COLLECTIVE FOR DESIGN

An active teaching and learning methodology for collaborative art and design disciplines within the framework of sustainable development.

Marta Miaskowska
Jeremy Hugh Aston
Marta Varzim

This publication describes the work of research and analysis for teaching-learning methodologies in the context of training designers and artists for future international careers. It is a complete and detailed work where the different dimensions, from creativity to critical thinking, are explored and experimented within a series of workshops. From this, there was an investment in articles resulting from this reflection; namely, there was a refinement in the evaluation indicators and conclusions, making their contribution justified and relevant for higher education.

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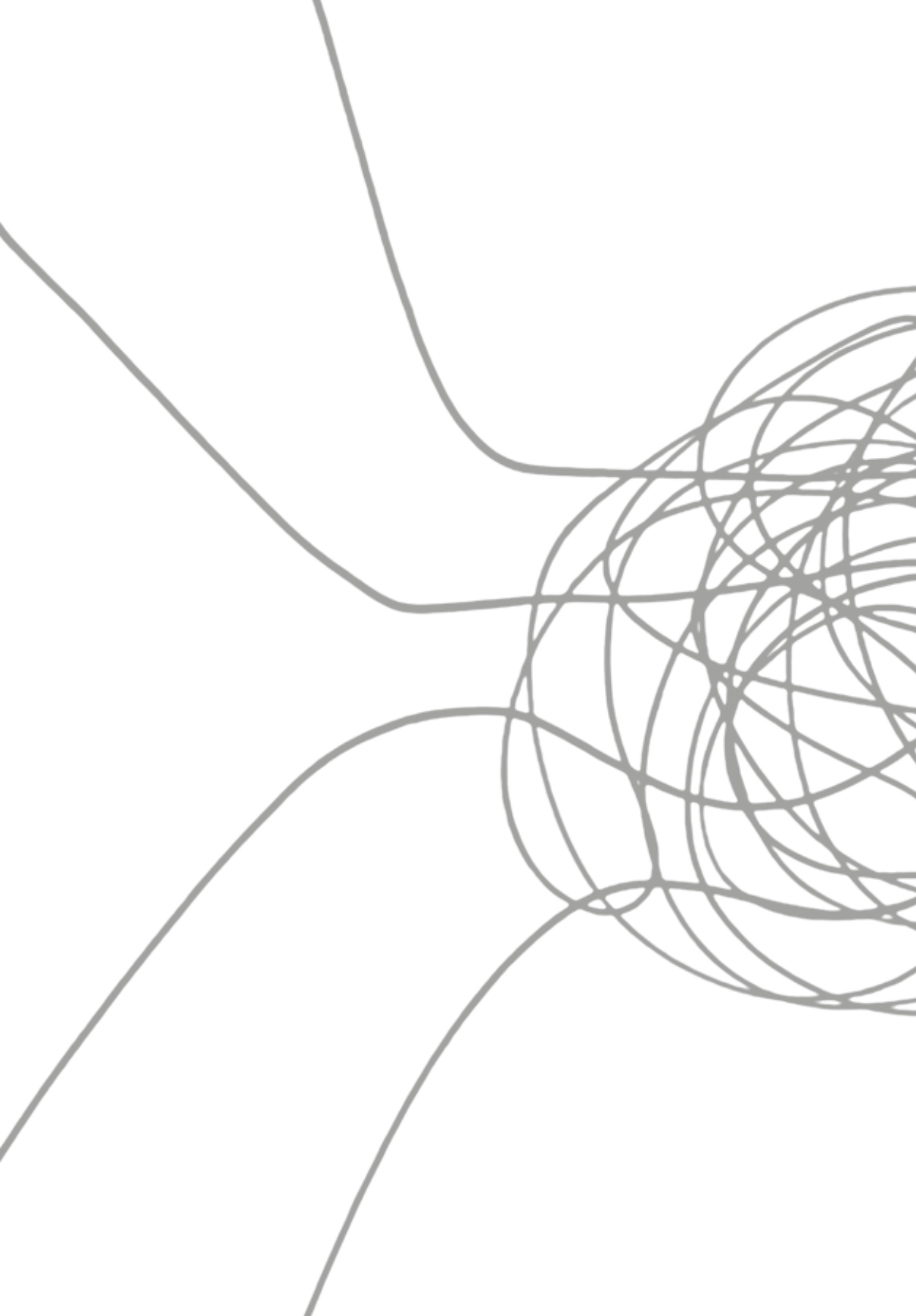
The contents of this publication use a language that is clear and understandable, not only for specific scientific or artistic circles, but also for a wider audience. The Collective Design Method, in addition to didactic values, includes others that are difficult to overestimate. It shows the great value of respect for other people, their culture and different traditions, along with technological innovation, all working synergistically to create better, lower cost and more environmentally friendly products.

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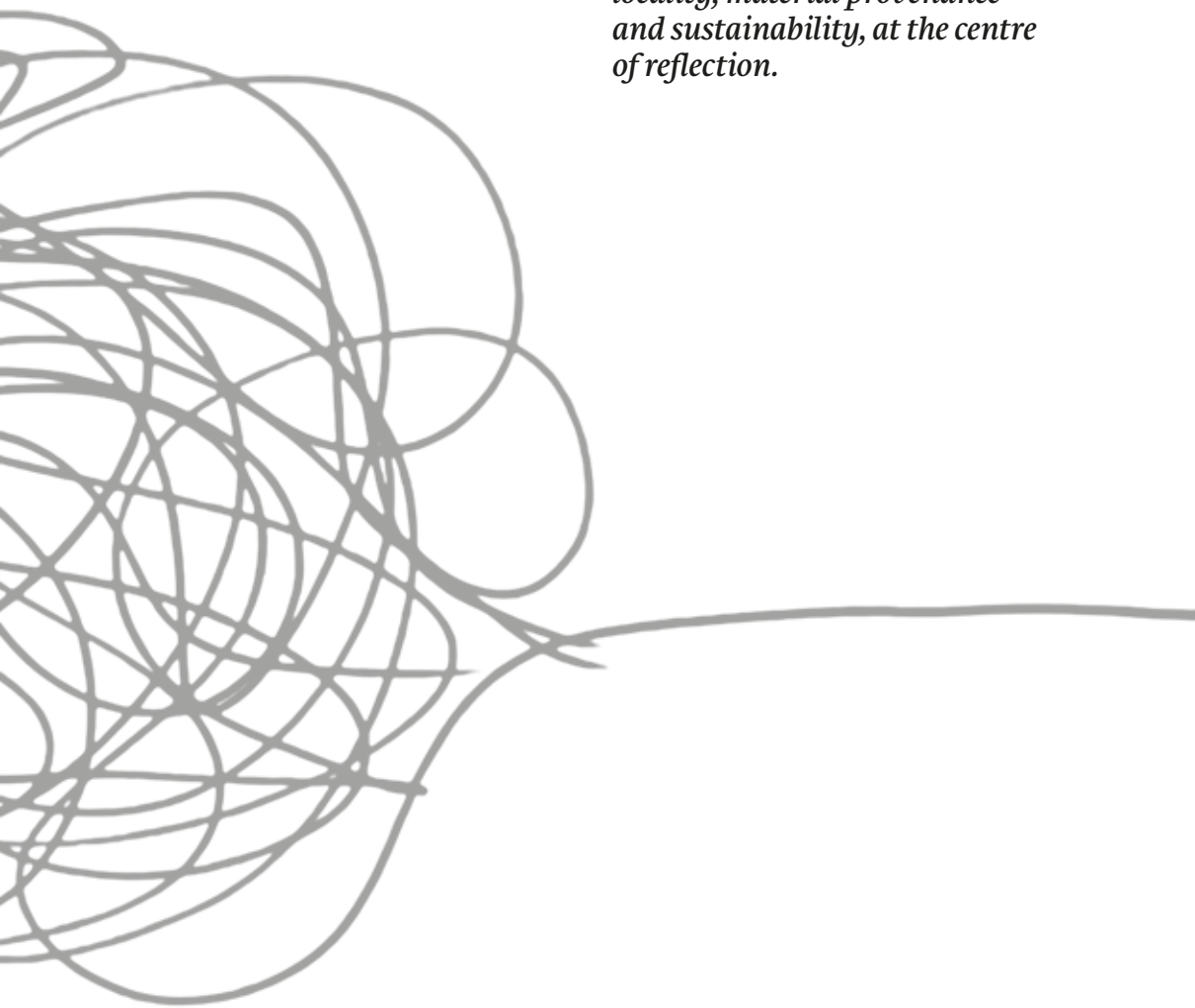
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This book addresses the need to re-evaluate current teaching--learning methods and aims to contribute to the preparation of art and design students for the international labour market, placing the issue of collectivity, locality, material provenance and sustainability, at the centre of reflection.



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Education is an organic and transforming area that has a primordial implication in the development of humanity and changes within society. In this ongoing process, educational institutions and their educators have the responsibility to keep up with these demands and work on teaching-learning reforms that efficiently prepare the next generation of students with skills and tools to deal with tomorrow's needs.

In recent decades, changes in education have centred around globalisation, particularly in adapting teaching--learning forms to the shifts occurring in communication and cultural exchange (Kwitok, 2016). The strong emphasis on building interpersonal relationships in the face of crossing cultures has resulted in the large-scale use of collaborative models, particularly in the higher education sector. As global education has broadened our perspective on the world — generating new inter-institutional collaborations and a mobile teaching-learning system, overcoming linguistic, cultural and geographical barriers — it also reflects on its adverse effects. While the leap in development supported by the mechanisms of globalisation has brought benefits to some, mass production and exchange of goods based on maximum economic benefit has also brought serious problems in the area of environmental pollution, product quality, raw material management and loss of regional identity.

