

## Education and production systems. Innovation and growth: Contemporary roles for designers<sup>1</sup>

### Educação formação e sistemas de produção. Inovação e crescimento: papéis contemporâneos para designers

#### Raffaella Fagnoni

fagnoni@arch.unige.it

University of Genoa. Department for Architectural Sciences. 16123, Stradone S. Agostino, 37, Genova, Italy.

#### Gessica Puri

gessicapuri@arch.unige.it

University of Genoa. Department for Architectural Sciences. 16123, Stradone S. Agostino, 37, Genova, Italy.

#### Clarissa Sabeto

clarissa.sabeto@gmail.com

University of Genoa. Department for Architectural Sciences. 16123, Stradone S. Agostino, 37, Genova, Italy.

---

#### Abstract

This paper proposes a reflection on the relationships between university and production system based on the results analysis of 50 activities agreed by the DSA - Department for Architectural Science (University of Genoa) with companies, institutions and organizations in the period 2005-2011. The paper is divided in three parts. In the first part "Innovation and Growth" the fifty conventions, the theoretical frameworks, the elements and criteria of the built dataset will be introduced supported by the presentation of the most remarkable case studies. The second part "Shaping data to bring out meanings" will show how a graphic visualization was drawn as a methodological tool of analysis and will underline the observations suggested and highlighted. The third part "Collaborative models - contemporary roles for designers" will draw the conclusions, inducted by the work on the dataset, of the role of design and the needs for designer training.

**Key words:** training design approach, design process, fringe design, star shaped visualization.

#### Resumo

Este artigo propõe uma reflexão sobre as relações entre universidade e sistema de produção baseado na análise dos resultados de 50 atividades acordadas pelo DSA - Departamento de Ciência e Arquitetura (Universidade de Gênova) com empresas, instituições e organizações no período de 2005 a 2011. O artigo está dividido em três partes. Na primeira, "Inovação e crescimento" as cinquenta convenções, os referenciais teóricos, os elementos e critérios do conjunto de dados construídos são introduzidos e apoiados pela apresentação dos estudos de caso mais marcantes. A segunda parte, "Configurar dados para produzir significados", mostra como uma visualização gráfica foi desenhada como instrumento metodológico de análise e sublinha as observações sugeridas e em destaque. Na terceira parte, "Modelos colaborativos - os papéis contemporâneos para designers", apresentamos as conclusões a partir do conjunto de dados sobre o papel do design e as necessidades da sua formação.

**Palavras-chave:** abordagem formação em design, processo em design, franja, visualização em forma de estrela.

---

<sup>1</sup> The article was written by: R. Fagnoni, author of "Innovation and growth"; G. Puri, author of "Shaping data to bring out meanings" and C. Sabeto author of "Collaborative models - contemporary roles for designers".

## Introduction

The dialogue and the interaction between the education system and the industry is a common practice, among design courses.

Thus, in the research on design education developing a programmatic analysis hitherto neglected on these collaborative activities, is a shared requirement.

Clustering the collected data can help to interpret the results and potentials of these collaborations to redefine the content and methods of design training.

The verification and the consciousness of the processes, involved in such collaborations, and their connections with the achieved outcomes is fundamental for the innovation in design education. It is necessary to understand and detect what the strong and the weak points, which characterize the collaborative experiences with companies and enterprises.

Creating a referential data set using qualitative indicators and parameters is useful to exemplify the role of design in the project, the training approach and the impact on the social fabric.

In order to analyse past experiences to plan for the future, this research makes use of proper design tools to accomplish our research task. We chose a "graphical"<sup>2</sup> approach that is very important in design activities and contemporary languages.

The purpose is to read the data and interpret the information that emerges from an elaborated info-graphic of the relationships between concepts, actions and processes.

It will be shown how the visualization of the soft clustering helped to identify three collaborative models and to outline an answer the question: what are the roles of designers emerging from this scenario and where is the design strategic responsibility in changing processes?

## Innovation and growth: Theoretical framework

The topic "design education" is directly connected to the growth both of the involved subjects, and of the cultural-territorial context.

In design teaching, aiming at the match between design and economic system leads to empower the interaction between people, ideas, capital and culture that is a potential vehicle for innovation in products and processes.

Universities, with their scientific and educational production, collaborating with institutions and local businesses, may be the driving force of economic and cultural development.

Furthermore, the collaboration between training system and productive-economic system can offer the opportunity - for an entrepreneur, or an institution - to confront new ideas, new experiments, through the application of validated methods and processes, while at the same time, it can be an opportunity - for students and researchers - to respond to real needs, developing new knowledge.

A fertile relationship between universities and economic context can influence entrepreneurial attitudes, in an

efficient system of interaction between people, professionals and businesses, organizations and institutions. Sharing ideas, knowledge, experiences, projects and technologies can encourage the growth of the territorial capital.

During the design process, experimentation is the moment when proficiency and awareness are acquired. In this mechanism interdisciplinary plays a very important role, enhancing the interaction among people, working in different fields.

To go further, as Edgar Morin (2011, p. 195) says, a step forward in the direction of transdisciplinarity is needed. This step is crucial to build a global vision, able to structure and combine different types of knowledge. "Understanding the interdependence of cultural systems and ideas is now more necessary than ever. This will help to change our way of thinking, giving us a tool to escape from the abyss into which the planet appears to be designed."

The starting point of our reflection was to understand where we are, to take stock of the situation developing a critical thinking on the overall situation of the experiences and the achieved results.

Which are and how are detectable the strengths and weaknesses that have characterized the educational experiences made through collaborations?

To answer this question it was necessary to analyse the data and create a referential dataset of the cluster. Each activity has its own story, made up of people, ideas, needs, outcomes, processes, errors and rewards. Each activity has its inevitable final verification, its assessment and possible developments. Every research has its own important phase of observation. If someone from outside examine how some actions take place, how to use objects and spaces, you can create the knowledge that comes from experience.

