INTERNATIONAL ENGINEERING AND PRODUCT DESIGN EDUCATION CONFERENCE
2-3 SEPTEMBER 2004 DELFT THE NETHERLANDS

DESIGN (EDUCATION) MOVES

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ABSTRACT
Design recently turned its attention to the role of emotion, engagement and experience in human-product interaction. This focus requires, first, the designer's sensitive, empathic understanding of what this attention comprehends, and second, creative skills needed to incorporate this attention in his work. These two designers' competencies have to be developed. We believe a way of doing this is through movement. That is the starting point for this paper: introducing movement as pivotal for achieving embodiment of these design competencies. In this paper we illustrate the incorporation of movement in design education at the faculty of Industrial Design, TU/e, through a novel design approach, Design Movement.

Keywords: interaction, movement, embodiment, sensitivity, empathy, understanding, creativity.

1 WHERE DESIGN (EDUCATION) IS MOVING

Design recently turned its attention to the role of emotion, engagement and experience in human-product interaction [1,6].
This attention to interaction cannot only be concentrated on rationally; it also needs to be approached through sensitivity and empathy. In order to incorporate these interactive issues in the design of products, the designer needs to develop:

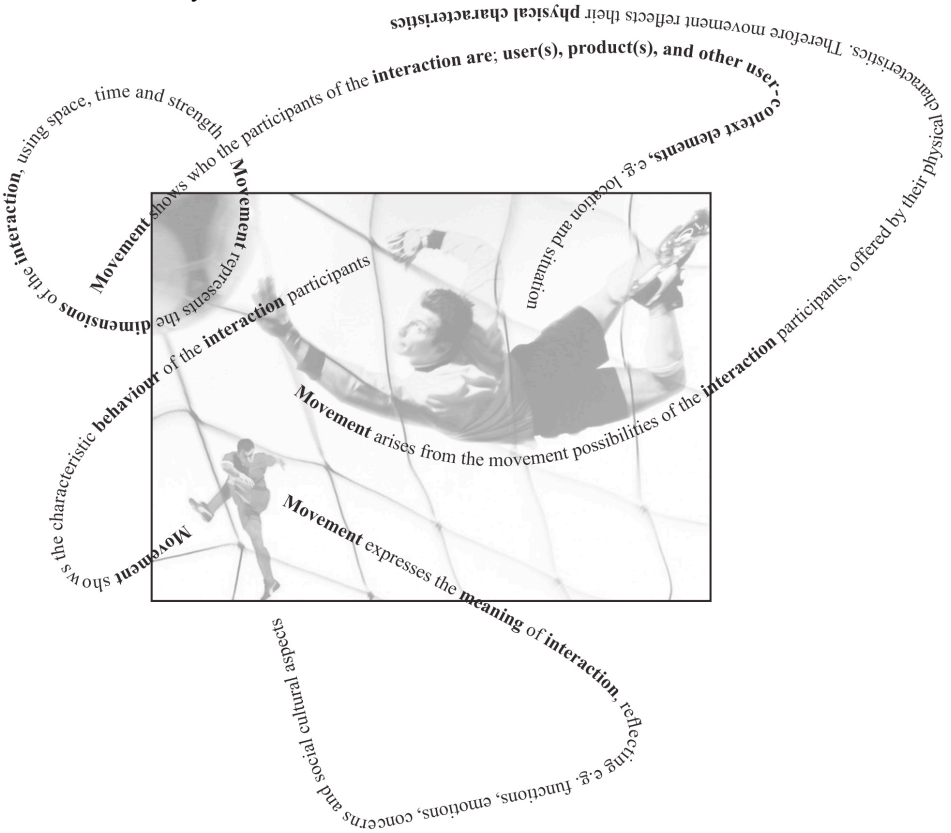
- a sensitive, empathic understanding of what interaction contains,
- creative skills to implement this understanding into the design of interactive products.

Therefore these designers' competencies need to be educated. This leads us to the question of how this can be realised.
During her master graduation project the first author of this paper explored the possibilities movement offers design practice, resulting in a novel design approach; Design Movement [2]. This work supported our premises concerning sensitive, empathic understanding and creativity. In the next paragraph we explain the reason why movement is pivotal to obtain these designers competencies.

2 MOTIVE FOR MOVEMENT IN DESIGN (EDUCATION)

When unravelling the designation 'interaction', other terms arise, leading to diverse interactive design issues: The interaction participants, i.e., user(s), product(s), and other user-context elements, e.g. location and situation; their physical characteristics; their character and related behaviour; the way the interaction uses space, time and strength; and the meaning of the interaction, including functionality, emotions, concerns and social cultural aspects.
The word movement is left out of this summary on purpose: movement is expressing and reflecting these different issues that together shape interaction. Moreover,

movement shows the way these issues are dynamically related and interconnected into an interactive unity.



