

EDUCATING INTERACTION, EXPERIENCE AND DIVERSITY

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ABSTRACT

When we look at the developments within design over the last years, two major buzz-words emerge: interaction and experience. At the Faculty of Industrial Design Engineering we try to anticipate and respond to these directions in design tuning our assignments towards experience and interaction and by developing new design tools, techniques and even a new structure for our design courses. These tools, techniques and courses do not only aim at supporting and enhancing interaction and experience, they also aim at diversity. Because experiences are highly personal, we believe that diversity is one of the key-issues to be addressed [1]. The new structure, called the *Boulevard of Inspiration*, trains design students to take advantage of and expand their personal competencies, capitalise on their drive and passion and explore an abundant number of tools and techniques especially through the first phases of the design process in order to gain a rich variety of products, which fit the diversity of users.

In this paper we will show a few of our achievements and discuss that designing for interaction and experience using the *Boulevard of Inspiration* and design techniques such as *Tinkering* and *IA-Cards*, seems a tempting, rewarding and feasible concept for contemporary design education.

Keywords: design techniques, curriculum development, styles of teaching, interaction design and experience.

1 INTRODUCTION

When we look at the developments within design over the last years, we see that interaction and experience are becoming increasingly paramount. The impact of these concepts is substantial not only in industry [2] and research [3, 4] but also in education [5, 6] Within our Faculty of Industrial Design Engineering these developments did not escape our attention and efforts. For example, we started the Master “Designing for Interaction” last year. Moreover, dozens of our students made their Master Thesis within the ID-StudioLab, which is a multi-disciplinary group of people who perform designer driven research that focuses on the full experience of the user.

In this paper, I will show several of our initiatives with which we anticipate and respond to novel directions in design. Our initiatives can be divided into three main areas: 1) a new structure for our (design) courses; 2) tools & techniques that support interaction and design for experience; 3) assignments that focus on experience and interaction.

2 NEW STRUCTURE: THE BOULEVARD OF INSPIRATION

Our everyday products have become personal pathways that allow individuals to find and create their own experiences. Instead of operating a device to obtain a ‘commodity’

or function, people are tempted and supported to enjoy listening to music, to take pleasure in cooking, to be surprised while phoning etc. [1]. Because experiences are highly personal, I believe that diversity is one of the key-issues to be addressed within design education. I propose that we train design students to take advantage of and expand their personal competencies, capitalise on their drive and passion and explore a number of tools and techniques especially through the first phases of the design process, in order to gain a rich variety of products which fit the diversity of users. This starting-point resulted in guidelines for restructuring several of our (design) courses [7]:

1. *Engagement of individual students and tutors.* Tempting both to explore and capitalise on their personality, passion, skills, knowledge and style.
2. *Offering a rich, diverse and tempting spectrum of topics and methods, in order to gain rich, divers, personal, experiential, tempting, innovative design solutions.* Enabling students to gather knowledge about and experience through hands-on exercises topics like design and interaction aspects, social and cultural issues, sensorial refinement, technological trends, and design tools and techniques.
3. *Tempting students to crystallize their view on society and design.* Firstly, by promoting critical thinking, consciousness-raising, sensitivity, confidence (even confidence to doubt), subtlety, and scientific rigour. Secondly, by letting them experience what engages people, what actuates industry, what drives their (future) design colleagues and what constitutes society.

These starting points converged in a new structure, which we called the *Boulevard of Inspiration*. The main difference with the traditional set-up of our courses is the Bazaar environment. At the Bazaars, a large number of design tutors, professional designers and researchers established their own shop offering their specific knowledge, skills, experience and passion. The Bazaars enable students to compose their own programme based on their interests and design assignment. The basic idea is to stimulate autonomy, responsibility and freedom [8]. By doing this, we aim at stimulating the personal development of a design student and the creation of rich, divers, personal, experiential, tempting, innovative design solutions. Moreover, to keep the number of shops surveyable, they are grouped around themes. At this point we have established five Bazaars: *Tales*, *Tools*, *Senses*, *Technology* and *Collection*. *Tales* is concerned with the narrative side of interaction. For example, what makes interaction beautiful, challenging or even moody? Or, what are the social consequences of a design concept? The *Tools* Bazaar enables design students to experience a broad range of design tools, techniques and methods, e.g. mood boards, extreme characters, tinkering and interaction relabelling



Figure 1. The Storyboardwalk shop learns students how to make scenarios.