The work of cataloguing and drawing an overall assessment on 50 different conventions that the DSA carried out between 2005 and 2011, as well as documenting the objective and quantitative data, has also started a rethinking of each activity by retracing and evaluating the steps of the process, providing an opportunity to an extensive qualitative reflection about the education system.

## Mapping method

The adopted method to map the 50 activities saw a first phase when the assets were catalogued by client, by period, by person responsible, by scientific groups involved (students, PhD students).

A second fundamental phase has been the selection and definition of the analysis parameters and the creation of a data framework that provided a system to read the data and drive the research.

Afterwards a graphic visualization was elaborated. It permitted to simultaneously read and confront the 50 conventions, passing from a descriptive analysis of the data to a multivariate analysis that allowed an interpretation and evaluation of the emerged relations (among actions and processes).

<sup>2</sup> G. William Balchin (1916-2007), English geographer. In 1972 he published research on the use of maps and charts, which requires a particular skill (Graphicacy), the ability to decipher the image as a first reading mode and later interpretation (Balchin and Coleman, 1966).



Ansaldo Breda is a representative example of how the results often evolve in succeeding moments.

The research started in 2009; it was developed from the need, expressed by the company, to present a new model of the Electro-train for regional and suburban transport, which had to be outfitted and set up for its launch foreseen by 2015.

The situation of the means of transport and the current service shows an evident uneasiness on behalf of the users and therefore the need to re-think not only the spaces but also a system of adequate fruition of the needs of the contemporary life, in which mobility, communication, relations, types of consumption have evolved without a correspondence with the typology of circulating means and services.

The topic was proposed in a laboratory product, in the first year of the Bachelor course. At the beginning of the project, through site visits in the company, a research brief, specific and structured on the requirements and systems from the engineering company was given to the students.

The students, in groups, developed different aspects of the survey related to the target, the needs and the materials.

They conceptually developed a series of proposals for new ways of living and enjoying the trip. Following up this experience, positively valued both by the company and from the point of view of the learning experience, Ansaldo Breda commissioned the development of a project to be set up on a structure already in production, carried out by a small group of young designers (PhD candidates). The implementation, held in parallel with the technical office of the company engineers, has allowed the continuous

verification of the technical and functional, as well as formal solutions.

The project is now in its final phase and will shortly be engineered by the Engineering Company.

### 3\_Training/design approach

The above mentioned example introduces the evaluation of the training process. What kind of approach was carried out? Each of the experiences studied were classified according to three different levels of intervention.

(a) Action. (product design-oriented) It includes those experiences (58%) that were conducted with a targeted approach to product development, material or immaterial. This includes those experiences implemented through the traditional steps of the design process, involving the basic skills of design, taught within the laboratories. The design is meant to be the “shaping” expertise.

(b) Direction. As direction experiences (22%) with companies/organizations/institutions oriented towards a possible result, predefined but shared, and guided by design tools were classified together with those activities in which design enters the process at a strategy level, often possible in second generation relationships. Among them there are, for example, those born after a previous experience of product development (design-oriented tools).

(c) Activism. The term refers to those activities able to catalyse, to stimulate, to give life to change, including social and/or cultural transformations. In this level, those conventions (20%) where the design approach is oriented to develop a process (or a product) as part of what we

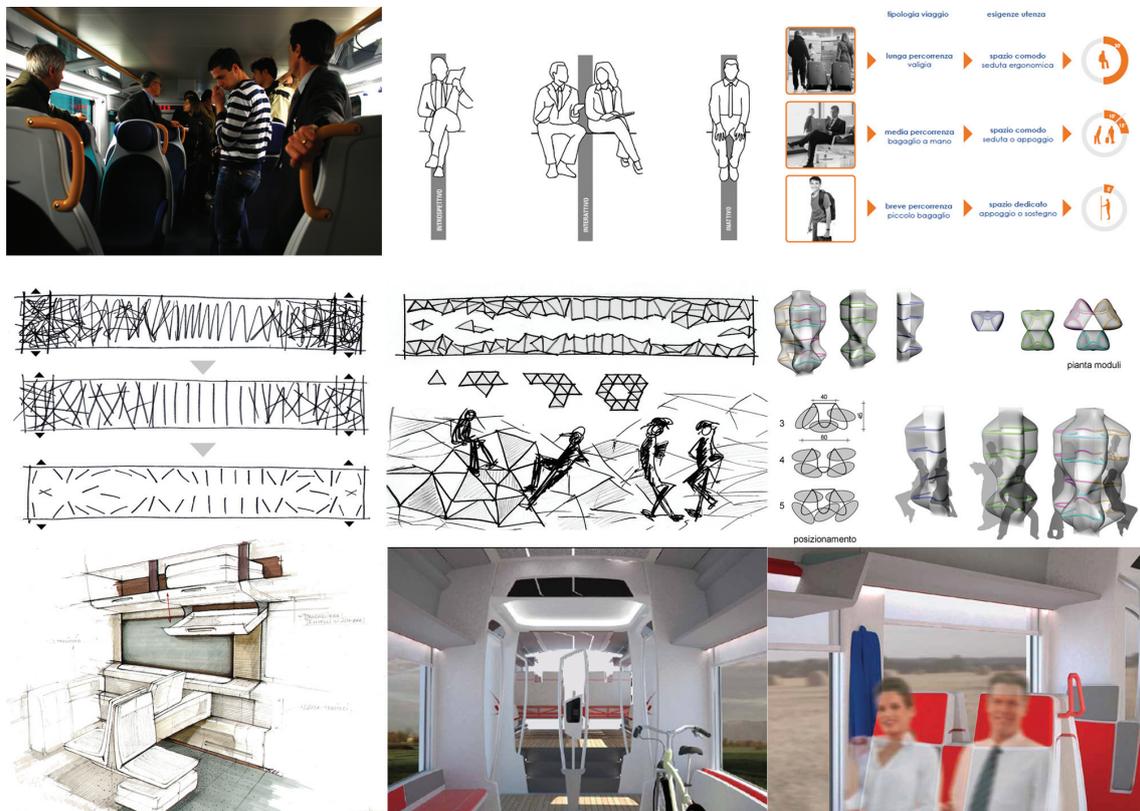


Figure 2. A few images from the design activity for Ansaldo Breda Company.