This brings us to the motivations for movement being pivotal in interaction design:

1 The designer needs an understanding of interaction, which cannot only be rational. It also needs to be understood sensitively and empathically. Movement enhances this understanding through the moving body of the designer. By putting the interaction in motion the designer becomes bodily aware of the different interactive issues as a whole, all at once. This includes the product's characteristics, which are offering interaction possibilities and simultaneously imposing constraints. In this way the moving body of the designer serves as an embodying tool for sensitive, empathic understanding of interaction and how products are part of this.

2 When designing interactive products the designer needs to be able to implement this understanding in a creative way. The designer needs to be able to creatively build concepts for interaction. This includes the different interactive design issues, among which the product, i.e., the to-be-created enabler of new interaction possibilities. Implementing the moving body of the designer as an embodying tool also serves this purpose. Movement enables him to ease away from the beaten track of knowing and devising. Through embodied explorations, the designer is able to discover unexpected, because unexplored, interactive possibilities and combinations. This principle is paralleling the practice of dance improvisation, where the dancer is letting go of known movements, making room for intuition in order to explore movement possibilities, enriching his movement vocabulary. Also a comparison to choreography can be made; here the designer is designing movement as a basis for the design of interactive products.

Starting from this idea for movement being pivotal for the design of interactive products, the first author explored the way movement could be incorporated in a design approach, using ViP [3] as an important frame of reference. The resulting novel approach, Design Movement, is now implemented in our educational programme. The next paragraph presents an assignment, which illustrates this implementation.

3 THE WAY DESIGN MOVES IN DESIGN EDUCATION

The TU/e faculty of Industrial Design focuses on educating designers of future intelligent products, systems and services [4]. The introduction of intelligence in products is expanding the interactive possibilities of actively behaving products. The feasibility of movement to awaken the required designers' competencies, for designing these highly interactive products, made us decide to implement Design Movement in the education of our students.

At the start of this academic year 2003-2004, the first author organised a second year assignment called Commotion, a contraction of communication and expressive motion. The assignment aimed at the design of a product that mediates in body language between people, using the Design Movement approach. Each student worked on this assignment individually. The students were asked to make a motivated choice for a Commotion, which they had experienced and which fascinated and inspired them to design a product for. They were asked to start from this personal choice because, in our opinion, developing sensitivity and empathy starts with awareness of your own bodily experiencing interaction. Their progress was presented weekly and all students attended, in this way exchanging their movement experiences and ideas.

Below the process of this Design Movement based assignment is presented, illustrated by examples of the resulting work of six of the participating students.

3.1 Scenery

As a starting point of the design process the participants of the Commotion were identified, they represent the scenery: The students were asked to choose a product that features within their Commotion. Again this choice had to be motivated, to trigger awareness of these intuitive design decisions. Within some student's Commotion there was no product participating yet. They designed a not yet existing product, therefore skipping this choice. By this choice, together with identifying the users and other user-context factors involved, the scenery of the Commotion was set.

- Selim Demirci designed for the Commotion where visitors of a movie share an armrest with their probably unknown neighbours, while sitting in rows, facing the screen; a Commotion about an undefined border of personal space (fig. 1). The scenery consists of the armrests (to be re-designed), the row of chairs, the screen and the people.

Figure 1. Selim Demirci; armrest Commotion.

3.2 Movement exploration

This phase aims at developing a sensitive, empathic understanding of the Commotion interaction: The students bodily explored the way their Commotion-scenery interactively moved.

They first pointed out the physical characteristics of this movement. To support this exploration the students were provided with a simplified version of the Laban Movement Analysis [5]. This version is used at the Academy of Dance in Rotterdam, as a tool for teaching, helping to build the dancer's awareness of movement possibilities and stimulating explorations thereof. In this version movement is represented by four elements: the *body*, which physical characteristics are offering movement possibilities, the way this body is using *space* to move, the way of using the element *time* and finally how *strength* is used as part of the movement. Through this exploration the students developed insight in the role of the physical characteristics of the commotion participants' bodies. This includes the product, which, together with the other participants, opens up the interactive movements of the whole. At the same time the students created awareness of the way the interaction used space, time and strength, the other three elements of movement.

Subsequently they made a visualisation of the Commotion movements, expressing the behaviour of the participants' characters and the meaning of the Commotion. This visualisation was accompanied by a short description in words, to support awareness of what the visualisation expressed.

- Arjan de Keijzer worked on the Commotion where two people romantically sit at a table. In his explorations he showed the symmetry of the two people's bodies approaching each other, sharing the space in between (fig. 2). The table represents this space and acts as a thrilling border between these people, building up the tension of approaching to intertwine, without completely being able to.

