World design. Educational approach for a new experience of sharing

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Abstract: The paper describes a didactic experience that completes a project with a practical approach with the aim of sharing objectives and methodologies of two universities in different countries, and of testing new ways for design teaching. The university teaching is confronted increasingly with the requirement to put in contact the education to practice, at the same time, it is essential to integrate the teaching approaches of other realities and ask to students to share languages and tools with the aim to increase their skills and expertise for suitable solutions. The experience reported in the paper concerns a experimental shared teaching program, conducted on the nutrition topic, that helps students to management all phases of the project from the scenario definition to the exhibition of prototypes. The didactic experience, meant like knowledge-oriented approach to shared ways of life and belongings, prepares the theoretical tools to deal consciously strategic projects of local development.

Keywords: educational framework, co-creation process, collective prototyping, food awareness, sharing food experiences.

Introduction

The education in design field has to deal with the increasingly obvious need to put the projects into practice, to realize the ideas, even giving rise to entrepreneurial activities. The possibility of learning through doing, to operate, through the deployment of actions defines the "learning by doing" approach.

Learning by doing has the objective of learning the "how to do" rather than "knowing what," translates into a working knowledge that can be immediately used; tools such as Goal-Based-Scenarios (GBSS) using simulations in which pursues a concrete goal by applying and using previous and integrating new knowledge and skills.

On the second hand, in educational design processes, visual culture and visual knowledge (Arnheim, 1974) have a central role as an explicit “ground” to interpret the contemporary issues, moreover, the
design assumed as a process of visioning which moves/acts on the basis of formal configuration processes as a specific “tool” of the evidence of design”.

The strategy of producing knowledge and its application through design reveals the culture of context, in terms of predictions and application tools. Otherwise, imagination and visioning constitutes some of the cognitive and practical abilities pivotal to the educational programme. Visioning is a design tool and there has been no lack of theoretic attention to this practice, which represents a veritable cognitive approach. “Translating thinking into pictures is a typical way of triggering design thought. But visualization is also the most common way of communicating and sharing design thought” (Bourdieu, 2003).

Building scenario consisting of possible future worlds where the product or products (where they exist) are just one of the elements that make up the visionary landscape of the designer who faces up, in this case, to the ability to implement new values, behaviors, methods of use, functional solutions and possibilities of service, moving in a design process where the design sphere is concerned with the need to restore intangible characteristics which have to find a way to be translated visually.

A crucial prospective, closely connected to the design educational theory and practice regards the issue concerns the design contexts; made up of tangible goods, intangible ideas and value-related aspects as a part of a complex system, which need of shaping process step by step. Each phase integrates multidisciplinary knowledge and skills that belong to heterogeneous actors system, which cannot be only in account to designers but must become a shared and applied knowledge.

The dynamic of sharing, made by different actors involved in the debate process for the construction of the scenario takes on new relevance. Differently, it is a question of working on contents and shapes of sharing solutions that are only partially tangible, which must be comprehensible by stakeholders who are the actors of the network (businessmen, institutions, technicians, economists, sociologists, etc.). They have limited visualization abilities, but they need to visualize the contents, understand the usability of the equipment, to access to knowledge in a new way to make it explicit.

### 2. The design educational theory and practice

#### 2.1 Learning approach

The alternative way to design teaching follows the sharing places and open approaches in which the disciplinary specificities are combined to generate new forms of educational collaboration.

Many examples of design and development approaches and tools for education and training purposes demonstrate that it is necessary to integrate the theoretical and practical side, to promote the collaboration with others university and research institution and users communities and to build new intensive experience on specific themes.

In the design scenario the spread of collective production models, sustained by open source approaches, digital networks, peer production has increased the complexity in the design process and has influenced the educational approach as well as the new manufacture technologies have conditioned the creation process development. (Bauwens, 2007, Gershenfeld, 2007)

The debate about the instruction of designers moves on the dualism of education and training the first related to the building of a culture, the second to professional practice (Guerrini, et al., 2015).
The role of the designer is changing and also the skills given from the training courses are changing at the same time. The new generation of designer needs abilities to manage all phases of the design process from its initial phase - idea generation - to its management and verify the product's industrial feasibility on one hand, and he needs to share multidisciplinary experience and to increase his envisioning capabilities on the other hand.