defined as a Fringe Design (*border design*), where design tools are tested to the limits of their power were placed. Those activities in which the design took a proactive role fall into activism area (Fagnoni, 2010). In these conventions, the process tends to interpret teaching and workshop activities as a research work for groups rather than as a fixed transmission of knowledge and expertise.

In the level *activism* conventions very different from each other are included. For example, in the Finnmark (a company that manages the health-Expo in Verona) project, in 2007, the DSA was commissioned the following initial study: "The therapeutic space, the environment as a method of treatment for patients with dementia", within an interdisciplinary group (Casiddu and Fagnoni, 2009). The result was a publication of a book and the seminar presentation. Following the results achieved, in 2008, a subsequent task was commissioned, where the design assumed a coordinating role as project activator and leader of a team of interdisciplinary researcher. Seven companies were involved, and with their help a workshop was organized with 100 students and graduate students to study objects and new solutions for independent living and home care for patients suffering from Alzheimer's.

Afterwards, through the work of selected small groups, some products were engineered and/or prototyped at the companies, and later presented at the Fair.

The typical approach of the company is often oriented to solve problems related to everyday work. The relationship with the University team and the ensuing confrontation on its innovative potential, identified during an audit phase, leads to the definition of a project brief, which is afterwards assigned to young designers (students).

What emerges, in particular for some of the analysed experiences, is how the choices of the industry and its expectations in respect to the project are often re-oriented, involving, in addition to the product, communication strategy, a sign of gradual understanding of the real possibilities of design and the clear need to reset some basic strategies of the company.

Freeing themselves from the idea of working primarily on the product, some projects dealt with larger areas, related to communication and to the structuring of the firm's ability to offer services and redefine the corporate image, identifying new markets and related strategies.

#### 4\_Design method

Regarding the method, a simplified classification was chosen, distinguishing two main groups: traditional (72%) and non-traditional (28%). Were included in the traditional group those activities where the work was carried out in working groups, within the laboratories, workshops or training, according to the most common practices.

In this category the experiences carried out in open workshops at a national level, or those where external and professional freelancers participated were included. However, those activities in which an alternative method was experienced, in some cases prompted by the subject in others pushed by a more specific desire to experiment, were classified as non-traditional.

An example is the activity carried out with Philips GmbH, in 2008, "new fields of application of OLED light-

ing," which included a workshop at the University of Genoa with 100 students, and an advanced-level workshop with a group selected out of the laboratories of Philips Research Centre in Aachen. The presentation of the results (including a patent) was held at the Science Festival in Genoa.

#### 5\_After effects

In the collaborations between universities and enterprises the induced effects are an important element. What kind of relationships and what opportunities were generated the activities? Some of them created new collaborative activities in continuation to those already made, some promoted the activation of new agreements with other parties, and others offered job opportunities, internships, recruitment or funded research grants and fellowships doctorate.

Our research showed that the development of new relationships or career opportunities did not depend on the training method used. An important element, instead, was the role of design. Where the design played a leading role in promoting new tools and creative strategies (direction and activism) conventions brought, more easily, to new research opportunities and to other conventions, generating a virtuous circle both for the training activity and for the industry.

An excellent case study in this sense is the relation with the Boero Group (active since 2004).

Along with the progress of the relationship, we evolved from specific consultancy project to a synergistic relationship of business strategy for the development of projects and methods for colour enhancement. Over 20 projects were carried out in different areas, from packaging services for retail and artefacts, to communication projects including international events, such as Home Decor, or colour design projects.

Moving the viewpoint to different situations, focusing on treatment centres or schools and extending up to the entire urban context, it was possible to experiment solutions that could trigger a process of innovation, both within the company itself and in the mechanisms of the relationship with the second part each time involved.

In the project "Colour and Life", 2009, for example, a training event was organized; it involved the public and the distribution network in a process of design-thinking. Afterwards, a workshop was held in a collaborative model, in mixed groups, within the corporate labs in a first phase and, in a second phase, was finished in the University classrooms where fifty, selected, students were involved and yielded a meta-project for new outlets and sales point of the product "colour". Some of the projects were chosen and prized and had been carried out by groups of students in an internship and work experience at the involved corporate.

#### Shaping data to bring out meanings

##### Approach and results

Charts and graphs are excellent ways to dig more deeply into a dataset, to tell a story from numbers, effectively helping to draw a picture of a given situation.

Semiotics acknowledged the homo sapiens' ability to recognize and read signs and codes and its instinctive need for them (Lotman, 1974). Our modern society is becoming more and more accustomed to recognize symbols and read graphics, thus we can generally trust and rely on the fact that graphics will be recognized as information vehicles (McCandless, 2010).

Nevertheless, it is necessary when designing a visualization tool, to focus on the need of easing the access to information in a more direct and quicker way, and to make it understandable not only by the researchers and data owners, but also by non-expert audiences.