Figure 2. Arjan de Keijzer; romance at a table Commotion

3.3 Choreography of interaction

These explorations served as a basis for designing the choreography of interaction, in which the designer expands his understanding into the creating of interaction:

The students were asked to consider the way the product-to-be-designed should influence the movement of the total Commotion of which this product is going to be part. Should the present movement be supported, exaggerated, changed, etc? Again the students were asked to motivate their personal choice.

Subsequently the students bodily elaborated this choice into the new Commotion movement; the choreography of interaction. Here the four mentioned movement

elements again were used, this time to describe the designed physical movement characteristics, supported by visualisations of what it expressed.

- Debby Vorstenbosch designed a choreography of interaction for the Commotion where people are sharing the space of an elevator, while waiting for the level to get off. She wanted to change the tense rigid situation of people avoiding and denying each other, into a light-hearted haphazard time to spend. The old Commotion movements and her design for the new Commotion are illustrated in fig. 3.

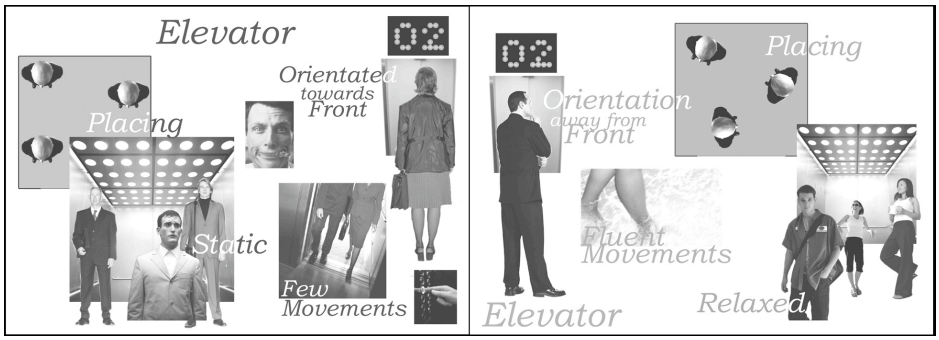


Figure 3. Debby Vorstenbosch; elevator Commotion

3.4 Product design

Using the designed choreography of interaction as the starting point, the students finally designed the product: one of the 'dancers' activating the designed choreography of interaction. The students generated ideas for product characteristics, both physical and behavioural, that arouse the designed movement when introduced in the Commotion. These explorations lead to the final concept for their Commotion product.

- Debby Vorstenbosch's design for the elevator Commotion resulted in a projection of a virtual outside environment (fig. 4). This animation represents the height related to a tree in the virtual outside world. Birds are flying round the elevator cabin, inviting to follow them with the eyes, creating space for crossing of gazes. In this way Debby wanted to open up random, turning movements of looking around. The walls of the elevator create space for this, instead of locking them in.

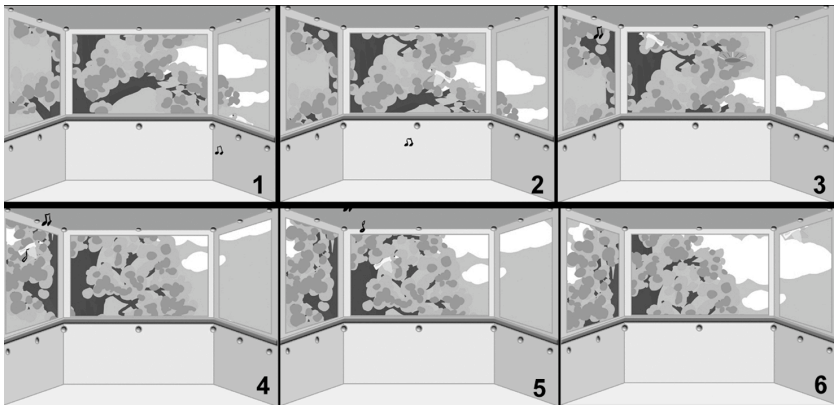


Figure 4. Debby Vorstenbosch; elevator Commotion

Figure 5. Ismail Cimen; kissing Commotion

- Ismail Cimen (fig. 5) wanted to stop the hesitation of two people, both and mutually, not knowing to head for the left or right cheek to kiss on. During his explorations he found this picture, representing a spatial aspect of cheek kissing. The object in this picture supports sensitive communication leading a mutual spiralling kissing movement; together holding the ring reveals the impulse and direction of the movement.

In order to enhance the intimate gesture of a hug, Martijn Dijkhuizen explored the way clothing accessories could be supporting. Fig. 6 shows two of the ideas he generated. The lengthened sleeves on the left enhance the gestures of intertwining and untying of the arms. The other idea is shielding openings, enhancing the closing of two people into a unity. In approaching and separating the closing and opening movements are exaggerated.