Starting from the traditional forms of learning and teaching, the most recent orientation follow new approach based on a mixture of collaborative and remote learning and face to face experience. The complexity of the design process demonstrates the necessity to increase the traditional learning model in order to provide knowledge through the collaboration with educational institutions and external organizations and through practice and theoretical activities.

There are many experiences of sharing of information through digital platforms offering open e-learning courses on specific issues, but at the same time it is essential the possibility of face to face experiences. The educational experience, realized as a combination of a face-to-face activities and online learning is able to support the evolution from traditional teaching to “active” learning and give the possibility to the students to create new relationship on study and on future work.

The use of e-learning platforms allows to expand the network of skills involved in the training course and to increase the contribution of experts in educational programs. Moreover, thanks to the digital platforms, in training, it is possible to create open transfer systems and to share teaching tools.

Thanks the dialogue with others students and with professor and tutors with specific competences becomes clear that the sharing of educational approach, the conversations about the design process and the validation testing helps understanding the efficacy of solutions and helps managing the difficulties.

The prototyping phase is fundamental to explore the various solutions, to verify a set of concepts, to select one and to improve it, thanks the feedbacks receipted during the testing phases.

For this reason the educational experiences that allow to check the status of the project step by step with validation phases are those in which understand what could be the real product, its functionality and the interaction with users.

3. The educational programme

3.1 Methodology and phases

The program aims to broaden the vision on the issue of nutrition through multidisciplinary contributions, through the acquisition of tools and practices of cultural exchanges, benefiting from the expertise of a network of European universities. Among the various activities, educational ones were completed with a workshop where were verified the concepts and were made models of products.

The phases of the training programme is based on an interactive and shared method that is divided into two levels, one on analysis and the another one on practice design, the part are integrated and managed in a non linear way. The process is cyclic starts from the analysis to the design prototyping but there are many revision and evaluate activities.

The analysis part explore the background related to nutrition and to the eating habits; the students are selected some range of opportunities in which define the concept. The topics chosen for in depth analysis are the production, the storage, the processing and consumption of food products.
The practices part is about the validation process of the project and on the selection of the materials for the prototyping.

The steps of the learning programme are:

1. Visioning;
2. Making;
3. Conducting;
4. Finding.

Visioning is the first phase of the scenario definition that highlights the issues and the design opportunities that foresee choices that can be made. During the Visioning phase research and studies have been developed, supporting the team table to build a tools dossier on nutrition and food consumption and transformation.

Making suggests the contents that can be utilized in the creative phase even though there is not complete information. During the Making phase, through multi-disciplinary expertise, new behaviors have been analyzed and then have been defined.

Conducting and Finding represent the latest phases, the practical-creative levels in which the design research and tools adopted are the outcome of a data test revealing the innovation level of the design process. During Conducting phases, through interactive discussions, the creative process starts, leading by consulting and providing co-design tools.

Finally during the Finding phase, thanks a co-design process, characterized by interview, thematic workshops and seminars, in which are involved professional consultants, researchers, students and users, the missing information have been included. In this way it is possible to define new concept and improve more innovation level in the creative process and to validate the outcomes.

Table 1. Educational training steps.

| Step | Type | Purpose | Who | how | Tool | Example |
|------|------|---------|-----|-----|------|---------|
| 1    | Visioning | Researching support | Lead professional consultants | Team table | Dossier | Spotlight scenario’s and define a range of opportunities |
| 2    | Making necessary choices in absence of complete informations | Approaching to the creative process complexity | Lead professional consultants Students | Seminary | On line talks on specific multi-disciplinary expertises | Prediction suggestions for investigate new behaviours |
| 3    | Conducting creative processes | Providing scaffold co-design tools | Consultants Students | Interactive discussion | Guidance and define topics | Making and definition of new needs |
| 4    | Finding missing information | Defining level of innovation | Consultants Students Users | Co-creation laboratory | Co-design tools | Doing design and service concepts |
An international staff, formed by professors, researchers, tutors, from the partner institutions, was constantly involved in the design process and in the organizations of training programme. The learning programme was conducted by visiting professors and tutors that followed up all phases via video conference sessions and thematic workshops.

All the activities are realized thanks to co-design approach which foreseen the involvement of potential communities of users and the conversations with experts. In this meeting the needs and a range of solutions to problems are emerged. Around this dialogue areas where these solutions are practiced and discussed are developed design ideas, sharing and validating the process steps.