In the face of the modern world, the organicity of education therefore takes on a literal meaning, becoming obliged to pursue reform and produce mechanisms to address issues related to sustainability, biodiversity preservation, climate change or pollution, all of which are at the forefront of the great acceleration of the Anthropocene (Crutzen, 2002).

Education is, then, in a process of change, producing models that balance the benefits of development with the consequences of global resource exploitation. Nevertheless, the relevance of this process depends on the ability to know how to nurture these mechanisms, thus benefiting humanity with further scientific achievements and cultural developments.

Looking at the consequences of civilisational development related to the need to produce objects, as well as considering the teaching of designers and artists — since they have a direct impact on this very process — are, then, at the core of this production.

In the past decade, the evolution of education within the field of art and design has made it possible to successively implement and apply socially responsible models within curricula (Szadzińska, 2015). One of the most popular models of *design thinking* — has developed over the past century as a design method based on a sensible and responsive process for producing new products (Brown, 2008). *Conscious design* is equally having a salutary effect on the emergence of poor quality, mass-produced products, but the awareness of young designers and artists alone is not strong enough to effectively solve the environmental crisis.

For art and design researchers The art and design researchers mentioned in this publication — who also teach and practise these disciplines — made it possible to observe this imbalance between education and market realities, where all too often the conscience of our graduates is easily "swallowed up" by the powerful mechanisms of corporations. In the face of this reality arises the need to prepare new generations to meet the demands of economic growth on a local,

national, and global scale, equipping them with the skills necessary to compete effectively in a business or industrial production environment, without losing the global and responsible vision of sensible and sustainable production.

Having its origin in the collaborative project: *Project — Product — Promotion, International Collective for Design (PiCoDe),* the teaching-learning concept being proposed in this publication is called **Collective Design Method** and is a *cross-disciplinary team-based educational* method aimed at art and design students, founded on the leading practices of international pedagogies, sustainable design methods and directives for contemporary labour market practices.

At the core of this method is the creation of a laboratory environment that simulates a professional workplace within an academic institution, allowing near-graduate students to face work challenges in a safe learning environment. This method of teaching-learning, with productive, hands-on roles and responsibilities, contrasts with the conventional internship scenarios that students often undertake during their education, and which usually have limited participation and responsibility. To achieve this goal, methods based on teaching mobility, interculturalism, designing for sustainability, using hyper-local materials, and emphasising regional identity for the designed objects have been incorporated and reconstructed. Above all, *professional simulation* is emphasised, in which students are asked to work with an unknown group of multidisciplinary designers, under a rigorous schedule and constraints with materials and processes, to achieve a specific challenge within a short period of time.

This publication offers, then, a description of the proposed **Collective Design Method**, along with details of the assumptions that guided the development of this teaching-learning concept. In addition to the editors and contributors of the method, other professionals and experts from the art and design community were invited to provide, through the diversity of their research areas, an in-depth and up-to-date reflection on a variety of contexts that envision the results of the method and cover the themes of intercultural communication; interdisciplinary teamwork; social responsibility; critical analysis; creativity; leadership and resilience.

This publication closes an investigation of over two years of work and experience in which professors and professionals from five art and design universities in Poland, Portugal, Turkey, the United States and Spain collaborated in the process of formulating the **Collective Design Method.** The additional materials developed during this research — which is intended to be useful for understanding the details of the method and its implementation in other universities — are intended to be delivered, together with this publication, to leading universities and art and design faculties. By doing so, it is expected that other researchers and teachers in higher education will benefit from this experience and the results of the research, knowing that, ideally, the **Collective Design Method** could be applied as part of an art and design course programme, or as part of a summer school incentive, for which practical results delivered within a short time frame are favoured.

The project researchers trust that the implementation of new educational methods based on collaborative projects and multicultural teams makes it possible to realistically evaluate

the strengths and weaknesses of a method tested in the laboratory, so that its final presentation has a sustainable and confident future. After more than two years of work in the scope of the *Project — Product — International Design Collective Promotion,* the results of this work are placed in the hands of the reader, hoping that the collective nature of this educational method will allow its successful use in higher education art and design environments.

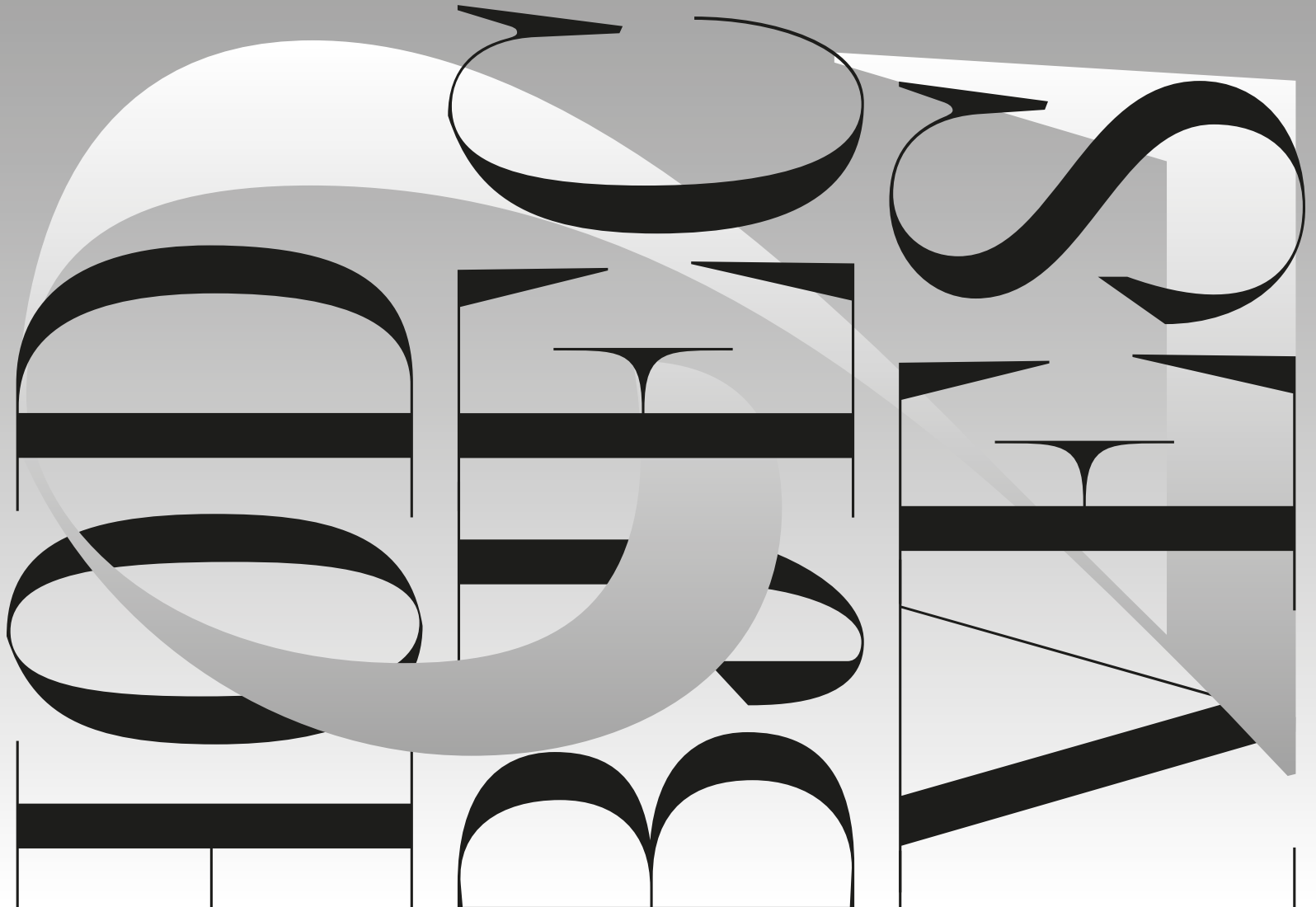
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METHOD AND OBJECTIVES

The method and objectives were the project researchers' original teaching-learning assumptions, developed over two years, suggesting tools, consulting with specialists, and testing with students at three different higher academic institutions in Poland, Portugal and Turkey. As a result, this chapter describes the outcomes of these assumptions, and structures the Collective Design Method as a curricular unit for future teaching--learning incentive on art and design courses or workshops.

2.1 Overview

The **Collective Design Method** is a teaching-learning methodology that prepares graduating art and design students for an international labour market (i.e., creative agencies or design departments within companies and industry), and to achieve the expected teaching-learning results, the following time and distribution are required.

Total teaching-learning hours — 80 hrs:

CONTACT HOURS (lectures, training and orientated activities) — 30 hrs;

AUTONOMOUS HOURS (studio activities and productivity) — 50 hrs.

Distribution:

PRACTICAL THEORY (8 hrs, 10% of total contact hours) — practical activities to enhance theoretical study;

PRACTICAL LABORATORY (64 hrs, 80% of total contact hours) — practical study within a complex learning environment to understand subjects through experimentation, observation and interpretation;

PRACTICAL ACTIVITIES (8 hrs, 10% of total contact hours) — learning experiences that support a particular subject (i.e., training, field-study and visiting cultural centres).

Note: some flexibility to the distribution of these hours is acceptable, however the majority of time should be dedicated to Practical Laboratory to meet the expected teaching-learning results (see — 2.3 Program: Expected teaching-learning results).

