Design, metadesign and the importance of vision

Design, metaprojeto e a importância da visão

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Abstract

In the European context today there are many reasons to re-think and re-design didactic activities. Design education in particular seems to be at the core of European Union goals: (i) the EU underlines, in several recent documents[1], the importance of research and educating future researchers, (ii) there is a continuous stress and promotion of interdisciplinary approaches and of internationalization to maintain and improve the higher education level and strengthen its competitiveness. Within our institution there is an educational model based on the so-called *Research and didactic units,* between which there is a virtuous circle. Starting from the virtuous circle between research and education and the importance of creativity in design activities the paper will explore the importance of a metacognitive approach and the central role of envisioning activities.

Key words: design, education, reaserch, metadesign, vision, envisioning.

Resumo

No contexto europeu atualmente existe muitas razões para repensar e reprojetar atividades didáticas. O ensino de design em particular parece estar no centro das metas da União Europeia: (i) a União Europeia sublinha, em vários documentos recentes, a importância da pesquisa e a formação dos futuros pesquisadores; (ii) há um estresse contínuo na promoção de abordagens interdisciplinares e de internacionalização para manter e melhorar o nível de ensino superior e reforçar a competitividade. Dentro de nossa instituição existe um modelo educativo baseado na pesquisa e em unidades didáticas, entre as quais existe um círculo virtuoso. A partir do círculo virtuoso entre pesquisa e educação e a importância da criatividade nas atividades de design o artigo vai explorar a importância de uma abordagem metacognitiva e do papel central das atividades de previsão.

Palavras-chave: design, educação, pesquisa, metaprojeto, visão, previsão.

Design education and the European context

Inside Europe there are several initiatives in support of design education and research in all countries with design support. The development of design education follows different paths: some states have focused on quantitative targets increasing the number of design graduates some others have recognized as a goal the quality of design education. Even though, in some countries the average unemployment rate of design graduates is higher than for other professions, in some other countries as Denmark and Finland it is acknowledged that there is a lack of designers with the right expertise. This situation led the European community to work on design policy and to consider the powerful relation between research

and education strategic. As suggested in the EU working documents (European Union, 2009 p. 8) *the development of tools and support mechanisms for design-driven, user-centred innovation, networking and research, and collaboration in education and training are areas of action that could help remove some of the barriers to better use of design in Europe.* Moreover, the need to train professionally active designers to take better account of recent developments in design-driven innovation appears urgent.

Design research is still a relatively small and recent discipline, inadequately recognized and not properly connected with more established areas of innovation research (European Union, 2009 p. 50).

If we want design to be considered as a strategic advantage, it is important that not only designers inside com-

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[1] Report from the Commission to the Council on the Council Resolution of 23 November 2007 on Modernising Universities for Europe's competitiveness in a global knowledge economy (October 2008)

panies or design academics understand the potential of design but also that the entire scientific and business community considers design as a key asset. To reach this target the American Design Management Institute, for example, promotes design thinking among non-design executives, providing training and research. It has been suggested that design should be an integral part of the business school training, as it happens in Rothman Business School of Toronto, and also in engineering and architecture. In the same way, management should be an integral part of design education. The need of an eclectic instruction is continuously stressed and promoted by the European Union through an interdisciplinary approach and internationalization to maintain and improve the higher education level and strengthen its competitiveness.

Relation between research and education

The document signed in Bergen underlines the importance of research, education to research, and promotion of interdisciplinarity, in order to maintain and improve the quality of higher education and strengthen its competitiveness. The polytechnic culture is an expression of a two sided medal: engineering on one side and artistic architectonic on the other. It represents, maybe more than any other university culture, a fertile field of development for design disciplines, and for the multi-disciplinary approach that is part of our School of Design.

At the core of this work, there is the conviction that design has a pervasive character and specific cognitive properties (Oxman, 1999; Cross, 2000; Downton, 2000). Furthermore, in a didactic context, the role of design cannot be limited to define the course contents; design should extend its role beyond its area of comfort. This means, engaging into the strategic and organizational transformation of education (Celi and Ramponi, 2009).