The project field is related to Product Service System Design with focuses on specific issues:

- Empowerment of Human abilities;
- Nutrition and Wellness sustainable local production chains;
- Daily-life product and services products to improve quality of life.

3.2 Visioning

In the Visioning phase the project is focused on enhancing human abilities with the increase in performance of the instruments and tools of daily life. In other words, human abilities are analyzed in relation to the tools used on every single day, so the state of the art shows a lack of awareness in the evolution of mind-style as a new environmental responsibility.

Wellbeing is a broad concept mostly due to features related to the aspects of everyday life, linked to self-care and based on the context in which we live.

The amount of things we own satisfies our basic needs, the quality of things and services at our disposal makes our lives easier and meets our latent needs, oriented to continuous search of ethics. In recent decades, in the West, it has been realized that’s no longer pursued the ‘bien vivre’ and the 'bien être', overshadowed by hedonistic models which pushed to consumption at full blast.

It has established the idea that to achieve the wellbeing we need to focus on life quality and this requires ethically and environmentally friendly behaviors at home and outside. The consumer no longer falls in the target, it is a specific user in his choices and his profile, hard to track, it is an expression of a personal mindstyle rather than a generic and rushed lifestyle.

It requires above all transparency in the production processes, launching controls throughout the supply chain, so it emerges the idea of 'short chain' that leads to the development of products of excellence that reflect the brands of the territories of origin, to guarantee quality. Good products guaranteed by regular checks are at the basis of healthy nutrition and living, technological innovation helps providing a tool that detects and stores data relating to each step of the supply chain: of their manufacturing processes, of their origin and composition.

From the early stages of analysis the research focused on specific aspects related to eating habits, lifestyles and actions performed in food preparation in order to identify possible areas of concept development and to test each step with the student and international teachers team.

The design area identified, “food and nutrition”, was the theme, deeply debated, at the last Expo in Milan, therefore, during the discussion on the program, there were many contributions that have influenced the design process.

Students and teachers involved during the design process had started a dynamic of sharing knowledge about the chosen topics, and their contributions had enlarged the field of application. In
this way the interaction environment that has been created, led to an integration of different points of view to build a common vision of the action program.

Investigations on water resources, habits and local lifestyles and culture of food have led to proposals for new products that integrate the know-how of tradition with innovation on materials and processes. The purpose is to get attention to eating habits, considering nutrition an essential for the well-being and expanding the awareness of sustainability along the supply chain from production, consumption, and distribution.

3.3 Making, Conducting and Finding

In the Making, Conducting and Finding phases the outcomes achieved are necessary to build up the creative process and to define new concept-products. The projects realized during the educational programme are focused on seven specific themes:

EAU / water - NURRITURE PRODUCTION CUISISON/ nutrition, production, cooking - STOCKAGE DE LA NURRITURE ET DE L'EAU/ food and water stockage. RECUPERATION ET RECYCLAGE/ reciclying.

“Living Food” is a multifunctional object for food, useful to self-handling and for transformation of vegetal raw foods, represents a new frontier for the natural healthy and ethic nutrition. Living foods maintain unaltered their nutritional properties, improving energy and all necessary nutrients to our body, inhibit carcinogenesis and foster the physical and psychological wellness. ‘Living Food’ – Figure 1, consists of seven stackable modules: a pestle, a plan for juices extraction from fruits and vegetables, a bowl to collect the juices and sauces and blends, a container for collecting drinking juice, a fruit holder that can be used as a tray or as fruit or aromatic herbs dryer plan, an inner bowl for storage of seeds, and finally a seeds sprouter.

“Legumes balance” is a new way to select, to dose and to cook the legumes. The base consists of a pot in advanced ceramic and a glass case for the bat, stacked to support many glass-jars that contain different types of dried legumes –Figure 2. All the glass jars have the same form but are stacked in different ways, endowed with dosing ferrules that, through a rotation, transfer legumes in a case in which there is the bath before the cooking. Afterwards, rotating the bath case, legumes are transferred in the cooking pot.