The Collective Design Method is conducted with the following four requirements:

(1) A hosting institution of higher-education with art and design courses;

(2) Between nine to twelve participants consisting of three or four teachers and six to eight students with different nationalities and art and design backgrounds;

(3) A briefing challenge to drive the workshop event, favouring the participant's art and design backgrounds and incorporating local assets;

(4) A schedule of two consecutive weeks with programmed activities (80 hrs).

These four requirements, also known as the **Collective Design Method — Tools**, are unique and essential components to support the expected teaching-learning results, concluding this event.

Hosting Institution

The institution of higher-education that hosts the event plays an influential role on the workshop event and the project theme, providing facilities to accommodate the participants and contributing means for conducting a series of collaborative and practical activities to achieve the design of an intrinsic product and meet the expected teaching-learning results.

Participants

To organise the event, three to four teachers from different institutions (or departments within the same institution) of higher-education, nationalities and art and design backgrounds should collaborate in selecting six to eight graduating students to join the international team, participating together in the workshop event and represent their respective art and design courses, institutions and countries.

Briefing

A briefing for the event, prepared by the teachers and shared with the students on starting the activities, describing the challenge, themes and objectives, and outlining the product requirements. This should include topics orientated towards the participant's art and design backgrounds, incorporating local influences, sustainable resources and addressing a real world *need* or *problem.*

Schedule

To achieve the expected teaching-learning results through this event, two consecutive weeks (80 hrs) are required to conduct the necessary stages and practical activities. Like this, the workshop event could be part of an art and design course curricular program, an Erasmus mobility event or a summer school incentive.

2.2 Synopsis

The **Collective Design Method** is a teaching-learning methodology that prepares graduating art and design students for the international labour market (i.e., art and design agencies or departments within companies and industry), as conventional teaching-learning methods in higher-education have limitations. Unless art and design courses offer employment incentives through internship programs, students rarely have the opportunity to experience the challenges of a professional workplace and which are commonly undeveloped in: communication; collaboration; social responsibility; critical analysis; creativity; leadership and resilience skill-sets, which are more social than technical, and that employers often look for during interviews. Therefore, the **Collective Design Method** is a resourceful alternative that promotes a time-efficient and effective teaching-learning methodology for simulating a professional workplace, whilst conducted within an academically controlled environment.

Method

The **Collective Design Method** is a teaching-learning methodology that consists of three parts: the method; workshop event and intrinsic product. The method itself is the foundation that drives the process towards the expected teaching-learning results, and the

workshop event and intrinsic product are vehicles within the method to practise and achieve these seven *skill--sets* considered essential for the international labour market within the art and design sector.

Workshop

The workshop is an art and design event organised by the teachers for conducting a series of group activities to address a *need* or *problem*. These activities are programmed within stages, therefore introducing different teaching-learning activities to serve the **Collective Design Method** objectives. These stages are: *climatisation; familiarisation; informatisation; contextualisation; conceptualisation; realisation and formalisation.* Within these stages, students participate in engaging activities, training, informative lecturers, creative exercises and intensive discourse to foster ideas and concepts for an intrinsically new product.

Intrinsic Product

With the teachers orientation, the intrinsic product is the focus for the students to design and make, and is presented to the students as a briefing commencing the workshop event, describing the challenge, product needs and requirements for design analysis. The briefing is written by the teachers and should suggest viable themes and objectives, considered important for the design and prototype of the new product:

— Compatible with participant art and design backgrounds;
— Makeable within the hosting institution of higher--education or with local partners;
— Feasible within the workshop time frame.

To orientate the design of the new product and benefit from the **Collective Design Method** objective, the locality and collaborative incentives of the workshop should influence the final product result:

LOCALITY, inspired by the local history, culture, customs and identity of the town, city, region or country;
COMMUNITY, promoting the local economy, ethical issues and social awareness;
INDIGENOUS, integrating a locally obtained sustainable material, process or resource.

Concluding the workshop event, the resulting product prototype should be physically and/or digitally represented, therefore tangible together with visual and interactive materials that embody the themes and objectives specified in the project briefing.

Participants

The art and design team for the workshop event comprises teachers and students from different institutions (or departments within the same institution) of higher-education, nationalities and art and design backgrounds. Each teacher's background essentially defines the art and design disciplines to collaborate and integrate into the **Collective Design Method**, workshop and product briefing, and they should select graduating students to supervise and orientate. Students who are in their final year of an undergraduate art and design degree, postgraduate or masters degrees are eligible candidates for the workshop, and through an interview process they are selected based on their creative and technical art and design skills, and their ability to articulate sufficiently in English. The number of participants for the workshop event should be between nine to twelve, consisting of three to four teachers and six to eight students, working together as a collective team or smaller task oriented groups.

Hosting Institution

The institution of higher-education that hosts the **Collective Design Method** workshop plays an influential role in providing partners and facilities to achieve the practical activities and the technical means to design, develop, produce and present the final product prototype. For the duration of the workshop this place (town, city and region) will become the *boot--camp* for this international team, therefore utilising various local resources to develop the final product and promote the local community.

The workshop should last for two consecutive weeks (80 hrs) within the academic calendar, to successfully achieve the teaching-learning results expected by conducting the **Collective Design Method**. This time frame is divided into seven stages with various practical activities to deliver and orientate the teaching-learning material throughout this program:

SIXTEEN HOURS (20% +/- of contact teaching hours) dedicated to practical theory classes and practical activities with stages: *(1) climatisation; (2) familiarisation; (3) informatisation and (4) contextualisation.*
SIXTY-FOUR HOURS (80% +/- of contact teaching hours) dedicated to practical laboratory classes with stages: *(5) conceptualisation; (6) realisation and (7) formalisation.*

The **Collective Design Method**, workshop event and design briefing challenge are essentially a *project curricular unit* that could adapt to part of an annual curricular program, an Erasmus mobility event or summer school incentive.

2.3 Program: Expected Teaching-Learning Results

By successfully completing a **Collective Design Method** workshop, students should be able to demonstrate skills (more social than technical) commonly required by an international labour market in the art and design sectors, and address a diversity of challenges that arise within a professional and creative workplace:

CROSS-CULTURAL COMMUNICATION (practising speaking, reading, writing, sketching and listening);
INTERDISCIPLINARY TEAMWORK (collaborating with other art and design disciplines, developing empathy, interpersonal interaction and working together towards a specific set of goals);
SOCIAL RESPONSIBILITY (using ecological resources, local assets and influences);
CRITICAL ANALYSIS (addressing problems, encouraging critical discourse and developing a constructive attitude towards cultural and social issues);
CREATIVITY (practising previously obtained art and design knowledge within a workplace scenario);
LEADERSHIP (motivating and orienting productivity within a team, adapting to circumstances, developing proficiency);
RESILIENCE (developing a professional attitude, competitiveness, integrity, adapting to circumstances and seeking new knowledge).

2.4 General Topics

The **Collective Design Method** is organised into seven stages to introduce the practical teaching-learning that contribute to the workshop program:

(1) CLIMATISATION (appreciating the locality) 4 hrs (wk 1 — day 1);
(2) FAMILIARISATION (meeting the people involved) 4 hrs (wk 1 — day 1);
(3) INFORMATISATION (understanding the workshop briefing and challenge) 8 hrs (wk 1 — day 2);
(4) CONTEXTUALISATION (informative experiences and investigation) 8 hrs (wk 1 — day 3);
(5) CONCEPTUALISATION (ideation, developing ideas and concepts) 16 hrs (wk 1 — days 4 and 5);
(6) REALISATION (iteration, design development, digital representation and prototyping) 32 hrs (wk 2 — days 6 to 9);
(7) FORMALISATION (promotion, presenting publicly) 8 hrs (wk 2 — day 10).

These stages represent the framework of the **Collective Design Method** workshop and simulate an art and design project work-flow. These stages may naturally overlap or extend into autonomous learning time, depending on the type of activity or circumstances. Within each stage, various practical activities are introduced to demonstrate the challenges normally associated with a professional creative workplace and achieve the expected teaching- learning results:

TEAM BUILDING (developing new relationships through formal and informal activities);
FIELD/STUDY TRIPS (visiting informative cultural locations, companies and industry);
LECTURES/SEMINARS (art and design theory and knowledge);
DEMONSTRATIONS/TRAINING (practising new methods and techniques);
BRAINSTORMING (creative discourse and visual representation);
FEASIBILITY (design analysis through testing);
FORMAL PRESENTATIONS (public speaking);
REVIEWS (pitching ideas and directions);
DISRUPTIVE MOMENTS (overcoming unforeseen obstacles).

2.5 Coherence Between the Programmed Topics and the Expected Teaching-Learning Results

The seven programmed stages and activities represent the framework of the **Collective Design Method**, which aligns with the expected teaching-learning results of the students.

(1) CLIMATISATION and (2) FAMILIARISATION focuses on the participants adaptation to the workshop location and the personal introductions between teachers and students involved. As a group, scheduled time should be spent exploring the local area, institution and workshop facilities, and encouraging team building exercises to develop interpersonal relationships and practise various communication skills prior to starting the workshop event. The **Collective Design Method** is an international project that promotes an interdisciplinary working methodology, therefore participants come together from different countries, institutions, departments and art and design backgrounds, working together towards a specific set of goals. In addition, these two stages are important to demonstrate the pace and momentum of the workshop, by introducing sprint challenges (i.e., Pecha Kucha presentations and other interactive exercises).