The role of research within education is important, but in the design field, it is necessary to distinguish between three different types of research: research *in* (or *on*) design, often carried out starting from other disciplines (historical interpretation, a sociological or technological one); research *for* design, as in research and development units (R&D); and research *through* design, where the project practice has a methodological role. Research through design regards didactics more closely than other forms of research: in such case, design is a research vehicle and

represents a means of communicating results. Research through design has been examined by different authors, who have defined it as either practice-led research, action research, or project-grounded research. Alain Findeli (2000, p. 58) in particular, regarded such forms of research as variants of research on design with a special accent on theoretical aspects, stressing the role of creativity and claiming its independence from other disciplines:

"[…] we are left with the conviction that there is indeed a specific "designerly way of knowing", that this knowledge and its objects deserve to be investigated and that creativity is a necessity, not only for design practice, but also for design research. Also, we may be confident that, after having depended on so many foreign – sometimes even exotic – academic disciplines, design is about to gain its sovereignty and to contribute to general knowledge, by posing new and relevant research questions and by helping reduce uncertainty and ignorance about what concerns us all: the nature, meaning, and purpose of the relationships of human beings with the world, especially the artificial world".

The relation between research and education is a virtuous recursive cycle in which the two parts feed each other and stimulate a continuous process of reflection as Schön advocates (Figure 1).

Designerly ways of knowing

It is meaningful to observe that the concept of specific designerly ways of knowing arises for the first time together with the development of new educational approaches in design. As clearly articulated in the journal Design Studies by Nigel Cross (1982), just as other intellectual cultures concentrate on the underlying forms of knowledge peculiar to their nature, design discipline must converge on the "designerly" ways of knowing, thinking, and acting. Design problems are often problems with a large number of open constraints-parameters whose values are left unspecified in the problem statement. Solving an ill-structured problem is partly a process of resolving these constraints (Guindon, 1990). Simon, emphasizing the role of the problem solver, wrote "There is much merit to the claim that much problem solving effort is directed at structuring problems, and only a fraction of it at solving problems once they are structured" (Simon, 1984 [1973], p. 187).
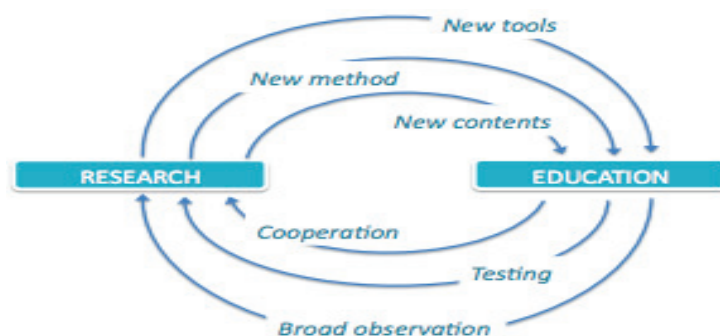

Figure 1. Relationship between research and education at the School of Design of Politecnico di Milano.

After Schön's work (1983), many researchers have realized that design practice has its own strong and appropriate intellectual culture, and that when design research is integrated into the design process new and unexpected questions emerge directly from the act of design (Zimmerman, 2003, p. 176). Design has always been understood, interpreted and told as a process. As Maldonado argued, design consists in coordinating, integrating and articulating all the factors that contribute to the constitutive process of the object's shape. But there is also a recursive dimension: the iteration of the process activates the reflection on action and the design process becomes a process of knowledge.

Searching for an education model that can help us to codify designerly ways of knowing as well as the recursive and reflective dimension, we can make a comparison with the interpretation that Leslie Cunliffe applies to learning in the arts (Cunliffe, 1999). Cultural construction is achieved through the mediation of different learning styles:

• Defining new knowledge though comparison with the mapping of previous knowledge;
• Including students' previous knowledge within a set environment;
• Reorganising the activities that result from a difference between the new information received from culture and previous knowledge;
• Perfecting schemes that allow the students to fine-tune their previous knowledge making it more accurate and understandable.

It is therefore through *mediation* that critical experience is emphasized so that the subject who is learning can create a cognitive frame in which the various aspects of the experiences carried out are mapped in relation to one another creating a network of meanings. The creation of cross references and the overlapping of areas of different design experiences are the uniting elements between design procedures, and previous theories and knowledge which together make up the curriculum of a designer (Celi, 2005).