The *Senses* Bazaar accommodates shops related to seeing, hearing, feeling, tasting, smelling. For example, what is the power of colour, rhythm or touch? The *Technology*

Bazaar refers to all kinds of technological ingenuity and related possibilities. For example, what are the possibilities of new materials? Or, how can one implement multi-model interactions and what is preferable? The *Collection Bazaar* offers all kinds of collections like books, products, materials and images. Students are stimulated to visit all five Bazaars during an assignment.

All shopkeepers have the liberty to determine the content and the type of shop. For example, a shop can be a lecture, a tutorial, a workshop, a visit to a certain place or event, a consultation, an exhibition, a performance, a guided tour, a playground or working at a design studio. Furthermore, shops can be virtual or physical or a mixture of both. They can be given once or even everyday throughout the course, depending on the shopkeepers availability and appropriateness within the overall time schedule. Finally, all shopkeepers create their own website with information about their ‘merchandise’, themselves, opening hours, type of shop and links related to their merchandise (e.g. <http://studiolab.io.tudelft.nl/vormtheorie1/> and <http://studiolab.io.tudelft.nl/id4250/>)

The Boulevard is used since 2001 for the courses ‘Form Theory 1 and ‘Exploring Interaction’. We’ve evaluated the Boulevard of Inspiration using a questionnaire. All participating students of Form Theory 1 were asked at the end of the course to answer 24 questions about their impression of Form Theory 1, including the Boulevard, and the appropriateness for them and the Faculty. The results show that the students experienced the Boulevard of Inspiration as a motivating structure. Moreover students considered a personal focus and diversity to be extremely important for both students and tutors. The results (questionnaires and the products designed during the courses) support our believe that the *Boulevard of Inspiration* is suitable for contemporary design education, stimulating and motivating, personal, diverse, and guided by enthusiasm [7].

3 TOOLS AND TECHNIQUES

Within the ID-StudioLab we develop tools and techniques to support designing for experience and interaction. These tools and techniques are aimed at both designers (students) and the future users of the products. They cover a variety of topics, such as.

- evaluating and manipulating the emotional impact of a design [9]
- using existing products in the generation of new forms and interactions [10, 11]
- exploring the vision of interaction [12]
- using bodily movements to design interactions and products spatially [1, 13]
- supporting the visualization and communication of new design concepts [14]

In this paper, I will discuss two techniques that I have (jointly) developed over the last years: *Tinkering* and *IA-Cards*.

3.1 Tinkering

Spatial models are extremely suitable to focus on experience and explore interaction concepts, because they can be seized, moved and used; in short experienced. Models come in all kinds of forms throughout the entire design process, from simple paper mock-ups to refined full-scale working prototypes. *Tinkering* is a technique that focuses on low-fidelity prototypes with a high-interaction relevance [15]. This group-based brainstorming technique aims at enhancing creativity, imagination and discussion, through the development of interaction concepts during the early stages of the design process. By offering designers a large amount of raw materials, scrap and props, they are challenged to build and evaluate working prototypes within a very short period of time (generally less than 30 minutes per model). The models are generally designed and

evaluated using play-acting. The tinkered model is used to ‘play out’ the interaction with the product. By role-playing different types of users one tries to understand the interaction with the product in its context. Because the materials used during *Tinkering* sessions are very diverse and also visually and tactilely expressive, they support a variety of aspects of interaction design, such as exploring user behaviour and aesthetics, designing feedforward and feedback, and determining functionality, see Figure 2. Moreover, *Tinkering* does not demand specialized skills, which make it adequate for participatory design.

Up till now, we have used this technique during (international) workshops, graduation projects and regular (design) courses within our Faculty, with both professional designers and students. Given the results of these workshops and projects and the positive response of the people using the *Tinkering* technique, I believe that *Tinkering* can be a valuable addition to the existing set of brainstorming and modelling techniques.

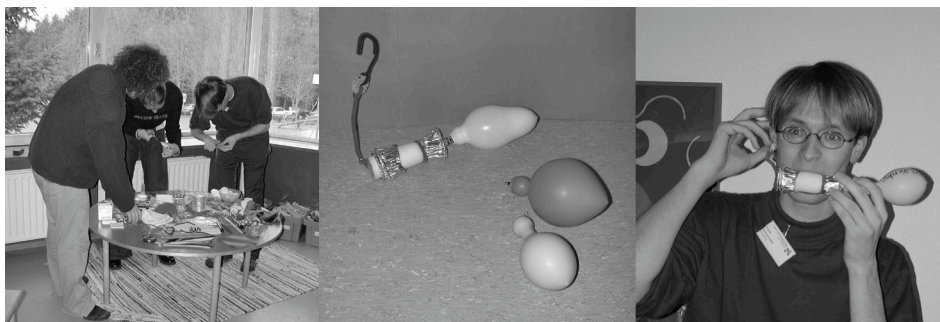


Figure 2. During this Tinkering session the participants were asked to design a soft drink container. The container should not only express the taste and feel of a given drink in terms of shape, colour, texture, and so on, but also enhance the character of the drink by the way in which people are holding, drinking and storing it, and so on.