(3) INFORMATISATION introduces and analyses the briefing challenge for the **Collective Design Method** workshop, reinforced by informative lectures, training and field trips that support the project's development and objectives. The briefing can vary in content for different workshops, depending on the location of the event (institution, town, city, region and country) and the art and design disciplines practised by the teachers and students. However, one of the main objectives for the briefing challenge is social and contextual responsibility, therefore using ecological resources and assets (raw materials, production methods and local incentives) to design a new intrinsic product that should be symbolic to the region and promote the local community.

(4) CONTEXTUALISATION is the investigation and research stage of the design process, analysing the problem through critical thinking, constructive discourse and visual representation. This is conducted

as a multidisciplinary team through brainstorming activities to identify parameters and orientate design direction. The teaching-learning environment plays an influential role in the effectiveness of this activity, therefore changing the furniture layout to benefit the activity or performing parts of this process in other stimulating conditions, promotes alternative thinking and output. Modes and conclusions from this process are organised and pitched by the students to determine product directions.

(5) CONCEPTUALISATION develops upon the contextual directions identified in the previous stage, and involves creative and practical methods to develop ideas into potential product concepts. This stage focuses on the ideation and exploration of a possible product and employs the art and design backgrounds from the teachers and students towards an interdisciplinary experience, normally associated with the international labour market. To encourage product concept diversity and competitive ambiance within the group, the students are divided into smaller multidisciplinary teams to inspire motivation, ambition and leadership. Concluding this stage, a range of product ideas and concepts are visually represented and explained by the students to move forward to the next stage.

(6) REALISATION takes the product concept selected from the previous stage and transforms it into a tangible state to determine its physical viability and digital presence. Through iteration methods, the concept is designed, developed, prototyped and tested to analyse the various steps of production and user experience, towards a final product proposal. Students have limited time to achieve this goal, requiring leadership, diplomacy and resilience qualities on their part to work efficiently as a team, allocating tasks, learning new skills and adapting to changing circumstances.

(7) FORMALISATION to a public audience, exercises the students' integrity to present and exhibit their workshop design processes and product conclusions. This event and preparation towards the final presentation simulates a *service-to-client* experience, giving the opportunity for the student teams to promote their final product solution to a commercial and technical assembly.

2.6 Description of the Teaching-Learning Methodology and Assessment

The **Collective Design Method** is a specific teaching--learning methodology that aims to educate near--graduate art and design students with the essential skill-sets to practise their field of knowledge and compose students for the international labour market. By engaging in an essentially practical teaching--learning strategy, this method situates teachers and students in close proximity, collaborating together in a workshop environment with different multicultural and multidisciplinary art and design backgrounds, towards an interdisciplinary objective. This method fosters competitive and disruptive moments, encourages work-flow agility and deepens curiosity into applied art and design activities, through formal and informal interaction.

The assessment of the students progress is monitored throughout the **Collective Design Method** workshop event and corresponds with the expected teaching-learning results. The students are evaluated on their ability to be:

COMMUNICATIVE (develop constructive discourse and argument within the group);
COLLABORATIVE (productive participation within the group);
RESPONSIBLE (social and ecological awareness);
CRITICAL (analyse problems and suggest solutions);
CREATIVE (demonstrate art and design processes, through experimental and authentic doing and thinking);
LEADING (develop team motivation and orientation);
RESILIENT (handle pressure, accept criticism and adjust to new criteria).

2.7 Coherence Between the Teaching-Learning Methodology and the Expected Learning Results

By teaching-learning in a practical workshop environment with an interdisciplinary product objective, the **Collective Design Method** contemplates organised lectures, practical activities, orientation and student autonomous productivity in which the seven skill-sets considered essential for art and design international employment are strategically exercised. These skill-sets correspond directly with the expected teaching-learning results, therefore concluding the **Collective Design Method** workshop event it is estimated that students acquire, apply and consolidate knowledge and experience that let them know how to be: *communicative; collaborative; responsible; critical; creative; leading and resilient.*

VOICES OF DEST ARTIST EDUCAT

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This Chapter presents nine original scientific articles from the project researchers and guest authors that developed discussions, reasons and insights into the proposed expected teaching-learning results of the Collective Design Method.

3.1

DRAWING AS A DESIGN MEDIATOR OF CROSS-CULTURAL COMMUNICATION.

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ABSTRACT

As designers or artists, we are becoming more interconnected physically and virtually through project work as a result of the propagation of media technologies and contemporary demands. When designing for a world that is uncertain and complex in its needs and dimensions, effective communication and cultural intelligence (Darvishmotevali, Altinay & De Vita, 2018) are of utmost importance, since, through communication, we can centralise what we see, how we understand things and how we express ourselves or connect with others. Given the need to find solutions that are increasingly effective and have an universal validity (Schadewitz 2009), co-creation and multicultural dimensions in art and design projects has emerged, compelling schools to prepare their students to be more flexible and adaptive to environmental changes and to market uncertainty, providing them not only skills to know how to design but also how to communicate different needs for/with different cultures (Meyer & Norman, 2020; Sohmen, 2001).

In collaborative projects, the way artists or designers communicate with each other can determine the efficiency and effectiveness of the project's outcome. The lack of communication due to a linguistic deficiency or cultural misunderstanding can be disruptive, creating tension between

co-workers, leading to compromised creative output or inconclusive results.

Through academic and industrial experiences, there are several methods that encourage artists and designers to work together towards common incentives. In these collaborative challenges, it was possible to observe that, during project development, communication through drawing has been the most favourable and effective method to interact and to "make visible to everyone" ideas and concepts that only exist in the creators' mind.

In this essay, we will analyse art and design processes, methods and tools that can benefit artists and designers, focusing on cultural intelligence and visual discourse through drawing that provide positive cooperation, clarity of communication and facilitate decision-making between co-workers within creative organisations. By using a mixed research approach, combining experimental and observational methodologies, we will present a case study of two academic workshops with the aim to investigate drawing communication within projects with multicultural design students, and analyse patterns and anomalies which attempt to understand drawing within an applied art and design context. As a result, this study will contribute to the recognition that cross--cultural teams may have greater potential to discover and build better responses to complex projects, but can face difficulties arising from different work processes and communication styles that must be managed collectively.

KEYWORDS:
Cross-cultural communication; Collaborative Art & Design projects; Visual discourse; Collective thinking; Cultural intelligence.

Introduction

Multiculturalism is an unquestionable contemporary phenomenon that proliferates in every corner of the world and has very direct implications on social, political and economic systems. The multiple cultures and ethnicities that cohabit the same territory (physical or virtual) have forced organisations to adapt to new circumstances and have profoundly affected the management of projects which have increasingly been executed by multicultural teams (Gardner, 1962; Sohmen, 2001; Hussain, 2018). However, as much as the world melts borders and appears globalised, the challenge of effective communication between multicultural teams remains a barrier to be overcome. For organisations that rely on collective projects or multicultural teams, it is vital to invest in quality and clarity of communication, as it is through this that information is exchanged, trust is built and profitable relationships are maintained: *"Effective communication in multicultural organisations is similar to a human neural network; and once it fails, the whole system becomes dysfunctional"* (Hussain, 2018, pp 44). In order to work with this reality, the development of cross-cultural communication and cultural intelligence are fundamental.

Cross-cultural Communication and Beyond

The search for cross-cultural understanding and the willingness to put *diversity* into an inclusive equation, has historically been a major challenge. Apart from language which can be the obvious communication barrier between people, there are other cultural tendencies and behaviours that can influence individual engagement within a multicultural interaction. For involvement and transfer of information to happen between individuals, especially the ones with different ethnographic profiles, it is then necessary to take into consideration various aspects of which verbal and non-verbal communication stand out. The so-called *cross-cultural communication* (Gardner, 1962) refers exactly to the ability to communicate in a way that everyone can understand and also to the aptitude to read and interpret the signals of the body language, expressions and posture of someone who may be regulated by different cultural codes. Knowing how to address the process, impact and outcome(s) of verbal and non-verbal interactions has obviously become a priority for organisations managing cross-cultural practices (Sohmen, 2001; Traver, 2022).

In order to improve the understanding of how to better manage diversity in teams and improve the effectiveness of intercultural work, another factor has to be taken into full consideration. And that is *cultural intelligence* (Earley & Ang, 2003). Being understood as a specific form of intelligence, focusing on the ability to function, apprehend, reason and behave effectively in situations characterised by cultural differences (Tu et al., 2019) the importance of this kind of intelligence has come to be reckoned with by global organisations. This capacity, which goes beyond our common knowledge and implies the ability to understand and be sensitive to how others think, feel and act, also requires what some of the latest theorists of intelligence called *emotional intelligence* (Sternberg, 1986; Salovey & Mayer, 1990; Goleman, 1995). In fact, cultural intelligence seems to be closely linked to emotional intelligence and according to some studies, people with high emotional and cultural intelligence are able to relate to others with greater empathy and understanding (Tu et al., 2019), and can operate effectively in the global marketplace given their emotional disposition to accept diversity and solve problems (Livermore, 2011; Tu et al., 2019).

Given the need to find solutions that are increasingly effective and have an universal validity (Schadewitz, 2009), co-creation and multicultural dimensions in art and design projects has emerged, compelling schools to prepare their students to be more flexible and adaptive to environmental changes and to market uncertainty, providing them not only skills to know how to design but also how to understand and communicate different needs for/with different cultures (Meyer & Norman, 2020). More than ever, the domain of the various dimensions of intelligence behind students' performance is something that definitely has to be prioritised and seen as a competitive advantage for those looking for sustainable careers.

