced mathematics is the main way to stimulate youngsters to abstract thinking. The designerly way of solving problems can be even more suitable in training abstract thinking, and it will also include ethical aspects of sustainable development and ecology. A design literate general public would therefore be a step forward in supporting the statement of commitment by the members of Cumulus; the 'Kyoto Design Declaration 2008'.

For this DRS//cumulus Oslo 2013 conference we are happy to continue our international cooperation for design education research. In advance of the conference we have cooperated on editing the conference proceedings at level 1 in the Norwegian system. After the conference we will cooperate for special issues of the following academic journals; *Art, Design & Communication in Higher Education*, *TechneA*, *Design and Technology Education*, *Studies in Material Thinking* and *FORMakademisk*. The role of journals as an arena for design education research is essential for the advancement of knowledge production within the field. For the Nordic design and design education research field, *FORMakademisk* has played a crucial role in its five years of existence, as a digital open-access journal for both design and design education research. Its first editorial wrote that:

The aim of the journal is to provide a venue for research in design and design education, and thereby develop an interest and working community of scholars in the field. The editorial team perceives design as a generic term that includes creative and performing activities in the great span of the artefacts 'from the spoon to the city'. The editorial team relates to design education as a field that includes the dissemination of design in society and the teaching of design at all levels general education, vocational preparation, professional education and research education - from kindergarten to doctorate.(www.formakademisk.org)

The Norwegian design education community includes design education for professional designers and teacher training for design educators. The teacher training is mainly developed through two master programmes—one in Oslo (Institute of Art, Design and Drama, Faculty of Technology, Art and Design, Oslo and Akershus University College of Applied Sciences - HiOA) and one in Notodden (Department of Art Education, Telemark University College - HiT). Two PhD-programmes; Oslo School of Architecture and Design (AHO) and Cultural Studies at the Telemark University College, have a focus on both design and design education. The AHO programme was chaired by professor Halina Dunin-Woyseth, who has played a key role in developing research within the 'making disciplines'. From the AHO programme the research network *DesignDialog* was established in 2002 with research focus on three themes; 1) Studies of dialogues of design in context, 2) Studies of design education, and 3) Studies of public dialogues on design.

I see this conference as a further step to international collaboration in design education research. Thanks to all those at HiOA, Faculty of Technology, art and design, who have supported this conference; Dean Petter Øyan and institute leaders Åshild

Vethal – Institute of Art, Design and Drama, Gunnar H. Gundersen – Institute of Product Design, and Laurence Habib – Institute of Computer Science. Without their support this conference would not have been possible. Thanks are also due to the leaders of Oslo and Akershus University College of Applied Sciences, rector Kari Toverud Jensen and head of research Frode Eika Sandnes, for general support to the internationalisation of design education research at HiOA, including this conference.

It is an honour for us that the DRS-Cumulus partnership will be signed in Oslo by DRS chair professor Seymour Roworth-Stokes and Cumulus vice-president professor Luisa Collina. Professor Michael Tovey and co-chair of this conference Erik Bohemia have played a central role in preparing for this partnership and this 2nd conference for design education researchers.

Warm thanks to the Scientific review committee, the Scientific review panel, the Programme Committee, the Organising committee, and the rest of the Editorial team; Janne Beate Reitan, Peter Lloyd, Erik Bohemia, Ingvild Digranes and Eva Lutnæs. Thanks also to colleagues and students for valuable contributions.

We are also grateful to our supporters and sponsors; the National Museum, the Research Council of Norway, Kjeller Innovation, Norwegian Design Council, Art and Design in Education, Norwegian Landscape Architects and Design History Society. Thanks to the musicians and designers Peter Opsvik and Svein Gusrud, the furniture companies SAVO, HÅG, STOKKE and Variér for generously providing display chairs for the exhibition and all the other supporters and cooperation partners. Thanks also to Lillegerd Hansen and Sissel Isachsen for their exhibition and to all students for their presentations and guiding, and all the other supporters and cooperation partners.

We hope, as the organizers, that the conference will promote design and design education as a field of practice and inquiry. We hope that it will create a fertile context for establishing new networks of future co-operation, nationally and internationally, and that design education research in its broad context will be recognized both inside and outside the design research community. The general public's interest for design and quality is developed from the kindergarten, through primary and secondary education and the public's attitude is central for professional activities and a broad democratic design participation.

Liv Merete NIELSEN
Professor, designer
Chair of the conference

Design Pedagogy Special Interest Group of DRS

This is the second symposium organised jointly by the Design Research Society and CUMULUS. The two organizations complement each other. CUMULUS is the International Association of Universities and Colleges of Art, Design and Media. It is a non-profit organization consisting of 165 universities and colleges of art, design and media from 43 countries. Cumulus was founded in 1990 and since then has been acting as an umbrella for many purposes and numerous projects for education and research of art, design and media. The Design Research Society is a multi-disciplinary learned society for the design research community worldwide. The DRS was founded in 1966 and facilitates an international design research network in around 40 countries.

The Design Research Society has three main aims. It focuses on recognising design as a creative act, common to many disciplines. It has the intention of understanding research and its relationship with education and practice. Then there is the overall aim of advancing the theory and practice of design. The membership of DRS is international.

The Society's Special Interest Group in Design Pedagogy is one of five in the society. It aims to bring together design researchers, teachers and practitioners, and others responsible for the delivery of design education, and to clarify and develop the role of design research in providing the theoretical underpinning for design education. These aims are not directed simply at one type of design education, but are intended to include all ages. However as the current membership of DRS is predominantly from universities inevitably the conference stream has concentrated on design education at that level.

The first DRS/CUMULUS Symposium was held in Paris in 2011. Its overarching aim was to explore how innovation in education is informed by and is informing design research. The symposium focused on design education, innovation in general education through design, and on innovation in business and engineering education through design integration. There was a particular emphasis on developing research in the area of Design Pedagogy. It was successful and it marked the point at which the Design Pedagogy Special Interest Group became could be said to be established as an effective force in design research.

This was consolidated at the DRS Biennial Conference in July 2012 in Bangkok. Papers aligned with SIGs were streamed through the conference programme. The Design Pedagogy stream consisted of 24 papers which was a strong representation within the conference. They focused on teaching and assessment, education and learning, design methods and processes, design approaches, cognition and creativity, and design culture, with papers grouped accordingly. Attendance at the sessions was good with informed and lively discussion.

In recognition of the strength of the papers at the conference, 8 of them were selected to form the basis of a special issue of the Design and Technology Education

Journal. It was edited by Erik Bohemia and Mike Tovey and it included a review of the conference and an editorial which related the developments in design pedagogy in higher education which the papers focused upon, to the wider issues of design teaching at the school level.

This second DRS/CUMULUS conference builds on these developments and develops them into new areas. Its theme of design learning for tomorrow encompassing design education from kindergarten to PhD is large and ambitious. The conference is intended to be an international springboard for sharing ideas and concepts about contemporary design education research. It is open to different facets of contemporary approaches to such research in any aspect and discipline of design education.

The context for this is set well by the organizers who say:

‘Designed artefacts and solutions influence our lives and values, both from a personal and societal perspective. Designers, decision makers, investors and consumers hold different positions in the design process, but they all make choices that will influence our future visual and material culture. To promote sustainability and meet global challenges for the future, professional designers are dependent on critical consumers and a design literate general public. For this purpose design education is important for all. We propose that design education in general education represents both a foundation for professional design education and a vital requirement for developing the general public competence for informed decision making.’

This is a powerful and energising assertion for all of us involved in research in design pedagogy. It is possible that you could argue that this is what is needed, for despite a richness of activity, the number of journal papers on design pedagogy research could be higher. In a ranking of design research journals (Gemser et al, 2012) *Design Studies* was placed first. In the last year it has published only three papers on design pedagogy. This is better than the second placed journal, *Design Issues*, which has none, or another highly rated publication, *The Design Journal* which also has none. A challenge for scholars of research in design pedagogy is to achieve a greater impact amongst our journals.

Design research is not the same as research in some other disciplines. (Ref) In a fundamental science such as physics if research stops then effectively the discipline comes to a halt. If there is no physics research then there is no physics. Design is not like that. If design research were to stop then design would continue, more or less regardless. Designers would continue designing things, and probably the world would notice no difference. It would seem that design research is not central to design practice.

Design research is an activity which is directed to exploring and understanding the nature of design, its processes and methods. It has loftier academic aspirations than the data gathering part of the design process. It is usually undertaken by academics, and it is expected to conform to conventional standards of academic scholarship and rigour. Design research is clearly necessary for the academic respectability of the discipline.

One of the purposes of design education within schools is to equip students with the information and capabilities they need if they are to apply to study design at a university. It is an intention which probably applies to a minority of the students, but it is important nonetheless. In schools design education overall has to achieve much more and its broader reach is extremely important. It is important that research into design pedagogy should also have this wider relevance.

The recently published 'Design and Designing: a Critical Introduction' (editors S. Garner and C. Evans) is intended to provide an overview of design for those at school who are considering embarking on a university or college education in design. It consists of a collection of essays from a large number of contributors each concerned with a different aspect of design. In the first chapter for example Tovey asserts that the purpose of design education at this level is to provide students with a passport to enter the community of practice of professional design (Tovey 2012). For a significant time this has been the intention of practice based design education. Many students have the ambition of achieving a level of capability to function as designers in the professional world. In order to reach this standard they need to demonstrate a level of professional 'polish' and presentation to match that of the practising designer. However Tovey also argues that the most fundamental quality they need is one of creativity. The key to their achieving this lies in their abilities to think in a solution focused way employing visuo-spatial intellectual abilities. The ability to engage in creative thinking, and more particularly the creative synthesising of ideas through design thinking, is the most important capability required to enter the community of professional practice.

These are capabilities which need development from an early age. Abilities such as tackling problems with a solution focus, and thinking visuo-spatially are not developed ab initio at university and college level. It has been argued that spatial ability is a fundamental form of intelligence along with others such as numerical and literary abilities. (Gardner, 1984) Cross has gone further in suggesting that designerly thinking might be a basic form of intelligence (Cross, 2006). Although the case for such a view is not proven, it is a productive stance to take as it helps to identify and clarify features of the nature of design ability and it offers a framework for understanding and developing it. What seems to be generally agreed is that these underlying capabilities are ones which need to be nurtured early and developed, not only as the basis for studying design but also to equip students with abilities needed across a range of occupations. As the organizers of this conference propose design education can make a vital contribution to the development of the general public competence for informed decision making. Thus design education can be seen to have a wide remit in both providing the next generation of designers, and developing competence in decision making more generally. If it is to meet these challenges then research into design pedagogy has a crucial role in supporting the development of innovative and effective design teaching.

Michael TOVEY

Convenor of the DSR Design Pedagogy Special Interest Group (PedSIG)

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About the Design Research Society

Design Research Society (DRS) is commending time, effort and energy and having already been investing these over the past 40 years to give rise to the most astute and relevant research in design.

When asked on numerous occasions to comment on design and design research, I've always been very careful, if not harsh, with regards to certain research projects whose content and/or approach seemed to fall short on the front of the relevant things in design. My reaction hit even closer to home in France where design is absent from academic disciplines, and design research has yet to really take off. I have to admit, nonetheless, that the strides undertaken by several universities abroad and continued by DRS have swayed me into believing that there really is an area that craves further learning and discovery, and cultivates fresh, relevance-hungry skills and competencies. Conferences and DRS-published works reflect a tremendous proliferation of new ideas, new projects and new ways to breed knowledge.

In 2010, and after having sat in on a conference in Seoul organized by the International Association of Societies of Design Research, I wrote the following: "Taking advantage of design's coming out and its lack of visibility research-wise for the purposes of Sociology, Psychology, Education Science, or even hard science, and playing them off as "design research" can only prove beneficial to design in the end. Employing the design research notion loosely, when, in reality, its usage is clearly career-gearred, does not seem all that fitting to me either.

The scope of research needs to be clearly outlined in a category of its own, and based on a language that both captures and communicates the knowledge from all fields spanning social and hard science, not to mention the socio-economic challenges that riddle our everyday. Design is a language doubling as an interface that connects people, ideas and knowledge, and imagines them in a better tomorrow. We could come up with our own scientific version of it as long as we don't get carried away and throw everything together haphazardly merely because design is omnipresent, and it suffices to get the intellectual juices flowing every now and then."

Time may have elapsed since these thoughts first emerged, but the issue remains the same. This text reflected the questions that crossed my mind following the various presentations I had attended. One presentation, in particular, caught my attention. It was given by a doctoral student who claimed that the work he was doing on the design of a bicycle was research. Twenty years ago, designing a bike was considered design. Today, that same bicycle now aspires to fall under the category of "design research." Let's try and refrain from wanting to label any idea, even the most relevant, "research." Despite their efforts to make a hard science out of Marketing, business schools are busy filling in the gaps left behind by research done in the Marketing field. Every

business owner and retailer in the world will tell you that Marketing is not a science, and wanting it to be one is just as futile as deciphering the gender of angels.

Design research is alive and well, and several universities have incorporated it into their agendas. It means nurturing a different kind of knowledge and insight at a time when other research fields lack the necessary to go head-to-head with the problems facing Mankind. There within is the incredible opportunity to truly, once and for all, set the fields of social and hard science apart. Kudos to DRS for being vigilant in choosing projects that are apt to map out a new direction between the two.

Just as design, creation and innovation are being positioned as solutions to problems in a world whose paradigms are crumbling, it would be, without a doubt, counterproductive for design research to cut ties with design practice. From an academic standpoint, it would also be a shame for design research to appear more virtuous and prestigious than design itself. That said, the loss would be just as great to reduce design to nothing other than a technique or representation. What design can offer goes beyond practicality. Design research goes beyond the designer. Their interconnectedness does not impede their individuality.

Design research and design itself are complementary. While loyal to the fundamental principles specific to each, both strive to find common ground and engage in a healthy give-and-take relationship to ensure balance and difference. With Mankind and its uses at the center of these issues, design gives impetus to an ideal or a potential, and not only pushes the limits of creativity and optimism to new heights, but seeks to defy them. At a time when science and technology are encountering a wary public, and where wealth and welfare are hitting glass ceilings, design provides an alternative future, and enables us to imagine it through a new lens. One thing is sure: Design researchers have their work cut out for them!

Christian GUELLERIN

President of Cumulus, International Association of Universities and Schools of Design,
Art and Media

Workshops

WORKSHOP 1: Design History in the Design Education Curriculum

This is a Design History Society Workshop/Symposium on design history in the design curriculum and on design history as design education. The Chair of the Design History Society, Dr Dipti Bhagat (London Metropolitan University), will chair the session, providing a 10-minute introductory paper to outline the background and context for the discussion. Four position papers, 15 minutes each, will follow. The session will then conclude with an extended audience discussion.

At the forthcoming 10th European Academy of Design (EAD) conference, 'Crafting the Future', in Gothenburg (April, 2013), a panel will explore the role of 'design history as a tool for better design'. Similarly, the DRS/Cumulus conference on the theme, 'Design Learning for Tomorrow - Design Education from Kindergarten to PhD', calls attention to the role of design history, design studies and contextual studies in design education. Organised by Dr Grace Lees-Maffei (University of Hertfordshire), with Dr Kjetil Fallan (University of Oslo), and supported by the Design History Society, this Design History workshop/symposium will examine design history in the design curriculum and design history as design education. The Chair of the Design History Society, Dr Dipti Bhagat (London Metropolitan University), will chair the session, providing a 10-minute introductory paper to outline the background and context for the discussion. Four position papers, 15 minutes each, will follow.

Dr Lees-Maffei will talk about the place of design history within higher education, as having grown out of the design studio and back into it again in the UK, and as the subject of optimism and growth in non-Anglophone countries. Lees-Maffei will argue that design history needs to develop as a research and a teaching subject. Dr Fallan will explore the instrumentalisation of design history and the prospects of teaching design history outside of design schools. Dr Hans-Christian Jensen (University of Southern Denmark) will examine the role of design studies, a field covering the ground between history and education/research/practice. Finally, Dr Annabella Pollen (University of Brighton) will talk about student practitioner perspectives on the benefits of historical and critical studies within an institution's discrete degree programmes in design history. Dr Pollen will also investigate contextual studies for design practice programmes.

Chaired by Dr Bhagat, an extended audience discussion will follow, in which delegates will be asked to reflect on and contribute understanding from the perspectives of their work in their respective institutions.

Organisers: **Grace Lees-Maffei**, Design History Society and University of Hertfordshire, UK; Contact: G.Lees-Maffei@herts.ac.uk
Kjetil Fallan, Design History Society and University of Oslo, Norway; Dipti Bhagat, Design History Society, UK; Hans-Christian Jensen, Design History Society and University of Southern Denmark, Denmark; Annabella Pollen, Design History Society and University of Brighton, UK.

WORKSHOP 2: Defining goals through collaboration using design thinking: Project team building consensus

This workshop will offer a hands-on exploration of design as an in situ ‘meaning-making’ process. At the heart of this non-traditional design practice is the engagement and collaboration of clients, users, designers and other stakeholders who constitute a project team.

This workshop will explore how a team of experts and non-experts interacts within a design project and achieves consensus on goals. We view design thinking from research perspectives such as Cross (2007) and Schön (1983), as well as the perspectives of practitioners such as Brown (2009) and Lombardi (2010). Using design thinking, teams reach common understanding on diverse concepts, grasp the complexity of the situation and generate solutions which are user-centred and sustainable. Design is a catalyst for business thinking (Boland & Collopy, 2004; Poldma, 2013 in process) and a method to improve collaboration among the members of an interdisciplinary team (Zahedi, 2011). For us, design thinking, when used collectively, systematically and strategically, has the capacity to bring a team together, to help them develop a holistic view of the project and to build new knowledge for the project. This workshop will focus on the early stage of a human/computer interface (HCI) design. The participants will form a project team and act as designers, users, clients and content experts. They will go through a set of activities, using design thinking to communicate meaningfully and to overcome the difficulties in sharing knowledge. The participants will also create personae and use case scenarios to align clients’ and users’ needs and wants, and to define the characteristics of the project. They will work collaboratively on the visual design of the interface, and we believe that this workshop will be invaluable for learning about the design process and understanding the potentials of collaborative design thinking, not only in the context of HCI but also in other multidisciplinary contexts.

Objectives of the learning exercises include:

- experiencing new tools for reaching understanding;
- learning how these tools can be explored in a groups learning process;
- seeing how this becomes a catalyst for learning in design studio situations;
- discovering how these tools are transferable in practices where designers and stakeholders work in dialogue; and
- understanding how users and stakeholders might work together to generate creative ideas and new knowledge.

Design thinking, as a process and a collaboration strategy, involves many people who learn from each other collectively and deal with complex and, at times, ill-defined problems.

Organisers: **Mithra Zahedi**, University of Montreal, Canada;
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WORKSHOP 3: What is/could/should a design PhD be?

This workshop will investigate the possibilities for design PhDs and their relevance to the future of design education and the design professions. Studied through a range of doctoral models, this workshop will explore the potential benefits of having design PhDs.

This workshop grew from a series of conversations between various participants regarding the possibilities for design PhDs and their relevance to the future of design education and the design professions. Consequently, a concern for the relevance of design PhD programmes has become apparent, especially as our understanding of design and its social, cultural and economic contributions, both within and beyond the design professions, is evolving. The participants in this workshop will represent a range of doctoral models, as they have experience in supervising, designing, assessing and undertaking doctoral studies in design from a range of educational models and contexts.

Tensions around the PhD prospect vary: What is the importance of a PhD when the MFA is a terminal degree? Do design faculty need to have PhDs if they are to work within the university sector, and what does this mean when there may be a greater academic emphasis on design practice and making than theory? Are PhDs only for future academics? That is, are potential PhD candidates only those who aspire to work in the education sector, or are they future design researchers or practitioners whose research will feed into industry, government and community sectors? How do design PhDs relate to funded research projects and university requirements for research outcomes, income and outcomes for the public good?

Put simply, how can we use Frayling's (1993) three categories (through, for or about) as a framework through which to consider, critique and challenge current conventions, and the above questions, as we work towards the evolution of dynamic design PhD programmes that both reflect the needs and expectations of various educational systems and the domain of design itself?

Organisers: **Laurene Kaye VAUGHAN**, Carnegie Mellon University, United States of America; laurenekv@gmail.com

Andrew MORRISON, Oslo School of Architecture and Design

Cameron TONKINWISE, Carnegie Mellon University, United States of America

Eva BRANDT, The Royal Danish Academy of Fine Arts

Thomas MARKUSSEN, Kolding School of Design

Thomas BINDER, The Royal Danish Academy of Fine Arts

Otto von BUSCH, Parsons the New School of Design

WORKSHOP 4: What can K-12 students learn from designers about promoting social responsibility and improving the economy?

This symposium will be an opportunity for participants to prepare a manifesto for the teaching of design to youth. In this symposium, the audience will work in teams to discuss this topic through prompts. The concluding piece will be a position paper for the support of teaching young students about social responsibility, improving the economy, and other essential topics that emerge, through design.

Many designers are addressing the social issues of environmentalism and the emotional and physical welfare of people. Sustainable design, based on less consumptive lifestyles, respect for the environment and the interdependence of life, is an example of this social concern. Architecture, urban planning and product design are immersed in sustainable design. Attention is also being given to universal design, which is the design of products and environments that are (to the greatest extent possible, without the need for adaptation or specialised designs) accessible to all people. One of the most important reasons to teach design to K-12 students is to address socially responsible design.

Many countries are looking at design as a way to produce more marketable products that serve to strengthen economies through competition and increased profits. Many countries have thus placed high value on design. Finland invested US\$ 40.9 million in design research, education and promotion for its Design Year 2005, which directly affected that country's fourth-place rating in global innovation and second-place rating in competitiveness by 2007 (Diamond, 2008). India adopted a national design strategy in 2007 (Diamond, 2008). In 2008, an Industry Canada report determined that design was the essential element to solve that country's problem with achieving higher productivity. China brought American designer Richard Buchanan to an international conference in 2004, where he offered recommendations for the transition in China from a manufacturer of foreign-designed products to a centre of original design (Buchanan, 2004). In Korea, a financial crisis occurred in 1997, and a conceptual shift that placed design at the centre of competitiveness, and the consequent rise of Korean design firms, is what pulled that country out of the crisis (Cho, 2004).

In this symposium, the audience will work in teams to discuss this topic through prompts. The concluding piece will be a position paper for the support of teaching young students about social responsibility, improving the economy, and other essential topics that emerge, through design.

Organiser: **Robin Vande Zande**, Kent State University, United States of America;
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WORKSHOP 5: Assessment criteria that meet an internationalisation agenda

The aim of this workshop is to establish a list of keywords in English for use in the application of assessment criteria across international boundaries. Participants will be encouraged to bring existing examples of criteria used in their respective institutions for exchange with each other.

A recent review of keywords across nine institutions in the United Kingdom (UK) reveals a wide variety of terms that range from the typical to the obscure. For example, on a scale of 0-100%, words or phrases used to guide student comprehension of achievement in the 60-69% grade band include: 'coherent', 'critical', 'sound', 'strong', 'quite flexible', 'orderly', 'notable defects', 'professional', 'testing', 'greater insight', 'inventive', 'creative' and 'very good'. These add to well-established keywords that reflect undergraduate degree achievements, typified through the use of 'excellent' to label a first-class degree, 'very good' for a second class (upper division), 'good' for a second class (lower division), 'moderate' for a third class, 'marginal' for a pass and 'fail' for a failure (Brown, 1997: 74). Increasing internationalisation agenda in the UK, increasing numbers of international students and overseas expansion mean that many more students who use English as a second language are exposed to assessment criteria that are rarely tested in global contexts. Recent research in art and design assessment pedagogy suggests that this is an issue under-researched in art and design disciplines.