3.2 IA-Cards

IA-Cards is a set of hundreds of visual attractive cards, which are used for inspiration and assessment during all phases of the design process. The cards are divided in different categories, such as people, products, consumables, environments, abstract images and textures (see Figure 3).



Figure 3. Examples of the different categories used in the set IA-Cards. From left to right: people, environments and abstract images and textures.

The set includes cards with text: emotions, objects, environments and adjectives. The cards are laminated and relatively small (slightly smaller than credit cards) which make them easy to handle, shuffle and move. This is beneficial during individual sessions, as well as group sessions.

The *IA-Cards* aim for inspiration during the first phases of the design process and assessment of ideas, concepts and prototypes during the entire design process.

3.2.1 Inspiration

The amount, diversity and ambiguity of the cards trigger the imagination of designers, especially during the first phases of the design process. Leonardo da Vinci pointed out that “*confused things rouse the mind to new inventions*” [16]. With these confused things he referred to the ambiguous character of sketches, but it is also applicable to the ambiguous character of the *IA-Cards*. *IA-Cards* help designers to determine the desired expression, experience and type of interaction of the product to be designed. Moreover, designers can use these cards to let people visualise what kind of experiences, interactions and products they desire, and use this output as inspiration. During workshops and courses, I often start with *IA-Cards* followed by a 10 minutes modelling session to translate the cards to an expressive spatial model. The result of both sessions creates a framework for the *Tinkering* session.

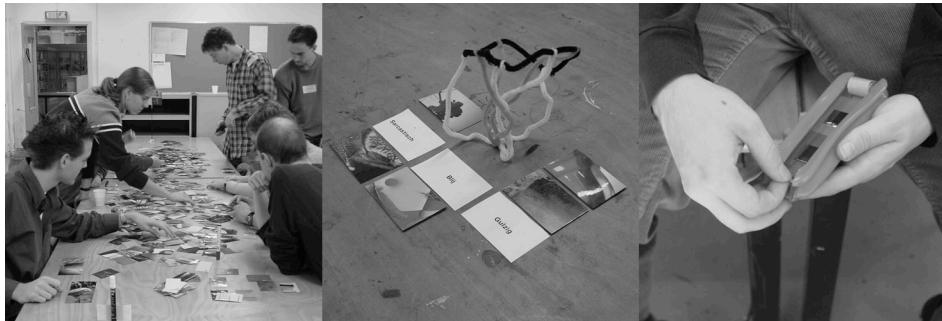


Figure 4. One of our students used *IA-Cards* and an expressive model to determine the interaction characteristics. The following *Tinkering* session yielded his concept for a notebook to reduce stress.

3.2.2 Assessment

IA-Cards can also be used to evaluate general concepts, ideas and prototypes. People are given one or several sets of images (depending on the task) and asked to evaluate the subject of discussion. For example, twelve persons were asked to evaluate several stress reducing products. They were first asked to use the prototypes during several days. Afterwards they were asked to select four abstract images to depict their impression of the different prototypes and the feelings these prototypes evoked. Next, they were asked to append a catchword to every image and describe why they chose these images. The twelve responses were clustered and analyzed. This analysis can either be performed using common sense and design experience, or they can address scientific rigor using e.g. cluster analysis and multi-dimensional scaling techniques [11], see Figure 5.

Up till now, I have used *IA-Cards* during workshops, participatory design sessions, regular (design) courses and design research. The results are very positive (e.g. many students would like to purchase the set). When used for inspiration, there are similarities

with existing techniques like mood boards. However, *IA-Cards* have the advantage of graspability, the different themes and the amount of cards, which make them extremely suitable for quick output and group sessions. Moreover, the technique does not demand specialized skills; therefore it is an adequate way to let users participate in the design process. Furthermore, the assessment-functionality of the cards seem a valuable addition to existing, mostly verbal types of evaluation techniques.