Hard-skills and Soft-skills

As we can understand, the quest to deal with these dynamic encounters and the attempt to efficiently assess students, collaborators or professionals profiles and skills began to be prioritised by institutions and organisations around the world. If in the past, the evaluation of these individuals was very much based on the competencies normally known as *hard-skills,* nowadays, with the development of the global labour market and the increase in the demands that a professional must meet in order to be considered qualified, the so-called *soft-skills* have started to gain an increasing relevance on the last decades (Sahni, 2011).

As hard-skills are essentially technical abilities that can be acquired through training or accumulated experience and that are easily recognised and qualified, soft-skills are more difficult to recognise and measure, as they are subjective and are closely linked to the individual's personality. With other words, they refer to mental skills and the ability to deal positively with emotional and behavioural factors. Soft-skills are difficult to assess, to be taught or assimilated, once they involve the entire psychosocial experience of a person (Asbari et al., 2020). Therefore, one can understand its importance, as it's no use having technically skilled students or professionals if they don't know how to deal with *diversity* in collaborative work environments (Asbari et al., 2020; Getachew et al., 2020).

Abilities like interpersonal communication, interdisciplinarity, critical analysis, creativity, leadership, resilience and, among others, professional ethics are, nowadays, widely appreciated, since it directly influences the entire project's development and organisational environments.

Communication through Drawing

When it comes to academic and industrial experiences, there are facts that encourage artists and designers to work together as they have the ability to provide positive cooperation, clarity of communication, and therefore facilitate decision-making among co-workers.

The action of drawing brings with it the possibility of experimenting, analysing, interpreting and developing a complex glossary of ideas and concepts, making them visible and enlightening to all those who may be directly or indirectly involved with the work. As drawing is an innate and necessary process for our expression and mediation, it reveals itself as a transferential mirror capable of communicating thoughts, emotions and feelings. Combining visual and perceptive acuity with the power of graphic and formal synthesis, drawing implies a capacity for intellectual analysis that activates all physical and mental resources so that the involvement with the subject, makes the drawing flow as if it were a visible extension of an inner need as natural as any other biological need (Mendanha, 2007). With unlimited access to the mind, it allows the artist, animator, illustrator or designer to transfer ideas to coworkers, viewers or users to any space or form, through experiences where stories or concepts can often be explained without resorting to words.

Drawing, as a vital, physical and spiritual action, has then the power to transform ideas and emotions into symbols, making visible to everyone

concepts that only exist in the creators' mind. In that mediation, there are countless possibilities of representational approaches that sometimes come close to a certain degree of resemblance with reality, in a logical and rational effort, and other times, flow into unreal territories, opening doors to dreams, passion and to mystery, and in an exploratory attitude of self-knowledge and of understanding the world and its circumstances (Merleau-Ponty, 1999; Wells, 2007).

As drawing can perform various functions as it effectively communicates and mediates through its various representational approaches, it is obvious that a certain visual discourse can better serve collaborative projects and facilitate decision-making within creative organisations. If some representations are easy to decode and useful for projects that rely on a faithful and universal interpretation, other representations with no formal or spatial concerns, can be difficult to decipher and therefore foment a subjective reading. If in the first case we are referring to representations of a schematic or objective type that normally serves design areas better, in the second we are referring to representations of the expressive or conceptual type, commonly used in areas with a stronger artistic character (Collier, 1985).

In a creative project, where ideas most often start in an embryonic state, it is common to use sketches to record and assist in the process of defining them. Being able to demonstrate graphically and be executed quickly, a sketch is not a basic representation and *simple* to do as it is often said. On the contrary, a sketch only fulfils its true function if it is capable of making an efficient *synthesis* of a whole. In order for that to happen, we must not forget that synthesis is one of the last stages of drawing (cognition, understanding, application, synthesis and evaluation), meaning that the attention to be given to the adequate teaching of drawing is, without a doubt, an essential asset for individuals in creative areas.

When a good visual synthesis is achieved, it usually brings with it the power to be universally understood, regardless of people's ground differences. To that extent, one can understand why this visual discourse is widely used in collaborative projects, both in schools and in industry, due to its efficiency in communicating and transferring information which may contain a high degree of complexity (Wells, 2007).

As we became aware of the undeniable ability that drawing has to communicate in a universal way, drawing itself has become collaborative through digital media and other virtual modes. In the last decade we could observe that this phenomenon of collaboration has been promoting verbal

and visual discourses over the internet, demanding interactive efficiency, fueled by scenarios of global companies and institutions and as a response to the pandemic constraints. The relevance of drawings in our days is that it strongly contributes to the exchange of knowledge and power from the individual to the collective.

Laboratory Studies

To analyse drawing as a communication mediator and its efficiency between different cultures within collaborative project based scenarios, two academic workshops were used to identify data that could orientate our research. For the purpose of this article, workshop (a) was called LEARNING FUTURES, and workshop (b) FLEXCOMP.

We used a mixed method approach, combining experimental and observational methods, to investigate drawing communication within projects with multicultural design students, and by analysing data between these workshops, revealed patterns and anomalies which attempted to understand drawing within an applied art and design context.

The two workshops were constructed with common and unique components, to analyse the outcomes in both quantitative and subjective ways, challenging cross-cultural characteristics and communication methods within the student groups.

(a) LEARNING FUTURES was a two week workshop held in China, between thirty Chinese and European undergraduate design students at the Central Academy of Fine Arts in Beijing. The challenge was an academic exercise, designing new products or spaces which enhanced a learning experience for toddlers, children, teenagers or adults. The briefing was broad and allowed students to explore a wide variety of teaching and learning needs, from community education environments to individual desk furniture and tools.

(b) FLEXCOMP was a two week workshop held in Portugal with thirty Portuguese undergraduate and postgraduate design students, online between ESAD — College of Art and Design in Matosinhos (near Porto) and UMA University of Madeira in Funchal. The challenge was a collaborative incentive with local industry, designing new products from a newly developed material called FlexCompact, developed by Fibrenamics for Surforma — Sonae Industries. The briefing focused on creating products within the

furniture, interior or mobility sectors, and allowed students to discover the material and explore new and innovative product possibilities.

In mixed student groups, the objective was to explore, develop and prototype various design proposals within this two week timeframe, and both workshops were structured with group activities and tasks, following a design process, using cognitive, discursive, manual and digital tools, including drawing, to assist problem solving, encourage interaction and motivate communication between group participants.

Most design projects follow a design process which can be adjusted accordingly to the theme or dimension of the problem. The Double-Diamond is a popularised model consisting of steps: discover; define; develop; deliver, which is a strategic approach to any design and innovation project, irrespective of methods and tools used (Ball, 2019). However, there are other non-linear approaches, such as design thinking that uses a circular method to address design challenges through steps: empathise; define; ideate; prototype and test, to systematically apply human-centred techniques to solve problems in a creative and innovative way (Friis Dam & Yu Siang, 2022).

Drawing plays an important role within the design process, enabling designers to develop concepts and share ideas with others. By drawing, we can convert a "plan in our mind" into a tangible form that is accessible to others. *"Drawing, as a medium for expression, is vital in the representation of ideas, thoughts, composition, form, materiality and sensation in the discipline of Design"* (Blankley, 2022).

Two distinct drawing moments occurred during each workshop, which played an influential role in visually representing, communicating and orienting each group's design work towards positive results.

For the LEARNING FUTURES in China, students started with brainstorming activities to explore the scope of the topic and exchange ideas within the group.

Brainstorming has a history since 1950, introduced by Alex Osborn and encourages users of this method to be: open to new ideas; produce a range of ideas; build on each other's ideas; encourage exaggerated ideas (Osborn, 1979). However, over the years it has evolved through academic research and different business applications into different forms, but the principle remains intact as a group problem-solving technique.

This brainstorming activity lasted two days at Central Academy of Fine Arts in Beijing, where multicultural students inputted, exchanged and organised their ideas collectively on a large table using post-it papers with



Fig 3.1.1: Brainstorming table for LEARNING FUTURES workshop at Central Academy of Fine Arts in Beijing, China.

notes, references and simple diagrams (fig 3.1.1: Brainstorming table for LEARNING FUTURES workshop at Central Academy of Fine Arts in Beijing, China). Written keywords in various languages were evident within this work, but the majority of the ideas were represented in a cartoon style, using symbols or simple diagrammatic drawing.

This type of drawing consisted of bold marker pen lines and was sufficient to discuss initial ideas within the groups, analyse each input, cluster modes within the information and identify potential design directions for the exploratory phase of the workshop.

The FLEXCOMP workshop in Portugal followed a similar design process to the LEARNING FUTURES workshop, but the students were all Portuguese, working online between two locations, ESAD in the north of Portugal and UMA in the island of Madeira. With this, the brainstorming activity combined physical walls in each location and digital platforms for student groups to interact effectively. The drawing and sketching styles were more elaborate in this workshop, mixing diagrams with paper models and pictorial references (fig 3.1.2: Brainstorming wall for FLEXCOMP workshop at ESAD, Portugal).



Fig 3.1.2: Brainstorming wall for FLEXCOMP workshop at ESAD — College of Art and Design in Matosinhos, Portugal.