Contributors to the workshop will work to establish a set of keywords that can be tested across a full range of potential grade recommendations and across international pedagogical contexts. Participants will be encouraged to bring existing examples of criteria used in their respective institutions for exchange with each other. A short introductory presentation will preface the group work, leading to recommendations for keywords that are suitable for use in art and/or design disciplines. The process will test the suitability of words, such as 'rigorous' and 'outstanding', that do not seemingly translate as well as words such as 'good' or 'satisfactory'.

This builds on focus group work with academicians and students in the Netherlands in February 2012, and workshop activity recently facilitated at the 2012 conference of the Group for Learning in Art and Design (GLAD), 25 April 2012, Kingston University, UK.

Organiser: **Robert George Harland**, Loughborough University, United Kingdom;
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WORKSHOP 7: DESIGN LITERACY - from primary education to university level: Applying for EU funding for the project

In this workshop, we invite researchers to participate in the preparation of an application under the EU Horizon 2020 Framework Programme for Research and Innovation. There will be introductions and discussions.

Worldwide environmental problems are closely linked to an increasing amount of waste and pollution related to the production, transportation and consumption of artefacts. Designers, decision makers, investors and consumers hold different positions in the design process, but they all make choices that will influence our future environment. In order to solve some of the crucial global challenges, designers and lay people must cooperate; for this purpose, awareness of design qualities from a sustainable perspective is necessary. We include such an awareness of quality, longevity and sustainability in the design process of artefacts and solutions in our understanding of DESIGN LITERACY. It refers to concerns and practices such as democratic participation in the processes, developing and using ethical responsibility, and understanding and supporting sustainable aspects of production and consumption.

The growing consumption of 'things we do not need' is an increasing problem for Europe. In this DESIGN LITERACY project, we will promote design education of non-designers (in their role as consumers and decision makers) as a stepping stone for a cultural strategy for change. The DESIGN LITERACY project will develop as an application for an EU project connected to smart, inclusive and sustainable growth, highlighted in the Europe2020 strategy (European Commission, 2010). Specifically, this workshop will be a further step towards an application for the Horizon 2020 Framework Programme for Research and Innovation.

The results of this research will be useful from wider a societal perspective, as well as for recommending specific changes in policy and educational implementation. This study's importance lies in the needs to better inform design education itself, to improve the quality of design educators, to educate reflective consumers and, as a result, to further the goals of a sustainable, creative society.

The workshop will consist of invited researchers and other researchers interested in the topics raised in the DESIGN LITERACY project.

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Karen Brønne, Volda University College, Norway

Abstracts of Papers

Design Curriculum

ICT, ideation pedagogy and Innovation Education: setting a new paradigm in graphic design education.

Edward APPIAH*, Johannes CRONJÉ

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Abstract: *The introduction of ICT into graphic design education has also brought in some challenges as far as the pedagogy is concerned, as it requires relearning, training and upgrading. Whereas modern practices and education is flouted with ICT, the pedagogy of graphic design education, especially in the developing economies, which is an adaptation of the Bauhaus theory, is in variance with current practices in both the profession and in its education. As part of an ongoing study, we discuss the literature of current graphic design practices as a contribution to the adaptation of Innovation Education (IE) in a specific Virtual Reality Learning Environment (VRLE) technology as way of looking at the paradigm shift due to the introduction of ICT in the developing countries. Some educational theories in the context of ICT and graphic design education are discussed. These discussions align with current ICT practices in the developing countries that call for a review of pedagogy that allows students to develop ideas digitally. It concludes with a call for an exploration of current ICT practices in graphic design education, that concern ideation and its pedagogy. We believe that if the much-touted potential of ICT to transform design education is to be realized, especially in the developing countries, then design educators will have to pay more attention to learning issues and the pedagogy.*

Keywords: *ideation, pedagogy, graphic design, innovation education*

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New challenges, new strategies in research applied to design and communication

Juan ARRAUSI*

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Abstract: *The paper discusses the evaluation of a master's degree in design and communication in Spain, and the impact of the evaluation on the development for future of the programme. Five years ago the first Master's Degree in Design and Communication (MUDIC) started at the Elisava design school in Barcelona. The social, labour, economic and academic situation has changed not only in our country but in many of those from where we receive our students. The premises with which the MUDIC was built must therefore be subject to revision. Now, half a decade later, the list of competencies sounds out of date, lacking in practical sense. The objectives, talking in academic terms, have moved into the background and the master has focused on completely reconsidering the basic and the specific competencies. Both answer the question: In what do the students should be competent in the end? The master therefore continuously has considered the multiple changing realities of the present situation and to combine them with the determinations of the didactic specialists, the pedagogues. The challenges have been distinguished by blocks coinciding with the phases before, during, or after the master's degree. A quinquennial review by the education quality agency will take place this year.*

Keywords: *New strategies in design and communication, Master's degree in Spain, Official Master's degree, Design education in Spain.*

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Bringing practice to the theory: Project-led education in Industrial Design Engineering

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Abstract: *The University of Twente started an educational programme on Industrial Design Engineering in 2001. The structure of the programme builds on project-led education, mainly to immerse students quicker and more profoundly in the field of expertise they are educated in. Given the impact of educational projects of considerable scope, complexity and scale on the overall programme, adequate balancing of the learning aims and implementation of projects and courses is essential. Based on the criteria for the programme, a reference architecture is devised that guides the way in which the programme is arranged. By means of an example, depicting one of the projects, the implementation of project-led education is shown. From this, the way in which students and teachers/tutors have changed their roles and demeanour is assessed. In this respect, it is depicted how experience and external measures have influenced the programme. Moreover, the consequences of introducing project-led education are discussed with respect to the vision of the overall educational programme.*

Keywords: *Project-led education, student motivation, Industrial Design Engineering.*

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Exploring Colour and Light as Dynamic Elements of Space Through the Activities of an International Workshop

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Abstract: *The ephemeral qualities of lighting are explored best as part of lived experiences. For students at the baccalaureate level, this is difficult and requires developing ideas that become realized through modelling by studying what happens when light, colour and material intersect with form. This process uses design thinking and hands-on experiences to show students how a dynamic interplay of design elements within a project occurs through learning and discussion. While creative processes require some form of abstract thinking and when ephemeral qualities aspects of light and colour contribute to the purpose for a particular use, the material aspects of a luminaire design using found materials recycled and used in new and unique ways adds context to proposed design solutions. This paper examines what happens when dynamic design elements such as light and colour are explored through learning activities of an interactive/international workshop. Two professors on different continents facilitate a series of learning experiences in interior spaces, confronting the immaterial ephemeral qualities of light as these intersect with found materials and cultural senses. Through a series of distance and local problem-setting exercises of proposal models, students work through possible ideas set in context and grounded in creative abstract thinking that are then transformed into a potential solution.*

Keywords: *Lighting design, education, internationalization, ICT, learning-by-doing, sustainable design, colour and light, design process.*

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UFSC Design Course. A brazilian study

Marília Matos GONÇALVES*, Luiz Salomão Ribas GOMEZ

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Abstract: *According to the National Survey of Students' Performance (Enade), held every three years by the Brazilian Ministry of Education, the Design course of University of Santa Catarina is now rated as second best in Brazil. The course objective is to provide facilities for the training of professionals able to operate in dynamic environments and diverse, capable of intervening in society to the criteria of innovation, environmental responsibility and entrepreneurship, offers students the mastery of techniques, methods and specific tools project. Currently the UFSC Design course works with a curriculum structure divided into three main nuclei divided as follows: Introductory, Project and Integration with the Market. The big difference is in the format at the nuclei of Project which is composed of modules of disciplines that must necessarily be realized together to build an effective project with the features of the module. Modules are offered in different areas of expertise such as Industrial Design, Graphic, Fashion, Promotional, Experiential, among others, that the academic have free choice. Thus the course enables the student within a general basis of design structure your training suiting your tastes and skills. That said, this paper aims to, through a study to present this curriculum. .*

Keywords: *Design, Brazil, Teaching.*

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Transformation and consequences: Do change and divergence in the premises of Bachelor of Design educations in Norway today reveal a need of a General Plan for design educations?

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Abstract: *This paper presents a small pilot study on Bachelor of Design educations which initiates a larger research on some problems within design educations and consequences of changes and school reforms in Norway during the last decades. Design programs of study are popular and the number of schools which offer these programs in Norway has increased since the 1990s. However, the premises for what a design study program should include as well as criteria for getting entrance to higher design educations have changed. This is particularly the case with newly established design educations at several University Colleges. While some study programs are labeled design without actually being that, other design programs are watered down by subjects less relevant to design, to make the education more profitable. Such tendencies may obstruct the concentration on design subjects and the time it takes for students to develop their abilities to create sustainable and competitive design. Changing the premises of higher design educations from great emphasis on design subjects to superficial study programs with less emphasis on design may in the long term undermine the quality of design and the capability for Norway to compete internationally. Thus one may ask; do Bachelor of Design educations in Norway need a General Plan to ensure that design students achieve the skills and knowledge which is needed to become successful designers?*

Keywords: *Bachelor of Design, Design study programs, Design curriculum, General Plan for higher design educations.*

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Knowledge generation in doctoral design education

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Abstract: *Knowledge generation in doctoral design education and its endeavour to meet a variety of interdisciplinary issues from engineering to aesthetics, sustainability and stakeholder requirements can be labelled with what Rittel and Webber called a “wicked problem” [1]. The following article reflects on conditions, methods and challenges to combine design theory and design research practice on a doctoral level. The study case for these reflections is the PhD course, PD 8300: “Topics in design research” at the Norwegian University of Science and Technology. The course introduces among others a disciplinary architecture for industrial design and three theory of science philosophies related to three paradigmatic design theories: Critical rationalism to Simon, Pragmatism and Hermeneutics to Schön, and Social Constructivism to Krippendorff. Further the course attempts to mediate research skills such as writing, analysing and evaluating texts and structuring one’s PhD work. The article is meant as a contribution to the on-going discussion on teaching design theory at different industrial design schools in Scandinavia and as contribution to appraise and develop doctoral education in industrial design.*

Keywords: *Industrial design curricula, PhD education, industrial design as academic discipline, theory of science, design theories*

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Classroom Architect: Integrating Design Thinking and Math

Jain KIM^{*}, Swee Hong David KWEK, Colin MELTZER, and Pilar WONG
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Abstract: *Classroom Architect is a project-based curriculum that uses the principles of design thinking to review mathematical concepts, such as measurement, scale and area. The anchor task in this curriculum is to create a 3-D virtual model of the ideal classroom, based on the data the students collect. The curriculum uses design thinking as leverage to help students transfer classroom knowledge to real world problem-solving situations. Specifically, the students go through design thinking process -- user needs discovery, ideation, prototype and redesign. In each step of the process different mathematical concepts are reviewed and reinforced through their application to the task. The students will present their final prototype, justifying their design decisions, and mathematical calculations. Classroom Architect promotes an enduring understanding of key concepts of both design thinking and mathematics. It focuses on the learning of cognitive skills, such as problem solving, flexible thinking, making connections, representation of material in multiple ways, collaboration and application of mathematical concepts and skills to develop solutions. The curriculum is developed by applying Wiggins and McTighe's Backward Design method, with six design imperatives, (i) Knowledge Transfer and Application, (ii) Experiential Learning, (iii) Multiple Entries to Learning and Mastery, (iv) Scaffolds that Enable, (v) "Fit For Purpose" Assessment and (vi) Technology that Inspires Learning.*

Keywords: *Design curriculum, Design education for non-designers.*

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Rethinking pedagogy for iterative design process learning and teaching

Jennifer LOY and Samuel CANNING*

Griffith University

Abstract: *Product Design as an academic discipline is a relative newcomer to higher education. As a result it has had to adapt to the teaching practices and organisation already in place in Universities. However, with the viability of the current business model of higher education under threat from economic pressures, the dominance of established practice could conceivably be challenged, suggesting the time is right for a review of Product Design education as it operates within academia. Product Design educators need to focus on developing an innovative, practical approach to the organisation of learning based on sound design practice-based principles and provide leadership in pedagogy rather than adapting to the pedagogy of others. Design is a unique discipline that can impact on other disciplines as it is necessarily predicated on ideas of leadership and innovation. The role of Product Design in higher education should not deviate from that. Product Design has a real world heritage that is characterised by realistic, considered, innovative thinking. This paper is a reflective opinion piece, suggesting how that thinking could be applied to redress an imbalance in teaching design process to facilitate a more real world experience for the benefit of students and confidence in the discipline as a whole.*

Keywords: *Learning spaces, workshop, computer-aided design, integration, pedagogy.*

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How Can We Make It Better? Translating An Innovative Medical Model Into Cutting Edge Design Curriculum

Barbara MCFALL*, Cindy BEACHAM, Kathryn BURTON, Ron DULANEY JR
West Virginia University

Abstract: *This is a story of design – of designing a viable present in transition from an increasingly obsolete past to a transformative future. More specifically, Karl Aspelund’s seven design process steps (2010) provided the framework for our curriculum redesign at a typical American Land Grant University. The **inspiration** surfaced from a combination of necessity and vision based on conditions within and around our design unit. **Identification** of the design problem resulted in key findings, among them that ours is a small design unit in a large university that explicitly favors STEM disciplines. **Conceptualization** provided a focus on human-centered design culture and process, asking the question “How can we make it better?” Moving into the **exploration/refinement** phase we needed to determine who else asks that question within a human-centered culture and process. Medicine emerged as a possibility. The University of Central Florida College of Medicine provided the pragmatic framework used. **Definition/Modeling** included the adaptation of our design curriculum to the UCF medical curriculum model. By engaging stakeholders to analyze the proposed design and iterate changes, we are currently addressing the project phase of **communication**. **Implementation**, to include establishing timeframes, tasks, responsibilities, and assessment processes, will be the next step in the process.*

Keywords: *Innovative design curriculum, design pedagogy, design process, PRSM, quality of living*

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Designing FunWritr: unpacking an affinity-based, professionalizing, graduate-level educational technology design experience

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Abstract: In this paper and presentation we describe, unpack, and reflect upon the dynamic, evolving processes of collaborative, democratized educational technology design that led to the creation of an open-ended literacy development and language acquisition environment named FunWritr. When the project began, each member of our group was either in a graduate program for educational technology design or interested in matriculating into such a program. Over the course of five years we have worked together, growing as designers, developers, and researchers of educational technologies. Reflecting on our authentic, self-guided, evolving curriculum of experiences, we recognize processes and unpack factors that contributed to our growth and evolving philosophy of affinity-based, collaborative, sustainable, educational technology design. In describing and theorizing about our experiences and outcomes we have come to understand avenues for cultivating growth in design education that go beyond classrooms, fixed hierarchies, grades, and semester-based projects. Our interactions have led us to identify and theorize about six interrelated guiding design parameters for educational technology creation.

Keywords: design, technology, affinity-based, education, student-led

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Programming Sketches: a bricolage approach to teaching computer programming in design education

Juhong PARK*

Massachusetts Institute of Technology

Abstract: *Many architecture schools have started to teach computer programming as part of their design education. Their main pedagogies follow a conventional computer science approach, which has a high failure rate and is less effective for novice learners. This paper describes a novel approach to developing a curriculum, "Programming Sketches", to teach computer programming to architecture students in the context of design education. A bricolage-based approach with an atelier learning environment was explored. Instead of focusing on learning the knowledge of computer programming language, students were prompted to develop their own ways of transforming design thinking into a programming structure with an incrementally repeating manner. The reconfiguring and externalizing process of students' varying design work and the iterative development of programming structures made students' learning progress transparent. Incremental iteration is at the centre of this successful progress. The daily exercises decompose debugging and make the error-finding process quick and easy. These processes reduce the burden on instructors by permitting easy detection and correction of students' errors. This study describes a successful learning experience of novice students of computer programming and discusses how to apply pedagogical variations for cognitively varying learners.*

Keywords: *Bricolage, Computer programming, Design education.*

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Reflections and prospects about the relationship between master thesis and design project in interior architectural education

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Abstract: *The Bologna process, initiated in 1999, propelled an ongoing reform of the European higher education. One of many processes is the integration of design schools – formerly belonging to a polytechnic or beaux-arts tradition – into academia. It presents challenges to universities and design schools alike. Commonly, many debates centre around the issue of research: output media, ‘measurability’ of output and the relationship between research and education. In this paper we would like to focus on the latter by discussing the set-up and organisation of our master programme in interior architecture. Reflecting about existing material of our students stimulated us to explain the strengths, weaknesses, opportunities and threats of our current approach. We also propose a line of reasoning about re-organizing the set-up of master thesis and design project at our department in the years to come. In our view, this line of reasoning will allow our students to better blend their research with the design project.*

Keywords: *interior architecture, philosophy of design curriculum, master thesis, master design project.*

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The “Nature” of Design Education: teaching design fundamentals in an outdoor classroom

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Abstract: *This paper and presentation will detail the on-going research and development of an innovative, card based system named “Fundamentals in Nature.” This system is used to teach design fundamentals in an outdoor classroom. Through developing appreciation for the natural world, design students develop skills that are more conceptual, sustainable, well rounded and connected. The need for this approach is supported by research revealing the current generation of students are losing touch with their natural environment. While this curriculum was initially aimed at educating college level design students, it is scalable to teach younger students and the general public. By utilizing the outdoors as a classroom, participants are able to experience first-hand relationships between design and the natural world. This unexpected relationship fosters an expansive thought processes. The natural environment combined with the collaborative nature of the exercises, creates a strong foundation for sustainable design concerns in future designers.*

Keywords: *Design curriculum, design fundamentals, outdoor classroom.*

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Contextually Teaching Motion Design

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Abstract: *Motion design (also called motion graphics) is an underdeveloped subject within design education. Often taught as part of a separate elective course, housed in a computer lab and taught by graduate students or adjunct faculty, this subject is often associated with long planning hours, tedious software exercises, and inadequate formal results. However, at Kent State University, we believe that motion design has significant value for the design student's education and deserves integration into design curriculum. Integration of motion into curriculum has exponential value: it teaches systems thinking, research skills, and information design. We are entering an exciting time in graphic design, when motion, interaction, and information are merging to form innovative products and applications. An understanding and familiarity with motion can help a designer anticipate movement and navigation through an interactive space or a three-dimensional environment. Designers with a clear understanding of motion can think in time and are prepared to clearly communicate information in a way that is applicable to current technology. An understanding of motion can broaden a designer's ability to draft scenarios, prototypes, and visual representation of complex information to the client or audience.*

Keywords: *motion design, strategies for teaching, information design, sequencing, expressive, and authorship.*

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A “filing system” for teaching research skills in interior architecture education

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Abstract: *Creating physical environments for humans, more specifically the design disciplines of interior architecture/design, involves a wide variety of aspects to be considered: material, technical, cultural, psychological, artistic... It is therefore important to provide students with the necessary tools (research skills) not only to address the different types of problems and questions that arise during this creative process, but –ultimately- also to ensure the continuing development of interior architecture as a profession and as an academic discipline through the development of its proper research methods. However, we have been coming across a number of obstacles and challenges in our effort to integrate the teaching of research skills in our interior architecture educational program. Here, we report on our experiences in an ongoing project in which we have tried to tackle these issues by providing students, starting in their first year, with a type of “filing system” in which we have specifically structured the information on relevant research approaches and methods.*

Keywords: *interior architecture, research skills, Design curriculum, Research informed designed education - Design education informing research.*

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Design Education for Social Sustainability

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Abstract: *In a changing world how do we educate students for equitable global sustainability and embed design for social need in curricula? This paper explores pedagogic methods for people-centred design and considers the benefits this can provide for students, whilst preparing them for future careers in a globally challenging environment. Examples of user-focused design relating to health, wellbeing and education illustrate social and community issues driving design ideation, process and outcome. Inherent value gained through experiential learning is analysed alongside associated assessment issues. Researched case studies indicate that students engaging with people-centred projects and learning through leading acquire enhanced multi-faceted professional and personable skills. A correlation is then explored between education for social sustainability and students gaining 'softer' employability skills. Studies suggest they understand the interlocking complexities of design and social behaviour and are better prepared as future sustainable thinkers and innovators. The paper culminates in the development of an educational digital content resource, the 'People-Centred Project Platform', designed for the clustering and sharing of information relating to community methods of working and is relevant for any arts and design discipline.*

Keywords: *Social Sustainability, Participatory Design, Design Pedagogy.*

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Low-tech skills in high-tech solutions Era: the cognitive benefits of basic craft techniques in formal design education

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Abstract: *The formal design education in the 21st century is confronted with an expanding list of challenges: knowledge availability on the Internet; handicraft vs. computer skills; amateurism; specialist vs. multidisciplinary curriculums; national vs. international agendas, etc. In a multifaceted design education where everything is accessible and the disciplines' borders are blurred, there is a rising necessity for structured and intelligent design process, to reflect the need for smart and sustainable design solutions in the complex high-tech Era. Equipped with computers and internet resources, students are allowed instant access to infinite repositories of visual material and ready-for-digital-recycling creative solutions. This may accelerate the research and the development stages in design projects, often resulting in omission of important cognitive processes, hence the weakening of decision making ability and decline in original thinking. This paper aims to underline the significance of the employment of basic handicraft techniques in comprehending the design process, beneficial not only for developing spatial understanding and enriching tactile experiences for the Net Generation, but also for enabling critical thinking, problem solving and decision making on the road to intelligent, relevant design solutions in professional design education. The analysis is made through a series of empirical studies including: observation of trends; tailored workshops with constrained design tasks; semi-structured interviews with students.*

Keywords: *Design education, Design process, Design thinking, Problem solving, Decision making, Basic craft techniques, Practical skills.*

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Developing Design Thinking Expertise in Higher Education

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AUT University

Abstract: Design Thinking describes a human-centred methodology for innovation, which has evolved from the study of the unique ways in which designers 'think', and 'practice'. There is growing evidence of the increased uptake of Design Thinking in design, business and other disciplines, and there is an emerging body of research. There is a need to develop sound University curricula that are founded in relevant theory and research findings, however, there appears to be a relatively small amount of rigorous research on the learning and teaching of Design Thinking. This paper presents the initial stages of a PhD research project that explores how Design Thinking can be best developed, delivered and evaluated in higher education to both product design and business students. The evaluation focuses on the students' learning and teaching experiences, and the impact of the curriculum on the development of their Design Thinking expertise. The research uses Action Research, Design, and embedded Case Studies. A number of key theories inform the curriculum including Design Thinking, Constructivism, Experiential Learning, Bloom's Learning Domains and Constructive Alignment. The paper presents initial research findings from the first iteration of the curriculum.