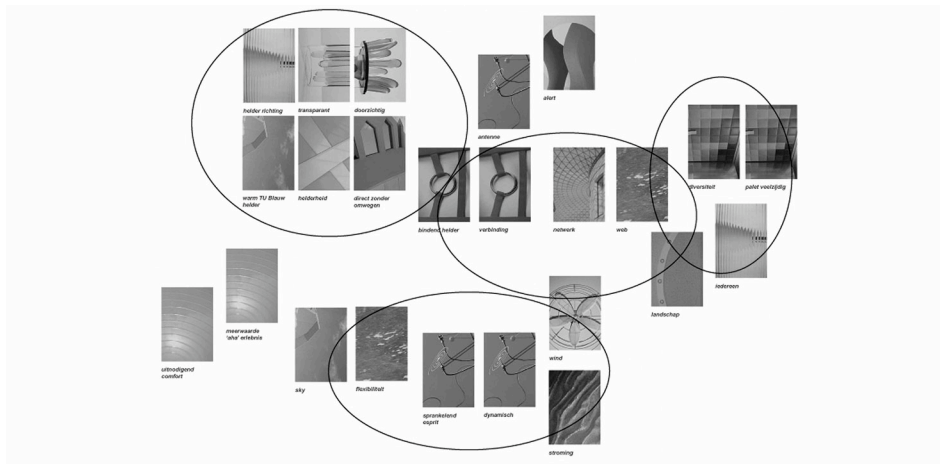


Figure 5. All responses of subjects can be represented in a multi-dimensional space.

4 FOCUS ASSIGNMENTS

I would like to end this paper with an example of a graduation project, which focused on experience and interaction. Structure, techniques and tools are very important to help students throughout the design process, however it is not the ultimate goal. They are merely means to enable designers (students) to design for experience and interaction.

We have seen over the last years, that the current and future technological possibilities in combination with experience, often shifts the design focus from the product and the result of interaction towards the involvement during interaction. Consequently, a shift is made from aesthetics of appearance towards aesthetics of interaction or use. Nowadays digital products show us the necessity of this shift because design “*has left us in the curious situation that we have products which look good at first sight, but frustrate us as soon as we start interacting with them.*” [17]. The following design concept addresses these ‘beauty of interaction’ issues.

4.1 Making intimacy tangible

Bart Hengeveld designed a conceptual system to use e-mail for intimate communication [18]. With his design he aimed at making relationships and accompanying Internet-communication more intimate and more personal.

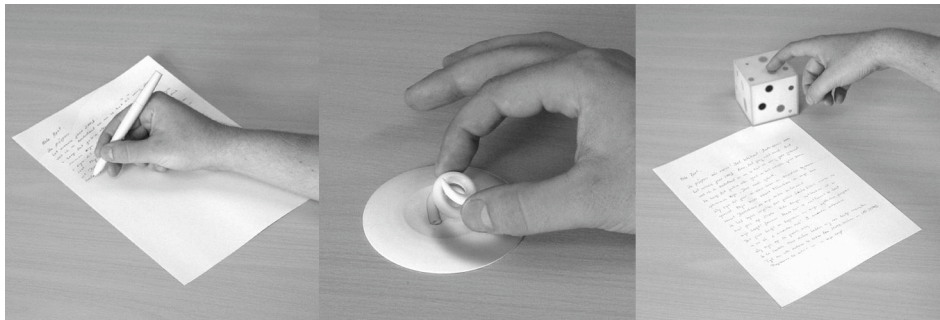


Figure 6. The e-mail system consists of an e-pen and e-paper to write messages. One can use personal tags to handle messages. The portal makes the connection to the Internet and the written and received messages can be stored in a cube.

The system consists of an e-pen, e-paper to write messages, tags to handle messages, a portal to the Internet and a cube to store messages. These physical objects appeal, by their very nature, to handle them in an expressive way. The emotionally smart objects then read the mood you're in, and show their understanding by, like a chameleon, changing colour patterns. These patterns escort the message to the addressee who has a similar set of objects inviting her to "taste" the messages. Tangibility in interaction design thus opens up emotional skills through perceptual-motor skills, by intrinsically linking the action-eliciting power of objects (affordances) to the expressive power of human behaviour.

This example shows that designing for interaction and experience can lead to novel concepts, that go beyond the existing, often technology-driven solutions. In this case, the human expressive powers were addressed by the action-eliciting power of the tangible objects. This example shows that it is important to take great care in prototyping product concepts and simulating their behaviour (already during the conceptual phase of the design process). In order to be taken in by the beauty of the interaction, people have to be able to play with a product and feel engaged. Again, this makes techniques like *Tinkering* so valuable.