Concluding the exploratory phase, this diversity of visual, physical and digital material produced by the student groups, made it difficult to define concepts and identify potential design solutions to progress to 3D computer modelling and product development. With this, the students used an analytical drawing style, with perspective and tone to emphasise shape with shadow. This drawing type was made with soft graphite pencil and unified the visual representation of each design proposal, therefore making design analysis and evaluation easier for the client (fig 3.1.3: Analytical sketches for FLEXCOMP workshop at ESAD, Portugal). When working in teams, sketching is a valuable tool for creative group activities such as brainstorming and concept evaluation. In professional design practice, sketching has proven to have a multitude of purposes which can be summarised under four headlines: investigation; exploration; explanation and persuasion (Olofsson & Sjölén, 2006).

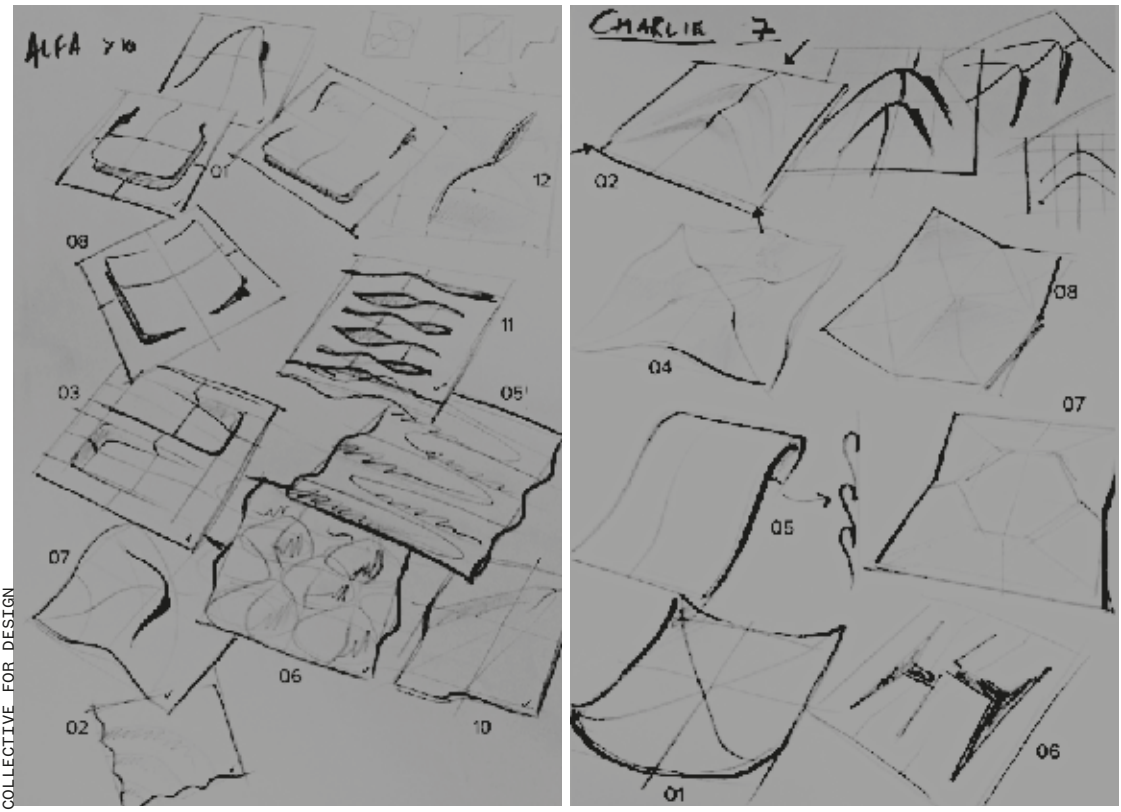
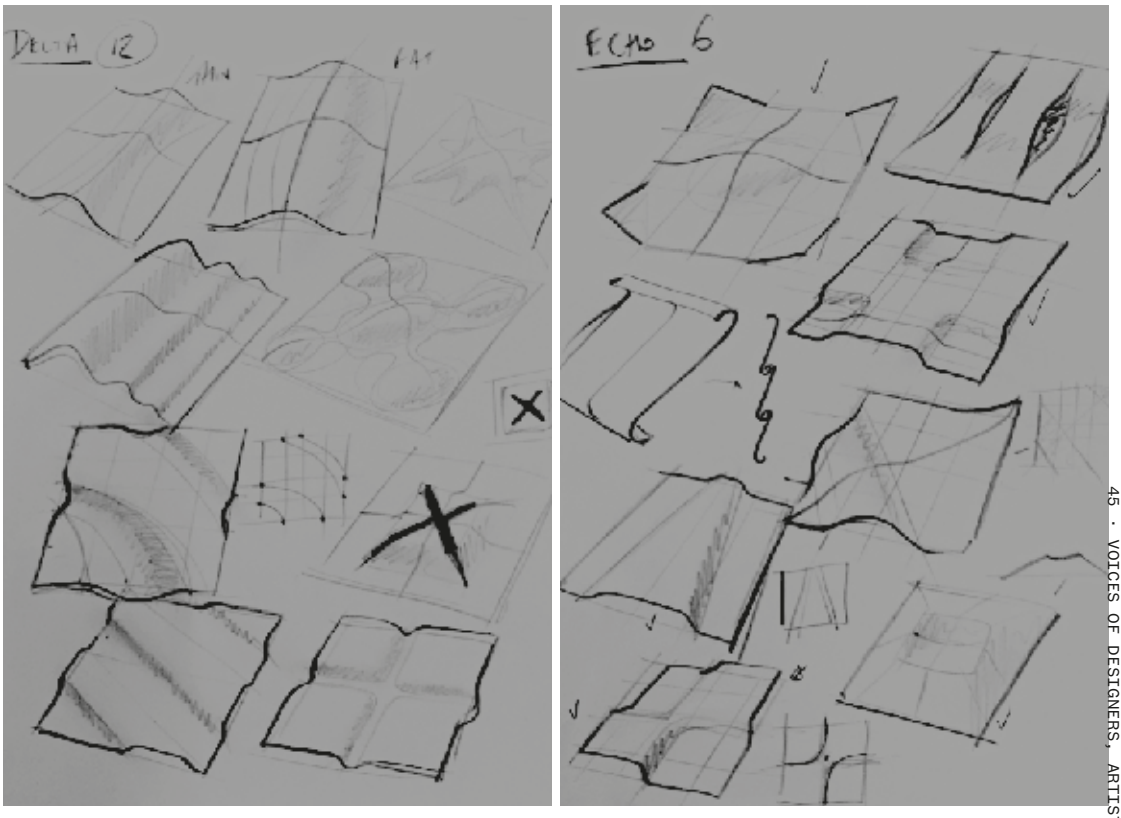


Fig 3.1.3: Analytical sketches for FLEXCOMP workshop at ESAD — College of Art and Design in Matosinhos, Portugal.

Through this process, both workshops achieved their objectives and produced prototypes in various tangible or digital forms from this foundation of collaborative drawing work. The coordination of the workshops, timeframes and different design challenges were similar and effective, and the student groups responded well to the majority of the tasks. However, through observation, some unexpected anomalies due to various communication, cultural and technological barriers, occurred between the student groups, causing frustration between participants and disruption within the project work.

In the LEARNING FUTURES workshop, two situations were observed that influenced the communication between the students. Firstly, after the first day of introductions presented in English, half of the Chinese students left the workshop due to personal incompatibilities. Reasons were given by the Chinese teacher and coordinator of the workshop, one being



the language barrier. Secondly, the Chinese students that stayed and participated in the workshop together with the European students, quickly developed strong working relationships that overcame the limited language barrier, and through other forms of communication, succeeded in completing the workshop with some outstanding results.

In the FLEXCOMP workshop, three situations were observed that influenced the communication between the students and the output of their project work. Firstly, the language barrier was not an issue. All the students were native Portuguese speakers from two Portuguese higher education institutions in mainland Portugal and Madeira. Secondly, the workshop invited design students from first and second cycle degree courses, working together in mixed groups. The students were coordinated by teachers in both locations and managed accordingly, and within the initial workshop activities, design competences and skills between the two degree levels

were aligned. However, midway through the workshop when defining concepts and entering the design development phase, some second cycle degree students with more practised design skills, separated themselves from the first cycle degree students within their group, in order to achieve their goals more efficiently. Thirdly, working online between students in two different workshop locations proved challenging. Initially, the proposal of working online, using virtual collaborative platforms and chat channels (i.e. Miro, Jamboard and WhatsApp) were accepted and used efficiently by the student groups to work together and exchange ideas. However, after the first week it was observed that interaction between group participants was sporadic and in some cases, lapsed completely, leaving incomplete groups to finish the project work. There was no hard evidence to show how or why this happened, but in comparison with the LEARNING FUTURES workshop in China, the Portuguese students, even without the language barrier, did not have the opportunity to develop relationships within their groups through physical proximity.

Drawing as a communication tool was present throughout both workshops, focusing on the exploratory design activities. Evidence from these experiences showed that as a cross-cultural method of communication, drawing does assist certain collaborative design tasks, but is only one hard-skill component to achieve understanding between people. Other motivations and soft-skills are necessary to accompany this process and to connect people effectively within the group activities.

Conclusions

As researchers, we entered this inquiry with a *hard-skill* approach, suggesting drawing could be a communication tool to bridge multicultural artists and designers in project collaborations. In part, through these workshops (LEARNING FUTURES and FLEXCOMP, we succeeded to witness that drawing played an important communication role in aligning thoughts and objectives within the student groups, but work efficiency was disrupted by individual anomalies (i.e. personal interests, language insecurities, undeveloped relationships and different skill levels), therefore hindering progress and causing frustration between individuals.