*"The main goal of data visualization is its ability to visualize data, aiming to be more effective, immediate and clear in communicating information."*<sup>4</sup>

To convey ideas effectively, both from aesthetic form and functionality, needs to focus on the meaning of the *dataset*, providing insights even for sparse and/or complex datasets, by communicating their key aspects in a more intuitive way (Hendee, 2010). While it is crucial to be very comfortable with the dataset and master the data to effectively design visualizations, an outsider (and thus someone not familiar with the data) will be able to understand them thanks to the visualization.

**Pie charts**

To this purpose, traditional pie charts, drawn from percentages and rates, are very good at showing information like distribution and preponderance.

We used pie charts to see the distribution of the three kind of *results* we highlighted (60% products, 34% concepts, 6% prototypes), the rather uniform distribution among *partner types* (36% public administrations, institutes and associations, 22% big companies, 42% small enterprises – reflecting quite faithfully the local economic situation), and the *training design approach method* where the predominance of the action approach (58% action, 20% activism, 22% direction) was immediately visible.

An efficient info-graphic will also allow the insiders and researchers to analyse the data in a better way, drawing out of them new information and meanings, disco-

vering relationships, connections and links hidden behind the numbers themselves, that might otherwise not be visible, or at least not very easily so in a database file or in a pie chart.

Our own research started from a big Excel file, crucial in the selection phase of the 50 conventions and constituting the base for the construction of the dataset. As the dataset was getting more and more complex, the file was growing bigger and more dispersed.

In order to analyse our data and understand the key points at the base of the educational process we needed to design a graphic visualization that could help us see the connections between the different parameters and their values for each of the 50 conventions, the kind of information that our pie charts could not make visible.

**Star shaped visualization**

The visualization we chose, to support our analysis, among other solutions we tried, is constellation system shaped.

This visualization permits to add, gradually, different levels of information. Each level corresponds to the analysis metrics that we used, translated into a graphic sign.

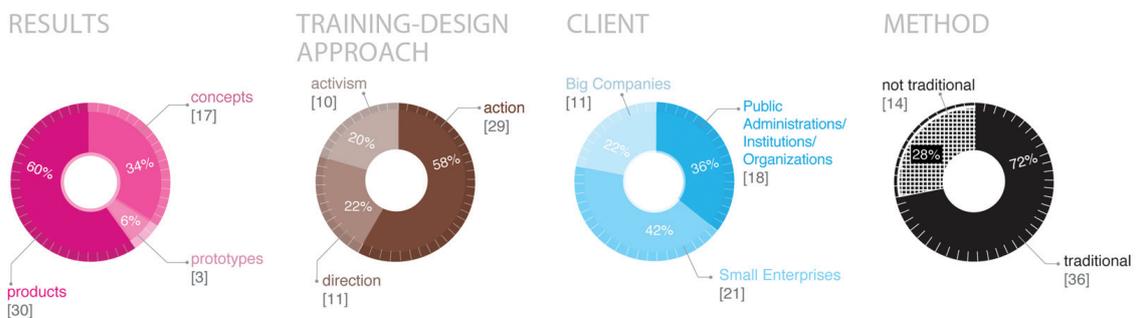
**Period = size of the icons (chosen to be a meaningful image of the convention)**

The icons of the 50 conventions have growing dimensions according to the year each convention began, from the smaller and older ones, to the bigger and more recent ones.

**Results (concepts, prototypes, products)**

The icons are positioned around the results achieved. By connecting every single convention to its result it becomes immediately visible how the result of most of the older conventions was a product, compared to the more recent ones that lead to a concept or a prototype.

These last two families of conventions, especially as they are more recent, give the hope that their results will possibly be further developed into finished products in a new convention.



**Figure 3.** Pie charts representing our data.

<sup>4</sup>The Printed Smashing Books released in February 2009 by Smashing Media GmbH.