5 CONCLUSIONS AND FUTURE WORK

The *Boulevard of Inspiration*, *Tinkering* and *IA-Cards* is an attempt to anticipate recent and future design trends such as interaction and experience. The set-up with several *Bazaars* offering a variety of shops aims at making design education personal, respectful, tempting, experiential, rich, innovative and dynamic. The first results of the *Boulevard* affirm our assumptions and show that we are on the right track. The same seems to hold for design techniques like *Tinkering* and *IA-Cards*. Moreover, these techniques appear to be extremely suitable for participatory design, because they do not demand specialized skills. The results strengthen my belief that course structures and design tools and techniques can be beneficial when focusing on diversity. More and more, we are training design students to take advantage of and expand their personal competencies, capitalise on their drive and passion and explore an abundant number of tools and techniques especially through the first phases of the design process. It seems that this strategy is indeed producing a rich variety of products, which fit the diversity of users.

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REFERENCES

- [1] Hummels C.C.M., *Gestural design tools: prototypes, experiments and scenarios*. Unpublished doctoral dissertation, Delft University of Technology, Delft, The Netherlands, 2000.
- [2] Aarts E. and Marzano S., *The new everyday: views on ambient intelligence*. 010 Publishers, Rotterdam, 2003.
- [3] Hekkert P.P.M., Keyson D., Overbeeke C.J., & Stappers P.J., The Delft ID-StudioLab: Research for and through Design. In: H. Achten, B. de Vries and J. Hennessey (Eds.) *Conference proceedings Design Research in the Netherlands*, Eindhoven, 2000.
- [4] Blythe M.A., Monk A.F., Overbeeke C.J. and Wright P.C., *Funology: From usability to enjoyment*. Kluwer, Dordrecht, 2003.
- [5] Davis, M., A Curriculum Statement: Designing Experiences, Not Objects. *LOOP: AIGA Journal of Interaction Design Education*, November, Number 1, 2000.
- [6] Vinke D. and Overbeeke C. J., Nine Competencies, Six Units - Industrial Design Education at TU/e. In: *Proceedings of the 2nd International Engineering and Product Design Education Conference*, Delft, September 2004.
- [7] Hummels C., Overbeeke C.J. and Wormgoor R., The Boulevard of Inspiration: Making design education tempting, experiential and personal. *Journal of the Asian International Design Conference Vol. 1*, Tsukuba, Japan, 2003, CD-Rom ISSN 1348-7817.
- [8] Simons R.J., Van der Linden J. and Duffy T., *New learning*. Kluwer Academic Publishers, Dordrecht, 2000.
- [9] Desmet P., *Designing emotions*. Unpublished doctoral dissertation, Delft University of Technology, Delft, The Netherlands, 2002.
- [10] Djajadiningrat J.P., Gaver W.W. and Frens J.W., Interaction relabelling and extreme characters: methods for exploring aesthetic interactions. *Proceedings of DIS'00, Designing Interactive Systems*. ACM, New York, 2000, pp.66-72.
- [11] Pasma G., *Designing with precedents*. Unpublished doctoral dissertation, Delft University of Technology, Delft, The Netherlands, 2003.
- [12] Hekkert P., Productive designing: A path to creative design solutions. In: L. Svengren (Ed.), *Proceedings of the Second European Academy of Design Conference*, Internet publication: <http://www.svid.se/ead.htm>, 1997.
- [13] Klooster S., *Ontwerper beweeg!* Unpublished Master Thesis, Delft University of Technology, Delft, The Netherlands, 2003.
- [14] Keller A.I. and Stappers P.J., Using video collages in the design process to experience presence and atmosphere. *Journal on CyberPsychology and Behavior special issue on Presence*, Volume 4, Number 2, April 2001.
- [15] Hummels C.C.M., Djajadiningrat J.P. and Overbeeke C.J., Knowing, doing and feeling: communicating with your digital products. *Interdisziplinäres Kolleg Kognitions- und Neurowissenschaften*, Günne am Möhnesee, March 2-9 2001, pp.289-308.
- [16] Gombrich E.H., *Leonardo's method for working out compositions. Norm and form: studies in the art of the Renaissance*. Phaidon Press, Oxford, 1966.

- [17] Djajadiningrat J.P, Overbeeke C.J. and Wensveen S.A.G., Augmenting Fun and Beauty: A Pamphlet. In: W.E. Mackay (Ed.) *Proceedings of DARE'2000*, Helsingor, 2000, pp.131-134.
- [18] Overbeeke C.J., Hengeveld B. and Hummels C., Making intimacy tangible. *Journal of the Asian International Design Conference Vol. 1*, Tsukuba, Japan, 2003, CD-Rom ISSN 1348-7817.

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