Metadesign as cognitive tool: process, visual dimension and reflection in design action

The second year Metadesign Studio, a fundamental class of the Product Design undergraduate program, is a six-month module with a methodological core although it is not a theoretical course.

The goal of the course is to make the student experience all the design phases reflecting on them, organizing activities and explicating every cognitive step with the aim of finding, developing and internalizing one's work method.

Such model, which has been experimented for four years in an undergraduate course, offers also an interpretational pattern of group activities specifically in the disciplinary field of design.

If nowadays knowledge is less and less linked to information acquisition and it identifies more with the ability of coding and de-coding messages, the Metadesign studio held at the second year at the *Politécnico* School of design has the purpose to provide an approach to design knowledge, to learn how to learn, to develop metacognitive skills, to acquire autonomy in coding and decoding information.

The Greek term Μετά means "through, after, behind, between" and over time it has acquired the meaning of "beyond, further than": in the specific context of our discipline, Metadesign means project of the project, organization of the project and has to deal with the initial discourse and with a more general and more abstract dimension. In the educational context, the Metadesign studio is proba-

Figure 2. Concepts, languages and background (adapted from Cunliffe, 1999)

bly a unique model and has the purpose of giving a method of work and to trigger meta-cognitive abilities. The need to decode the professional practice is the core of the inductive approach and inside our course this translates into role games in which students have to cooperate within small design teams to develop a specific project for a specific company. The main focus of this experience is set on the pre-project research phase: understanding the elements of the context (territory, market, company, stakeholders…), considering needs of all the actors involved in the process not only of the final user, exploring (and forgetting!) all the already existing solutions, to reach a new concept.

The didactic activity of Metadesign studio is divided into theoretical lessons, lessons to support the assignment (or tools), and continuous reviews of group projects. The theoretical lessons are oriented to draw cultural background elements, and to provide stimuli and suggestions to rebuild the design context. The tools lessons, week by week, address the students with some practical indications for their work: research planning methodology, information about references, solution for research communication trough info-graphics, critical instruments and a visualization kit.

Nevertheless, review activity still represents the most important moment of design studio.

Reviews, or design juries, are the traditional way to assess student design work. Conventionally, a group of students hang up drawings to a wall (with physical models in front in the last step) and explain their design concepts orally to the professors, tutors, visiting critics and students who gather around the pin-up space. After the oral presentation is completed, critics develop oral arguments in favour or against different aspects of the student's design projects. After the presentation and the critique are completed, the exhibit spaces are dismantled, and the jury reviews the next student.

This learning experience, adequate to design knowledge level of undergraduate students, has been conducted in two different courses with different topics: the first one, inside Product Design course is based on the project topic "Design for Food" and it proposes design issues related to typical Italian food; the second one, inside the Furniture Design course, works on entertainment spaces with the theme "*Mobili non immobili*" (furniture that is not immobile). In both cases we chose different types of objects, in order to assign similar but different issues to students. That way, students can take advantage of questions raised for other topics to improve their own knowledge and add value to their work.

Every design topic is articulated in three sub-topics: typical food or specific entertainment space with questions connected to cultural issues and behaviours during consumption phase; brand, with questions connected with industrial production and design bonds; industrial product, with questions related to market competition, product originality and innovation.

A complete overview of the three sub-topics was collected in a "design card" explaining the details of the design brief. For example, a group of students was asked to investigate the typical Italian Olive Oil, in order to design a gift pack to be produced by Alessi. The work plan is organized in three main steps: (i) Context research, (ii) Research selection and inspirations (from description of needs to the concept), (iii) project development (Figure 3). While the first two steps are mainly characterized by research activities, in the stage of concept development students had to work closely in groups to solve the specific design issue related to their topic.