Keywords: Design Thinking, Curriculum Development, Learning and Teaching

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Assessment

Mind the Gap: an evaluation of joint development practice between FE and HE tutors within art and design

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Abstract: *An English art and design college was the setting for this project which aimed to improve the transition of Access students into design Higher Education (HE). The Access course is made up of non-traditional, mature students who may have no previous formal qualifications. They come from diverse backgrounds, ethnicities and nationalities; often overcoming barriers to education in order to fulfil their ambitions to study on a design degree. Previous research had discovered that Access students were susceptible to dropping out during the first year of their degrees. In order to improve the critical thinking and resilience of Access students staff from both sectors worked together to develop the pedagogy of studio critiques. This project was based on two theoretical principles. The first was assessment for learning where formative assessment can be a very effective teaching strategy. The second was joint practice development (JPD) which is an approach to course improvement through cross-sector collaborative activities. The research used a case study methodology to identify and evaluate JPD activities across the two sectors that were both effective and sustainable. This project is situated within the changing context of Further Education (FE) where technical-managerial models potentially conflict with democratic and professional values.*

Keywords: Research informed designed education - Design education informing research, Assessment

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Constitutive and regulating modes of learning in creative design education

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Abstract: *The main aim of this research to analyse the learning process in order to recognize the characteristics currently associated with creating and/or creative students profiles. This paper focuses not much on the psychology of individuals as on the learning process as an intersubjective network of social relations. The theoretical framework considers holistic judgement and arithmetic assessment as evaluation modes and the relevance of fiction within the learning process. With these referents we have developed a polarized parametric system as a framework for mapping learning practices and teaching strategies. On one side we consider the actions related to the constitution of new spheres of creativity. On the other, we discuss regulation sets that allow the creation of design projects. This analytical tool is a guide for actively involved observation, we have tested the theoretical model and the parametric system within a series of project oriented courses in the Design Degree. As a result, the learning process in design happens to be a mode of learning rather than a learning style. We developed a communicating vessels model explaining unfeasible contradictions in the assignment of marks as the result of an experience based device to adapt assessment to both learners and design diversity.*

Keywords: *assessment, modes of learning, design creativity.*

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Aligning assessment, feedback and action planning for international students

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Abstract: *What language should feature in assessment criteria for international students? How do students reflect on assessment feedback to allow the creation of effective action plans for future learning? Have universities adjusted their assessment methods sufficiently to match the increased demand for studying abroad? What can art and design contribute to these issues? These are some of the questions this paper seeks to address by reporting on recent pedagogic research at the School of the Arts, Loughborough University, in the United Kingdom. Language use is at the heart of this, and yet, it has been overlooked as an essential tool that links assessment, feedback, and action planning for international students. The paper reveals existing and new data that builds on research since 2009, aimed at improving students' assessment literacy.*

Keywords: *Assessment criteria, Feedback, Action planning, Internationalisation.*

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A Preliminary Study on Time Management in Undergraduate Industrial Design Students

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Abstract: *Time management is one of the most important factors affecting the learning process and outcome. The purpose of this study aims to explore the time management behaviors and attitudes of undergraduate industrial design students. The study applied a time management questionnaire to 646 students, ranging from sophomores to seniors, from seven universities in Taiwan. The findings are summarized as follows: 1) Most students recognize the importance and effectiveness of time management. 2) Most students are dissatisfied with the time management and methods used. 3) Female students have better planning and control of time than male students. 4) Degree of time management increases along with school year increment, however the ratio of completing tasks on time declines accordingly.*

Keywords: *Design, time management, education.*

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Normal Creativity: What 1,038 t-shirts can tell you about design education

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Abstract: *The study of creativity in design has tended to emphasise its value, scarcity, and location in the individual designer rather than in choices made by a consuming public in the context of a wider culture. This paper, in presenting and developing a view of creativity in design as a normal concept, will present initial results from a study of 1038 student design assignments obtained from a distance-learning course in Design Thinking from The Open University in the UK. We show how ‘normal’ distributions of design outputs can be contived from a structured design process and argue that the creativity that is displayed is a natural result of the ‘grammar’ of that process, in a similar way to the syntax of a sentence allowing new combinations of words and meanings to be easily formed. Seen like this creativity is less of an individual ‘gift’, as some theories imply, but a common everyday response to open-ended problems.*

Keywords: *Creativity, assessment of creativity, originality, design process, design education, design assessment.*

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Creativity in the subject Art and Crafts: the weak link between learning and assessment

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Abstract: *This paper explores the assessment of creativity in the Norwegian school subject Art and Crafts. Creativity, or its sibling, originality is frequently used as an assessment criterion in assignments given to pupils at the level of lower secondary education. Written assessment criteria contribute to the public face of the subject, revealing core values to pupils, parents, headmasters and politicians. I have studied the assessment repertoire of teachers when negotiating final grades and legitimising their assessment practice in interviews. The teachers struggle to find words to describe what makes pupils' design creative or original. Creativity seems to be something that just happens or not. Some pupils come up with design solutions that fit the teachers' specifications; others remain frustrated and have to ask for the teacher's help, which they know from previous experience will lower their grade. The teachers find themselves caught in an educational trap: If they aid the pupils, they could end up assessing their own ideas. Without help, some of the pupils would not proceed from the drawing table to the making of objects. In this, I identify a paradox: one of the subject's undisputed diamonds, creativity, has a weak link between learning and assessment.*

Keywords: *Assessment, creativity, lower secondary education.*

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Art as a Way of Learning: An Aesthetic Environment Assessment Tool

Patricia Anna PINCIOTTI* and Emily VERBA

Abstract: *This paper introduces a model and tool for creating and assessing aesthetic aspects of early learning environments based on five aesthetic operations: repetition, formalization, dynamic variation, exaggeration and surprise. It discusses the impact of aesthetic decision-making on learning, the brain, and child development. Traditionally, childhood environments have focused primarily on the organization of furnishings, displays, and space, or accessibility for children with disabilities. However, there is a renewed interest in the aesthetics of environments for young learners inspired by an arts integration model and Reggio Emilia. Early childhood education is steeped in child development, health and safety, curricular best practices, and engagement with families. Background in design and aesthetic principles are sorely lacking with regards to preparing accessible, culturally rich, aesthetic learning environments that reflect understanding of how individual children grow and learn in a particular community. Current literature expounds the role of the environment as the “third teacher”, even though teachers have little guidance in viewing, assessing or using aesthetics in developing engaging environments for learning. This model and assessment tool affords multiple opportunities for intentional aesthetic decision making to impact learning in early childhood environments.*

Keywords: *Early learning environment, Assessment, Aesthetic operations*

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Evaluating Architecture students' perspective of learning in peer reviews.

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Abstract: Existing research suggests that peer review is a highly effective method for delivering formative feedback, and that it embodies numerous qualities that align closely with creative programmes. However, little research has evaluated creative students' qualitative opinion of the process. This paper summarises a case study that identified Architecture students' perceptions of peer reviews, addressing: how they compared to traditional feedback methods, the value of peer feedback, and how peer review contributed to their learning both in relation to the work being evaluated and beyond. Peer reviews were held with a group of final year undergraduates to provide feedback on their concurrent design project, and the students' views of the experience identified through a questionnaire. A key objective was to draw conclusions on the nature of learning associated with peer review, and its appropriateness as a forum for formative feedback. The study found that students valued the feedback from their peers, and that the process contributed to their own critical thinking in subsequent work. They were generally highly supportive of peer review, but not as a substitute for traditional feedback methods. Some notable contradictions with existing research on peer review were observed.

Keywords: Peer review, formative feedback, design review, student perceptions.

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Internationalisation of design education

Design Education and non-EU students: shifts in teaching practice

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Abstract: *The number of UK international HE students has gradually increased over the last decade, in particular the number of non-EU Chinese and Indian students. This influx has resulted in the recognition that exposure to an unfamiliar pedagogical cultural habitus can cause problems, often compounded by language problems. This paper outlines the response of an MA teaching team at Coventry University to misconceptions that a cohort of Chinese and Indian students expressed during a research methods module. This was evidenced by uncertainty as to what they were expected to produce in terms of a research proposal, as the extension of the boundaries of creative thinking necessary to tackle ‘wicked problems’ seemed beyond their capabilities. This echoed previous undergraduate research, which surfaced a threshold concept, ‘the toleration of design uncertainty’. Using this as a baseline, the teaching team shifted from a sequential method of teaching, towards a much more conceptual mode, underpinned by use of visual tools and a greater emphasis on group collaboration. These innovations are now been embedded within the curriculum, and early indications are that students are much more engaged and confident in the embracing of research territories: the innovations have also been introduced across the whole MA curriculum.*

Keywords: *Internationalisation, Masters Course, design education, design education methods*

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Multiculturalism as an Approach to Prepare Egyptian Government School Students for Micro-Scholarship Through Art Workshop

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Abstract: *Egypt today needs to build a modern democracy while respecting its own heritages and those of others. We should therefore invest in developing multicultural notions of peace that will help different people and nations to understand and respect each other. This would reduce conflict. Art enables students to express themselves and to convey information about their cultures. For this reason, this aspect of education may be considered to be one of the most important in promoting mutual understanding with other cultures, and achieving peace. The concepts of multiculturalism, cross-cultural empathy, awareness, responsibility, participation, personal achievement and mobility reveal to us multiple strains of thinking that now compete and coexist under the umbrella concept of global citizenship. This paper addresses the achievement of mutual understanding with other cultures through art workshops with secondary government school students in Alexandria, Egypt, who participated in The English Access Micro-scholarship Program (AMIDEAST) 2011 in order to: 1) Prepare students for diverse workplaces and multicultural environments. 2) Promote better understanding of other cultures and societies through art. 3) Nurture creative insight through cultural appreciation and comparison. 4) Facilitate problem solving and knowledge of other cultures. 5) Enable students to contribute to their societies' development.*

Keywords: *Multiculturalism, Global Citizenship, Micro-scholarship, Art Education, Government school.*

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City reflections: design collaborations for cross-cultural learning

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Abstract: *Design educators must learn to develop and lead successful intercultural projects and exchanges for students entering into a globally connected and diverse profession. Teaching students to approach problems by using collaborative and interpersonal skills provides them with durable assets to better understand international audiences, colleagues, and perspectives. The proliferation and integration of first-hand cross-cultural experiences into design curricula can result in innovation and knowledge sharing, indicating synergistic properties in which the whole is greater than the sum of the parts. This research explores how collaborations between geographically separate design students in San Francisco, California, USA and Dubai, UAE—mediated by virtual communication—can impact learning, cultural awareness, and audience sensitivity. The two distinct courses challenge students to work together in teams, understand a range of audiences, give and receive critical feedback, exchange projects, and respond with culturally sensitive design solutions. The paper introduces the rationale, methods and design-related outcomes of a series of collaborations to encourage design educators to develop cross-cultural methods in their own classrooms.*

Keywords: *Cross-cultural, design education, collaboration, internationalism, cultural perspective, virtual communication.*

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Design English collaboration and presentation: Developing international designers at a Japanese university

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Abstract: *This study reports on a long-term project to improve the English presentation skills of students in the Faculty of Design at a Japanese university. The first two years of a collaborative effort to pair Industrial Design majors with advanced students in the Department of International Culture to collaborate on a product or product concept and present their work in English will be described. Recent measures to improve English education in Japan include the introduction of English study in elementary school, and adopting communicative-based learning in high schools. At the university level, content-based English education, or English for Specific Purposes (ESP), has been implemented in some curricula to provide students with language ability and competence that will serve them in careers where English is a required skill set. A number of disciplines have attempted to use content-based teaching; unfortunately, little has successfully been done in design faculties at Japanese universities to prepare graduates to become international designers. This project recognizes that it is essential for design students to get specialized training in not only communicative English, but also the specialized vocabulary and presentation skills that will be required of them in careers in the design field.*

Keywords: *English, presentation, globalization, multidisciplinary, Japan*

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A New Way To Improve Design Students' Creativity - Based on Thinking Style

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Abstract: China is developing rapidly in many areas; currently over 50% of products (including household supplies, industrial products, some raw materials) in the world are 'made in China'. However, during the past 30 years of reformation and opening, there have been very few designers, educated in China, with a global reputation. To change current situation of 'made in china' to 'created in china', re-energizing Chinese design education is important. The research focus on higher education and explores new approaches to improve design students' creativity. Thinking styles are not dictate by physical condition. This indicates that we cannot judge a person's thinking style with the standards, high or low, good or bad. In the field of Education, providing a suitable match between teaching methods and thinking styles will facilitate effective development (Sternberg, 1997). It is proposed, therefore, that to improve students' creativity efficiently it is important to identify their thinking styles and identify and facilitate the corresponding teaching methods. This article presents research exploring an 'alternating teaching method' applied in Higher Education for improving design students' creativity. The research concerns thinking styles and the relationships between design process, creative process and education system.

Keywords: creativity, thinking styles, legislative, executive

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Philosophy of design education

Social Design

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Abstract: *This project aims at the collective definition of social design. The process of exploring this definition is considered a workshop that gets people involved and passionate. In this process there are various elements that represented tangible reference points and draw to defined public spaces in the city and central at the University of Applied Arts Vienna. Social Design is a well-established term and has various forms of interpretations. Though this project aims to understand more about these interpretations. To achieve this, individuals were animated to think about the term 'design' and involved in defining new paradigms. This was done with the help of various interactive, crowd sourcing methods, such as idea gathering in the city by interviewing pedestrians and cyclists, with a participatory exhibition, and an open source website addressing the virtual community ... The project is organised and conducted by a trans-disciplinary and multicultural group of students of the Joint-Master Programme Social Design at the University of Applied Arts Vienna and Konservatorium Wien University. They believe that problem solving is a collective process as suggested, by Mau (2004). Accordingly a solution orientated strategic model attracting interest, raising awareness, and motivate individuals to share their ideas was designed. The project started in Vienna and should be continued in other cities. It will further be presented and discussed in more depth with various keynotes and crowd-sources at a conference in Vienna in 2013.*

Keywords: *Social Design, Participative Methods, Crowd Sourcing, Urban Design, Sustainability, Urban Strategy, Cities, Exhibition*

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Ecological Literacy in Design Education: A Foundation for Sustainable Design

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Abstract: *Responsible design in an era of scarcity and risk associated with environmental problems must be ecologically informed. Ecological literacy is necessary in order to both understand the nature of environmental problems and to respond effectively by designing sustainable ways of living. Embedding ecological literacy into design education is happening at the most progressive institutions – and yet for many others, sustainability education is still virtually absent from the curriculum. Progress is slow despite the fact that natural scientists warn that risks will escalate if we do not take dramatic action. Ecological literacy is a severe challenge as it disrupts educational cultures and challenges basic assumptions about what constitutes good design. While sustainability can seem profoundly difficult, ecological learning is the basis for sustainable design and thus it is a basic imperative in design education. Design education needs to expand its scope of inquiry to include a range of disciplines in order to address complex environmental problems. This paper will present an introduction to ecological literacy for design education, describe six ecological principles including associated concepts in systems design, and explain why critical thinking is necessary to make the work of transforming structurally unsustainable systems possible.*

Keywords: *sustainability, philosophy, design education, knowledge, ecological literacy, epistemology, philosophy of design education, multidisciplinary design education*

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Visual Grammar: A Literature Review

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Abstract: *Based on a database query and a manual search of Nordic literature about visual grammar, this article provides an overview analysis of six Norwegian contributions. The question in mind during this analysis concerns how the current academic theory of visual grammar is presented, and in particular, its purpose, the way it is systematized, its degree of theoretical discussion and its view of knowledge. In different ways, these contributions have an art- and/or design educational purpose. From this overview analysis, three elected topics were discussed: The degree of systematic and schematic representation, the discussion of the origin and construction of visual grammar, and the context defined norms regarding the use of visual language. This discussion is meant to pave the way for the subsequent development of an academic textbook where visual grammar would be presented in a contextual perspective.*

Keywords: *Academic textbook analysis, visual grammar, art- and design education, Art and Crafts, visual literacy, visual genre, primary- and secondary school*

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An exploration of design thinking across educational domains.

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Abstract: *To teach design effectively foundational design thinking needs to be understood. Treating the design process as a mysterious mental talent provides little scope for teaching the subject. This study explores the origin of designs and how experience impacts the sophistication of design ideas across educational domains. Secondary and tertiary students were given a common architectural brief and students' outcomes were compared and contrasted to seek commonalities or differences in their approaches to solving design problems. Additionally, interviews were conducted with participants and a panel of design experts to further explore the students' design practices. The results provide insight into design cognition from multiple viewpoints. We argue that designs come from various forms of copying; metaphors, analogies and icons are used as preconceptions by which a design problem is understood. Moreover, experience had a direct link to expertise which is evident across educational domains.*

Keywords: *design, cognitive process, secondary education, motivation.*

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Changing Attitudes Towards Art and Design: Activating Expectations and Design Change

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Abstract: *From fashion to furniture, magazines to medical equipment, airplanes to auditoriums, design infiltrates and influences every aspect of contemporary life. But if the benefits of good design are to continue to enhance our lives practically and aesthetically then we must change our views on education for sustainable design in order to meet the greatest challenges of the 21st century. In the transdisciplinary understanding of art and design education today, sustainability issues and approaches are viewed as a complicated series of relationships, some of which go back to the early twentieth century. Art and design is a radically diversified field concerned with as many processes as concepts. This paper will endeavour to understand some of the trends, developments and responses within art and design practice in recent years, it will assess how our conceptions of art and design are relevant to the problems surrounding global debate on the future of the planet and whether art and design can play a meaningful role in the future in terms of education for sustainable development (ESD). Modern lifestyles and material cultures made possible by design are now so deeply implicated in un-sustainability that a re-writing seems inevitable not only of design history but aspects of art history too.*

Keywords: *Change Making, Descriptive/Empirical/Validity/Design/Art*

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Branded: the sister arts of rhetoric and design

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Abstract: *As a professor of rhetoric at an art and design college in the United States, I am keenly interested in philosophies of design education and their relationships to philosophies of rhetorical education. Clearly teachers of rhetoric and of design have much to learn from one another, yet we rarely interact. One way in which design and rhetoric should be informing one another is through the related concepts of branding, familiar to designers; and ethos, well-known to rhetoricians. I know from faculty colleagues in design how important branding is in design curricula. Students learn the value, as Richard Buchanan puts it, of designing a product whose voice people are willing to bring into their lives. Branding has obvious connections to rhetorical ethos, and in the general education classroom I have used Aristototele's tripartite concept of ethos as the audience's perception of the speaker's phronesis (prudence), arête (virtue), and eunoia (goodwill) to deepen our discussions of both ethos and branding, particularly focusing on the ethical dimensions of both. This paper offers a survey of literature on rhetorical ethos, practical classroom strategies for teaching ethos to designers, and commentary on the possible productive relationship between teaching rhetorical ethos alongside branding.*

Keywords: ethos, rhetoric and design

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Making scholarship: Describing the field of inquiry and the research approach

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Abstract: *The project described in this paper is an upcoming postdoctoral project with the aim to explore the concepts of 'making scholarship' and 'doctorateness' in the practice-based field of Art and design education. This paper will describe the field of inquiry and elaborate on self-ethnography as a research approach. Self-ethnography can be an alternative when a researcher aims to study a professional community to which he or she is already a member. 'Doctorateness' is a central concept in organised research education, and even though the term has its origins in the discipline-based fields of research, the concept is of great importance to practice-related disciplines as well, such as the making disciplines. In 1976, the master program in Art and design education was established at two pedagogical institutions in Norway. The development of the master program shows how a practice-based field has acted with the intention to meet with the academic world, while at the same time, maintaining the field-specific character. Today we can see that there are some similarities between the situation in 1976 and the challenges addressed at the doctoral level. The project presented is part of an on-going Scandinavian research project.*

Keywords: *making scholarship, doctorateness, self-ethnography, Art and design education*

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Development and pathology of Graphic Design in Iran

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Abstract: *Graphic Design is an aggregative art and has a huge function in its international field. But, in Iran there isn't any correct understanding of that because the different branches of this amazing art has not separately been defined and utilized to make the people see and receive its effect in their life environments. The graphic designer has to be like a working machine and does work in all of the branches alone to propound the functions in society. Although the designer knows all of these branches, such as designing a logo, they are not supposed to be included in her work experience, because each of those requires academic professional experience. On the other hand, the communications has taken a special new form these days and although the Iranian designers haven't still reached such technical development in the framework of graphic design profession, they have to follow the global direction and use digital technology but, the presence of digital technology has forced them to almost quit working with the previous tools and equip themselves to this new one, because the mentioned presence has been put into work before creating a suitable ground of acceptance for it. This occurrence has made the situation worse. Old hand designers have lost their jobs and even though just a few of them could have learnt skills in this regard, the power of computer is completely at the hands of young generation. According to my research, some solutions can be offered for this problem.*

Keywords: *Communication, Environment, Graphic Design, Iran.*

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From Tutor-led to Student-led design education: the Global Studio

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Abstract: *“Tutor-led” design education has been argued to be a system where lecturers are at the centre of teaching & learning activities and where educators’ tastes strongly influence students’ outcomes. Design education has also been argued not to prepare graduates for working in highly complex professional capacities synonymous with the contemporary era. We argue the role of tutors in tutor-led design education to be a factor in this.*

The Global Studio runs Web 2.0 enabled industry sponsored international collaborations between students. One aim is to introduce learners to “complex project situations” and consequently to prepare them for contemporary working life. It is operationally different from “tutor-led” design education as lecturers are more “distant” in teaching & learning activities and students construct conversations and outcomes primarily via interaction with peers. Feedback from home-institution students suggests many individuals struggle with making decisions without “tutor-led design education” involvement from tutors.

Given the on-going change in funding provision and the continuing dissolution of “normal” structures, universities are predicted to continue to undergo extensive transformation in their remit and the way education is delivered. We ask whether tutor-led design education is maintainable and whether educators and students are prepared for the consequences of change.

Keywords: *peer learning, learning to deal with complexity, tutor led learning*

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Design values, designing values and valuing designing: three scenarios for values in design education.

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Abstract: *This paper discusses the importance and role of values in design education. As design scenarios constantly change, so do values pertaining to design. Design education should be ahead of those changes, however the theoretical development of design has not given values the same importance as other issues. This paper presents a theoretical framework to help understand the role of values in current design learning. It provides a general comprehension of how values affect both designing and design outcomes, thus aiming to offer arguments that strengthen the awareness and importance of ethical and moral issues in design education.*

Keywords: Values, ethics, moral, learning.

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Which Way is Up? Space and Place in Virtual Learning Environments for Design

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Abstract: *The role of 'place' in design education is essential in providing a structured learning experience that can be trusted and which allows dynamic social connections to emerge in the development of reflective practice. With increasing demand for distance and online learning resources, this paper considers how such a sense of place can be arrived at using 'virtual architecture'. Analogies with physical architectural space – for example 'homes', 'forums', 'studios', 'libraries' can be useful, but in many ways the opportunities for design learning in virtual architecture go far beyond what is possible with physical architecture. We describe how the virtual architecture of an Open University course in Design Thinking has consciously tried to create place rather than space, in crafting an environment with intrinsic learning opportunities, and the benefits this has brought to students studying the course.*

Keywords: *Place, space, design education, virtual learning environments, phenomenology.*

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From Bauhaus to DESIS: exploring solution-focused methodology for social design education

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Abstract: *What are the social responsibilities of design schools? In order to explore this question, we employed action research methodology. Through our on-going collaborations with different design schools, our main research goal is to investigate the social role of designers and further of design schools and the design education system as a whole. 'Ageing in place', the overarching concept for these labs, was to enable participants to experience and question how the life-course approach to ageing could inspire new community design processes. So far, we have engaged different types of design schools and in this paper, we reflect on one of our design labs with a vocational training college in Hong Kong. We worked with staff members and students teaching them how to employ design as a means to engage housing estate residents in their neighbourhood. In-depth interviews and observations of stakeholders who participated in our design actions have been conducted throughout the process. To conclude, three tactical actions on how an individual designer's responsibilities relate to the systems of design education will be suggested and shared: confrontational tactics, empathy and imagination of replacement.*

Keywords: *Solution-focused, Civic Education and Design Lab*

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Digital gardens with *real* toads in them: the place of heritage media in a digital art and design education.