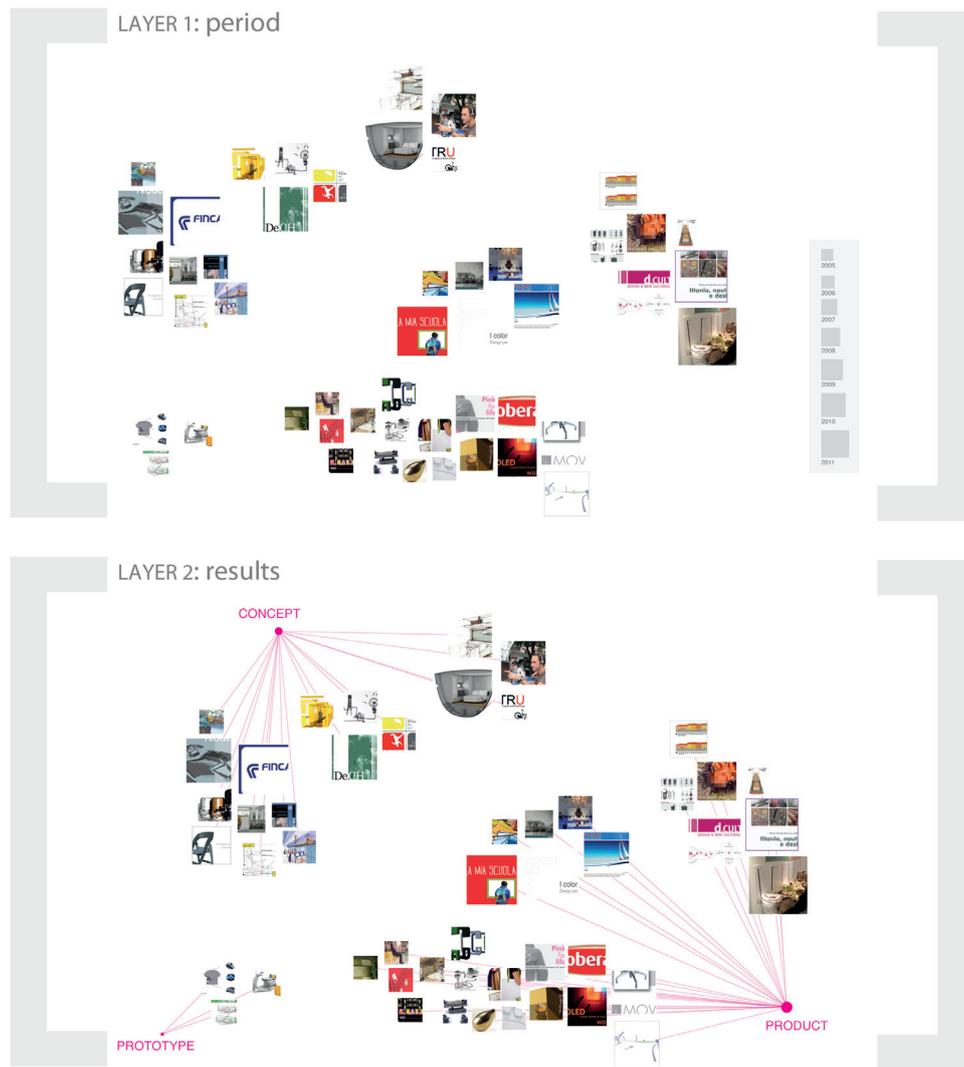


Figure 4. Star shaped visualization: layer 1 period; layer 2 results.

**Training design approach = brown circles (size is in direct ratio with the percentage of conventions involved)**

Adding the training design approach level, as three planets that attract each convention according to the approach involved, we note that the product-oriented approach, identified as *action*, is the most popular among the conventions aiming at developing a product. This same approach collects all the three conventions leading to a prototype.

It is also evident that the majority of the *action* approach was used in older conventions. Naturally this approach is more common, and more conventional, while direction and activism took hold in recent times.

We might argue that before, a more passive role of design was expected and required and the collaboration with the University was probably sought more for the proficiency of its collaborators and the quality of its the results, and partially maybe for political or economical reasons.

In the last years this tendency seems to be gradually changing, giving more importance to other aspects like

the innovative capacity and creativity in researching (and finding) new strategies and design processes, activating a positive evolution for the reciprocal cooperation and growth for both the productive (industry) and the training system (university).

**Clients = three shades of blue colour (overlapped layer to corresponding conventions)**

Comparing the clients' pie chart with our visualization (Figures 3 and 5) the uniformity of the distribution of the client types was also confirmed throughout the period that we chose, since it is evident that there is no particular concentration of one of the three in certain years.

At this level the visualization helped us to note another interesting fact: for the most part, small and medium businesses turned to University with a defined brief and a specific request, implying a "classic" role of design. As we have already seen, this classic role is the most suitable way to implement the phases of the traditional process of design training to get to a finished product.

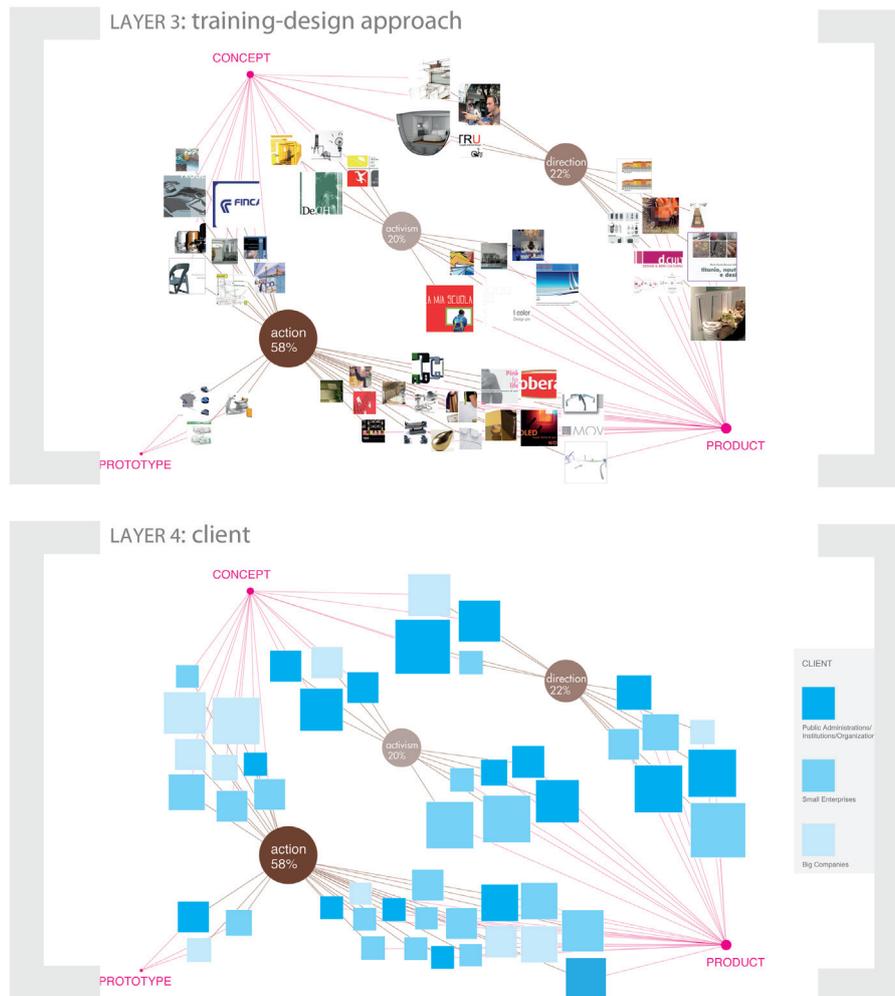


Figure 5. Star shaped visualization: layer 3 training design approach; layer 4 client.