Context Research: The project research carried out by every group was organized splitting the three subtopics on the three week of exploring activities. Thus, the first week students had to collect information about their spe-
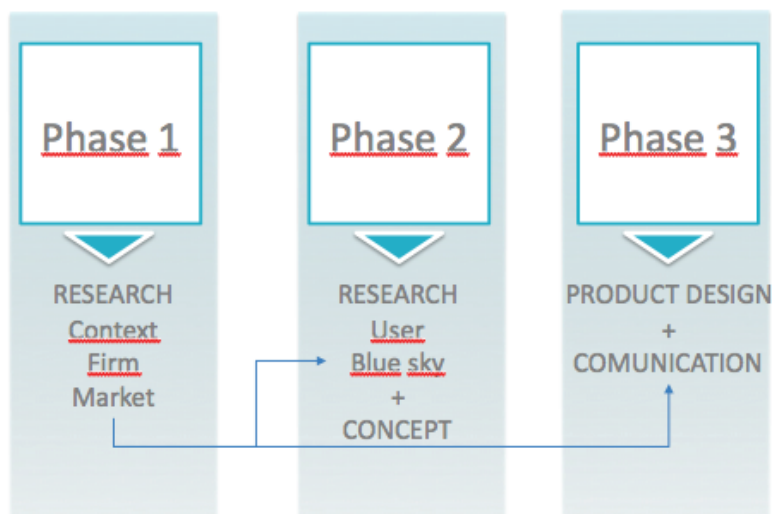

Figure 3. The three steps of the Metadesign Course.

cific topic, considering cultural and technological issues connected to production, distribution and consumption. During the second week, they analyzed industrial market issues, gathering information about a precise industrial brand, pointed out in the "design card", to understand which kind of technical and aesthetic constraints can affect the design process. Finally, on the third week, students had to analyze the existing industrial production, in relation with the specified product family, to identify problems related to existing products and to discover possible week areas.

Research Selection and Inspirations: After the first data collection about the context and the product, students begin a deeper research looking for useful information to define and describe the requirements. The ability to discover latent needs is often the key to the potential success of a new product and each group is requested to carry on user needs, even the company and hypothetic retailer ones. At this step, the moodboard is a key graphic tool that collects images and features that anticipate an abstract version of a concept. This tool, which has been adopted from the fashion world, becomes a new graphic expression about the product qualities even before becoming a concept.

Interconnection and synthesis: Starting from the attempt of concept identification to the definition of all the design components, students are invited to draw a diagram of connections between the gathered information to valorize the meaning of the research process which ultimately will be summarized in an original product.

Envisioning activities

When talking about research for design and in particular when focusing on the front end of innovation we have to underline that, as designers, we work primarily with images. There is a fist level in which images are a way of communicating contents and shapes but also emotions. These envisioning activities start from problem interpretation via visual stimuli (Garned and McDonagh-Philp, 2001), continue with info-graphics, sketches and finish only with the last project screening. But there is also a higher level of envisioning: a vision of the future, an image that anticipates scenarios. The ability to synthesize concepts and forms of the future through images is a more strategic ability that often makes a difference in products' success. The progressive development of metacognitive abilities and envisioning skills are complementary in design education. A research described trough good quality images but with little substance cannot sustain a successful product; only producing images within a system of meaning we could build a "design research".

View: the ability to see something[2]

Observing reality is a form of research and at the same time of learning. The design activity often starts from the observation of users, from understanding needs and identifying problems inside real situations, however, the "ability to see something" could be related

also to the interpretation of design activity itself. According to Rivka Oxman (1999, p.110) "design learning is the acquisition of the cognitive ability to manipulate the *representations of design knowledge*, to acquire basic schema in design thinking, to understand knowledge structures". Novel designers need to acquire abilities to manipulate characteristic strategies of design thinking such as generic and typological design, adaptive design, analogical thinking and creative exploration. These cognitive abilities are not constrained to a theoretical dimension of the project. Schön clearly expresses the importance of reflection in practice for education arguing that the challenge to the professional schools, lies in helping people to become more competent in the indeterminate zones of practice, and at carrying out processes of reflection-in-action. In his thought the practical side of the discipline (or applied science) has its own cognitive abilities that are not the application of theory but represent another way of learning:

> "I'm arguing that it (applied science n.d.r.) has a special zone of relevance which depends on our ability to do these other things, on the one hand to set problems in ways that the categories of applied science can fix and fit and, on the other hand, to fill with art the gap between theory and technique and concrete action" (Schön, 1983, p. 33).