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Abstract: *At a time when digital media is regarded as orthodoxy in education, in advanced global economies there is a pressing argument to review the lessons of the past and reflect on whether they are still applicable. This paper will enquire into today's issues with digital practices in art and design education using relevant, historical examples from the main changes in approach of the last century. It will also explain how the changes of approach to art and design education has affected the choice of materials, the stress on different skills and the values of different creative arts within the subject. From a position as a practitioner in the moving image, and in response to this autoethnographic research, the author puts forward a pluralist approach to teaching design, through a hybrid of particular aspects of 'heritage' and digital practices.*

Keywords: *design education, drawing, digital, hybrid practices.*

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A Multidisciplinary Approach to Design Education: Providing a framework for informed designers of the future

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Abstract: *This paper recognizes the need to integrate design in all levels of education in order to foster creative skills that are applicable in most aspects of life. It highlights unique challenges associated with teaching design in the digital age and the need to encourage students to see in a critical and meaningful way. The methodology used in design education must build on existing virtual tools to promote a physical reconnection to one's surroundings in order to promote an appreciation and understanding of place. This paper explores the notion that design does not occur in isolation and is part of a larger process that involves sharing in a collective sense. A multidisciplinary design education drawing parallels between various areas of design, other diverse fields, and larger societal structures, will allow students to see the importance of sharing in building a solid design foundation. This will lead to more informed citizens and a better quality of life.*

Keywords: *Design, physical connection, sharing, digital*

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Teaching Constraints, Learning Creativity: Leveraging the Guided Distractions

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Abstract: *Different disciplines require different approaches to education.*

The teaching of formalized sciences (such are physics, chemistry, etc.) requires the study of consolidated and already verified results and is conveniently carried out through lecturing (e.g. lectures or books) while formalisms and techniques are learned together with disciplinary contents. Soft disciplines (such are fine arts, interior design, media production, journalism, etc.) require “learning by doing”: the study of facts and techniques that is weakly related to the ability to produce masterpieces or new ideas. Design is in an intermediate position: techniques can be learned (e.g. modelling, representation, materials, colours, etc.), but the ability to design “new meanings”, i.e. creativity, is left to personal sensitivity and to teaching by examples. Creativity can be stimulated, and methods can be provided: constraints. In our experience in teaching design (in particular communication and service design) at our university, we combine theoretical lessons with many design activities, together with constraint driven activities. Constraints stimulate the lateral thinking and make students aware of their mental frames that oppose limits to their creative capacities; constraint driven assignments force the students to focus on the technical aspects, distracting their attention from the creative content so reducing “conceptual censorship”. This paper presents the methodology we use and some of the experiences we carried out with respect to different design fields (products, communication artefacts and services), both in academic as well as in professional environments.

Keywords: Constraints, creativity, design, education, methodology.

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Teaching Design Project in sight of Design Partnership: a new-old way to teach Design

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Abstract: *This work intends to deepen the discussion on Design Partnership. To build this argument we propose a reflection that will be introduced by a bibliographic revision followed by a presentation of different Design concepts. In a second moment, we examine the concept of Design Partnership, and analyze how it occurred in the undergraduated Design programme. The Design Partnership experience is a model of teaching, used in the project disciplines also offered in the first year of the course, the student, a future designer, have to work with a partner in a defined context, and to work with a real problem. These disciplines contribute to the development of autonomy and self-expression of the student, helping also to recover and develop the creative potential of them. This helps to develop their critical sense and give them the possibility of the easier discovery of opportunities and problems and present solutions to the real society that they belongs to. The analysis will be held drawing on examples from real classroom practices and projects realized by the students.*

Keywords: *Partnership design, design teaching.*

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Enhancing structured reflective practice to complement the “Design Praxium” vision

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Abstract: *This paper suggests that an Enhanced Reflective Practice model, as part of a structured reflective practice discipline, supports the vision of an initiative known as “Design Praxium”. This initiative aims to fulfil: (i) a need for a new type of design practice; (ii) a deeper design educational experience; (iii) a new generation of designers that are able to shape new contexts through design. Design Education would benefit from the inclusion of practical ways to cultivate values that may develop hand in hand with design theory and technique. If mental training disciplines that aim to ultimately foster cooperative human qualities can be inserted within existing structured reflective disciplines in an educational context, then rising design students may progress into professional endeavours with higher potential of making more sustainable and socially responsible choices. This paper presents the theoretical context for a developing study that will investigate if the techniques of Enhanced Reflective Practice stimulate mindfulness and promote cooperative human qualities. It is argued that developing these qualities within a design education environment holds the potential to move 'Design' towards the vision of 'Design Praxium'. Moreover, it is concluded that the significant value of this approach is the seamless integration of the disciplines of mindfulness and that of structured reflective practice.*

Keywords: *Enhanced Reflective Practice; Mindfulness; Stillness; Meditation.*

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Design for a city state: An overview of design education in Singapore

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Abstract: *Singapore, which started its modern life as a trading port under the British rule in 1819, became a sovereign nation in 1965, breaking away from the federation of Malaya just a few years after independence. Since 1965, the leaders of Singapore have transformed Singapore many times, starting from its trading roots, to being a manufacturing centre, to financial centre, to a service economy till its present state as R&D centre for science & technology. This paper presents an overview of the development of design education in Singapore, starting with vocational schools that taught design as a skills, through the polytechnic education systems to the present state where there are three universities offering design education at bachelor's level together with a semi-autonomous college of the arts. While sketching the overview of design education as it unfolded since 1988, the author offers his personal insights into how the emergence of design education in this island state coincided with the changing phases of Singapore's economy, concluding with his observation of where design education could be heading in the age of 'design thinking'.*

Keywords: *design education, economic development, education development, overview of programmes*

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Design knowledge

The Music without Melody of John Cage, the Literature without Words of James Joyce, the Art without a Subject of Joseph Beuys and the Architecture without Construction of Enric Miralles

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Abstract: *The contradictory is an appearance. Investigating John Cage, James Joyce, Joseph Beuys and Enric Miralles we get to learn that game, constriction, contradiction and chance are homogeneous strategies in the processes based on an artistic evolutionary commitment, being this a key factor to assume established creative processes in a critical realism and a relational aesthetic. Taking reality as it is, not escaping from what the voices mean to be a block for the development and even be open to the dialogue, assume the complexity of the real thing, not shutting oneself up in the known, but being open to the unknown, relaxing in swampy fields without yearning for safe structures, is the base of an education which will teach self-sufficiency capacity and self-management to people, promoting the ambition for a critical and constructive life together. Contradictions must underlie the echo of the memories, which emerges from the subconscious, forming an essential part of the creative processes and being on the other hand the mirror of the context we live and in which we take active part. The paradox as a unifier of reflection. Reality is also an appearance.*

Keywords: *Creative processes, critical realism, relational aesthetic.*

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The introduction of new technologies in design: a Brazilian perspective

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Abstract: *Design as a field of developing new products and interfaces has been following some technological innovations, such as the appearance of new software and tools that allow the product designer perform various tasks such as product analysis. Today there are new challenges to the design field, such as continuous learning and operation of computerized equipment. The objective of this paper is to show how new technologies are related to the development process of product design by Brazilian designers.*

Keywords: *Design methodology, Design education, Product design.*

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Developing (architectural) design knowledge: A learner-researcher study

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Abstract: *While design researchers use diverse approaches to study designing, non-designers face specific impediments in adopting these research approaches in their quest to gain design knowledge. Recognizing such challenges, this paper outlines how one education academic engineered a first-person methodology to investigate the nature of designing. Through undertaking a learner-researcher study in an undergraduate architectural design basics subject, learning about design through learning to design, she tracked her developing design ideas and crystallized a view of architectural designing as a three-phase heuristic for value selection: imagining possibilities, interpreting ideas to form architectural principles and distilling quality. Her subsequent small-scale test of this value-selection design heuristic in recent cases of architectural design provided preliminary affirmation of its viability. This paper concludes by speculating on various research directions arising from this learner-researcher methodology and a view of designing as value selection and, in particular, provoking consideration of how similar developmental data might be collected and analysed for explanatory insights in diverse design and educational contexts.*

Keywords: *Architectural design knowledge, first-person research methodology, learner-researcher, value selection, design heuristic.*

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Informal peer critique and the negotiation of habitus in a design studio

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Abstract: Critique is considered to be a central feature of design education, serving as both a structural mechanism that provides regular feedback, and a high stakes assessment tool. This study utilizes informal peer critique as a natural extension of this existing form, engaging the practice community in reflection-in-action due to the natural physical co-location of the studio environment. The purpose of this study is to gain greater understanding of the pedagogical role of informal critique in shaping design thinking and judgment, as seen through the framing of Bourdieu's habitus. The methodology of this study is informed by a critical theory perspective, and uses a combination of interview, observation, and stimulated recall in the process of data collection. Divergent viewpoints on the role of informal v. formal spaces, objectivity v. subjectivity of critique, and differences between professor and peer feedback are addressed. Additionally, beliefs about critique on the individual and group level are analysed as critical elements of an evolving habitus, supported by or developed in response to the culture inscribed by the pedagogy and design studio. This form of critique reveals tacit design thinking and conceptions of design, and outlines the co-construction of habitus by individual students and the design pedagogy.

Keywords: Critique, habitus, design studio, peer assessment, reflection

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Agile Thinking in Motion Graphics Practice and its potential for Design Education

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Abstract: *Motion Graphics is relatively new subject and its methodologies are still being developed. There are useful lessons to be learnt from the practice in early cinema from the 1890's to the 1930's where Agile thinking was used by a number of practitioners including Fritz Lang. Recent studies in MA Motion Graphics have accessed some of this thinking incorporating them in a series of Motion Graphic tests and experiments culminating in a two minute animation "1896 Olympic Marathon". This paper demonstrates how the project and its design methodology can contribute new knowledge for the practice and teaching of this relatively new and expanding area of Motion Graphic Design. This would be not only invaluable to the International community of Motion Graphic practitioners, Educators and Researchers in their development of this maturing field. But also to the broader Multidisciplinary disciplines within Design Education. These methodologies have been arrived at by accessing the work of creative and reflective practice as defined by Carol Grey and Julian Marlin in Visualizing Research (2004) and reflective practice as defined by Donald Schon (1983). Central to the investigation has been the approach of Agile thinking from the methodology of "Bricolage" by Levi Strauss "The Savage Mind" (1966)*

Keywords: *Design knowledge, Multidisciplinary Design Education, Practice, Target, Reflection.*

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Like or dislike: Aesthetic judgements on textile patterns

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Abstract: *In different areas of handicraft and textile production, teachers, researchers, purchasers and others have to judge products based on different factors such as function, aesthetics, taste and so on. The whole process of designing – from ideas and visions to finished product – includes aesthetic judgements: In the first planning phase, several sketches are made that can later be changed, adjusted and further developed. When a product is finished, further judgements are needed: designers and artisans evaluate the result of their efforts, teachers judge the works of pupils or students and purchasers or consumers judge the suitability of the textile based on their particular needs. Because different persons make different choices when making or buying a textile product, it is interesting to study people's experiences of fabrics as well as their reasons for making certain aesthetic judgments. This article presents a study of judgments and values expressed when designed printed fabrics were displayed for designers, teachers of textile crafts, consumers and schoolchildren. The present study shows that subjects make their judgements on the basis of formal, functional, cultural and emotional contents. These aspects should therefore be in focus in design work and design education.*

Keywords: design, aesthetic judgement, structures of attention, emotion, textile pattern.

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Colour and Light in Design - Levels of experiencing colour and light

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Abstract: *In our designed culture, every environment, object and picture is analyzed from the viewpoint of colour and light. Colour and light play an important role in social life and culture. This paper springs from an epistemological project about concept formation in the field of colour and light. Based on own observations and scientific and scholarly references it presents a graphic model describing possible constituent relations between colour and light experiences. Design is the art of using knowledge – implicit or explicit – about how humans perceive, experience, and relate to the world around. In design all senses are involved, but when dealing with colour and light we can confine ourselves to vision; designers must understand the conditions of visual perception. Human experience of colour and light has many sources; the given cultural context (conventional meanings of colour and light), the direct experience of the world around (colour and light expressions) and the basic perceptual functions (formal aspects of colour and light). There is need for distinct concepts and concise approaches to understand coherence of aesthetic and functional expressions. Design education calls for coherent and well defined structures that can be used to describe connections and distinctions between experiences of different kinds.*

Keywords: *Colour, Light, Experience, Perception, Concept*

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Mindfulness: The holy grail of design education?

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Abstract: *In the field of design education, the term ‘mindfulness’ has been criticised as a mystification of the creative process and derided as a ‘holy grail’ (Moore 2009). I will argue against this criticism, try to establish some general rules for the chaotic diversity of individual creativity and highlight the role of flow and mindfulness in connection with the creative act. These reflections are rooted in my own experiences teaching croquis drawing with a live model, as well as many years as a practicing artist and pedagogue. My main focus is on elucidating the relationship between context and mindfulness in a teaching situation. It is my hope that this presentation will contribute to a wider understanding of the act of drawing, including cognitive, psychological as well as philosophical aspects.*

Keywords: *focused/non-focused attention, croquis drawing, overlearning, flow, mindfulness, distributed attention, ego-centred control.*

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‘What do you think the campus is telling you?’ Teaching-led research exploring campus design and perception.

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Abstract: *Learning to ‘read’ places is a fundamental skill for built environment designers. Although we may intuitively respond to different designed environments - the silencing effect of a church interior or the imposing scale of a grand estate, for example - the ability to understand how places are spatially and semiotically constructed (encoded) and interpreted by others (decoded) is an ongoing aspect of design education. In this paper, a teaching-led research project addressing such design literacy is presented. This project simultaneously introduces the concept of design interpretation to students whilst addressing the research question ‘how do different students read their own university campus?’ A cohort of first year architecture students were asked to voluntarily complete an online survey capturing their responses to a range of campus spaces, and the survey results were presented to the students in a follow-up lecture titled ‘Reading the Built Environment’. This exercise benefits students by informing them about the communicative power of architecture and landscape design, encouraging them to critically reflect on their own place perceptions, and engaging them in research methods. The research findings provide educators and University management with evidence suggesting how campus spaces can be designed and represented to be more welcoming to students.*

Keywords: design, teaching-led research, architecture, landscape, campus.

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The Intervention of Criticism into Practice

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Abstract: *The goal of the present essay is to show that a number of critiques, following in succession from the first efforts to professionalize design, played a key role in the formation of the discipline as we know it today. Such critiques of design, by countering established practices, created gaps in knowledge – created a discontinuity, the consequence of which was the creation of the possibility for a new way of working. What the discipline lacks today, then, is precisely such a critique of this sort: one that would oppose a situation in which design submits itself uncritically to market demands and accepts the universal relativism of social consensus. For the first time in the history of design, it seems that the professionalization of the discipline is increasingly determined by what is supposed to have chiefly produced it (as a side product during the industrial revolution and the division of labour). Similarly for the first time, we in the profession are indifferent to such a situation.*

Keywords: *design, critique, emancipation, Anti-Design.*

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Redesign of traditional Chinese umbrella

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Abstract: *The project is about the redesign of Chinese traditional umbrella, discussing the possibilities of the traditional umbrella coming back to people's daily life. The designer studies the characters of traditional umbrella, including its features, manufacturing processes, technical skills, materials, costs, and differences from the modern umbrella. On the basis of the studies, the designer tries to combine the traditional elements with the modern life style, revitalizing and inheriting traditional culture at the same time. The whole process consists of the design of umbrella, its packing and propaganda materials. With establishing the artistic conception of the project, it is the project that can enhance people's attention on traditional culture, arts and crafts.*

Keywords: redesign , traditional umbrella , modern daily life

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Counter-Design: Alternative Design and Research Methods

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Abstract: *Art is critical in its ability to propose an alternative to an accepted reality, and produces a counter-consciousness; a “negation of the realistic-conformist mind” [Marcuse, 1979, p 9] Communication design, is a formalized practice embedded in and serving conventional cultural production and capital. An alternative counter-design “...chooses instead to emphasize the need for a renewal of philosophical discourse and for social and political involvement as a way of bringing about structural changes in our society.” [Lang, 2005, p. 46.] For communication design to dismiss its conventional service to capital is in itself a critical negation. Additionally, communication design’s prescribed functions allow it to act as a Trojan Horse, imitating commercial work while surreptitiously engaging in critical practice. Its ubiquity and systematic conformity makes its counter a natural for challenging conventional consciousness. Can Counter-Design offer a model of design research as an agent for critical thinking and cultural agency? Can it engage design students in a critical process of investigation and analysis? Is this valuable for today’s design student? I will show by way of theoretical models and some case studies how this methodology questions predominant roles of design and design pedagogy.*

Keywords: *Design, Research, Experimental, Counter-Design.*

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Applying Design to Learning: Cognitive Science Supports Visual Language Principles in the Design of Effective Reading Materials

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Abstract: *This experimental study examined whether formatting of textbook content influenced reader engagement, understanding or recall of topics. The 48-student population, ages 18-25, represented equal numbers of males | females with two levels of reader-ability, proficient and remedial. Four topics on nutrition were redesigned in grayscale to create three additional formats for each topic: original text with graphic mark-ups; chunked text; and visual language format, thereby producing 16 topic-format stimuli. After participants read four separate topics, each in a different format, they completed: a Personal Background Form; Multiple Choice Test; Prior Knowledge Form; written Survey; verbal responses to Open-ended Questions regarding formats read. This applied four conditions: Reading for Learning; Comprehension Test; Rank Survey; and Open-ended Questions, while incorporating three dependent variables - test scores, Likert scales and verbal responses. Quantitative and qualitative research methods found format statistically significant for influencing engagement, understanding and recall. Proficient and Remedial Male Readers' preferred visual-based formats yet tested highest on text with Graphic Mark-ups; Remedial Female Readers' preferred and tested highest on visual-based formats. Statistically significant data indicated all Reader Groups preferred visual-based formats for engagement, understanding and recall. While designing these formats, positive connectivity was found between cognitive science constructs and information design principles.*

Keywords: *Cognitive design, information design, reading, visual language*

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The four-second window: how the time constraint of working memory and other psychological principles determine the success of a graphic design.

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Abstract: *This article discusses universal psychological principles derived from cognitive psychology that are useful in creating an effective graphic design. The most important are: the strict constraints of working memory which persists about four seconds, the viewers' co-construction of perception and meaning based upon their prior relevant background knowledge including their knowledge of culturally constituted design conventions, especially those of genre. If the designer consciously exploits these cognitively and culturally constituted principles the result will be an effective graphic within a specific geographic and temporal context. Better designs are likely to result from familiarity with these principles.*

Keywords: *working memory, co-construction of meaning, genre, context, inference, design conventions, background knowledge, graphic design, information design, data visualization.*

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Rotational geometry as a teaching tool: applying the work of Giorgio Scarpa

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Abstract: *This paper focuses on a teaching unit in drawing for design that uses and applies Giorgio Scarpa's principles and methods in rotational geometry, as put forth in his book *Modelli di Geometria Rotatoria*, (*Models of rotational geometry*, 1978), and tests their validity through the construction of physical models built by the students. These models are derived from the sectioning of regular polyhedra such as the cube. The resulting modules can be re-configured into closed or open "chains" capable of folding back into their original minimal volume. This process has parallels in geometric folding, such as in linkages, origami, and polyhedra theory in general. This paper will introduce Scarpa's work to English-speaking specialists, and will illustrate how the subject can be made useful to design students.*

Keywords: *rotational geometry, drawing, design, geometric folding, linkages, origami, polyhedra, chain.*

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What does it mean to be a “materially attuned” practitioner?

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Abstract: *This paper reports on research in progress that explores the potential role the materiality of things plays as a tool for the critical understanding of the human relationship with man-made objects. The paper argues that many designers habitually engage with production and consumption of meanings more through the materiality of things than words and symbols. It proposes a hypothesis that materiality is a key to understanding the context, knowledge and information the man-made objects may “embody”. Through the case study of an exhibition, the paper examines the ways in which this embodiment may be facilitated. Referring to Heidegger’s notion of “thingness”, it further explores the origin of the mediating, and the “engaging capacity” of objects. The paper draws on the more established analysis of the origin and the experience of the work of art, in its examination of the role that materiality plays in the production and consumption of meaning and in facilitating the experience through objects. While exploring the potential advantage of an anthropological approach to design, the paper suggests that an attunement to materiality and an active reflection on their observations enable the designers to have better insights into the workings of the human-object relationship.*

Keywords: *Materiality, experiential knowledge, tacit knowledge, knowledge in design practice*

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Listening design: a new methodology for design and innovation processes

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Abstract: *The aim of the paper is to describe a design methodology in the area of innovation design highlighting the importance of sharing strategies, methods and listening practices to be implemented at specific stages in the project's development. The ability of creative systems to generate product or process innovation and to integrate creativity and know-how in the products is the necessary condition to promote design activities and the following competitive dynamics able to meet the needs of the ever-changing world of consumption. The presence of universities, defined as "engines of innovation" (Florida et al. 2002), in complex production territories can establish close links between local development and intellectual capital and generate innovation processes. The interaction of and exchange between different competencies (universities, enterprises, institutions, users) makes up the environment where to formulate, share, design and test the demand for research-led innovation. Starting from the Design Thinking approach, the paper puts forward a methodology for the development of activities that may generate innovation, giving a crucial role to the "open listening" stage meant as the experimentation of an open, equal listening model provided with specific tools.*

Keywords: *Innovation design, knowledge-intensive, creative ecosystem.*

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Research informed design education – Design education informing research

Versioning: full-scale prototyping as a prototype for design education?