These conventions are therefore the most likely candidates for teaching and training, exposing every designer to the basic steps of a project that they must master.

On the contrary, the agreements with public authorities or associations often give the opportunity to address the task with a research oriented mindset, linked to an approach in which students can use tools, knowledge, and design options to research and propose solutions appropriate to the customer's needs, and to guide their strategic choices. The visualization shows that a majority of the conventions that have an activism design approach were held with public administration.

**Method=black/traditional – dotted/  
non-traditional (overlapped layer to  
corresponding conventions)**

In our visualization it has been interesting to discover that a traditional training method is preferred in those agreements in which the approach of design are in the action type, that is, a more classical approach, and a choice in accord with the very nature of the request.

In fact it emerges that all the 86% of the conventions in the action area were approached with a traditional training

method, acknowledged to be effective in training students and guide them in learning the basic tools of design.

A less traditional method perhaps, by its very nature, leads naturally to a proactive approach to training and a promotive design, which becomes an active part in the relationship and strategic cooperation, with new solutions and a wider vision of the target.

**After effects = violet circles (external to the  
constellation, connected with each convention  
that gave rise to new opportunities for  
collaboration, new agreements with other  
parties, offered job opportunities, internships,  
permanent positions, or funded research  
grants and scholarships)**

Adding the after effects layer to the training method we could understand that the process of fertilization and the possibility of new relationships or career and research opportunities did not seem to depend on the training method used.

Instead, the role of design emerged to be the strong point in promoting new relationships. Where, in fact, the design played a leading role (direction and activism),

70% of the conventions led to new relationships (90% if activism alone is considered, promoting new and creative strategies and tools, creating new research opportunities and other collaborations in a virtuous circle for both the university and for the company).

To conclude, our Info-graphic shaped the very process we intended to document, that is the collaboration with the industry throughout a selected period. It helped us understand a complex system, analyse and comprehend the results achieved, identify possible problems, and report a growing change in the educational attitude, precious information in the future for programming and managing incoming conventions.

**Collaborative models – contemporary roles for designers**

**Conclusions**

The measurement of quantitative and qualitative data led us to design explorations in data visualisation,

transforming complex data into an understandable narrative. This creative effort has been and will be able to offer strategic opportunities for the evaluation and planning of training in the design world.

Design is changing; hence scholarly training cannot fail to follow such an evolution. Students will be the new creative, facilitating and motivating force to prompt tomorrow's sustainable changes. Yet, it is necessary to provide opportunity for them to practice and embrace these innovative roles through collaborative projects, encouraging context that enable them to create narratives and storytelling experiences, through relationships across different cultures such as academia and the corporate sector.

A focus on relationships and collaborative models is one of the main aspects that mark the emergence of new approaches design education. Working in synergy by integrating skills and proceeding from the needs of those located in this reality, and in particular promoting applied and experimental research, means developing multidisciplinary connections in which companies can achieve

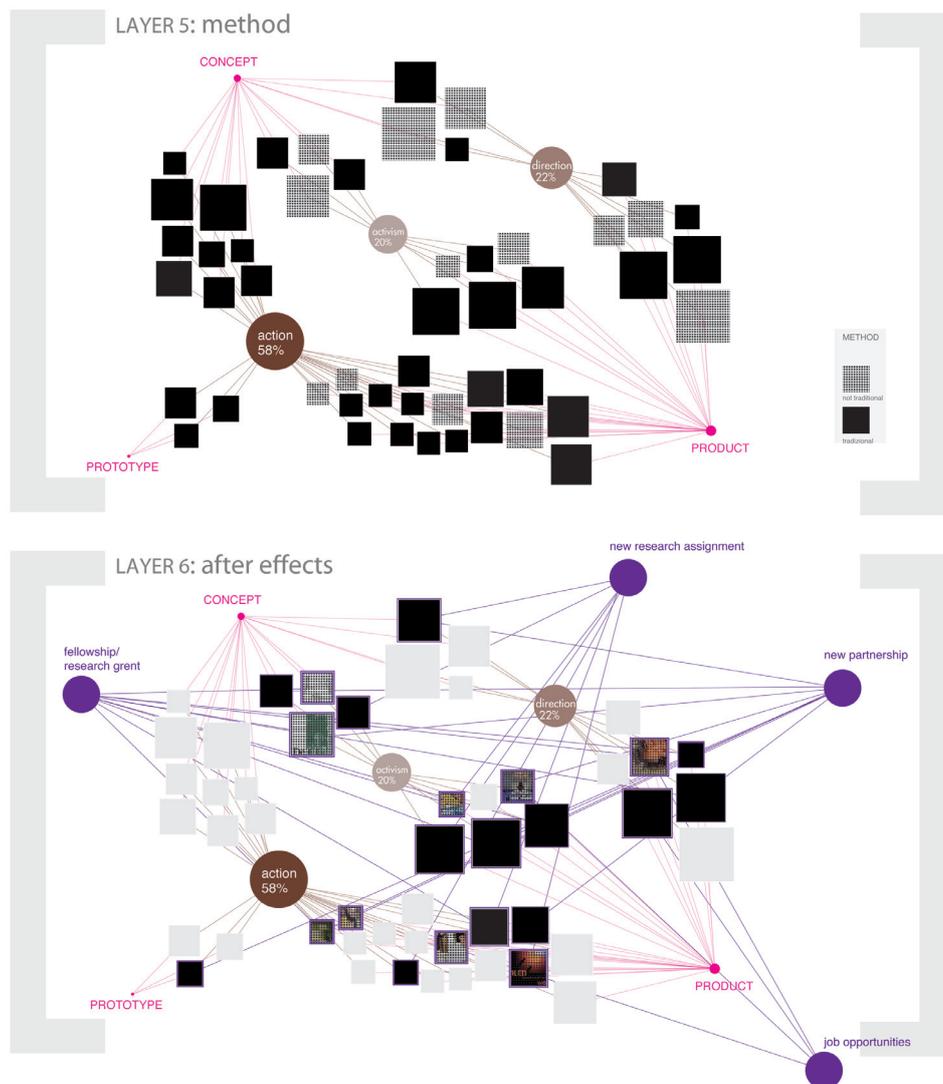


Figure 6. Star shaped visualization: layer 5 method; layer 6 after effects.

tangible results on qualified research and on innovation, while the academic community can measure itself and grow by solving real-world problems. It is in this sense possible to find much common ground upon which to connect, and then to point out where an innovative way to change perceptions can be developed.