“Cooking chamber” is a system that shares many different cooking ways at the same time. The overall shape is inspired by a Greek vase and it is characterized by various elements: the first one is made by advanced ceramic to cook food by boiling; a basket made in bamboo for steam cooking; a container made in glass that have a central flue that passes through the lid for steam cooking. The central drilled channel allows the steam, created by the boiling of foods below, to cook food of the glass container which requires long times. Finally, the wooden lid collects the water vapor produced by condensation, which can be reused –Figure 3.

“Wearable storage” is a system of domestic transport and storage realized by fabrics with special properties that allow a natural conservation of foods. It is possible to wear it and allows you to do shopping and to stow different types of foods in fabric bags-containers. The structure is designed in breathable material while the bags-containers are formed from a fabric treated with poly-coupled natural substances able to preserve food for a long time. The laurel prevent the insects’ proliferation in grain and flour; honey contains enzymes and sugars that preserve fruits or vegetables, lemon or vinegar inhibit browning. Therefore, the bag for the flour and cereals is made by a textile treated with essential oils of laurel while the one for the preservation of fruit and vegetables, with essence of honey and vinegar.
“Diet Shift” is a lunch box which starts from the assumption that food is synonymous of conviviality, sharing and relationship. The box is transported as a bag; it is possible to put it on the table and open to become a great dish that receives the foods contained in poches placed along the sides. The material used is a polylaminate, formed by a textile and food silicon treated with calcium carbonate, talc and titanium dioxide; this allows to store food without altering the organoleptic qualities of it.

“Open Fridge” is a system for the conservation of fresh food; self-energy system, it is able to preserve vegetables and fruits’ nutritional levels. The object consists of three types of different sizes wall modules, in which are inserted several containers; every containers have its specific conservation habitat. Through a double bottom for storing water, straw or ash, it is possible to preserve fresh food for a longer time. The container, allowed to store fruit and vegetables, uses water to obtain a fresh and moist habitat due to a interspace for the passage of moisture; the case for fruits and vegetables is more warm and dry, it uses the straw and is aerated; finally, the case for food that requires a dry and dark habitat, uses the ashes and is fitted with a lid.

“Multiplying Water” is a system that allows the filtering of gray and domestic water; thanks to a multi-level treatment, the water is made usable again for specific uses. The system consists of bags for water collection and modular elements inserted in a vertical structure that oxygenates the water during the passage to the level below. The phases of phytodepuration are made in the first level through a pad of kenaf and in the second with kenaf + polypropylene, on which are grafted aquatic plants. You can choose, depending on the origin and final use of water, in which level put the water and start the process of depuration.
Figure 1. “Living food”. Large bowl for preparing food. Composed of a pestle, a plan for the extraction of juice from fruits and vegetables, a bowl for collecting the juices to drink or to use as a dressing.
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Figure 2. “Legumes balance”. It’s a new way to select, to dose and to cook the legumes. The base consists of a pot in advanced ceramic and a glass case for the bat, stacked to support many glass-jars that contain different types of dried legumes.

Figure 3. “Cooking chamber”. It’s a system that shares many different cooking ways at the same time. The central drill-led channel allows the steam, created by the boiling of foods below, to cook food of the glass container which requires long times. Finally, the wooden lid collects the water vapor produced by condensation, which can be reused.
3.4 Prototyping

The prototyping phase took place in two different stages and in two different places: firstly during the workshop held at Ecole Supérieure des Arts Saint-Luc in Liege and the other one in Italy.

The first prototype phase has been realized with Italians and Belgian students in the school labs in Belgium: the prototyping process was exciting and full of new design ideas – Figure 4. This first prototype phase has moved to a second phase where the prototypes were performed in Italy. Artisans, students and teachers have been working to achieve the working prototypes in a co-design environment.

The prototype was a stage widely followed by students and professors: the inputs of the design process, the executive drawings, the choice of materials involved all in the realization of first prototypes of the form. The latter have been studied and have been emphasized the criticalities then move on to the stage of realization of functional prototypes. The contact with the different manufacturers highlighted some problems due to the realization of complex objects composed by different materials.

Thanks to those manufactures which their professionalism and perseverance have supported and advised throughout the prototyping phase and parallel implementation the results during the exhibitions.
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Figure 4. Student at work in multi-material Laboratory at Ecole Supérieure des Arts Saint-Luc, January 2015 in Liege (Belgium).
4. Spreading results

4.1 The exhibitions
The promotion and dissemination of the results of the World Design program is represented by the participation in two international events, with the exhibition of prototypes and scheduling of meetings, workshops and performance.