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Abstract: *This paper discusses the development of an emergency shelter that can be inexpensively mass-produced and rapidly deployed to disaster relief sites. A seeming simple project wrapped in multiple shrouds of complexity, the project demanded that we not only design an object, but also devise the process for its production, determine how it would be constructed and sourced, identify the most efficient assembly sequence, and outline a strategy for the shelters' distribution. The authors saw this project with its equal emphasis on design, assembly and production as the perfect opportunity to apply the concept of versioning, a strategy that borrows heavily from the disciplines of industrial and packaging design. Versioning utilizes digital tools to combine form finding, the assemblage of materials and the means of fabrication in a single feedback loop that informs multiple iterations. Similar to rapid prototyping, versioning moves the design process towards a system of vertical integration whereby the designers drive how space is both conceived and constructed. This paper discusses the methodology of versioning and positions it within the larger concept of design intelligence. It then looks at its application to the design and fabrication of four generations of prototypes used to develop a flat pack emergency shelter. Finally, the authors speculate as to whether this methodology can be expanded into a pedagogical model for interdisciplinary design studios for architects and engineers focused on small, community-based, design-build projects.*

Keywords: *Collaboration, construction, design, design build, fabrication, pedagogy, public engagement*

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So what do Design students really think? Exploring perceptions of Learning Landscapes

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Abstract: *This paper investigates learning environments from the view of the key users - students. Recent literature on designing Learning Landscapes indicates a near absence of the student voice, assuming that the majority of students are either uninterested or unable to express what they want or need, in a learning environment. The focus of this research is to reveal Architecture and Fashion Design students' perceptions of their learning environments. Furthermore, this study questions the appropriateness of usual design of learning spaces for Design students, or if the environment needs to be specifically catered for the learning of different disciplines of Design, such as Architecture and Fashion Design. Senior Architecture and Fashion Design students were invited to participate in a qualitative mixed method study, including investigation into existing literature, questionnaires, focus groups and spontaneous participatory research. Through the analysis of data it was found that students' perceptions validate discipline specific learning environments and contribute towards the development of a framework for the design of future Learning Landscapes, for Design education.*

Keywords: *Learning Landscapes, Students' Perceptions, Design, Architecture, Fashion, Studio*

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Interdisciplinary Connections between Health Care and Design – a Case Study in a Psychogeriatric Ward in Norway

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Abstract: *Interdisciplinary communication can contribute to the development of a sustainable environment. The promotion of interdisciplinary collaboration among specialists and with people in general is an objective in design education described in the second cycle of higher education in the Bologna process. This article introduces a case study of a creative process initiated to explore how the use of material and visual aesthetics contribute to create a health promoting environment. Health professionals were invited into a process of materializing suitable art objects for a geriatric ward in mental health care. A participatory design process illuminated different intentions from the participants and these influenced the creative process in the making of communicative forms with various shapes and surfaces. An analysis of the case was performed to disclose structures in the process and furthermore to synthesize the key findings into an expanded knowledge on intentionality in design. The key findings make relevant concepts for learning outcomes in product design education and are defined as the; pragmatic flexibility of an open conceptual form, the potentials of a skilled and emancipated view on materiality in interdisciplinary collaboration and the promotion of interdisciplinary collaboration through visual and tactile communication.*

Keywords: *interdisciplinary collaboration, sustainability, material communication, design education, microsociology*

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Methodological Foundations of Design Pedagogy: The Scholarship of Teaching and Learning in Design

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Abstract: *Design as a discipline has been discussing its body of knowledge from different perspectives. An area that will bring new insights to such discussion is a better understanding of how the knowledge in teaching has been constructed and expanded. Using Maryellen Weimer's perspective and classification scheme on the scholarship of teaching and learning (SoTL), this study aims to descriptively analyze the disciplinary pedagogy in design. The content of 174 pedagogical articles published from 1999 to 2010 in three design journals were analyzed. Findings show that in design, experience-based and research-based approaches to SoTL have almost equal significance. The plurality in SoTL approaches suggests that the definition of credible and high-quality SoTL studies in design as a discipline is yet to be discovered.*

Keywords: *scholarship of teaching and learning, design education, design knowledge.*

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Examining the Textile Design Creative Practice Research-Teaching Nexus

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Abstract: *Due to the nature of higher education (HE) in the United Kingdom (UK) educators often operate under pressure. This can be connected to requirements to undertake research and produce outputs, linked to funding awarded to HE institutions (HEIs). Approaches to research that utilise professional and or creative practice are adopted and formulated, prompting use of terms such as ‘practice-led’ and ‘practice-based’. Variation in opinion exists regarding research and creative practice by academic staff and within HEIs. The positive impact that educator research and or creative practice bring to the educational environment, learning and teaching has been recognised. Textile design exists on the periphery of academic discourse regarding design research and education. This paper contributes to literature relating to these disciplines. The focus is on examination of textile designer educator engagement with research and creative practice. Investigation is carried out to ascertain if and how research informs textile design education. The positive impact that operating in the educational environment can have upon undertaking research is described. The paper concludes with discussion surrounding the key findings and proposes considerations for enhancement of the textile design research-teaching nexus and visibility of textile design research to the wider community.*

Keywords: *textile design research, higher education, creative practice, designer educator.*

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Undergraduate Design Studio Task to Internalize Learner Locus of Control

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Abstract: *Designers intentionally influence events and outcomes, making an internal locus of control (LOC) desirable for them to have. Recently, engineering programs have provided more opportunities for design in their undergraduate programs than in the past, but these do not attend to learners' LOC. Because undergraduate learners with a high external LOC can enter these programs, it makes sense to attempt instructional interventions that could help these learners to internalize their LOC. Here, an intervention for internalizing LOC was piloted using a design task in an undergraduate engineering design studio. This was an innovative application of educational psychology constructs to engineering design education, previously two mutually exclusive domains. Although the study was small in size, measures showed a consistent trend: subjects with an external LOC prior to the design task shifted toward an internal LOC, while subjects with an internal LOC prior to treatment retained an internal LOC.*

Keywords: *Attribution, collaboration, design study, beliefs, classroom research, internal locus of control, external locus of control*

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From teaching sustainable product design to teaching sustainable behaviour design

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Abstract: *Traditionally, sustainable product design research and education has been focused on manufacturing and end-of-life aspects. With a new found focus on the use stage, as in the research area of Design for Sustainable Behaviour (DfSB), a better understanding of how a focus on behavioural aspects can reduce life cycle impacts has emerged. Preliminary findings from on-going DfSB research were used as basis for the development of a method to guide designers in selecting promising design principles that can contribute to change user behaviour into more environmentally friendly patterns. This method is presented, and experiences with using the booklet in a sustainable product design course are shared. The paper reflects on how students cope with this research-based approach, and how research has benefited from this course.*

Keywords: *Design for sustainable behaviour, sustainable product design education.*

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The role of identity development in design problem-based learning: essential challenges in sustainable design learning

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Abstract: *This study focuses on challenges students face in learning through problem-based activities, in UK higher education in design for sustainability. Social theories of learning indicate the highly significant but possibly problematic nature of such social contexts for learning, a view underlined by psychological perspectives on potentially significant aspects of the learning process. In particular, the relevant development of identity is considered to play a centrally important role in learning, including in building expertise in tackling complex design problems. A key aspect of identity theory concerns the properties of self-evaluation during meaningful activities, and this suggests an important emphasis in examining the ability of specific educational programmes to enable successful independent learning. Investigating the role of identity, in relation to success in learning through design project work, is potentially of central importance in increasing the relevance and effectiveness of design education programmes. This paper presents the results of a study focusing on problem-based learning during the final project component of an undergraduate taught design module. Working with small tutorial groups during classroom-based activities, their developing responses to externally set design briefs were investigated primarily through the analysis of tutorial discussions relating to the production of project work.*

Keywords: *Design for sustainability, self-evaluation, problem-based learning.*

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Designing teaching—teaching designing: teacher’s guidance in a virtual design studio

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Abstract: *This study examined pedagogical aspects of virtual designing. It focused on how an industrial design teacher organized a plastic product design course and how the teacher guided student teams’ design processes in a virtual design studio. The model of Learning by Collaborative Designing was used as a pedagogical and analytical framework. The study employed qualitative content analysis of the teacher’s notes posted to the Moodle database. The results indicated that teaching exhibited three characteristic emphases: problem driven, solution driven and procedural driven. The main part of the teacher’s notes was solution driven statements, including new information, design ideas and evaluating design. The results of the study demonstrate the link between the model of Learning by Collaborative Designing and the three teaching approaches.*

Keywords: *Collaborative design, computer supported design, design education, design process, industrial design.*

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Design Knowledge from Practice(s)

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Abstract: *The main premise of this paper is to centralize the experiential mode as a fundamental to Design Research whether by practice-based or by practice-led knowledge. This paper will map the process of different 'knowings' of practice, how they manifest themselves into critical knowledge for Design. Through this researcher's engagement with the experiential, came an understanding that could not otherwise have surfaced without the practice-based inquiry and methodologies. 'Practice' is a central imperative of Design, yet the nature of these activities we call 'practices' is never the less complex in its critical edification and defining how it contributes and shapes 'culture building' (Scrivener 2008). To advance research the knowing needs to have 'impact of consequence' (Biggs 2006). While the research needs to 'change the knowledge' (McAllister 2006) of the subject domain, it also often changes the nature of the 'practice'. Making sense of how 'knowing practice' can add to research of / for / by Design education and therefore locating practice in the institute needs to be relevant to the contemporaneous Design Research*

Keywords: *practice-based, practice-led, experiential practices, research practice, design education*

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Building appetites: the design of locative media apps for learning the networked city

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Abstract: *Recent years have seen the rapid growth of mobile communication and more recently smart phones and apps. But how might we approach 'learning the networking city'? In this paper we reflect on the negotiation of a mobile app for cultural mapping of the networked city developed as part of a large design research project into social media and the city. The negotiation took place as part of an international master's level class of students of urbanism, architecture and design. The app called Streetscape was developed and trialled as part of a large funded research project into social media and the city. Drawing on research on mobile design, sociocultural learning theory and assemblage theory we describe the process and outcomes of the students' strategies for redesigning a cultural mapping tool. In summary, we found that the app stimulated learning in three broad ways: 1) as a device for ways of looking at the city, but also for exploring the city, 2) as a means to thinking about design potentials for design intervention, and 3) as offering ideas about alternative and future ways of reading and mapping the city.*

Keywords: *apps, mobile learning, cultural mapping, urbanism, assemblage, sociocultural, networking city*

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The scholarship of teaching: threshold concepts and research informed design education

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Abstract: *This paper considers the growing body of established scholarly research culture in the creative arts: which, it is argued, is in the process of 'catching up' with more established disciplines such as science, history and economics. This slow growth is linked to the need for practitioner-focused lecturers within the discipline, some of whom have little engagement with scholarly theory before entering the academy. The paper then goes on to consider the introduction of a particular theory - the threshold concept framework - to a cohort of industrial design staff at Coventry University and outlines some of the main impacts on both their continuing professional development and their teaching and learning practices. Specifically the main impacts have been an embedding of a threshold concept 'lens' through which the lecturers interviewed now see their teaching and learning practice, which has resulted in both changes in curriculum delivery, and an enhancement of publishing profiles.*

Keywords: *Research, design education, design curriculum*

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Exploring Real-life Settings: Integrating Research and Learning as Thinking-and-Doing in Design Studio Projects

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Abstract: *This paper presents the activities of a multi-sectorial research project within a baccalaureate design studio, two seemingly diverse experiences that come together for a dynamic exploration of issues of accessibility for people with disabilities. Students collaborate with various stakeholders to develop design concepts for the scenario within a public space. They explore how multiple contexts including visual impairment, sensory, environmental, cultural and social issues of integration affect design responses within the environment. In this learning context, students are confronted with how the social construction of reality of the world we live in is not independent of real life settings, how actions play out socially and personally in co-operative inquiry (Berger & Luckmann 1966; Guba & Lincoln 1994; Heron & Reason 2001/2006) and how learning is informed using research alongside design thinking and doing, wherein the design studio in turn informs perspectives of both researchers and stakeholders. Collaborative and individual activities frame student understanding of diverse issues not normally understood in the design studio classroom, including the dynamic of the stakeholders and how priorities are framed within design intentions, project aesthetics, universal design issues, and social considerations such as inclusion and participation of users through their lived experiences in real time.*

Keywords: *participatory action research, social inclusion, co-operative inquiry, re-adaptation, integrated design studio, theory informed practice, project-based learning, problem-based learning, inquiry-based design*

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A phenomenographic pilot study of students' conceptions of design research

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Abstract: *In view of the current inadequacies of design research, a group of art and design researchers have urged for alternative research methodologies, which is challenged by opposing views that a formal research structure and a rigorous research should similarly be applied to design research. To address these divergent views, this paper aims to explore the potential use of formal research procedures in design research. This study uses the phenomenography method as the basis of its research design. Focusing on visual communication studies at undergraduate level, this paper is a documentation of the development and implementation of the formal research procedures on eighteen design research proposals. It shares the insight on how students experience, understand, perceive or conceptualize various aspects of design research. The findings have affirmed aspects of formal research procedures and represent a first step in explaining the different ways in which visual communication students conceive design research. The future aim of this research study is to better inform the application of theory to practice in design education.*

Keywords: *Phenomenography method, design research, formal research procedures.*

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Learning to See: Contribution to an Analysis of the Teaching of Free Hand Drawing by Kari Liv Brundin Torjussen at Oslo National College of Art and Design, 1947-1990

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Abstract: *The National College of Art and Design (Norwegian abbreviation: SHKS) in Norway was established in 1818, as a school for educating craftsmen and artists. Until late 20th century, free hand drawing was its foundational subject. Today, this is no longer the case, and the recurrent questions are: Which competences do design students need in free hand drawing, how should this subject be taught, and what should the education curriculum comprise? This paper aims at clarifying the tradition in which free hand drawing is embedded. Asking what the institutional teaching of free hand drawing actually was, reveals that little information is available. This teaching has been demonstrative and oral, therefore, only scarce sources are available. The exception to the rule is Kari Liv Brundin Torjussen (1922-) who has left a personal archive of her teaching work. She taught free hand drawing in the first year design class at SHKS from 1947-1990. This paper represents an initial phase of a broader research project of the institutional history. It presents a brief biography of Kari and the beginning of an analysis of her teaching, based on interviews with her, statements from some of her students, institutional archival material, literature and her personal archive.*

Keywords: *Free hand drawing, teaching tradition, college level.*

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Designerly well-being: implications for pedagogy that develops design capability

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Abstract: *The concept of "designerly well-being" identifies the value for individuals and society of the development of design capability inherent in all humans. This concept builds on ideas more generally of capability, well-being and democratic design. The paper explores pedagogic issues, particularly in relation to the development of an individual's understanding of themselves as a designer, how they engage effectively in the processes of designing and how they develop the confidence and confidence to positively exploit their own designerly capability in their personal life, social and community life or professional life. Key to this is the stance of the educator on the processes of designing. The paper will present research that make the case for an iterative, dynamic view of process, responsive to the changing demands within any design or design related task. This research illustrates the importance of recognising the preferred approaches to design activity of individuals and the importance of supporting individual preferences whilst building new strengths to establish a repertoire of design methods, processes, knowledge and skills. Achieving designerly well-being across society is ambitious. In considering pedagogic approaches that could support this ambition and drawing on research findings from projects with primary and secondary aged learners (ages 5-18), the relationship between individual approaches to designing and the way design challenges are presented structured will be explored.*

Keywords: *designerly well-being, design pedagogy, design education research.*

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A different approach on gaining practical experience by acting as an (open) innovator at Industrial Design Engineering

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Abstract: *At Industrial Design Engineering we aspire to provide contemporary education, both in the content of the program as well as the way in which we teach. We aim to facilitate our students to become responsible entrepreneurs of their own learning experience. At the start of the second year we challenge students to initiate, organise and execute individual, international research abroad for 3 months. Students have to choose a research topic, initiate contact with companies and set-up a project. This ambitious setup at first creates confusion and excitement among the students. However, facilitated by a step-by-step approach, students arrive to inspiring research projects driven by their personal interests. We conducted a case study research to evaluate the educational approach as being successful in stimulating student entrepreneurship. We studied both the preparation course and the student projects. Insights on this approach are retrieved through the collection of multiple data from multiple sources and qualitative analyses. Results indicate that the majority of students are capable of designing an individual research project in an international setting and the balance between freedom and structure resulted in constructive friction*

Keywords: *new teaching, new learning, innovation.*

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Fostering deep learning in respect to the social aspects of sustainable product design

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Abstract: *This paper presents findings from a doctoral study, which investigated effective methods for teaching social sustainability within product design courses in British and Irish universities. Specifically exploring how appropriate methods can be used to foster deep learning in respect to the social aspects of sustainable product design. The importance of deep learning is reflected in both the sustainable design education (O'Rafferty et al., 2008, Griffith and Bamford, 2007) and education for sustainability literature (Warburton, 2003). Three 'Rethinking Design' workshops were designed and developed as part of the doctoral main study to introduce students to the wider social aspects of sustainability and were conducted in five universities in Britain and Ireland. The workshops were developed to foster principles that encourage students to adopt deep learning methods, including motivational factors such as relevance, appropriate teaching materials and opportunities for collaborative learning. The workshops were successful in fostering deep learning by facilitating learning through discovery, critical reflection, peer learning and creativity leading to an exploration of design thinking solutions.*

Keywords: *Deep Learning, Sustainable Product Design, Net-Generation learners.*

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Multidisciplinary design education

A case study on action research: Barri Gòtic Barcelona

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Abstract: *The Design Degree program at Elisava Escuela Superior de Diseño e Ingeniería de Barcelona includes tools and mechanisms to focus students on the users, the social context and communication. The idea behind this is that greater density should be sought in the projects and a fabric of relationships should be generated in a social and geographical environment ranging from the most local to the most global. As part of its "Products, context and user" subject, Elisava planned action research during the 2010-11 academic year between a group of graphic design students and the members of the 'Asociación de vecinos del barri Gòtic' (AVVBG or Gothic Quarter Community Association), the Gothic Quarter being the district of Barcelona where the School is situated. As the AVVBG has few members, it considered the need to develop new communicative strategies. The teachers provided the students with the traditional social science methods (documentary sources, participant observation, in-depth interviews) with two goals: the first, that they might become deeply aware of the district's social reality, its relationship with the rest of the city and the true needs of the AVVBG (diagnosis); and the second, to establish bonds with the members of the AVVBG that would lead to starting spaces for reflection, joint creation and joint participation in designing the association's new communication strategies. The changes between the students' first proposal made with the typical conventional project methodology, and the following, after the action research and the users, students and tutors' reply, give a good account of the values and challenges of this methodology and enable design discipline self reflection.*

Keywords: *Research-action, critical social science, Barcelona.*

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Multidisciplinary Design Education

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Abstract: *Since 1994, the Interdisciplinary Laboratory of Design/Education (LIDE) has been cataloguing works that report experiences, graduation projects and postgraduate researches focusing on the teaching of Design and Design in Education. This paper gathers a collection of the main projects developed in LIDE since its creation and that integrate the research directory of the National Council for Scientific and Technological Development –CNPq, with the aim to make available to academia and society a vision about researches dealing with Education in Design and Design on Education. Those are broad research fields; still few explored and, incidentally, that have been objects of research from various perspectives. It can be said that with each new experiment performed, the field of Design is widened and, consequently, the work possibilities for the designer are broadened. This move of permanent expansion of barriers, limits, is positioning Design as a multidisciplinary area. In this paper are presented abstracts of research projects that will make part of the content of this book, entitled “Things Written about Design Pedagogy: 20 years of research in the Interdisciplinary Laboratory of Design/Education”. The collection brings together articles that have as their base themes addressed on PhD theses developed in the Postgraduate Program in Design.*

Keywords: *Design, Education, Multidisciplinary.*

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Spatial and Service Design meet up at *Coltivando* Convivial Garden at the Politecnico di Milano.

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Politecnico di Milano, DESIGN dept

Abstract *'Coltivando'* is the community garden set up by the Politecnico di Milano, a collaborative project that calls for both Spatial and Product Service Design competences, developed by a team of three postgraduate students supervised by researchers and teachers from the same fields. This paper describes the process and the tools used to design this garden: from the first "design studio based" concept (November 2011), to the final solution deployment (October 2012). Both soft and hard components of the project were included in the process, starting with design for social innovation and including Participatory Action Research as a way to test and prototype the ongoing outputs. Different competences merged to address questions such as: how to shape the spatial layout; how the temporary urban solutions could create a scenario to be developed as a long-term project; how to design the service model; how to approach Community Centered Design to engage the neighbourhood and academic staff in co-design activities, in order to open the campus space to the city. It is an example of a multi-disciplinary team collaborating with civil society representatives to engage various stakeholders and to shape a democratic design process.

Keywords: Collaborative service, co-design, Spatial Design, Urban Agriculture, garden.

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Design as a second language. Design as a multicultural-multidisciplinary space of integration: Challenges and advantages of introducing design to non-design students, in a second language, in a new cultural context

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Abstract: *Teaching design to design-illiterate students is usually a common case for every first year class instructor at any design program. In addition to this, a particular combination of extra challenges makes Design Fundamentals at -the University of Alberta- a very special spot to learn and teach design. Most sections of this class are open to students from many other fields and levels, from psychology to engineering, and from first year students to senior students. Masters students, who usually come from various countries, are often appointed as teaching assistants as part of the graduate program experience. Some of them choose to stay and teach upon graduation. Diversity is even more distinct amongst undergraduate student. In 2010-2011 this university received about 5800 international students from more than 140 countries, three times larger than the figures of 2001, and increasing every year. The combination of multidisciplinary and cultural diversity from both sides, teachers and students, is a symbiotic and synergetic phenomenon that offers additional challenges and opportunities. This paper intends to describe the experience of teaching-learning design under this environment and ultimately depict the Design Fundamentals classes as a space of integration.*

Keywords: *Design education, Design Fundamentals, second language, multidisciplinary teaching, teaching non-designers.*

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Integrating multidisciplinary collaboration in undergraduate design education: Too many cooks spoil the broth?