In the first place, what emerges from Genoa's experience is that the role of design is certainly the essential engine of new relationships (Spadolini, 2009). Where, in fact, design played a directive and creative role in promoting new strategies and tools, the conventions led more easily to new opportunities for research and for other collaborations, sparking off a virtuous circle for both the university and its educational activities. The type of processes applied and the quality of results were closely related to the relationships and roles of those involved. Of course, there are no forms and collaborative models that are universally valid. Each choice must be harmonic in relation to the actors that interact in the process in respect of the resources and the two specific cultures: that of training and that of business. However, this mapping project allowed us to define and represent three types of collaboration in which different relationships among the actors involved and the role of design could be distinguished.

The first collaborative model, called "product design oriented", is the traditional one, where students have the role of developers creative and in which design is the instrument subordinated to the project to achieve a result earlier planned by the company. This relationship is essential for the basic training of students.

The second collaborative represented relationship deals with the definition of a purpose shared between company and university, with design as a partner, while the students are creative strategists. In this case the com-

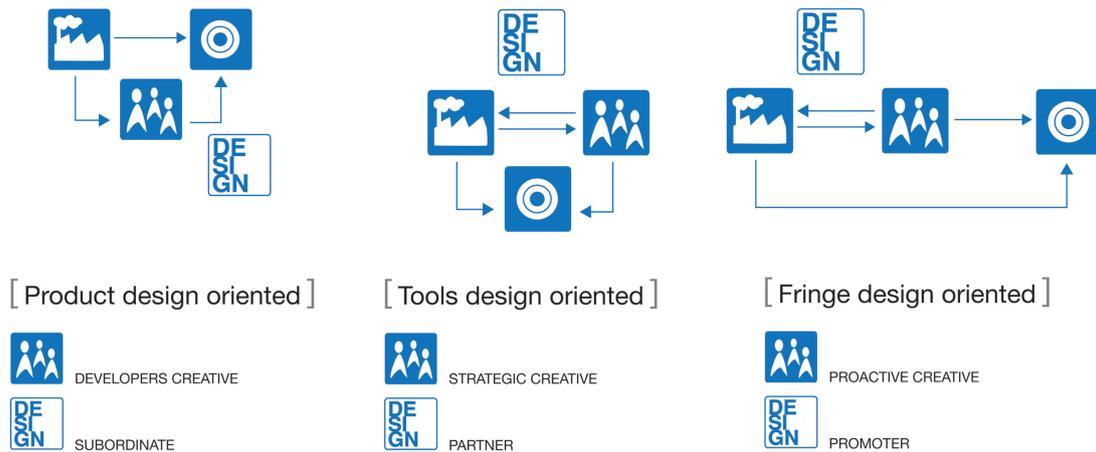
pany gives the design process a role of director which tries out unconventional methods through a multidisciplinary project synergistically managed together by a mixed team composed of University and Business.

This is a collaborative model that represents a type of relationship in which design has the function of partner and coordinator-director and students must have already acquired basic training and a well-established awareness of the available tools. The training approach is therefore "direction type".

The third collaborative model is located in what was defined "border design". This is at the limits of the discipline's traditional area of expertise, and sees design as a process activator as well as research and purpose supporter in order to provide the company with answers in a close collaborative relationship and dialogue among companies and universities whose students, once acquired and metabolised an awareness of the tools and methodology of the project, can play a proactive creative role.

Relationships, communication and information are the basis for a shared creative process. Designing means to activate new processes to obtain a deeper understanding of society and their needs, to identify opportunities, to generate creative possibilities, to invent innovative effective solutions, and to present them to the world as innovations suitable for multiple scales.

The essence of designing can demonstrate how design can be an effective method which is applicable to situations far from the horizons of traditional design, such as health, transformation of education, sustainable development and so forth, up to larger scales of strategic planning, organisational transformation and public policy. A proper definition is provided by George Cox<sup>5</sup>: "Design is what links creativity and innovation. It shapes ideas to become



**Figure 7.** Graphs representing collaborative models between company and university. From left: Product design-oriented model, Tools design-oriented model, fringe design-oriented model.

<sup>5</sup> From *The Cox Review of Creativity in Business* in which Sir George Cox describes the importance of creativity, design and innovation to business performance and the UK economy. Sir George Cox is Chairman of the Design Council, before which he was Director General of the Institute of Directors from 1999 to 2004.

practical and attractive propositions for users or customers. *Design* may be described as creativity deployed to a specific end.”

Nowadays, there is a need to redefine the role of conscious action able to invite to action, transmit values, to produce culture, to become a necessary strategy to design social welfare and new behaviours, as well as to be a process developing sharing and meaning assimilation actions with full awareness of the meaning of communication and ethics, while also providing new systems of production and consumption. Design, therefore, should be seen as a *verb*, not just as a *noun*. It should be conceived as a planning action which is not driven by processes, but activates new processes itself, bringing culture, claiming a social role, and representing the will for substantial changes.