It was observed in both workshops that communication through drawing was an effective medium to convey a visual message to colleagues within the exploratory stages of the project. However, if the viewer did not connect with the challenge, return minimum discourse for constructive

interaction, build a productive coworking relationship or produce material to a similar academic experience level, then dissatisfaction, and in cases, ostracisation occurred within the group. Therefore, time for students to adjust to collaborative project situations is one of the many challenges of communication. You simply can not change how the listener functions. However, most people are aware of and sensitive to how they want to be treated. By adjusting yourself to how other people want to be treated, you become more effective in your communication (Erikson, 2019).

Beyond our expectations, the research from these workshop experiences revealed that the human behaviour between individuals within the group influenced their communication, listening, drawing and orientation towards their project work.

Yet, through these experiences, once students were able to connect to the project challenge and master drawing, the transfer of knowledge and information became clearly fluid and with a degree of legibility that could be understood by individuals from the most disparate cultural or geographical backgrounds. Thus, if we understand the transferability of drawing and if investment is made in its quality of teaching, we will come to see drawing not as a hard-skill but rather as a sensible communication skill, indispensable in today's cross-cultural interactions and cooperative projects.

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3.2

THE NEW COLLECTIVISM: Individualism and Teamwork in Art Education Against the Background of Social and Systemic Changes.

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ABSTRACT

Changes in art education are inherently dictated by the evaluation of education and art. A clear mechanism for this transformation is the shifting balance between individualism and collectivity, which, depending on the market, political and social situation, shifts one way and the other way.

The first part of the text looks at these areas to highlight how market and political changes have affected approaches to collectivism. It cites contemporary market research and consumer expectations, followed by the historical political form that eviscerated the notion of collectivism and inhibited the development of the arts.

The next part, the broadest one, discusses selected artistic phenomena of a collective nature, with a particular focus on new media art and Polish art. The same section also outlines the path of development of contemporary collective activities in art that result from the social involvement of artists.

The final section was devoted to education, what the nature of the project-based development of the education system is and what proportions contemporary art education adopts in terms of individual and collective practices.

The title collectivism in art education is presented against the backdrop of new phenomena in art and social and political changes that affect the new meaning of this devalued concept.

KEYWORDS:
COLLECTIVISM; Individualism; Art; Society; Education

Climate change, pandemics, political, armed, religious conflicts and other global problems influence our consciousness and push us to discover ways of functioning sensibly in a changing world. Also art and economy, in search of a new identity, are shaping different attitudes as remedial forms geared to the benefit of the natural and social environment.

Such a turnaround also entails changes in the education of artists who do not want to be indifferent to the problems of civilization, and this involves an evaluation of their working methods, which, rehearsed during their study time, will have a beneficial effect on their new approach to the environment.

One of the issues to be sorted out in the process of changes in artistic education is the eternal dilemma related to the proportion of supporting the development of individualism and collective activities. While individualism is indispensable in the process of developing special talents and shaping the artistic personality, collective action broadens the horizon of creative work and increases professional opportunities.

Higher education needs to be responsive to market expectations to ensure its graduates have a secure position in the industry, but no less so should the highest level of artistic units that drive progress.

The search for the perfect relationship between individualism and collectivity in art education varies but is relatively constant in the arts division, where by their very nature musicians and filmmakers practise much more collective activities, in choirs, ensembles and production groups, and artists in the visual arts and designers outdo each other in authorial concepts.

The shifting criteria for these proportions in the case of artists and designers are the general development of art and the market situation, which, depending on trends, the economy or the regime, influence the art market and the demand for products and thus the need for changes in the education system.

An Informed Market

A look at the market situation reveals a gradual shift over the years away from mass-produced goods aimed at achieving the lowest possible price, which is often at the cost of poor work ethics and excessive environmental degradation. The data from 2020, collected in a report presenting shopping attitudes, proved a significant increase in the knowledge of customers, who limit the purchase of unnecessary things, read the composition

of products, trust companies' declarations about the ecological features of production and support the second circulation of products (Accenture Polska, FashionBiznes.pl, Fundację Kupuj Odpowiedzialnie, 2020).

Consumer awareness and therefore market changes are not only the result of economic conditions. Market development is also based on intangible values, those related to cultural resources, making it socio-economic. The sustainable development concept has become a popular model, but the effectiveness of its application is not due to the mere announcement of its basic assumptions. The actual success of the new approach depends on the social environment (Hauser, 2017).

The awakened need for conscious and responsible management of basic needs, followed by the prolonged COVID-19 pandemic, which affected supply shortages and delays, and further austerity policies, ultimately influenced the adoption of new business and consumer attitudes based on the human-environment link.

The latest research, from 2022, points to five key trends: individualism, the end of affluence-based thinking, the development of products and consumption mechanisms in a digital world, expanding communication with product audiences, and care for the environment, production workers and consumers (Accenture, 2020). Two of them will be particularly important for the problem discussed in this text: individualism and caring, which ultimately overturn the old order shaping new structures of work, individual and collective, thus setting new directions for the development of art education, graduates of which will have to deal with these very trends.

On the one hand, it seems that society is consciously abandoning mass products, where the need to influence sustainability supports the production of individual or limited edition items. This trend definitely favours original designs, which are often made alone. On the other hand, multidimensional concern for the environment and for others encourages teamwork, where the sharing of resources is environmentally friendly and community creativity develops the product more effectively. An additional advantage of the trend favouring collective work will be the satisfaction of the need for contact with another human being, which has been badly damaged by isolation and remote work during the pandemic.

The new market situation is therefore between a new individualist-oriented approach and a sensible teamwork resulting from concern for resources and the other person.

Collectivism the Old Fashioned Way

Collective work, however, bears the marks of the old order, based on mass production or, going back to the history of political systems, on Sisyphean work that excludes individualism in the name of ideology. Particularly in the cultures of Central and Eastern Europe, which for decades of the past century were under socialist dictatorship, the very term "collectivism" functioned in common social usage interchangeably with such terms as: socialism, communism or statism (Szacki, 1999). The economy of these countries then subordinated to the state good, based on collective toil, gave rise to a number of absurdities and bad practices, such as the nationalisation of private goods, corruption and the spread of dictatorship (Skidlewsky, 1999). Moreover, the Stalinist regime very clearly divided disciplines by blocking the cooperation of various fields and the flow of ideas through different circles. Art and science, like all other areas, were the property of the nation and were supposed to support the development of its economic power. The policy of central planning ruled out the possibility of deviating from the given norms and standing out from the collective. The surveillance system disciplined attempts to break out into independence, no matter if they were good attempts or not, but against the strategy of the authorities (Jelewska, Krawczak, 2014).

Radical forms of collectivism, however, had no chance of global success, as the fall of fascism and the Cold War against the socialist Eastern bloc with the simultaneous liberalisation of Western markets proved at the end of the Second World War. Eventually, even the USSR gradually loosened its utopian system of central governance and, by giving up coercion of its citizens, lived to see its collapse (Skidlewsky, 1999).

In the wake of the liberation of Central and Eastern European societies from socialist dictatorship, production did return to diverse forms, but the word "collectivism" itself became a pejorative term. The recovery of its true meaning, the purging of ideological affiliations, required generational changes and went a long way to re-establish itself in the nomenclature of various collectivities.

Collaborative and Social in the Arts

In the 1960s and 1970s, in spite of the constant influence of the communist authorities in the Eastern Bloc, avant-garde activities appeared in the

sphere of art which broke out of the dictate of the non-mixing of fields. The independent avant-garde of the Western countries had long been a tribute to the interpenetration of technology and art, which resulted in the development of film creative activities in the field of fine arts. The most momentous stage of this technical fascination is the analytical phase of artists' cinema, which was brilliantly represented in the West by Nam June Paik, e.g. in *Zen for film* from 1962, and Andy Warhol, e.g. in *Sleep i Empire* from 1964 (Nitosławska, 1989). However, on the eastern side of the Berlin Wall, such revolutionary activities were only tentatively in their infancy, and the collective was a safe form of activity in which, under the cover of the old order, because in a group, new media were being discovered, which in the near future were to become permanent in the field of fine arts. The artists of the Polish avant-garde cinema of the 1970s, who gathered at that time in the Warsztacie Formy Filmowej, an artistic group which initially operated as a study group at the Łódź Film Academy, took an equally analytical approach to the new activity. Its members, especially Józef Robakowski, e.g. in the films *Rynek* from 1970 and *Test I* from 1971, and Wojciech Bruszewski, e.g. in the films *Yyaa* from 1973 and *Pudełko zapałek* from 1975, undertook experiments aiming at rejecting an aesthetic attitude in favour of a cognitive one, revealing the nature of the film medium (Kluszczyński, 1998).



Fig. 3.2.1: Members of the artistic group *Warsztat Formy Filmowej* — photo from the collection of Józef Robakowski.

Eliminating literary influences and focusing on formal considerations was not only a natural consequence of exploring the new medium, but also guaranteed the independence of artistic expression, which at that time in Poland was struggling against censorship.

The end of the communist system in the Eastern Bloc countries brought the longed-for artistic freedom, and thus independence and a mass turn towards an individual approach to creative activities. Team activities were still functioning well, but the expected artistic independence became leading.