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Abstract: *Employability studies continue to highlight the fact that digital media design graduates may not be sufficiently prepared to bridge the gap between university and industry. In response, an alternative learning and teaching approach for digital media design education, the POOL Model framework, was developed and subsequently trialled at an Australian university. A broad underpinning strategy of the framework is to reflect industry practice through implementing workplace realities such as multidisciplinary teamwork. Introducing multidisciplinary collaborative practice into design education is identified as necessary; however, exactly how these collaborations can be managed at an undergraduate level is less well defined. This paper describes the design of a collaboration that engages undergraduate digital media design students in multidisciplinary teamwork with information technology students and subsequently multimedia journalism students as well. Can such multidisciplinary collaborations be beneficial for all participating students? Are there too many disciplines involved? Challenges that commonly occur when undergraduate design students engage in multidisciplinary collaborations with disciplines outside the creative arts were identified. These informed the development of strategies (pragmatic principles) which aim to facilitate the functioning of the POOL Model framework and the development of a sustainable solution. Findings from a three-year study are presented.*

Keywords: *multidisciplinary undergraduate design education, POOL Model framework, multidisciplinary collaboration.*

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Teaching the Design of Narrative Visualization: Using Metaphor for Financial Literacy and Decision Making

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Abstract: *The authors provide a scholarly definition for metaphor-rich, story-driven “narrative visualization,” and assert the importance of this methodology in contemporary design education. They propose “narrative visualization” as especially useful in promoting financial literacy: a context in which design can both facilitate understanding and possibly influence behavior. This emotionally-engaging means has the potential to affect the “System 1” intuitive decision-making processes that Kahneman and others have identified as the primary drivers of financial behavior. The case study here presents a recent design course that was customized to teach “narrative visualization” in a financial-literacy context. Student work from that course is examined through a newly-devised framework: the infoEmotion[®] matrix of visual and content elements. The infoEmotion[®] matrix is introduced here as a first step toward establishing best practices for teaching “narrative visualization” and for assessing animations, graphic novels, informational short films, and illustrations.*

Keywords: *Design education, Narrative visualization, Information design, Metaphorical visualization, Behavioral finance, Financial visualization, Financial illustration Financial literacy, Financial education, Financial capability*

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Cross-cultural design attitude: open-ended design solution for welcoming the Diversity

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Abstract: *Italy draws lots of refugees from the Mediterranean regions: in 2010, Milan received more than 850 people in its welcoming Centres. Municipalities, citizens but also professionals must be involved in the collective answer to such a kind of phenomenon. The ephemeral nature of the settlement in the Centres, the precarious conditions of staying, as well as the variety of tenants' identities (multi-ethnic and gender turns) shape a new research field of great, social, importance which challenges the designer to imagine new strategies and tactics for collective living. These reasons convinced a multi-disciplinary group (designers, social workers and environmental psychologists) to start a dialogical process, addressed to redefine characteristics and qualities of host-structures for asylum seekers and refugees, in Milan. The diversity of disciplines shared methods of analysis and interpretative models, whose availability was granted by designers' work. The research methodology is inspired by a recent approach of AR, called pro-occupancy, which considers target-need as a complex system made by tangible and intangible queries. The research process feeds, in a circular way, the final year studio of the Interior Design BA (Politecnico di Milano): students developed scenarios and practical solution to rethink the current "state of art" of the Centres.*

Keywords: *Education and sensitivity; role of habitat; design research for social inclusion; asylum seekers and refugees; place attachment.*

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Wicked Futures: metadesign, resilience and transformative classrooms

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Abstract: *This paper presents an Australian case study entitled “Designing Futures”. It examines a six month multidisciplinary design program offered by a large co-educational, inner-city state school in Queensland in 2011. The program extended an already successful and innovative school-based design curriculum and involved students in Philosophy, Science, Mathematics and English classes, as well those in Art and Design. Additionally, there were 5 full-day workshops where students combined a wide range of skills to brainstorm, design and create sustainable solutions. The design thinking used in this program was based on the concepts of metadesign, design activism and design futuring. “Designing Futures” linked over 700 middle and secondary school students and staff with nine designers-in-residence from diverse disciplines, including bio-ethics. The program aimed to empower students from highly diverse cultural and social backgrounds to engage in authentic, participatory design processes, prepare them for future social and environmental challenges, and increase personal and community resilience. The research results will inform ongoing program development and research in K-12 design education, both within the school and in conjunction with university and community partnerships in Queensland.*

Keywords: *Metadesign, design activism, resilience, participatory design, social inclusion*

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An effect of multidisciplinary design education: creative problem solving in collaborative design process

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Abstract: *This study verified whether the students who received multidisciplinary education can be considered to have attained more creative problem-solving abilities than the students who majored only in design, based on their completion of a project after teaming with students from various other departments. When it is heterogeneous and in the in-depth discussion stage, the EMT(heterogeneous teams, including multidisciplinary design major) produced more creative output than the EDT(heterogeneous team, including design-only major) as a result of an experiment. Therefore we compared the creative process of the EDT and the EMT in the in-depth discussion stage of the heterogeneous groups by the conversation analysis. In the problem-solving approach, the EMT focused more on context and the multidisciplinary students considering much more diverse aspects of design content. Analysis of the group activity process showed that the EMT and multidisciplinary students actively engaged in idea generation and review & summary. As such, this study was able to confirm that students who received multidisciplinary design education, when they form a team with various other majors to do a project and in the in-depth discussion stage, show differences in creative process to solve problems and more creative output than students majoring in design only.*

Keywords: *group creativity, multidisciplinary design education, design process*

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Tell it with colours: Case study of Multidisciplinary educational program for non-designer

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Abstract: *The aim of this paper is to identify qualities associated with pupils' interactions with aesthetic learning processes when creating multimodal texts. The study addressed the following research question: How do pupils experience and interact with the appearance of aesthetic elements when they create multimodal expression? The topic chosen is associated with an interest in children's encounters with art and developing an understanding that will assist practitioners who work with creative processes in their daily activities to take part in teaching in schools. This facilitates the expression of creativity as well as innovation and the development of the pupils' sensibility with regard to cultural expression. The meaning making that occurs during interactions among the pupils, the teachers, the art form and the tools is explored. The theoretical perspective for this study is socio-cultural, and a socio-semiotic multimodal theory is presented and discussed. The method used was a case study. The data generated within this project were qualitative, including field notes, video observations, photos and children's multimodal texts. The study subjects included six pupils in the first grade of primary school. In the analysis, a narrative approach was applied to provide nuanced descriptions of situated aesthetic learning processes and experiences.*

Keywords: *Aesthetic learning, multimodal texts, multidisciplinary, creativity, encountering the art, early childhood education.*

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Mobile Museum Communication Design and new literacies

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Abstract: *The relationship of technology to museum practices is a field that continues to evolve; acknowledging the potential for generating innovative engagement with museum visitors. Engagements that will require understandings on the part of museum communication that include: content travelling across contexts, iterative participatory methods suitable for mobile social media participation, and sustainability of the media involved. In this paper we demonstrate how the use of a small-scale prototype experiment is used as the basis for generating methods in which design thinking and cultural investigation can contribute to understanding emerging literacies for museum communication design. As a team of researchers making inquiries into the role that social media can have for extending the space of museum communication, we see this rising need of understanding the cultural practices of these media as an active design-thinking problem, rife with opportunities and potential pitfalls. Opportunities to develop deep-seated investigations that lead to new knowledge and pitfalls that result in limited scope, outcome or attitude.*

Keywords: *Participatory design, small scale prototyping, social media, cultural heritage, urban participation, design literacies*

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Energy and Emotions: transdisciplinary design education for resource conservation

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Abstract: *In our contemporary world we are using resources extensively to the point of their depletion. The call for more sustainable ways of living is louder than ever before, asking for a better awareness of the flows of resources and energy. This paper looks into existing design perspectives towards energy use in our daily living. By exploring relevant literature in social sciences and in design, and earlier research related to energy use, we identify a need to connect the design for conservation more strongly with human emotions and their relations in the social realm, and thus iterate the systems collaboratively in real-life settings through constructive design research approach (Koskinen et al. 2011). The questions arising from the earlier research on design in such context are elaborated further into notions relating to design action and education. Consequently, we suggest elements for such action, as well as an educational model to further the inquiry between energy use and emotions.*

Keywords: *design for sustainability, design education, emotions, conservation, feedback.*

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Translations: Digital & Physical Interchanges

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Abstract: *This paper presents experiments in digital design teaching methodologies at the collegiate level within architectural education. The experiments manifested themselves in the form of three design workshops for students from different levels within the undergraduate architecture degree program at the University of Kentucky. Collectively titled “Translations”, these workshops speculated on strategies for the integration of analogue drawing and making with digital translations within the architectural design process. The events were organized around the concept of employing multiple modes of making, a diverse set of design techniques, and mixed media. The theme of the workshops grew from the belief that multiplication and hybridization of making ensures a cyclical design process in which concepts are translated from state to state, opening the possibility for interpretation, intuition, and innovation within the process of architectural design. The workshop series demonstrated the production of sophisticated architectural concepts and potent architectural design investigations through carefully considered blending of analogue techniques of drawing and making with complex digital design software and relevant digital fabrication resources. Materiality, pattern making, composition, architectural form, and digital craft were featured as primary points of departure and output within each workshop event.*

Keywords: *Architecture, Digital Design, Parametric Design*

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Cultivating creativity: documenting the journey

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Abstract: *As a Master's of Education in Learning Sciences candidate at the University of Washington and a licensed architect, I co-taught the course Cultivating Creativity with Professor Iain Robertson, Winter Quarter 2012. This course is offered annually to a group of 15 Honors students at the University. Professor Robertson has taught this class for five years. Participating students were in 'non-creative' majors such as Biology, Chemistry, or Math. Two students were in Computer Science and Religious Studies. Most of the students arrived expecting to 'learn' how to be creative. Through exercises that Professor Robertson developed, the students gained confidence in their individual and collective creativity. They also began to experiment with materials and ideas as they discovered their creative confidence and voices. Students wrote weekly reflections after each week's exercises. I have created a Prezi presentation using excerpts from these reflections with images from the course work to demonstrate the power of a course designed to cultivate creative thinking. The students' voices, together with supporting literature, shows the importance of teaching design and creative thinking skills within the framework of "non-creative" curricula. This paper works in tandem with viewing the Prezi.*

Keywords: Creativity, design thinking, innovation, creative thinking skills.

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Craft education: authentic design constraints, embodied thinking, and craft making

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Abstract: *Craft education, as a form of design learning, has a special significance in inspiring human creativity, particularly when conceptual and material aspects of the process reciprocally support one another. This article underlines the relevance of craft and design education; 1) the importance of dealing with various constraints and professional design knowledge, 2) the role of the embodied thinking in design and making activities, and 3) the ability to foster students' awareness and competence in exploring, evaluating and improving their local environment and design culture. Two longitudinal elementary students' design projects will be described as examples of integrative and thematic school projects. In addition, implications and possible future for craft education will be described.*

Keywords: *Craft education, design constraints, embodied thinking, making, collaborative designing.*

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Music iconography used as video montage guide – Conception, development and validation of a teaching module in Communication Design

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Abstract: *The article proposed describes the findings retrieved from the researched carried out in the PHD in Design. The experience, combining sound, video and drawing, had as purpose design a learning experiment on Video montage in the scope of Communication Design. The drawing was used as music translation and provided guidance in conducting different paces in the moving image sequence. The use of drawing enabled the creation of a graphical score used in video montage as well as an implicit method to record the experience. The work can be described as a border line research making contact with distinct areas such as; drawing, moving image, sound and Technologies of Education. The research included dramaturgical and expressive amplitude, dramaturgical within the sequence of learning amplifying each phase of the Learning sequence, through relations with historical references. Those relations worked as scenarios relating the different areas close to the project, the experiment stimulated in the students the construction of relations between different areas and exercised trans codification practices through the expressive amplitude of drawing. The Learning module related the drawing of sound with video montage designing a transcodification tool for further learning activities.*

Keywords: *Video montage, drawing, graphic score, transcodification.*

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Multidisciplinary design for intercultural learning. Crafting digital services for a multicultural society

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Abstract: *Several literatures acknowledge that design education has been shifting from the mere training of young students to be skilled professionals to a more profound understanding of the social context in which the future designs will emerge (Norman, 2010) (Findeli, 2001)(Frascara, 2007). This comes from the increased understanding that in order to craft sustainable and viable products, being material or virtual, students have to refer in the first place to their living environment and feed their creativity with the challenges experienced in real life. For educators this starts firstly an investigation on how to guide their students in the exploration of the well-known and therefore unquestioned events they experience, and secondly on how these experiences can be articulated into design projects. The particularity of the case study reported in this paper, comes from the multidisciplinary team of professors, from communication design and computer engineering, and the novelty of the project brief dealing with the intricate topic of intercultural communication and social integration on the Italian and Milanese territory (Granata, 2011) (Pedersen, 1995, 2004).*

Keywords: *higher education, pedagogy, interdisciplinary collaboration, communication design, ICT, intercultural learning*

A Polydisciplinary Journey: From Coffee to Prototype

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Abstract: *Multidisciplinary research and access to multidisciplinary learning experiences are recognized as critical to our time. However, most universities are not structured to accommodate co-teaching, cross-linking of courses between majors or colleges, or other curricular methods of bringing people of dissimilar backgrounds together. While faculty are pushing these limitations around the world, it is often done outside of institutional structures, and may require an act of magnanimity. In addition to infrastructural hurdles, disciplinary specificity can make communication and collaboration as challenging as speaking different languages. This paper presents an approach to overcoming these difficulties from a social beginning resulting in extracurricular research teams with leaders and members from various disciplines, including architecture, architectural engineering, mechanical engineering, environmental engineering, computer science, industrial manufacturing engineering, and landscape architecture. Teams may consist of professors with Ph.D.'s down to undergraduate students. An example socialization-to-multidisciplinary research process is demonstrated by an architectural research and design project. The example project will also illustrate the use of analog simulation and computation as a communication tool between various disciplines, allowing verification of design ideas through the simple fundamentals of science.*

Keywords: *multidisciplinary, indoor air quality, undergraduate research, interdisciplinary, professional learning community*

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Challenges in design education methods

Who is the Designer?: An Experience of Collectivism in Basic Design Course

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Abstract: *This study focuses on a specific Basic Design exercise, which has been conducted for four following semesters in the Department of Industrial Product Design at Istanbul Technical University (ITU), Turkey in 2010-2011. In this exercise, students were expected to design a Jury Invitation (card) collectively specialized for the specific semester. The exercise has four main phases to which students followed: Generating ideas in the form of models individually, voting, redesigning the top four or five collectively, and finalizing and reproducing. In this study, we aim to discuss the process of this exercise and the outcomes of it in the light of collective design. So, it can be considered as an endeavor to experiment collectivity rather than conventional individualistic approach in basic design education.*

Keywords: *Basic design, Collective design, Design education.*

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Making, using and interpreting design probes: how subjective is participation?

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Abstract: *The wealth of participatory methods in human-centred design adheres to the notion of a democratic process and solutions that respond to the experiences and needs of users and stakeholders. However, as human-centred design philosophies permeate the landscape of design education and research, the designer's role as both an objective facilitator and creative decision-maker suggests their impact upon stages of data collection and analysis. This paper advocates tools and techniques to support design students in initiating user engagement and insight-gathering whilst simultaneously recognising and utilising their own subjective experiences and knowledge. Drawing comparisons between our practice-led masters and PhD research, we discuss how an interactive activity pack is used to gather community members' perceptions of fear and safety in the urban environment before examining how observational illustrations are employed to examine the multiple functions of an art school. In this, we consider how the designer's creation, use and interpretation of design probes can establish an empathic and intersubjective dialogue in participatory design exploration. We propose that the application of a reflexive methodology can strengthen students' critical awareness of sociocultural issues and promote authenticity and rigour in human-centred design.*

Keywords: *human-centred design, participation, probes, dialogue, reflexivity*

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Pedagogy for teaching design – with an emphasis on sustainable design

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Abstract: *Teaching sustainability is not solely a question of providing relevant information; it is foremost about training students to meet the challenges of tomorrow. In design this can mean to shift the focus from material, form and function towards systems, correlation and time – a process supported both by how we teach as well as what we teach. But pedagogy still seems to be treated like a poor cousin to the more important design knowledge. This made us curious about the correlation between pedagogy and teaching design for sustainable change.*

By applying a study of Eilam and Trop (2011) onto the curriculum of an undergraduate design programme and through interviews with students we investigated the underlying pedagogy. Eilam and Trop had identified four pedagogical components that supported a holistic learning experience in their study.

It proves more fruitful to incorporate sustainability wholeheartedly in a programme, instead of teaching it as a separate course. Pedagogies like emotional learning in realistic design projects and multidimensional learning in theoretical courses support an education for sustainable change and prepare students to meet the challenges of tomorrow without missing their professional development.

Keywords: *Sustainable Design, Pedagogy, Design Education*

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Another future for designers in America

Kate CATTERALL*

Abstract: *The rationale behind mass-industrialization, now normalized, is embodied uncritically in the practice of many new designers. What if the industrial past could be explored and experienced as a foreign territory, providing a vantage point from which to critically evaluate contemporary design practices and define new paths? Young American designers are searching for alternate roles, and ways to design and live. Many experiment with models from elsewhere, places where new futures are growing from useful pre-industrial remnants. America, a country synonymous with industrialization, has no such resources upon which to build new practices, and slowing while creating value through quality is pitted against the dominant ideology of democratic capitalism and a national mythology that conflates freedom and prosperity, with ownership and abundance. Students who lack understanding – critical or otherwise – of mass-production, its precedents or antecedents, learn first-hand the values of making one and making one million by producing spheres through whittling, turning, casting, and using software defaults to send the perfect sphere off for automated reproduction, ad infinitum. This exercise develops in the manufacturer (student) a nuanced understanding of worth and consequential value, and creates receptivity, otherwise absent, for identifying and testing new patterns of behaviour.*

Keywords: *Sustainability, reconfiguring values, design education*

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Inspiring and Investigating Imaginative Capability of Design College Student

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Abstract: *One's imaginative capability will influence his/her design idea and final product, therefore the imaginative capability is important to a designer. People always considered that the imaginative capability is natural endowment; however, the authors considered that it could be inspired by the family and school education. The purpose of this research was to find a feasible way to inspire students' imaginative capability, and investigate the relationship between the students' imaginative capability to their family education and school education respectively through a devised experimental teaching. For this purpose, some reasonable influential factors of imaginative capability were selected by references and experts' suggestions, and then classified into three facets. The facets were personality, study atmosphere, and imaginal thinking respectively. The experimental teaching proved that the imaginative capability indeed can be raised by acquired education.*

Keywords: *Imagination, imaginative capability, design.*

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Learning problems and resources usage of undergraduate industrial design students in studio courses

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Abstract: *Design students face certain learning problems and difficulties as they explore the design problems space. The purpose of this study is to understand those learning problems and the resources that undergraduate industrial design students need in studio courses. To collect the data, a questionnaire was designed according to the preliminary studies. A total of 334 students from 4 Taiwanese universities participated in the survey. The results demonstrated that the most difficult design tasks for students included concept generation, design presentation and design decision. The main problems that the students experienced included the cost issue in design presentation, time pressure in design documentation, inspiration in concept generation, digital modelling in design presentation and vertical (deep) thinking in concept generation. The causes of these problems were personal issues, resources and interactions with instructors and peers. The learning resources that the students used to solve their learning problems fell into four categories: people, object, method and environment. The information provided in this study can deepen the understanding of the learning process of students and provide a reference for teaching planning and the setting of the learning resources in design education.*

Keywords: *learning problems, learning resources, design education.*

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Design: The continuous construction of competences

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Abstract: *This article concerns high education curricula and training of designers. The key question considered by Design teachers and explored in this article is: How can we supply designers with useful and essential skills through training that will allow them to effectively respond to the needs of business environment? To answer this question we present the results of a research designed to focus on market and business needs of design competences, and expectations about designer's performances. We intended to provide further information and discuss the curricula in design higher education. Finally we present a model that allows higher education institutions to design new and innovative higher education curricula in design, able to fulfil company's requirements.*

Keywords: *Competences, Curriculum, Design studies, Competitiveness*

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Understanding the PhD by Publication

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Abstract: *This case study refers to the submission of prior research for the award of PhD by Publication, and compares and contrasts this with best practice in conventional PhDs. Unlike a conventional PhD, which is usually taken at the beginning of a researcher's career, the PhD by Publication may be taken after a lifetime of research. The regulations governing such awards vary across institutions, but the award is often granted to very experienced research practitioners who have a track record of significant publication in their area of specialism, indeed they may already be leading authorities in their subject. There are several aspects of this relatively new award which are different to a conventional PhD. This case study details the approach taken by a candidate and his supervisor, and discusses the problems and opportunities that arise from this qualification.*

Keywords: *PhD by Publication, doctorates, training*

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Down the Rabbit Hole: a situated approach to design education that facilitates socially responsible emergent designers

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Abstract: *This paper is centred on the progressive curriculum and sustained positive impact of the Rabbit Hole – the University of Western Sydney’s Bachelor of Design teaching studio. The award-winning Rabbit Hole is a unique learning environment, incorporating participatory design methods and a work integrated learning framework that facilitates situated learning experiences, where live projects with real-world outcomes bridge the gap between academia, community and industry. Through a series of case studies, this paper demonstrates how the Rabbit Hole utilises the transformative agency of its innovative design pedagogy to inspire and empower socially responsible emergent designers.*

Keywords: *Work integrated learning, participatory design, design advocacy, situated learning, design responsibility, visual communication pedagogy.*

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Social Networking as a Mentoring and Engagement Tool Between Design Alumni and Early Design Students

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Abstract: *In graphic design education, there is an increased need to integrate design thinking, with less focus on the designed 'object' and more focus on its message. Realities of the contemporary profession mandate the development of broad thinking skills; students need to begin viewing themselves as problem-solvers first, image-makers second. The Alumni Mentor Initiative was devised to introduce beginning graphic design students to design thinking as it manifests itself in practice. Using the LinkedIn website, 80 alumni from the university's graphic design program were identified and asked to participate in an online mentoring program. Each was matched with one beginning student, who posted three questions to a discussion forum. In this phase, 240 questions and responses were collected. This is phase one of a research initiative. In this phase, the questions and responses have been analyzed based on the following questions: 1) Will experienced design practitioners reinforce the need for abstract thinking skills? 2) Does discussion with alumni help students to understand the groundwork we are setting for advanced communication challenges? 3) Can students better integrate textbook knowledge of theory and methods through conversation with practitioners?*

Keywords: *Mentoring, social networking, design education.*

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Social Network as a Tool to Develop Personas for User Research: An Exercise from Design Education

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Abstract: *This study focuses on a brand new type of user research as a part of a design project conducted in 2012 Summer School Project Studio in the Department of Industrial Product Design at Istanbul Technical University (ITU), Turkey. Students are required to get information from an open Facebook profile by concentrating on its demographics (age, gender, and nationality), descriptive attributes, mottos, likes, dislikes, hates, beliefs, activities, work attitudes, holiday attitudes, socializations and favourite objects etc. They are expected to propose some keywords and concepts to describe the persona after learning from the Facebook profile. By depending on these keywords, they are required to develop mood boards to summarize, abstract the data to generalize the persona to represent a real user group. This is supported by an exercise in which students fill a fictitious shopping cart of the persona according to the so-called buying habits of him/her. Finally, they are expected to act as the persona they developed in a role playing session in couples to enliven the persona and enhance the degree of empathy. This paper benefits from persona forms, mood boards and video recordings and aims to question whether new sources of social network such as Facebook is helpful as new and progressive tools for design research and education.*

Keywords: *Social network, User research, Persona, Design education.*

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Materials Selection: from technical to emotional material properties

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Abstract: *Materials now have the ability to transform energy, to adapt to the environment and to mimic effects only previously possible for nature. They change their properties with external stimuli and provide different perceptions depending on environmental conditions. This dynamism then converts the materials into pure mechanism, pure machine, pure image and pure feeling. The relationship of the person who works with the material, engineers, designers, etc. is no longer so direct. This connection based on experience, on a physical and perceptive knowledge of the materials is today mainly abstract. This fact hinders material selection, as it focuses on the technical characteristics, missing their sensorial inherence. Considering this, a working methodology has been created combining the selection based on technical and sensorial properties. For the selection based on technical property, databases such as CES Selector, MatWeb, CAMPUS, etc. are used. While for the selection based on sensorial properties have been worked with Materfad, Materials Centre of Barcelona and its physical database that permits to know, touch and feel 4000 innovative materials samples. These have allowed the proposal of a convergence between both criteria and introducing the material selection in the beginning of the product design and development project and thus prevent the student from postponing the selection to the final phase.*

Keywords: *Materials Selection; Functional Materials; Sensorial Properties.*

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Adapting the Front-end of Innovation to its context: a methodological approach.

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Abstract: *The Front-end of Innovation (FEI) is the innovation process phase where new products are defined prior to development. The outcome of this process is of great importance for the innovation and design phases that come after the FEI (Backman et al., 2008). The FEI is a lightweight process with a huge impact on the New Product Development (NPD) process that follows the FEI. Still, the FEI is considered a difficult to manage process, both in industry and academia.*

Although FEI is mainly considered a strategic process, it could benefit from a more design driven approach where divergent thinking is implemented on different levels throughout the innovation process. The results of this research provide more clarity on the concept of exploration and exploitation in the FEI and point at possible improvements in the approach of the FEI, starting from a model where abstraction levels are clearly defined and possible sub-phases can guide the approach to search field generation and idea generation. That way, the early phases can be approached as a creative activity where both divergent and convergent thinking are involved, and where the process can be adapted to the specific context.

