

THE POTENTIAL CONTRIBUTION OF PSYCHOLOGY TO THE EXPERTISE OF DESIGNERS AND ENGINEERS - THEORETICAL DIMENSIONS AND PRACTICAL APPLICATIONS

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Abstract: *Several recent and growing areas of research in Psychology such as Positive Psychology and Environmental Psychology intercept the contemporary issues of how improving the well-being of individuals and communities and how promoting the adoption of a more sustainable lifestyle in every life-stage. These contemporary challenges request for Designers and Engineers acquiring knowledge and skills that can enable them in creating new concepts, ideas and manufactures. The systemic approach to these complex issues about well-being and environment will request to future experts the ability to work in multi-professional teams and integrate their expertise in order to reach a multidimensional solution. Through a mixed methodology, theoretical and with active participated laboratory, students enrolled in Design and Engineering Courses improve their knowledge in these psychological topics and then apply it in group laboratories, producing new ideas through the creative team techniques such as brainstorming. A special attention is reserved to the interpersonal communication processes for their pivotal role in favouring a positive psychological climate among the participants that increases motivation and creativity at work. The experience of the experimental Course of Creative Thinking and Psychology for well-being of population and for sustainable behaviours that took places at Obuda University and in Italy will be discussed and some elaborations produced by students will be presented.*

Keywords: *psychology, positive design, soft skills, creative thinking*

INTRODUCTION

Several recent and growing areas of research in Psychology such as Positive Psychology and Environmental Psychology intercept the contemporary issues of how improving the well-being of individuals and communities and how promoting the adoption of a more sustainable lifestyle in every life-stage.

Particularly, Positive Psychology, a research area born in the early 2000s (Seligman & Csikszentmihanyi, 2000) [1] adopts a systemic and innovative perspective on individual, group and social well-being. Instead of highlighting, as happens in other areas of Psychology, the difficulties, maladjustment and critical situations, it focuses its attention on the resources and strenghts possessed at the individual level and by social structures. The analysis of the dimensions of well-being carried out by Positive Psychology has led to the identification of different, fundamental concepts and components of well-being. On the individual level, there are two fundamental dimensions: the Hedonic well-being (Kahnemann et al. 1999)[2] and the Eudaimonic well-being (Ryff, 1989; Ryff & Singer, 2008). [3] [4]

The well-being defined as Hedonè derives from the ancient Greek philosopher Aristippo (435-366). According to this perspective, happiness is determined by the presence of a high level of life satisfaction (global life satisfaction and declined in its affettive-relational, social, working realities..), together with the presence and prevalence of positive emotions as inner affective states. This component of well-being posits the emotional dimension as essential for a high level of happiness and life quality, especially as subjective perception.

The individual psychological well-being defined as Eudaimonia derives from the ancient Greek philosopher Aristotle (383-322), which in the Nicomachean Ethics sustained that happiness consists in the actualization of talents and potentials of the individuals in favour to the development of the society. Ryff [3], one of its most important scholars, has identified six components of the Eudaimonic well-being: Self-acceptance; Autonomy; Positive Social Relationships; Personal Growth; Purpose in Life; Environmental Mastery. The psychological well-being declined in a Eudaimonic key, posits the places the self-realization tension as its essential, core element.

In addition to the development of individual well-being, Positive Psychology deals with the identification of modality for improving the well-being of groups, communities and society more generally (Zambianchi, 2015) [5]. There are several theoretical models developed on the social side: one of the most relevant was proposed by Keyes (1998;) [6], who defines Social well-being as the result of five components: Social Integration, Social Actualization, Social Coherence, Social Contribution, Social Acceptance. The proximal community also represents a field of investigation and planning of interventions: the Sense of Community model proposed by Mc Milan and Chavis (1986) [7] indicates four components for a positive sense of community: Integration and Fulfillment of Needs; Shared Emotional Connection, Influence; Sense of Belonging.

Which could be the potential contribution of Design to the improvement of individual and social well-beng? This design potential has been the subject of theoretical analysis and design development only in recent years (Desmet & Pohlmeier, 2013; Yoon et al., 2020) [8], [9]. Through the new construct of Positive Design (Desmet et al., 2013) [8] some fundamental objectives of this integration between the two disciplines and its theoretical-methodological aspects have been identified.

Thinking at Design as a resource for the promotion of well-being in its various components represents a new, interesting area of intervention with a social function (Munari). [10] The production of artifacts, concepts, communications aimed at the development of a specific component of well-being (e.g. design of interventions in the cultural-museum context for personal growth through cultural fruition implies the encounter with the Eudaimonic dimension of well-being; design of benches for a city park, implies thinking about the impact in terms of activating relationships and social communication, and therefore promoting the sense of community) is currently a promising path for research in a multidisciplinary key. As Desmet et al. [8] (2013) underline, design can contribute to Hedonic well-being (design for pleasure), Eudaimonic well-being (design for personal meaning) and Social well-being (design for virtues), thus adopting a dimension and objectives not only of an economic nature, but also of promoting the development of the individual and society.