The meetings hosted during a week had international experiences on project developments related to food culture; those one alternating with lectures and laboratories, a books presentation and workshops, in order to formulate a real proposal for dissemination of innovations on the culture of food.

The promotion and dissemination of the results of the World Design is represented by participation in Expo Gate in Milan, with the exhibition of prototypes and scheduling of meetings, workshops and performance, in April 2015 – Figure 5.

The exhibition of prototypes tells about innovation on cooking methods, conservation and eating habits, which highlights the need of change. The experiments carried out show that this is possible and desirable.

The week ends with the workshop titled “World Design & Nutrition” for the dissemination and sharing the results obtained, in order to formulate a real proposal for dissemination of innovations on the culture of food.

After which, “World Design & Nutrition” participates to Reciprocity Design Liege in Belgium, in the exhibition titled “The taste of change. Design for food-tools, services and systems” realized on an international call for entries addressed to schools, students and designers.

The exhibition encompassed change of habits, lifestyles vs. mindstyle, food consumption, conservation, production and distribution and bio-cultural diversity. Through the exposition of World Design & Nutrition prototypes, we helped to engage ourselves and collectively to reveal how today design challenges provides objects, services and systems which foster innovation.

The inauguration of the exhibition took place on October 1st 2015 and lasted a month.
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Figure 5. World Design & Nutrition, Expo Gate exhibition, Milan, April 2015.

Figure 6. World Design & Nutrition Reciprocity exhibition Liege, October 2015.
4. Conclusion

The educational programme World design is able to build a interaction between the students, researches, enterprises and territory. The design activities, realized during the six months, have concurred to define a cooperative process of learning oriented to integrate the different educational approach of two different European universities. This programme was the opportunity to share competences, knowledge, abilities and skills and to integrate the practical and theoretical students capabilities.

During the activities were encouraged thematic conversations with the aim to generate ideas and then products with validation process. The students have increased own practical abilities in the laboratories and have realized different level of prototyping before at the university and then with local enterprises. This process was very important for verify the project in different steps and to select the appropriate material for the final realization. The collaboration with the local enterprises aimed to build the final prototype was an important phase of the educational programme. The students had the possibility to understand the production process and to improve the projects further. The dissemination of educational results shows the design process developed during the programme and defines specific events like workshops, discussions, lectures, laboratories spreading approaches, ideas and visions on the culture of food.

The objective of the programme is to offer to the students the below opportunities:

- experiment an alternative learning experience;
- to have an overview of cooperation to development taught by renowned visiting professor;
- to benefit from different european schools and university network useful for early exposure to research;
- to learn the collaborative tools from international worldwide expertise;
- to increase the student’s abilities and culture in wide range of future possibilities.

References

Arnheim, R., (1974). Art and visual perception. University of California Press (2004).
Bauwerns, M., (2007). “Peer to Peer and Human Evolution”, Foundation for P2P Alternatives, (p2pfoundation.net).
Bourdieu, P., Boschetti, A., (2003). La rivoluzione simbolica. Marsilio Editore.
Collina, L., Scullica, F. (2007). Designing Designers: Unbranded Design for New User Expectations, East and West. Milan: Poli.design.
Edelson D., C., (2002). Design Research: What We Learn When We Engage in Design. Journal of the Learning Sciences. Volume 11, Issue 1.
Gershenfeld, N., (2007). Fab: The Coming Revolution on your Desktop from personal Computers to Personal fabriation. New York: Basic Books.
Hummel, C. (2011). Open Design Now: Why design Cannot remain Exclusive. Amsterdam, BIS Publishers.
Hummel, C., Manderveld, J., Tattersall, C., & Koper, R. (2004). Educational modelling language and learning design: new opportunities fro instructional reusability and personalised learning. International Journal of Learning Technology. I(1), 111-126.
Guerrini, L., Jarauta, P., Rampino, L., (2015). Training and Educating the new generation of designers, The Virtuous Circle: Design Culture and Experimentation, Proceedings of the Cumulus Conference, Milano 2015. Milan: McGraw-Hill Education.

Lopes, A., M., Clune, S., Andrews T. (2007), Future Scenario Planning as a Tool for Sustainable Design Education and Innovation. Connected 2007 International Conference on Design Education. UNSW.

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