Keywords: *Front-end of Innovation, design methodology, exploration and exploitation.*

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Students as choice-makers: developing altered consciousness as an aspect of design and global citizenship literacy

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Abstract: *Choice, as an aspect of existence, may be taken for granted or it may not exist at all. Choice may be complex, simple, false, or not apparent. Choices can be quantitatively and qualitatively different. There are ironies of choice in that profusion of choice can mean confusion of choice. Equally, and perversely, those who have choices can also enjoy the privilege of not choosing – itself a choice. Design is a site of choice-making – not only within the nuances of design processes but also for the role it plays in identity formation, social being, politics, and global interactions. This paper aims to address the significance of choice not only for focussed design and technology education but also for the general education of all students in their preparations to become fulfilled and engaged global citizens. The paper: a) explores choice from philosophical, social, political and consumerist perspectives; b) presents the student as both person and player in, and on, the world; c) offers two illustrations of curricula considered supportive of choice education for design and citizenship literacy; and, d) discusses ‘pedagogies of choice’ which can contribute to the growth of ‘altered consciousness’ through design education.*

Keywords: *Choice, choice education, altered consciousness, design literacy, curriculum, citizenship, design and technology education.*

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Art and Design Schools in Transition: The Uncertain Future of the Workshop Model

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Abstract: *Recent reforms in higher education promote standardization and comparability. However, the academic disciplines set the standard that the art and design schools are expected to adapt to. This new and more theoretical approach can come in direct conflict with the traditional way of teaching at the art and design schools. These schools have traditionally been teaching in accordance with a workshop-oriented method, where theory is more related to and part of practice than in the academic sphere.*

Keywords: *Art school pedagogy, Workshop model, Reforms in higher education.*

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A methodology for appraisal and validation of User Centered Open Innovation Programs: a case study critical analysis of an energy supplier co-creative innovation program.

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Abstract: *Design thinking programs for innovation in accordance to a service-dominant logic (S-D logic) in co-creation with stakeholders is often described in the literature as an adequate procedure for added value and sustainability (Vargo & Webster, 2011; Mateus & Rosa, 2011; Ostrom et al., 2010; Brown, 2009; Vargo & Lusch, 2004, 2006, 2008a, 2008b). However, it seems to be absent from research robust validation methodologies. This article describes an empirically developed methodology for validation of design thinking Ideas(R) Evolution methodology applied to a User Centered Open Innovation Program for a more efficient behavior consumption of home energy. This program was developed within the framework of seven sequential workshops with a fixed panel of stakeholders (clients, community opinion leaders, suppliers, company decision makers and experts) at the University of Évora in 2012, in Portugal. The methodological validation of the innovation program was based on quali-quantitative methods, and applied through a longitudinal design by a set of self-administered instruments that diachronically collect the emotional and cognitive quantitative and qualitative measurements of the workshops. The results demonstrated that the methodological approach essayed is parsimonious, reliable and generalizable for future use, and adds accuracy to Ideas(R)Evolution methodology.*

Keywords: *Branding, open innovation, value co-creation, creative intelligence, design thinking, service-dominant logic, validation methodologies.*

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“Learning by doing” revisited: an interactive experience in teaching design methods

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Abstract: *This study represents an interactive experience towards conducting an undergraduate theory-based design course, ‘Design Theories and Methods’ in a product design department. These types of theoretical courses are usually conducted with a classical form of teaching where the lecturer is in a dominant position and bestows knowledge upon the learner (Wood and Rust, 2003). However, according to constructivist learning theory, knowledge cannot exist independently of the knower, but must be constructed through his own understanding of the situation (Hein, 1991). Therefore while a ‘revisit’ to Bauhaus education model is suggested, the main hypothesis is that “learning by doing” would provide a better learning process for the students and considering that the success of the students depend on their engagement in what they are learning, (Bayer, 1976). With this approach, students are made responsible for the ‘teaching’ within teamwork where the students are positioned to be active and creative where the lecturer is providing guidance (Yazici et al, 2001). The outcomes of the study show that students endeavor significantly more to learn and reformulate the topics in order to teach, and the interaction between students allows a more effective process for learning.*

Keywords: *Learning by doing, constructivist learning theory, teaching design methods.*

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Simon Says Syndrome in Art and Design Education

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Abstract: *Learning is an important ‘task-conscious process’ that help changes in behaviour (or potential for change). In other words, learning is seen as an outcome - the ‘end product’ of some process. The ‘Simon Says Syndrome’ term was coined based on observation where teachers provide little learning for students other than the experience of doing. This resulted in students being apt at following instructions rather than exploring the process of learning. This paper also argues that ‘Simon Says Syndrome’ may be defined or reflected from the set of conventional practices and systems for teaching (or learning) especially within the art and design context; which ways and methods of teaching for the acquisition of necessary knowledge and skills are through the application of sequencing and memorising of instruction as a skill. The art and design field need students to acquire problem solving skills, which tends to require a much higher level of perfection to represent and solve problems. The danger of “Simon says Syndrome” also lies in the learnability and acquisition of principles in development of ideas. This is evidence in Malaysian classroom, where it is common for the art and design teachers to offer students suggestions or solutions by memorising and imitating techniques and examples of artwork from the books. This paper discusses on issues concerning teaching and learning experiences in art and design in Malaysia.*

Keywords: *Art and Design, Teaching and learning experiences, learning activities, behaviour.*

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Relating creativity, fantasy, invention and imagination: studying collective models of creative collaboration from Kindergarten to University Degrees

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Abstract: *In recent years, cognitive psychology has supplied interesting analytical frameworks for the processes involved in the construction of knowledge at all levels of education, from kindergarten to college.*

In design teaching and for many decades theories have been proposed about design projects "methods" and "methodologies". However, only in recent years theoretical approaches to "creativity" and the creative process have been proposed and have started to be implemented in academic curricula, or as working methods (co-creation).

Creativity, thus, has become an area of "focus" of research, with important implications on the design discipline. However, creativity, invention, imagination and fantasy simultaneously interact within the mind, and it seems difficult to distinguish specific procedures for each and every one of them. How to encourage and nourish these mental processes in design students? Is it possible to discriminate "phases" of these processes on the different contexts of learning? It seems that when we reach adulthood our mind no longer has room for fantasy. Is it possible for a professional designer to operate using fantasy and imagination? The aim of this paper is to contribute to an understanding of how fantasy can stimulate creativity.

Keywords: creativity, invention, imagination, fantasy.

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Educating multidisciplinary postgraduate product design students: challenges for a new programme

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Abstract: *Design professionals are increasingly expected to work in interdisciplinary teams, often working together to solve more and more complex problems. This may contradict aspects of traditional design education where effort (and assessment) was focused on the skills of the creative individual. While expertise or skill in a specific discipline is still critical to perform as a designer, a greater awareness and understanding of other disciplines is required. These educational challenges are further compounded in a new Product Design programme at AUT University due to its relatively small number of students. However, developing a new programme presents an opportunity to support new approaches to teaching and learning, without the constraints of institutional history and tradition. An innovative pedagogical approach to product design was developed that expands the definition of a 'product' to become 'the product of' a creative design process rather than necessarily the tangible, physical 3D product outcomes. This paper outlines and discusses the key aspects of the learning and teaching approach that underpins the postgraduate Product Design Programme at AUT. Practical examples of learning and teaching interventions, in and outside the curriculum, are presented; along with examples to demonstrate how these have been incorporated into practice-based postgraduate research projects. In addition a holistic approach that has been taken to integrate the key learning and teaching elements to develop a framework that will be the foundation for further curriculum development in the postgraduate programme is discussed.*

Keywords: *Design Thinking, Curriculum Development, Learning and Teaching*

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Design Puzzles as a learning platform for morphology design research

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Abstract: *Design Puzzles open up a new field of visual and manual learning material for research in design morphology. The way Design Puzzles are instrumental as educational tools involves using them as research systems (frame works) in which spatial / visual problems are posed, requiring formulations of hypothesis as strategies for developing solution paths. The concept can be applied to a wide range of products, (physical and digital), for different ages (K-12 through University) and contexts (open ended play and/or guided classroom situations). Problem identification and approach skills as well as creative thinking strategies are brought into play as spatial / visual challenges are encountered in systematic and organized contexts, requiring designing responses. There is a clear distinction made here between designing a response and solving a problem. The underlying idea behind Design Puzzles is to associate the intrinsic rigor of geometry with aesthetic sensitivity towards form within an organized system allowing variables to be manipulated within certain parameters. This association strengthens informed intuition skills while simultaneously developing analytical hypothetical deductive approaches. Through this integrated inquiry process, design thinking strategies are clearly identified and can be subsequently developed as specific design research skills and aptitudes.*

Keywords: *design research, learning, strategy, morphology.*

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Design School: Design Education in the Age of Digital Capital

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Abstract: *Design, we are often reminded, has a direct social purpose that is capable of reaching all sectors of public life. National design organisations across the world proclaim that design acts reflect a nation's social and cultural values; design shapes the everyday products people use, the buildings we live, work and play in, and the clothes we wear. Furthermore, design communicates those values to others. It is therefore an extremely powerful tool that can communicate and express a nation's values to others and has a significant role in the social, cultural and economic wellbeing of its people (Newman and Swann, 1996). Moreover, it has been suggested that design is the best tool that we have available to us to make sense of the contemporary, complex modern world (Sudjic, 2009). But how should a design school in the age of digital capital best prepare future designers for this complex world? How can the design school maximize the potential opportunities suggested by this future, uncertain world? Can the design school truly help address some of the emergent and huge global issues we will surely face? By looking at the contemporary situation this paper explores how the structure of design education has been transformed by a number of internal, external, and contextual factors. The paper will expand upon the operative scope, flexibility, and vulnerability of teaching design, its history/theory, and representation in the years and decades ahead in the design school.*

Keywords: *Design School, Design Education, Irresponsible, Undisciplined.*

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Design Schools as Incubators of Social Entrepreneurship

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Abstract: *This paper aims to reflect on the intersection of design education, research and social enterprise incubation within a design studio run as part of the Master in Product Service System Design at the Politecnico di Milano, School of Design. Entitled "Accidental Grocers", it aimed to explore the potentialities of Service Design applied to "Local Distribution Systems" to provide the city with local food. Students were requested to rethink the way we do food shopping and to propose services based on collaboration, making use of existing assets, and creating unusual connections between profit and not-for-profit, amateur and professional, market and society. As experienced in previous workshops at Politecnico di Milano and Tongji University, the studio was related to an on-going action research project to create short chain food services in a district of Milan. The aim was to develop ready-to-use solutions, establishing direct connections with citizens and local stakeholders, using methods of community centered design and simulating the conditions for incubation in a real context. This experimentation field functioned as a "protected environment" to test potential service start ups and to develop entrepreneurial teaching and learning practices.*

Keywords: *service design education, service design research, incubation, start up, social entrepreneurship, social innovation.*

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Systems Oriented Design: The emergence and development of a designerly approach to address complexity

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Abstract: *Designers are especially well suited to cope with the complexity of the real world because of three reasons: they are trained to synthesise solutions from complex and fuzzy material and they are good at visualising which is an enormous advantage for thinking in complexity. Finally they are creative people trained to come up with new solutions. There already exists design practices geared towards dealing with complexity. But such practices need to be systematized and developed further. One way of doing this is to develop its relation to other practices of complexity found in systems thinking and systems practices. This paper reports on the development of Systems Oriented Design, an approach to learn how to better cope with very complex issues as designers. The approach is influenced and inspired by modern systems thinking and systems practice and inspired by generative diagramming. Design practice, systems thinking, systems practice, design thinking, information visualisation, diagramming, GIGA-mapping, research by design, research through design, design for complexity, sustainability.*

Keywords: *Design practice, systems thinking, systems practice, design thinking, information visualisation, diagramming, GIGA-mapping, research by design, research through design, design for complexity, sustainability.*

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“Not two weeks in a place tidying-up the paper drawer” – an employability agenda case study

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Abstract: *It seems improbable that a student might graduate from four years of full-time education with an honours degree and, simultaneously, three years of work experience. Yet this is the premise of the Design Agency Project at Edinburgh College of Art, University of Edinburgh. It celebrates four years within the BA Graphic Design programme so 2012 provides a natural opportunity for reflection, marking the graduation of the first cohort introduced to the project at the commencement of their studies.*

Annually, the students of the programme’s senior year form several design agencies. They brand and advertise vacancies, for which students in junior years are interviewed and appointed. The university’s human resources and enterprise departments provide guidance. The agencies operate as profit generating companies with provided briefs and self-initiated commercial work. Each agency has an established industry expert as mentor. All undergraduates are allocated one day per week to work on the project throughout the academic year.

This paper presents the project as a case study, with viewpoints from lecturers, students and industry mentors. The project is timely since employability has gained traction as a measurement of HE performance outcomes, yet the term itself remains nebulous. Specific case study may elaborate.

Keywords: *Design Agency Project, case study, ECA, Edinburgh College of Art, Edinburgh University, graphic design, employability, mentoring, pedagogy, industry.*

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Liminal moments: designing, thinking and learning

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Abstract: *This paper provides a contextual reflection for understanding best practice teaching to first year design students. The outcome (job) focussed approach to higher education has lead to some unanticipated collateral damage for students, and in the case we discuss, has altered the students' expectations of course delivery with specific implications and challenges for design educators. This tendency in educational delivery systems is further compounded by the distinct characteristics of Generation Y students within a classroom context. It is our belief that foundational design education must focus more on process than outcomes, and through this research with first year design students we analyse and raise questions relative to the curriculum for a Design and Creative Thinking course—in which students not only benefit from learning the theories and processes of design thinking, conceptualisation and creativity, but also are encouraged to see it as an essential tool for their education and development as designers. This study considers the challenges within a design environment; specifically, we address the need for process based learning in contrast to the outcome-focused approach taken by most students. The authors base their reflections on teaching design students at a university in Queensland, Australia.*

Keywords: *Design education, design thinking, creativity, threshold concepts*

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Form, fit and flair: considering the design doctorate

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Abstract: *Across the domains of design education the Design PhD is an area of much contemporary discussion and debate internationally. As the field of the discipline of design matures, so does its relationship with this qualification: its form, methods and relevance within and beyond the academy. In this paper, the authors critically reflect on their respective observations of differing models of undertaking design PhDs and subsequent models of submission and examination. Founded in their observations of the diversity of design PhDs pedagogically and structurally, the authors have begun a global mapping of current PhDs in design and are exploring how the various forms of design PhDs 1. Reflect socio-cultural and economic contexts of the study, and 2. Evidence a design research mode of inquiry and contribution. Through this discussion they question how do we design Design PhDs that have relevance to the field, respect design's particular contributions, and maintain the critical and scholarly contribution that is the basis of the PhD qualification?*

Keywords: *design, doctorate, education, research.*

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Design and business double education: cross-country comparison

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Abstract: *Design thinking is the buzz in the management community these days. Managers are encouraged to get out of the box, apply user-oriented research and think more systemically and less analytically, the way designers are trained to do. Previous research on business education best-sellers in France and Brazil shows evidence that design is not considered or is restricted to a very limited content, pointing out that managers are not prepared to understand design. That reality is also perceived on the day by day relationships of both designers and managers and brings forth the issue of double education. Is it the solution? Does teaching design to managers bring value to the relationship? This paper proposes a discussion on double education as a way to bridge this gap. For that, researchers in Brazil and France conducted an exploratory study that investigated how design and management could be developed as double education to better develop design management.*

Keywords: *Design Management, Double Education, Cross-Country research.*

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Teaching New Product Development to Design Led Innovation

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Abstract: *Recently many international tertiary educational programs have capitalised on the value design and business can have upon their interception (Martin, 2009; Brown, 2008; Bruce and Bessant, 2002; Manzini, 2009). This paper discusses the role that two teaching units – New Product Development and Design Led Innovation – play in forming an understanding of commercialisation needed in today’s Industrial Design education. These units are taught consecutively in the later years of the Bachelor of Industrial Design program at the Queensland University of Technology, Brisbane, Australia. In this paper, each teaching unit is discussed in detail and then as a conglomerate, in order to form a basis of knowledge students need in order to fully capitalise on the value design has in business, and to produce a more capable Industrial Design graduate of the future.*

Keywords: *Design Led Innovation, Design Education, Industrial Design.*

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Constructing design knowledge built up on the kindergarten education

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Abstract: *This study aims to further the growing body of knowledge about design education with an alternative view; discussing the importance of beginning it at the kindergarten which ideally suits to the approach "develop the creative-thinking skills". In an environment where children "imagines, creates, practices, modifies, recognises, manipulates, shares etc..." knowledge, experiences and objects through play are crucial issues in the design education. Derived from this concern the study brings the argument of advancing and directing early childhood education on the basis of 'basic design issues' such as design principles, conceptualization, 2D/3D spatial allocation and composition more comprehensively which will provide to construct children perceptual, critical and analytic point of view in a very early age and the ability to develop in the future. This hypothetical study's argument is to establish a curriculum of design education in the kindergarten which will constitute children the basis of a strong ability of design knowledge, enable and stimulate their cognitive development.*

Keywords: *child-design education, basis design knowledge , develop creative thinking..*

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Design education for non-designers

Connecting for Impact: multidisciplinary approaches to innovation in Small to Medium sized Enterprises (SMEs)

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Abstract: *This paper reveals the methodology developed and adopted by groups of Multidisciplinary Design Innovation Masters students whilst working on projects with regional Small to Medium Sized Enterprises (SME's). It exposes an eight-stage approach and shows how the creation of a 'problem-space tapestry' acts as a mediator between different disciplinary approaches. The authors used a combination of observation, interview, post project-analysis and auto ethnographic reflection in order to uncover this process and to draw conclusions about the conditions that are necessary to support university based multidisciplinary design-led innovation projects of this type.*

Keywords: multidisciplinary, innovation, SME, problem-space.

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I “Like” Design: Participatory Web Sites and Design Lessons for the Masses

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Abstract: *In North America, published advice literature and design-based television and radio programming served as prominent vehicles for communicating lessons about what or what not to do when making their own interior design decisions to the general public in the twentieth century. This passive approach to teaching the lessons of design has been supplemented in recent years by a more interactive model: the participatory web site. This research is a qualitative analysis of social media platforms, independent web sites and blogs that monitor and promote new contemporary works from around the world and this paper focuses on the content of four: design sponge.com, apartmenttherapy.com, clippings.com, and houzz.com. By providing platforms that use imagery and text as persuasive devices to promote new designs, such sources present the qualities of “good design” to be potentially absorbed by the general public. By linking site readers to design professionals or by addressing direct inquiries about solutions to design problems, today’s participatory sites enable non-designers to envision improvements to their own environments. The invitation to comment on designed products and spaces provides a valuable vehicle for formulating and sharing critical perspectives on the qualities of design that matter most to those who participate.*

Keywords: *Advice literature, design criticism, design-based web site*

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Student Goes on a Journey; Stranger Rides Into to the Classroom: Narratives and the Instructor in the Design Studio

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Abstract: *Enthusiasm is growing in non-traditional environments for teaching design by adapting knowledge and approaches from studio pedagogy, described as a “signature pedagogy” by Shulman in 2005. Meanwhile, those in fields where some variation of studio pedagogy have been used for decades are engaged in addressing some of its experienced shortcomings. Within this landscape of change, the authors have been engaged in study of their own studio-based courses, (interior design, instructional design, and interaction/experience design), reflecting on how this form of pedagogy is contributing to students’ development as designers. In this study we consider the role of the instructor in the studio using a lens informed by narrative aesthetics and transformative education. The narrative that an instructor encourages students to experience with regard to themselves, to the instructor, or to both, has a profound impact in the studio environment. This paper will explore that impact within the context of the authors’ own courses via review of course notes and collaborative reflection with colleagues.*

Keywords: *studio education for design, transformative education, narrative*

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Designing a creativity training plan for companies

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Abstract: *It is widely recognized that training in creative techniques enhances competitiveness and efficiency of the company production process. Relying on the idea that creativity is the basis for innovation, to learn and manage creativity techniques becomes strategic to meet a company's need for innovation. Hollanders and van Cruysen's system of indicators (2009), based on the European Innovation Scoreboard (EIS), is aimed at quantifying creativity and design, and the role of professional training is key for a company's success on the market. This paper presents a methodology for drafting a training plan for companies. The methodology counts on two approaches similar in structure but different in outcome, both able to meet a company's specific needs. The first approach considers innovation enhancement based on a company's ability to be creative (IDEActivity). This approach relies on co-design and it aims at teaching how to shape creativity tools in an independent way. The second approach is centred on CPS (Creative Problem Solving) aims at enabling people to work creatively both individually and in teams. It aims at training the employees' ability to generate innovative solutions. The methodology presented in the paper aims at: enhancing creative collaboration; teaching techniques tools; coaching companies using hands-on workshops in order to promote the use of methodologies and techniques for innovation.*

Keywords: *Creativity, methodology, creativity tools, innovation*

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HCID: Who is an interaction designer?

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Abstract: *The development of technology with all its ubiquity and pervasiveness provides new opportunities and new challenges for the interaction design practitioners, both those coming from the design tradition and computer science tradition. An increased level of problem solving and creative thinking is needed when designing for interactions with new technology. In order to develop the skills and methods for dealing with increased complexity and connectedness of technology, human computer interaction design (HCID) education needs to embrace to a larger extent design practices and design thinking. This paper aims to answer two main questions: 1) why is it necessary to teach HCID students design thinking skills and 2) how to actually implement the changes in HCID curriculum. The second question is answered based on our experience and the solution we adopted. Subsequently, we discuss the success of our approach.*

Keywords: *HCID, interaction design, education, design thinking, project-based learning, practice, cool, possibility design.*

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Technology and Design as part of a public school from 1st to 10th grade

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Abstract: *Technology and Design was introduced as a multidisciplinary subject in Norwegian school in the context of the new curriculum in 2006. The topic should be a collaborative effort between the subjects of Science, Arts and Crafts, and Mathematics. In working with Technology and Design students develop a composite competence on product, process and context that we call Technology and Design expertise. There has been, and still remains, challenges associated with practicing the subject Technology and Design. The complex and many-faceted areas of expertise cause teachers within the traditional school subjects to experience the subject as strange, and it's challenging to establish a well-functioning multidisciplinary cooperation. In the desire to contribute to better practices in the subject the National Centre for Science, the National Centre for Mathematics and the National Centre for Arts and Culture in Education have in collaboration with the Oslo and Akershus University College of Applied Sciences developed teaching programmes in Technology and Design. Based on these challenges we will describe one of these teaching schemes and point to the challenges we met and still meet in our work with Technology and Design. Technology and Design expertise is a type of compounded knowledge that is in great demand in the labour market. We believe the subject would be a valuable contribution to the overall design education in primary school.*

Keywords: *Technology and Design, Education, Design, Curriculum.*

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Learning from co-designing

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Abstract: *A designer-focused approach is often taken when observing co-design processes and the designers' learning is reflected rather than the users. This study takes an all-inclusive angle in observing an inclusive design workshop which involved five professional designers, five users from a diverse backgrounds, and five design researchers. Questionnaires were distributed to the designer and user participants, before and immediately after the workshop, to gather data about their opinions on broader issues relating to inclusive design. The design researchers carried out observations during the workshop, gathering detailed notes and audio-visual data. Follow-up interviews were conducted to identify any issues relating to the workshop, and to let participants reflect on their experiences. It was found that the participants interpreted inclusive design and user-involvement in many different ways. The designers were not necessarily 'user-centred', but the fact that they were brought together with the users in the workshop did make them think more inclusively. Challenges for co-design were identified and suggestions were made to improve the co-designing process.*

Keywords: *Co-design, inclusive design, workshop.*

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Design Minds: An online design education platform for non-designers to enact cultural change

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Abstract: Education in the 21st century demands a model for understanding a new culture of learning in the face of rapid change, open access data and geographical diversity. Teachers no longer need to provide the latest information because students themselves are taking an active role in peer collectives to help create it. This paper examines, through an Australian case study entitled 'Design Minds', the development of an online design education platform as a key initiative to enact a government priority for state-wide cultural change through design-based curriculum. Utilising digital technology to create a supportive community, 'Design Minds' recognises that interdisciplinary learning fostered through engagement will empower future citizens to think, innovate, and discover. This paper details the participatory design process undertaken with multiple stakeholders to create the platform. It also outlines a proposed research agenda for future measurement of its value in creating a new learning culture, supporting regional and remote communities, and revitalising frontline services. It is anticipated this research will inform ongoing development of the online platform, and future design education and research programs in K-12 schools in Australia.