An area of recent development but of growing importance is represented by the Psychology of Sustainability and Social Responsibility (Di Fabio, 2017). [11] This is an area of study of an interdisciplinary vocation and has among its aims the reach of global well-being that includes also socio-economic dimension and the care of the environment. The Psychology of Sustainability and Sustainable Development (Di Fabio & Rosen, 2018) [12] has, as its specific focus, paying attention to positive sustainability and positive sustainable development processes. Positive sustainability includes the following aspects: attention to both respect and regeneration of resources; renewable resources, as well as purification and oxygenation processes for people and the environment; taking responsibility for health/wellness improvement and renewal. Construction and management of a sustainable project can be based not only on the use of ever smaller quantities of resources (materials), but also on regenerating resources. On the theoretical level, fundamental is the interaction between scientific discovery, technological application, good design and positive social effect (Positive Psychology & Sustainability Psychology), which require a multidisciplinary approach with points of contact (and collaboration of research and intervention) between Positive Psychology and Sustainability Psychology also through the concept of Positive Environment (Corral-Verdugo, 2019) [13], defined as "*A condition, or a context, that allow people to meet their needs and thrive, while simultaneously motivating the conservation of*

the resources it offers. Such conservation is aimed at protecting current environmental resources, but, most importantly, resources for future generations" (Corral-Verdugo, 2019). The concept of Positive Environment involves: Tourism (sustainable tourism); Aesthetic appreciation; Spiritual experience; Recreation; Education. Positivity is the result of the interaction between persons and the environment. As stated Corral-Verdugo (2019), the perception of the restorative quality of the environment predicted 23% of the variance in general ecological behaviors.

The systemic approach to complexity as a paradigm of analysis and intervention in human and environmental contexts represents an essential point of theoretical study for the training of designers and environmental engineers. The paradigmatic change that took place in the 1970s (Engel, 1977) [14] has changed the way of observing, reading, interpreting and intervening on reality, being it physical or bio-psycho-social. The central concept of "system", understood as a structure composed by many variables, whose functioning is qualitatively more than the simply sum of them and characterized by the interactionist-recursive logic, has replaced the linear-monocausal model of explanation, typical of systems with greater simplicity (generally two variables involved in a connection of a linear nature). Understand, on the part of the students, that their action, their design intervention takes place in a complex system characterized by the multiplicity of relationships and that any modification in a point of the system (such as the introduction of a new object in a domestic environment; the modification of a cycle path in an urban context; the introduction of innovative objects for environmental sustainability in a tourist resort of particular aesthetic value) involves, over time, the modification of the perception and characteristics of the entire system, offers them a fundamental competence for planning and dialogue with other professionals in a multidisciplinary approach (Leporelli, Santi & Di Sivo, 2018; Santi & Leporelli, 2019) [15], [16]: for these authors there is urgency of a vision capable of reconstructing a reconnection between health, urban planning and architectural design in line with research on sustainable development and environmental sustainability. The concept of "*Systemic Design*" implies therefore the fundamental role of the Designer and of the Engineers for the conservation and respect of the environment. It is based on the awareness that every solution they found in the planning phase will have an impact on the ecological system, setting in motion a transformation of it. Design and Engineering, in particular Environmental Engineering, play a central role in promoting environmental sustainability and promoting ethical development that fosters the social responsibility of individuals, groups and society in a broad sense. A key concept in this direction is represented by sustainable design. The sustainable design is defined as the result of the best compromise between environmental and technical -economic parameters, on the evaluation of environmental impacts and on the choice of materials, shapes and structures (Tamborrini, 2009) [17]. The interventions of designers and engineers can also acquire an educational value; eg. the creation of sustainable objects of aesthetic value can suggest to an adult public that sustainability is combined with aesthetic usability, with a strong positive emotional value. as an intervention to promote sustainable behavior. This also through the support of effective communication to promote the designer product: going beyond the development of environmentally friendly products, tending to suggest sustainable behaviors (Tamborrini, 2009).