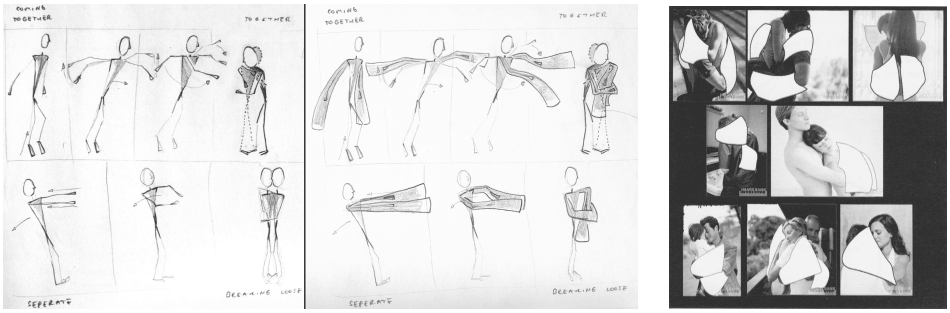


Figure 6. Martijn Dijkhuizen; hugging Commotion

- Flip van den Berg designed for the way people pass pots and pans when eating together. While manners for other activities during dinner are specified in etiquette rules, this sharing movement is not organised. Flip designed movements for passing, based on rules for sharing the table space. Each dinner participant owns a personal space for eating and next to it there is a space within reach of the arms and a space out of reach. These spaces are translated into a pattern on a tablecloth: (1) showing the personal spaces, which can not be violated, (2) showing who is/are in reach of the dishes to be passed through and (3) showing the paths of passing through the different reachable spaces. The result in this way represents the space for passing through, while at the same time it is a decorative tablecloth (fig. 7).

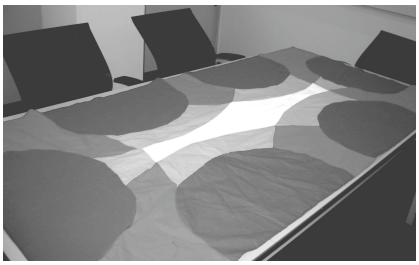


Figure 7. Flip van den Berg; dinner Commotion

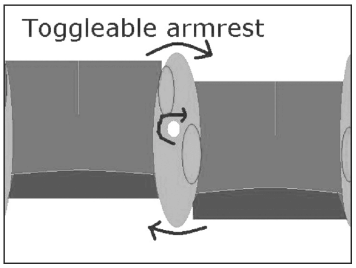


Figure 8. Selim Demirci; armrest Commotion

- Selim Demirci (fig. 8) designed his Commotion for exploring the borders of personal space through indirect contact. By making the encounter indirect and flexible, he wants to open up a playful way of exploring and expanding each other's personal space.

4 MOVING TO CONCLUSIONS

In this paper we introduced movement as pivotal in design education focussing on interaction: Interaction design is essentially dynamic, requiring (1) the education of embodied understanding of these dynamics and (2) the education of creative skills to incorporate this understanding in design, i.e., the designer's body needs to be educated. By presenting a case of the implementation of Design Movement, embodying the dynamics of interaction in design, we showed it promises to arouse and develop the student's understanding and creativity in designing interactive products.

In the line of educating and implementing the body in design, the introduction of dance professionals is a logical move to make. We recently made a step in this direction: Another Design Movement activity was organised in collaboration with Houkje van Hoek, a teacher in dance improvisation. During a one-day workshop the students were guided full time in using their own moving body to explore and design the dynamics of entering a space (they designed an entrance). In this way movement expertise was incorporated and the education of the body implemented radically.

It goes without saying that we think movement and the Design Movement approach are valuable not only for design education, but also for design practice. Furthermore the Design Movement approach is just one way movement can be implemented in design. Still a broad field related to this view is waiting to be explored. However there is already research going on in this field: Hummels [6] suggested tools for gestural design in her PhD and is actively continuing her research in this field. Weerdesteijn [7] did a case study on "learning to talk with your body", in which she developed an aid for gymnastic education of children, making them aware of body language. These product designs expressed emotion through their movements when interacting with children, evoking expressive reactions of the children. The designs were inspired on the emotion expressing movements they were going to represent. Oprins [8] is doing his graduation project on developing tools for translating the design of movement into the design of products. These are only a few examples of nowadays explorations on implementing movement. It is clear that design turns its attention to movement being pivotal: Design moves.

We do believe in the importance of movement, both for design education and design practice. We are convinced that it will lead to radically new products that afford and invite innovative ways of interacting with them.

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