Keywords: Design thinking, digital technology, K-12 schools, distance education

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Hooked on peers' drawings: Learning through the visual wildfire

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Abstract: *Children's drawing activity has been theorized as traces of cognitive and biological development, with cultural variations as minor sources of visual and traceable influence. Even though present, less research has been done on documenting the social aspect of drawing; seeing drawing as visual communication between children. This aspect of drawing development, or learning, is visually traceable, but is still often neglected because children's drawings can be seen in light of a discourse emphasizing the individual solitude and expression of the professional artist. Collection of drawings, observations and interviews took place in one elementary school art room for one academic year among students of 9 to 12 years of age. In a case study sociocultural theory was used to investigate children's formal and informal drawing activity; a segment of the findings is presented in this lecture as a narrative analysis of parts of the data. The result indicate that meaningful drawing activity among these children formally (in drawing classes) and informally (outside formal drawing teaching) included "hooking up" with parts of peers' drawing focus, explained as the visual wildfire. These processes are seen as dialogical and therefore valuable for children developing their ability to communicate visually through drawing.*

Keywords: *Peer, learning, drawing, sociocultural, visual.*

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What is Industrial Design? Providing a Guide for University Applicants

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Abstract: *There are currently a wide range of Higher Education Industrial Design courses available in the UK. In the present era, a wider breadth of narrative has developed within the subject, and as a result the content of industrial design educational offerings varies considerably. The paper assesses the industry view of Industrial Design as a discipline from the perspective of those employing university graduates. These views illustrate a change in the discipline, and this is considered in respect to current education practice. The choice of entry courses for the student wishing to embark on a career in the subject has also widened. It is argued that at present, the access to courses offers a haphazard informational stream to the potential applicant. An approach to developing an online facility to enable potential students to apply for the right course is discussed. It is suggested that a consistent and comparable platform of guidance is needed by which potential students can identify and match the course offering against their aptitudes and aspirations. Given that course choice will ultimately define the nature of their career opportunities this would be a useful and productive asset.*

Keywords: *Industrial Design, Design Thinking, Learning style categorization, University Applicant*

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Sketching design thinking: representations of design in education and practice

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Abstract: *Research on design pedagogy has shown that students progress through a variety of barriers on the path to becoming a successful design practitioner, and that frameworks for explicit reflection can be beneficial to the development of design students. Schön uses the concept of reflection-on-action to describe one form of reflection on design practice, with the eventual goal of improving design processes and judgment. In this study, sketching is used as a form of reflection-on-action in a first semester intensive course in interaction design (IxD). This sketch reflects the student's current understanding of the "whole game" or holistic view of design in IxD. Current practitioners in IxD companies were asked to draw the "whole game" sketch as well. Parallels among the sketches and areas of divergence are discussed. In summary, students shifted from abstract, linear representations of process early in the semester to more concrete, iterative representations by the end of their first semester. Practitioner sketches were more abstract and linear, but also included representations of business terminology and design teams.*

Keywords: *Reflection, sketching, human-computer interaction (HCI), design practice.*

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Teaching ‘design thinking’ in the context of Innovation Management—from process to a dialogue about principles

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Abstract: *There has been increased interest in design and ‘design thinking’ in recent times. This has led to the development of a number of interdisciplinary courses where non-designers have the opportunity to learn so-called ‘design thinking’. However, ‘design thinking’ is an ambiguous concept, which is challenging when trying to apply it in non-design learning and teaching contexts: notably, for this study, innovation management. The aim of this study has two aspects: first, a conceptual one, to articulate what ‘design thinking’ means in context of a design-driven approach to innovation management; and second, a more practical one, to consider how it could be taught in this context. In this paper, a seminar called ‘Design Thinking’ is analysed along with key texts within the range of design thinking discourses. This paper concludes by identifying the principles underlying ‘design thinking’ and develops a teaching framework based on these principles, by using the model of action research. This study is therefore the first stage in an on-going action research project.*

Keywords: *Design, design thinking, teaching, innovation, management, action research*

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Practically Creative: The Role of Design Thinking as an Improved Paradigm for 21st Century Art Education

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Abstract: *Art and design education hold a unique role in preparing the kinds of innovative, balanced, synthetic creators and thinkers needed in the 21st century. This paper sheds light on how learner-centered art classrooms, that incorporate design thinking as a balanced process, can better develop the overall learning capacity of students. In a mash-up between mixed model research involving the impact of learner-centered pedagogies on visual art students' balanced intelligence and reviews of literature surrounding the promotion of depth and complexity of knowledge, new conceptual frameworks are offered. Towards a vision of fostering deep, connected, and independent thinkers, the author—as designer, artist, and art educator—explores design thinking as an aesthetic, inquiry based process that integrates complex intelligence theories.*

Keywords: *Design thinking, design pedagogy, balanced thinking, critical thinking, creative thinking, practical thinking, learner-centered, dispositions, successful intelligence, quality thinking, learning capacity*

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The imaginative approach: Characteristics of craft artisans' and design trainers' in-depth cognitive levels during a design training program

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Abstract: *This paper investigated and discovered the differences that exist between craft artisans' and design trainers' in-depth cognitive levels during the use of the imaginative approach in a design training program. We employed a concept network method based on the associative concept dictionary to extract the verbalized thoughts of four craft artisans and four design trainers. We then identified semantic relationships based on factor analysis. Our findings revealed that craft artisans tended to activate lower in-depth cognitive levels and design trainers tended to generate deeper in-depth cognitive levels. Our study demonstrated that craft artisans tended to place greater focus on aspects of an artifact, such as operation (replace, reduce, and so on); shape (waist, body, and so on); proportion (length, size, and so on). Alternatively, design trainers gave more consideration to the presence of surroundings issues such as scene (silverware, custom, and so on); companion (fruit, bagel, and so on); and appeal (fresh, salad, and so on). We discovered that the employment of widely used design methods for training tended to keep craft artisans in a mental state that created perceptual barriers and obstructed their imaginative approach.*

Keywords: *Creativity, cognition, imagination, craft artisan, design trainer.*

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Visualising ideas: a camera is not enough

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Abstract: *When photography was widely introduced as a tool for documentation, the art of mimetic drawing was challenged as a main activity in art education. This raised the question: Why bother with mimetic drawing in art classes when any object, person or event can be documented with a camera? The question of mimesis in painting and drawing existed long before the introduction of cameras, and it raised philosophical questions in relation to the ideals of pictorial representations. This paper problematises some issues that have constructed a counterproductive contradiction when it comes to training mimetic drawing in general art and design education. This topic relates to stakeholders with agendas for art education, which in some ways is different from the agendas held by stakeholders within design education. The issue of training mimetic drawing in primary and lower secondary education is seen as part of building design literacy as a future competence for all.*

Keywords: *visualisation, mimetic drawing, design education, design literacy.*

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Digital design and creativity: A reflection on curriculum change in landscape architecture education

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Abstract: *In comparison to the allied design disciplines of architecture and urban design, the creative potentials of digital media have been slow to influence landscape architecture. Many landscape architects consider digital media to lack the intuitive capability of more traditional means of design such as hand drawing. This paper argues for the creative potential of digital technologies in design pedagogy of landscape architecture. Drawing on the experience of the first year of the professional Master of Landscape Architecture program at the University of Melbourne, we outline a shift in design curriculum from planimetric design techniques to a focus on three-dimensional digital modelling including parametric design. We argue that immersing beginning design students within a three-dimensional understanding of space disrupts the linear problem-solving emphasis supported by conventional landscape architecture design techniques. We identify three avenues for creative exploration provoked by digital technologies –topographic form, creative unpredictability and a focus on experience and demonstrate how these moments encourage the beginning design student to develop a complex enquiry of program, form and experience.*

Keywords: *creativity, landscape architecture, pedagogy*

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OutReach Initiative for Education of Future Industrial Designers

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Abstract: *This paper discusses a program undertaken to educate high school students about the Industrial Design profession. An innovative OutReach program model is presented where design professionals, academic (college-level) and high school students are brought together to conduct a real life experience project. Urbanism is a designated topic for the program model. Findings are also presented, supporting success of the initiative.*

Keywords: *outreach, industrial design, high school*

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Learning by watching: what we can learn from the Inuit's design learning

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Abstract: *In this paper, I explore a single case of vernacular clothing design—the learning and practice of design for contemporary Iñupiaq-Inuit clothing made by the women of Kaktovik, North Alaska—and I hope to contribute to a better understanding of design practice and learning in general. Design research has many unexplored areas and one of these omissions is vernacular design—or ‘folk’ design. In my opinion, professional and academic design may well have something to learn from vernacular design, although this research is about vernacular learning, didactics about what, why and how to learn within the ‘making discipline’ of clothing design. The study was based on observations, interviews with seamstresses and authorial participation in designing and sewing in conformity with Iñupiaq tradition, and everything was recorded on digital video film. This investigation of Inuit clothing design indicates that learning-by-watching is the most common way of learning. Learning-by-watching is important within learning-by-doing. This concept of learning-by-watching can be seen as a development of both Schön and Wenger’s theories of learning, a concept that will probably be of great importance in further research on the learning process of design, from kindergarten to PhD.*

Keywords: *Vernacular design, clothing design, design thinking, learning-by-watching, learning-by-doing.*

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Introducing high school students to design and creative thinking in a teaching lab environment

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Abstract: *Many students in the United States have limited exposure to design thinking, formal techniques or creative experimentation. For many, a design education begins in college, as one selects their major. Unfortunately, many high school art programs have been eliminated or dramatically reduced, resulting in students receiving less creative exposure and limiting their design preparation before college. Creative problem solving skills are in demand. Sir Ken Robinson, a recognized leader in the development of creativity and innovation, believes our schools are educating students out of their creativity. He argues that we train students to become good workers instead of creative problem solvers. The status quo stifles our profession, with students ill-prepared to face the daily challenges as they begin their academic journey and professional career. We developed Inspire, a creative camp that educates teenagers about design, creativity and critical thinking. Our goal is to prepare students to enter higher education by building insightful portfolio projects, gaining knowledge about the profession while working with mentors. The camp serves as a teaching laboratory for faculty and graduate students interested in design pedagogy. Graduate students participate in curriculum development, lead projects, write lectures and test teaching techniques in a low-stakes arena.*

Keywords: *design education, k-12 curriculum, creativity*

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Rock Paper Scissors: Reflective Practices for design process in the landscape architecture novice

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Abstract: *We describe a pedagogical approach that addresses challenges in design education for novices. These include an inability to frame new problems and limited-to-no design capability or domain knowledge. Such challenges can reduce student engagement with design practice, cause derivative design solutions as well as the inappropriate simplification of design assignments and assessment criteria by educators. We argue that a curriculum that develops the student's design process will enable them to deal with the uncertain and dynamic situations that characterise design. We describe how this may be achieved and explain our pedagogical approach in terms of methods from Reflective Practice and theories of abstraction and creativity. We present a landscape architecture unit, recently taught, as an example. It constitutes design exercises that require little domain or design expertise to support the development of conceptual thinking and a design rationale. We show how this approach (a) leveraged the novice's existing spatial and thinking skills while (b) retaining contextually-rich design situations. Examples of the design exercises taught are described along with samples of student work. The assessment rationale is also presented and explained. Finally, we conclude by reflecting on how this approach relates to innovation, sustainability and other disciplines.*

Keywords: *Reflective Practice, problem framing, landscape architecture, conceptual thinking, creativity, abstraction, teaching design, assessment, sustainability.*

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Building the Narrative Cloud: Reflection and Distributed Cognition in a Design Studio Classroom

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Abstract: *Education in Human-Computer Interaction Design (HCI/d) aims to instill a human-centered perspective among its students, encouraging a designerly way of thinking that allows them to develop creative solutions that consider the implications and consequences of people interacting with technology. It has been known that a practicum (Schön, 1987) environment contributes to developing this way of thinking by means of reflection (Schön, 1987). We present in this paper a pedagogical approach based on narratives to be employed in studio-based courses for HCI/d. We discuss how oral and multimedia narratives support in conveying content-independent concepts that affect the learning experience. We propose a set of components to help the elaboration of these stories. Additionally, we introduce a conceptual space called the narrative cloud, which helps us to elaborate on the ideas regarding this approach and closely ties to the concept of distributed cognition (Hutchins, 2000). Therefore, the goal of this paper is establish a base for discussing a further development of this approach, or any framework or methods where narratives constitute a fundamental element that supports reflection in HCI/d education.*

Keywords: *Human-Computer Interaction, Design Pedagogy, Design Studio, Narrative Cloud, HCI, Reflection, Distributed Cognition, Storytelling, Narrative.*

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Educating Process of Design to Learn Urban Park Design for Non-Landscape Architecture Students

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Abstract: *The aim of this paper is to apply urban design disciplines as method of teaching in urban planning bachelor program especially for urban park design course. Contemporary situation of urban planning students identify that there are less design courses, so they normally less introduced with design principles also design bases in the department, and so this condition creates problems in the process of urban park designing. So methodology of this research based on the questionnaire technique with a comparative approach to ask opinions of students before and after the course. Finding of research identified that students were less introduced with application of basic geometrical design such as point, line, plane, and volume before of this subject. Additionally, students identified that imaging process of landform and landscape has had weakness particularly in topography, site analysis, and environmental qualities in education syllabus of urban planning department. Results of research identify that mix model principles can explain and detail those design disciplines for students also introduced them with design concepts particularly in those missing parts. Furthermore, mix method learning system is effective regarding opinions of students as sufficiency in conceptualizing and imagination process after studio.*

Keywords: *Urban Design Principles, Park Design, Non-Design Students.*

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K-12 Design Education, Creativity, and The Corporate World

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Abstract: *Creativity has been described by a number of researchers as a 21st Century Skill and a way for students to succeed as learners, workers, and citizens. The corporate sector has had tremendous impact on what happens in American education for years and continues to do so. Teachers should understand that it is often beneficial to speak the language of business and cite corporate authors to offer validation for what they teach as being essential for creative skills. An effective way for teachers to teach creativity in the context of business is through design education, a natural integrator of various subject areas.*

Keywords: *K-12 Design Education, Creativity*

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Human-Centered Design in Primary Schools: a Method to Develop Empathy with and Knowledge of the Needs of Elderly

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Abstract: *Human-Centered Design is of growing importance for professional designers and in the past two decades a series of techniques for designers to develop understanding of and empathy with a diversity of users has been developed within this field. In the second half of the 20th century, intended users were involved late in the design process, i.e. during the testing of products or prototypes. More recently, the user is involved in the early phases, when the direction is set. Users have rich local contextual knowledge and can work together with professional designers. Although these techniques are now entering mainstream design education at the university level, they have not yet reached Design and Technology Education in primary and secondary schools. Teachers do not yet provide opportunities for pupils to conduct research to uncover the needs, wishes, and experiences of specific user groups. However, this understanding of users belongs in D&T education, because artifacts have a dual nature: a physical and an intentional nature. In this paper we describe a Contextmapping method for pupils (aged 9-12 years) and illustrate this with a design project. The assignment for the pupils was to “design a playground in which children and elderly people are active together” in which the pupils developed an understanding of elderly people through Contextmapping.*

Keywords: *Human Centered Design, Primary school, Contextual User Research*

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A methodological approach to modelling design led innovation across secondary education: An Australian case study

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Abstract: *Incorporating design thinking as a generic capability at a school level is needed to ensure future generations are empowered for business innovation and active citizenship. This paper describes the methodology of an investigation into modelling design led innovation approaches from the business sector to secondary education, as part of a larger study. It builds on a previously discussed research agenda by outlining the scope, significance and limitations of currently available research in this area, examining an action research methodology utilising an Australian design immersion program case study, and discussing implications and future work. It employs a triangulated approach encompassing thematic analysis of qualitative data collection from student focus groups, semi-structured convergent interviews with teachers and facilitators, and student journals. Eventual outcomes will be reviewed and analysed within the framework of a proposed innovation matrix model for educational growth, synthesising principles responding to 21st century student outcomes. It is anticipated this research will inform a successful design led secondary education innovation model, facilitating new engagement frameworks between tertiary and secondary education sectors, as well as providing new insight into the suitability of action research in prototyping social innovation in Australia.*

Keywords: *Design led innovation, design thinking, secondary and tertiary education, action research.*

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The creative citizen: Understanding the value of design education programs in the knowledge economy

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Abstract: *The knowledge economy relies on the diffusion and use of knowledge as well as its creation (Houghton and Sheenan, 2000). The future success of economic activity will depend on the capacity of organisations to transform by increasing their flexibility. In particular, this transformation is dependant on a decentralised, networked and multi-skilled workforce. To help organisations transition, new strategies and structures for education are required. Education systems need to concentrate less on specialist skills and more on the development of people with broad-based problem solving skills that are adaptable, with social and inter-personal communication skills necessary for networking and communication. This paper presents the findings of a 'Knowledge Economy Market Development Mapping Study' conducted to identify the value of design education programs from primary through to tertiary level in Queensland, Australia. The relationship of these programs to the development of the capacities mentioned above is explored. The study includes the collection of qualitative and quantitative data consisting of a literature review, focus groups and survey. Recommendations for the future development of design education programs in Queensland, Australia are proposed, and future research opportunities are presented and discussed.*

Keywords: *Knowledge economy, creative economy, design education*

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E-learning

From Long-distance to No Distance: Performance-based long-distance education in art and design

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Abstract: *This paper is to introduce an enhanced teaching and learning experience, which brings people in different location to act in the same spectacle, a real-time building together rather than only verbal communications in front of the screen. The “e(ating) meeting – Project of the VISIT 2012” is a teaching project undertaken in the year 2010~2013, and is a cross-cultural long-distance learning and collaboration experiments between two international universities. The objectives of this collaborative project are to develop and experiment new teaching approaches and tools through an intercultural and interactive platform in art and design. This paper unfolds the process and outcomes of the project “the Intercultural and education dialogue” with the aim of developing a practicable model of long-distance education in art and design through innovative teaching methods. This paper also analyses how those methods of teaching can improve the quality of learning practice, especially in online distance art and design education practice.*

Keywords: *Performance, Atmosphere, Long-distance education.*

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Supporting Art and Design student transition into Higher Education

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Abstract: *In 2007 the UK National Audit Office reported retention levels as an important factor in measuring university success. It also reported institutional variations in withdrawal themes concluding that some differences were likely to relate to how well individual institutions were helping students to deal with the challenges of study in HE. As a great deal of research has found retention to be related to student satisfaction, and this in turn to be primarily dependent upon student preparedness and their expectations many institutions have focused on enhancing this area of the student experience. This paper raises awareness of the predominant role of emotions and social interactions in art and design pedagogy and describes the development and implementation of an online portal designed to support a cohort of students about to undertake a BA (Hons) Fashion Design and Technology programme. Support was designed to promote early induction and engagement and to assist in student's preparation, six weeks before arriving at university. The project followed the ADDIE development model and adopted a multi-phase sequential mixed methods research strategy. Evaluation of this project inter-mixed focus groups and semi-structured questionnaires over five key research phases targeted at appropriate stages of the ADDIE development model.*

Keywords: *Transition, Pre-entry, Retention, Withdrawal, Art and Design.*

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Feel the Fear: Learning Graphic Design in Affective Places and Online Spaces

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Abstract: *This paper explores the idea of pedagogic affect in both onsite and online graphic design learning spaces, and speculates on the role that this affect plays in the formation of the design student. I argue that embodied design knowledge is built by interactions with design professionals, activities that mimic the daily work of designers, **and** practices of display such as student work galleries within design schools. Therefore bodies in motion, and the places they move within, take on more importance in the making-up of a graphic design student than we may expect. This idea has implications for online design learning. This paper crosses both Actor-Network Theory (ANT) and Non-Representational Theory (NRT), and works three instances of affect. The analysis presented here is targeted towards exploring the contribution of affect to teaching in onsite and online learning spaces. As the practices described here carry through time and space to other design schools, this paper has implications for a broad suite of practices in design education. Thinking through how affect plays out in the onsite design school points the way towards more vibrant online learning spaces.*

Keywords: *Graphic Design, Design, Education, Online Learning, Social Media, Actor-Network Theory, Learning Spaces, Non-Representational Theory, Material-Semiotic, Socio-Material.*

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Developing interactive learning environments to promote scaffolding and reflection: A look at the *Digital Process Book* for design studio education and comparisons to K12 science education applications

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Abstract: *The purpose of this paper is to describe the development and rationale for the design of the Digital Process Book (DPB) learning tool for design education at the University level and discuss the similarities with applications to learning tools in K12 science education. The DPB is an interactive learning environment that is intended to promote reflection throughout a student's design process, as well as integrate important scaffolding elements in the system that supplements the traditional in-person contact between a student and an instructor. It is based on tenets of Cognitive Load Theory, which argues that learners are not able to work to their potential if there are too many elements that they need to process in their working memory. The goal of instructional technologists and instructors is to help students decrease their extraneous cognitive load so students have more cognitive resources to focus on the tasks at hand. Design projects are complex design problems that require a way for students to organize, categorize, and sort the many artifacts and ideations that are produced in their design process. These same goals and needs for university design students are similar to learners in K12 science education.*

Keywords: *Design process, instructional technology, human computer interaction, scaffolding, reflective learning, cognitive load theory*

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E-learning as a balanced way of teaching museums and exhibitions to provide both theoretical and practical education

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Abstract: *One of the challenges of teaching museums and exhibitions courses is that the lecturer has to both teach a theoretical curriculum and organize field trips. The aim is to make the student practice museum education as a model of communication-educational patterns, and recognizes the importance of art exhibitions in developing creativity within the curriculum of a bachelor stage of art education in Egypt. However, the course includes a large amount of knowledge, such as types of museums and the nature of art exhibitions, as well as the importance of museums, in addition to the practical portion, which includes the design and implementation of programs, activities, and workshops in museums; however, it is not allocated in the schedule. On the other hand, two hours per week for the course is not enough to teach the curriculum in a balanced manner. E-learning features a maximum utilization of time, reduces the workload at the university, and increases the students' understanding of the content, allowing them to make more field trips throughout the duration of the course). Consequently, the researcher designed an approach for this course that depends on blended learning through sessions using the Internet. The designed course will rely on specialized teamwork and a group of programs, such as Firefox, Internet Explorer, Flash, RealPlayer, and Excel.*

Keywords: *E-learning, Museums, Exhibitions.*

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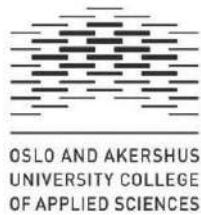
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