CONFRONTING THE COMPLEXITY AND UNCERTAINTY OF POST-MODERN SOCIETY. SKILLS TO "NAVIGATE" CONTEMPORANEITY IN A PROACTIVE AND RESPONSIBLE WAY BY THE "EMERGING ADULTS"

Contemporary society, defined as "post-modern society and of complexity" (Bauman, 2007; Beck, 1991) [18], [19] is characterized by a progressive opacity of the future, which becomes increasingly difficult to plan and reconnect with the actions produced in the present, together with a growing flexibility of roles and life biographies (Zambianchi, 2018; 2016; 2019) [20], [21], [22]. These characteristics, also summarized in the acronym VUCA (Volatility, Uncertainty, Complexity, Ambiguity) (Bennet & Lemoine, 2014) [23] require skills and resources to be able to deal with it in a positive and productive way, in particular, even if not only,

by the younger generations, in particular by the "Emerging adults" (Arnett, 2010; Zambianchi, 2018) [20], [25], which include university students by age.

The Division of Mental Health of the World Health Organization highlighted, since the nineties (WHO, 1994) [26], the growing importance of Life-Skills, defined as a set of cognitive, social and relational skills that allow young people to face the needs of daily life in an effective way, relating with trust to oneself, to others and to the community. The life skills identified by the WHO are the following: Self-awareness; Management of emotions; Stress management; Critical thinking; Decision making; Problem solving; Creativity; Effective communication; Empathy; Interpersonal relationships. They have been designed with a view to increasing skills and abilities that can both guarantee an effective management of life transitions (such as, for example, entry into workforce, the construction of a family), and the ability to manage situations of criticality and stress. Similarly, the concept of Soft Skills (Robles, 2012) [27] offers a set of skills useful for entering the world of work, such as, for example, effective communication and social skills. These skills, or at least some of them, can be thought of within university curricula such as a specific subject area, or within courses in the psychological area as a module for in-depth study of cognitive, social and relational skills and processes. Degree Courses in Design and Engineering could enrich their training offer in this sense as a complement to strictly specialized training.

The construction of a didactic proposal of the psychological area for the cultural and professionalizing profiles of the future graduate Designer and Environmental Engineer. The teaching methodology

Considering the future professionalism of the undergraduate student in Design and Environmental Engineering, that implies the possession of strong projecting abilities coming from the acquiring of theoretical and laboratory knowledge, the didactic proposal of psychological area involved the methodological choice of a mixed methodology of theoretical analysis and subsequent concrete application through the activity of laboratory groups. Through indeed a mixed methodology, theoretical and with active participated laboratory, students enrolled in Design and Engineering Courses improve their knowledge in these psychological topics and then apply it in group laboratories, producing new ideas through the creative team techniques such as brainstorming (learned during the theoretical part of the Courses). A special attention is reserved to the interpersonal communication processes for their pivotal role in favouring a positive psychological climate among the participants that increases motivation and creativity at work.

RESULTS

The didactic experiences from University Institute ISIA, Italy, and Obuda University, Hungary

1-A: The workshop on Psychology of Sustainability and Social Responsibility at ISIA University Institute.

The Workshop that has been proposed to the ISIA students (enrolled in every Course, both Bachelor and II Level Degree) had its theoretical and practical focus on Psychology of Sustainability and Social Responsibility. They then applied the principles of creative- divergent thinking and the techniques of brainstorming to their group-work.

In the first part of the Course, the key concepts of the Psychology of Environmental Sustainability and Social Responsibility were studied in depth, together with the Theory of complex systems (von Bertalanffy, 1980) [28]. Sustainability was then declined in specific areas such as recycling, attention to the environment, sustainable tourism (the latter through a specialist intervention by a professor of Economic Geography with a

lecture on this topic and a discussion with the participants), sustainable nutrition. Subsequently, the students were divided into two groups, and each of them chose a theme on which to build a social communication project. A group chose the sustainable tourism; a group the issue of sustainable food and healthy -sustainable diet, with a specific attention to Mediterranean Diet. Below are two posters drawn up by the students, with the iconic dimension and the structuring of the argumentative path.



Figure 1: *THINK. FEEL. ACT.* The poster created for encouraging a Sustainable Tourism among adult

Personal reflections and considerations upon the Course by ISIA students

„Nel complesso ritengo il workshop abbia creato numerosi spunti riflessivi su temi che non sempre metto al primo posto, e che talvolta ignoro. Motivo per cui ho deciso di entrare a far parte di questa esperienza collettiva. Sento nel complesso di aver sviluppato maggior senso critico riguardo alla sostenibilità ambientale.” Overall, I believe the workshop has created numerous reflective ideas on issues that I do not always put in the first place, and that sometimes I ignore. Reason for which I decided to become part of this collective experience. Overall, I feel I have developed a greater critical sense of environmental sustainability (Valerio M. student at ISIA)