Visualize: make (something) visible to the eye

How can design research be expressed? When working in the design field, even if using a research approach, we need to use specific design tools. As Ochse suggests, "creativity depends on technique, although, of course it goes beyond it. Routines provide creators with the symbols and the language of their culture: they provide sensory motor skill for artists, heuristics for scientist, vocabulary for poets (Ochse, 1990, p. 242). From the observation of the analysis phase until the final prototype, visualization should be used as an instrument for comprehension. The information gathered during the exploration phase may be exploitable in a better way if organized through graphic mind-maps or in flow charts.

Dimensions, colors, and different outlines are useful to assign importance and value to topics, needs and solution feasibility. Draws and sketches, on the other side, can be used to grasp knowledge about existing product solutions and get the big picture. How does it work? What are the components? How is it made? In this way drawings and sketches become both a note down tool with a mnemonic function for details and on the other hand an instrument to retrieve ideas for new solution.

Even if we think of ethnographic methodologies there are designerly ways of knowing that distinguish designers' tools from those used by sociologists: mapping qualitative and quantitative methods, verbal and non-verbal inquiry tools we can see that usually designers position themselves in the right upper quadrant (Plowman, 2003). The description of problems comes from deep qualitative observation and it is expressed through visual artifacts.

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[2] The definitions have been retrieved from Oxford English Dictionary http://oxforddictionaries.com

Vision: the ability to think about or plan the future with imagination or wisdom

When talking about design the term *vision* refers to the capacity of seeing beyond reality, the ability to imagine a new world every time, through an idea-solution that, starting from a radical innovative approach, implies new lifestyles and new behaviours rather than shape or function.

In the same way, when a company defines its vision, it identifies the values and the mission through long term objective and the description of a future perspective. It is an adventurous proposal for a collective experience, a sort of entrepreneurial dream that can be carried out with the participation and the active involvement of all the collaborators.

The vision represents a strong expression to define a challenge or, to say it better, to indicate the horizons at which a project may aspire. The vision overwhelms logic and reason, opens to a broader reality with previsions and scenarios, to bet on the feasibility of a dream: it isn't a foolish plan or an adventure but the deployment of an horizon, the focalization of a great and important target to aim at with all the mental, physical, professional and emotional strengths as authentic and sincere expressions of values, needs, and feeling of people.

Moodboards: from visualization to vision

These three different levels can be associated with the Metadesign lab phases: we first ask students to observe context, enterprises, existing products, and then they have to visualize the research result and to envision a product scenario trough moodboards.

The visualization and moodboard phases embody a key step toward a successful concept. Design studios have the primary role of supporting students to find their own way to become designers. It is a context concerned with enabling the development of an artistic practice based on an individual's own interests and unique vision (Winters, 2011). The moodboards, being essentially a collection of images, colours and texture with the aim of representing emotions, feelings or 'moods' suggested by the initial design brief, tend to be purely visual, and transcend linguistic restrictions. They nevertheless have an important function in developing students' ability to articulate their thinking (Garner and McDonagh-Philp, 2001). Through the examples (Figure 4) mood boards are presented as a tool for creative problem interpretation as well as for assisting with the development and resolution of design problems once articulated. Considering that student design briefs are intentionally indefinite and vague the research direction is up to the student choice. Even if it could happen that investigative activities are directed in the wrong direction, we do not believe that it is a waste of time: the occasion to gather information as an answer to a foggy brief can inspire students and give them the right amount of freedom. Although the collection of information is partial or incomplete the value of the technique depends on resources selection and elaboration. As shown in the examples we ask students to visualize information about the entertainment space and about the company – topics for which they have

Figure 4. Moodboards in the design process: works of the student of Metadesign studio "Mobili non immobili".

reliable information – but then they have to reproduce sensations that match different identities, finding the way for a new product concept. The mood boards are the result of the exploitation of a broad variety of available and original images and of their reassembly. The mood boards are then used to suggest shape and graphic elements for concept generation.

In our experience the creation of a mood board motivates students to explore the ephemeral side of the design project trough colors, textures, shapes and images with their personal sensibility. Mood boards represent a liberating experimental phase that puts you in touch with your perceptions about the brief and to visualize them, they enable you to recognize the problem as it comes into view and to envision scenarios or future lifestyles.

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