It is now imperative to provide answers to a world that asks for a conscious design while remaining linked to local trademarks with a global environmental vision and a critical view of technology.

We need to stimulate curiosity and vitality, dialogue, discussion, listening, therefore pushing to participative and common growth, and creating critical viewers. The designer must be seen as an educator able to produce change through the project and through new attitudes (Mau, 2004).

Yet, who should educate the designer? Toward which direction should the designer’s training be oriented? It is perhaps necessary to increase the designer’s training, conscious that the project could be much more valid and consistent if those who develop it are able to weave together science, art, technology, philosophy, economics, computer science, psychology, and even neuroscience, thus creating as many connections and relationships as possible among these fields.

The designers of tomorrow will have to be multitasking brains to produce a holistic design of the project’s vision, with an imaginative capacity to investigate the project field seen as *pro-iacere* (Chia, 2008): moving forward, building new places of vision and new possibilities. Italo Calvino in his *Lezioni Americane* talks about the strength of imagination and vision as intrinsic to the project:

“Se ho incluso la visibilità nel mio elenco di valori da salvare è per avvertire del pericolo che stiamo correndo di perdere una facoltà umana fondamentale: il potere di mettere a fuoco visioni a occhi chiusi, di far scaturire visioni e forme dall’allineamento di caratteri alfabetici neri su una pagina bianca, di pensare per immagini. Penso a una possibile pedagogia dell’immaginazione che abitui a controllare la propria visione interiore senza soffocarla e senza d’altra parte lasciarla cadere in un confuso, labile fantasticare, ma permettendo che le immagini si cristallizzino in una forma ben definita, memorabile, autosufficiente, ‘icastica.’”<sup>6</sup>

It seems necessary to invest in knowledge at first, reinventing teaching through an educational system that develops knowledge, skills and attitudes necessary for intercultural dialogue, critical thinking, problem solving and imagination; secondly, it is important to support culture by creating new links between different fields and business to stimulate the creative industries to innovate. We should encourage companies to combine scientific knowledge with empirical knowledge and diversify their staff in terms of gender, training and nationality. Innovation, employment and education policies must co-exist in a major project that sees the synergy of different skills in the processes of change.

“Process is more important than outcome. When the outcome drives the process we will only ever go where we’ve already been. If process drives outcome we may not know where we’re going, but we will know we want to be there.”

“Make new words. Expand the lexicon. The new conditions demand a new way of thinking. The thinking demands new forms of expression. The expression generates new conditions.”

These are two of Bruce Mau’s forty-three guidelines<sup>7</sup> to govern the design process and outline the attitude of the designer and the very essence of design, which, in its nature as an activator of processes, is associated to the concept of meme (Dawkins, 1989), a cultural element that, like a gene, tends to replicate itself leading to the spontaneous emergence of evolutionary effect in the cultural field.

Thus Design becomes a vehicle of diffusion and of cultural contamination. Designer as director of tomorrow’s cultural mutation.

## References

- BALCHIN, G.V.; COLEMAN, A.M. 1966. Graphicacy should be the fourth ace in the pack. *Cartographica: The International Journal for Geographic Information and Geovisualization*, **3**(1):23-28.
- CALVINO, I. 1988. Lesson 4, Visibilità. In: I. CALVINO, *Lezioni americane: Sei proposte per il prossimo millennio*. Milano, Ed. Mondadori, 164 p.
- CASIDDU, N.; FAGNONI, R. 2009. Il design per lo spazio terapeutico: progetti, prodotti, habitat. In: P. BERTOLA; S. MAFFEI (ed.), *Design Research Maps. Prospettive della ricerca universitaria in design in Italia*. Milano, Maggioli Editore, p. 188-191.
- CHIA, B. 2008. Guardare, vedere, progettare: educare. In: Roma Design più, Design After School. La Sapienza University, Rome. Available at: <http://www.aiap.it>. Access on September, 2011.
- DAWKINS, R. 1989. *The Selfish Gene*. Oxford/New York, Oxford University Press, 352 p.

<sup>6</sup> Calvino (1988, p.103). “If I have included the visibility on my list of values to be saved is to warn of the danger we are running of losing a basic human faculty: the power to focus on visions with closed eyes, to create visions and forms from alignment of black alphabetic types on a white page, to think through pictures. I think about pedagogy of the imagination that can teach the control of an inner vision without suffocating it while also not letting it fall into confused, unstable fantasising, but allowing the images to crystallise in a well-defined, memorable, self-sufficient, “figurative” form.”

<sup>7</sup> Mau (1998). It outlines BMD’s design process articulating beliefs, strategies, and motivations.

- FAGNONI, R. 2010. Orizzonti disciplinari del Design, Progetto Valore Responsabilità, Comportamenti. In: M. FALCIDIENO, *Le scienze per l'architettura. Frammenti di sapere*. Firenze, Alinea, p. 290-321.
- HENDEE, R.W. 1997. *The Perception of Visual Information*. 2<sup>nd</sup> ed., New York, Springer, 409 p.
- LOTMAN, Y. 1974. The sign mechanism of culture. *Semiotica*, **12**(4):301-305.
- MCCANDLESS, D. 2010. *Information is beautiful*. London, Collins, 256 p.
- MAU, B. 1998. Headings 3 and 28. In: B. MAU, *Incomplete Manifesto for Growth*. [S.l.], Combination Press.
- MAU, B. 2004. *Massive Change*. New York, Phaidon Press, 239 p.
- MORIN, E. 2011. *La sfida della complessità. La défi de la complexité*. Firenze, Le Lettere, 131 p.
- SPADOLINI, M.B. 2009. *Design, Scuola, Territorio*. Firenze, Alinea Editrice, 286 p.

Submitted on May 15, 2011  
Accepted on August 12, 2011