“Al giorno d’oggi un designer non può ignorare aspetti come la “sostenibilità ambientale” e la “responsabilità sociale” nei propri progetti, per questo è importante che questi concetti vengano appresi attraverso un corso incentrato sulla psicologia, in modo che il progettista prenda coscienza delle problematiche.” Nowadays, a designer cannot ignore aspects such as "environmental sustainability" and social responsibility in their projects, so it is important that these concepts come learned through a course focused on psychology, so that the designer becomes aware of problems”. (Andrea F. student at ISIA)

1-B The Creative Thinking Course at Obuda University

The Course deepens the following areas of Psychology: The Positive Psychology and its relevance for Design; the Psychology of Sustainability and Social Responsibility; Positive Aging and Design (this issue was chosen due to its growing relevance for all the societies); Creative processes (the course deepened the different logics of thinking and the detailed characteristics of divergent thinking style, with individual exercises); Psychology of Interpersonal Communication. The Course provided firstly a theoretical background and then the students enrolled were divided in two groups. A group chose sustainability as area for the project (A Recycling Machine); the other group chose the interface between climate change (sustainability) and design for life-quality (The Multi-brella).

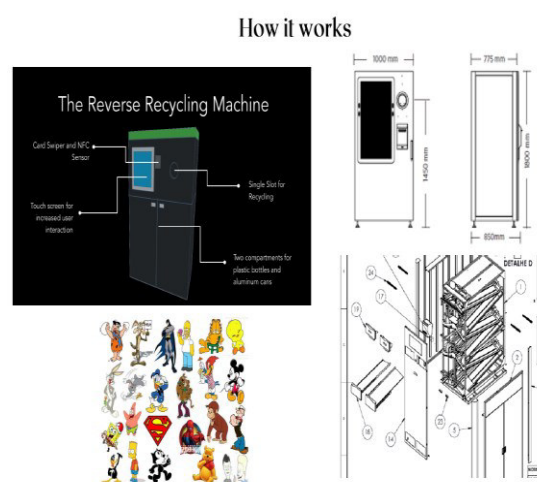
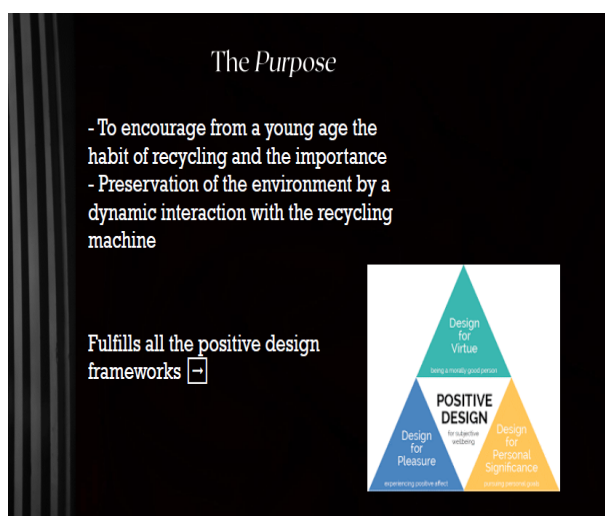


Figure 2: The Project of the Recycling Machine for children

Personal reflections upon the Course by Obuda students

"In my personal opinion, the course has highlighted the importance of theory. It is important to stick to sometimes criteria and examine the circumstances and guidelines and not just focus on creativity. Focusing on the theory helped me to enlarge different aspects of design thinking, such as design principals and social participation. I believe that both the positive aging and creative thinking topic were very intriguing to explore. I have to say that they sparked several questions in my mind about implementing theoretical research into my future design studies" (Anna S., student at Obuda University)

"I have been working as a designer and a marketer. I though I had some experience in this field; however, the creative design course has not only taught me what it means to be a good designer, it taught me what it means to be a good communicator, a good team player. I have successfully integrated the communication theory lesson to my life and embraced myself not to be misunderstood by the meta-communication. My most favourite topics were intelligence and creativity comes from, and psychology of communication. I believe these topics give great step by step details in how to effectively and directly positively impact your life. As a person who works with many other colleague son marketing campaigns, on designs, and on products, I find fostering creativity as a team and as an individual, effectively communicating with them and not making them feel psychologically unsafe is the greatest lessons I could have learnt in any course" (Aria Z. student at Obuda University)

CONCLUSIONS

The courses held at ISIA and Obuda and the encouraging evaluation by the students indicate a path with potential for development at the didactic level and, for emerging contents, on the theoretical and application level. Meeting the challenges of contemporary society: Designers and Engineers can be seen as professionals who intervene to improve the quality of life of people, groups, communities and ecosystems.

The presence of skills (also) of a psychological nature enriches the training and professionalizing university path by offering both theoretical interpretations of reality useful for working in multi-professional teams, communication, critical and creative thinking skills, essential for interacting with others and creating methods of interventions, conception and explanations of innovative, or urgent, phenomena of reality.

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