Following further manifestations of the purification of the term "collectivism" in the creative space, attention must be paid to the social character of artistic activities in recent art. After all, current cultural events can most strongly influence the market and educational environment. This type of art should therefore be divided into those which make the social context the main creative theme and those which base the very act of creative work on collective activity. Collective activity in this case will of course be called collective action, but its origins are inextricably linked to the social theme of creativity which, through the work of individual artists, has paved the way for the expansion of a mode of creative work based on sensitivity towards the "Other". The intensification of such activities could be observed at London's Tate Modern at the beginning of this century, when the social theme returned several times to the Turbine Hall, the central hall of the gallery. At the turn of 2008/2009, the Colombian artist Doris Salcedo presented *Shibboleth*, a large crack without beginning or end, on a huge expanse of floor, which symbolised cracks and social divisions, especially those between Third World countries and Europe, pointing to prejudices against origin or skin colour (Kwiatkowska-Tybulewicz, 2017). A year later, in the same hall, the Polish artist Mirosław Bałka also reminded us of racial divisions, but also of crimes against humanity. As part of the installation *How it is* Bałka presented a colossal container, blacked out and soundproofed inside, which viewers could enter to feel like Jews being transported by cattle car to a concentration camp during the Second World War or like illegal immigrants crossing borders under the deck of a ship (Sienkiewicz, 2009). These examples can be described as a kind of socially engaged art, drawing attention to the problems we face, but above all making us reflect on this situation.

One step further are the activities of artists directly involving the social environment, which is called community art, art with community, participatory, interventionist or dialogic. Regardless of the term, however, it

is a community action, a collective one, involving not only the individual artist, but the whole group in the creative process. Often such activities are organised in public space, which may stimulate the local environment to reflect on their efficiency, both of the participants and observers who do not have the courage or desire to join in, but want to observe. Such practices democratise art, make it accessible to all and erase the myth that only outstanding individuals create great works presented only in renowned galleries (Stokfiszewski, 2018).

The Polish artist who best exemplifies this kind of creative activity is Julita Wójcik, the author of *Tęcza*, a monumental installation made of flowers in the shape of a real rainbow placed on Zbawiciela Square in Warsaw in 2012. The object quickly became a source of misunderstandings and environmental disputes between right- and left-wing groups, and the *Tęcza* has been destroyed many times, especially by burning, but also rebuilt just as often.



Fig. 3.2.2: *Tęcza*, installation by Julita Wójcik in Warsaw — photo Mateusz Opasiński, CC BY-SA 3.0.

The artist invited various groups to this constant work on rebuilding the installation, and in a symbolic act of "not giving up" they wove the *Tęcza* back with flowers. In addition, the activities around the *Tęcza* took the form of social collaboration, to which social media contributed in particular, expanding the group of recipients, but also the very notion of engaging the collective. Several accounts dedicated to the *Tęcza* and associating its fans have been created on Facebook; more and more events related to the *Tęcza* have been initiated by social network users, who have invited *Tęcza*'s defenders to protest meetings; workshops on weaving new flowers for the *Tęcza* have been organised at Zachęta Gallery in Warsaw, and social media have been used to sign up for them; appeals have been published to leave the *Tęcza* at Zbawiciela Square. All these activities took place on the initiative and through thousands of social media user accounts, with only some events in the galleries as a consequence. The lifespan of the Rainbow theme was much longer on social media than its physical presence in Saviour Square (Miaskowska, 2019). In another collaborative activity, *Bezdech — Model punktu oporu przed brutalną falą,* the artist invited residents of the Kozanów housing estate in Wrocław, the place most devastated by the floods, to stack sandbags together and practice breathlessness. The actions with the bags were supposed to practise cooperation between people, and breathing exercises were to secure the need to hold one's breath for a longer time. The whole action was obviously not only an exercise before the next wave of water, but above all a metaphor for securing oneself against the wave of hatred, which fuels the contemporary socio-political divisions in Poland. In her action, Wójcik refers to the notorious xenophobic incident of burning a Jewish puppet that had just occurred in Wrocław in 2015, a year before her actions in Kozanów, Wrocław (Wójcik, 2018).

Contemporary artists coming from countries torn by political upheaval, especially those with the stigma of socialist regimes, best understand the need for a new approach to active collectivity.

The new collectivity has a pro-social, freedom-oriented character, emphasising the agency of individuals and sensitivity to the "Other". Thus, the return of collectivism, purged of old connotations, becomes an important element of change in art education, as new forms of art and economic resources require a new approach to their creation.

Diversity

However, the disenchantment with collectivism does not mean the devaluation of individualism, where subjectivity, identity and autonomy are the basis of a full existence and the condition of development. It is individualism that upholds values and culture by opposing consumerism, and education cannot deny the right of every person to individual development. The training of artists and designers will therefore be based on the process of developing individual skills, but with the need to relate to the social environment. Ultimately, a radical orientation towards one form or the other may generate adverse side effects, where individualism detached from the collective threatens a narcissistic sense of superiority that inhibits effectiveness, while a collective that disregards individuality stifles originality and freedom. The model combining these two approaches is referred to as diversity, where the potential of the individual is enhanced by different types of collectivity (Sztobryn, 2017). Furthermore, it is not said that there is a clear division between individuals with an individual and collective mentality, and individualism and collectivism alone cannot be understood only in terms of opposition. The characteristics of both mentalities are ingrained in every single person, and only their proportion will vary (Reykowski, 1999). The education of artists and designers must therefore take into account both forms of education, develop the individual artistic attitude and support the specialist conditions of the individual, and adopt to work with the socio-economic environment by practising cooperation.

The New Collectivism in Education

While the elements of individual training are relatively constant and are based on practising classical techniques at the grassroots level and extended through specialisation, the collective forms are subject to more frequent changes.

The new approach to collective cooperation in education fits into the project method based on developing not only specialists but also social competences. It is a mechanism that allows new teaching assumptions to be tested before they are introduced into teaching standards. This approach to education makes it possible to create a situation very similar to the one graduates will already encounter in the real labour market, as projects work on problematic situations resulting from the local environment and current market conditions. Moreover, project work refers to both collective

and individual activities. On the one hand it shapes social attitudes in relation to the group with which the project is carried out, but also to the local environment. On the other hand, it is oriented towards the participants' interests, self-realisation and self-responsibility, which definitely develops the individual characteristics of the participants (Karolak, 2005). Within the framework of curricular educational activities, the formation of pupil subjectivity, in a model based on the pupil-teacher relationship, is an extremely fragile matter. The teacher must appropriately balance between creative freedom and constructive criticism in order not to undermine this subjectivity. Avoid radical criticism, which extinguishes creative enthusiasm, but also do not confuse the development of creative autonomy with autodidactism, the shortcomings of which are sometimes curricular gaps and vanity (Górska, 2006). Working in a creative team seems to automatically exclude such dangers. The ongoing revision of the project by several persons allows for quicker identification and filling in of gaps, and joint responsibility motivates constructive criticism, which is received quite differently from a co-creator than from a mentor who does not participate in the implementation.

The new approach to collective work among artists is teamwork based on the specialised skills of individual team members. The old collectivism based on mass production according to a specific model has lost its meaning in the face of civilisational changes.

The new collectivism breaks with the old divisions of disciplines and promotes teamwork with diverse experiences and approaches. This attention to the individuality of individuals in collaborative teamwork is an entirely new aspect of collectivism, one that sharply distinguishes it from the old model, which was all about mass, repetitive and reproductive activity.

Today's teamwork is not geared towards increased manufacturing benefits, but towards active problem solving that can be effective in a group of people with diverse backgrounds. Today's collaborative teamwork focused on achieving positive results is not a closed model, ready to be reproduced faithfully, but geared towards the flexible configuration of individuals in relation to the task being solved. This flexibility just as clearly distinguishes the new collectivism from the old, it does not impose fixed variables to be replicated regardless of circumstances, but promotes a dynamic community, ready for change, oriented towards developing positive outcomes. Qualitative outcomes distinguish the goal of the new collectivism from the old, which pursued quantitative goals.

The positive attitude of artists to work in teams, to engage their surroundings and to influence the social contexts of life is not only the result of the development of socially engaged art. Without a supportive social environment, artists' intentions would remain in the realm of individual action, so there would be no participatory art phenomena were it not for the parallel development of the market and the consumer.

The new collectivism is thus the result of artistic and social changes, but also of market changes. Today's conscious society and the prospect of increasing climate change requires, on the one hand, innovative actions, i.e. those initiated by individuals with highly developed individual characteristics, and on the other hand, a communal sensitivity for the sensible, sustainable management of resources and attention to other people.

The contemporary education of artists is obliged to broaden the curriculum standards focused on the development of individual qualities and to introduce collective activities that will prepare future specialists for market realities. The increasing number of design forms of such activities and their cyclical nature has a chance to permanently change the education programme in this area, and thus be part of a global recovery plan.

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3.3

LOCAL MARKERS: Material Narratives Through Place-Based Design Research.

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ABSTRACT

Researching through local materials has the capacity to produce results that are both emotional and functional. The source of the materials, when identified by the individual, imparts a subject-object impression, or *marker of place.* This marker of place, along with the makings of the matter, has the potential to generate a narrative of the past for the future. As a result, this practice-based research explores materiality through human experience. The research process is rooted in observing, collecting, making, and assembling materials, which are investigated to form a critical analysis that maps a connection to place. The series of material interactions represent singular experiences alongside a communal collection — a shared material story — within a local-global community.

The aim of this text is to show the ability of local materials, as defined by their provenance, attributes, and their natural ability, to create a material connection through a subject-object model. Within the two shared examples, (1) *Point of Origin,* led by the author from an collector-maker-curator approach combined with public interaction; and (2) *Material Connections,* led by the author from an educator-collaborator--designer approach, the storytelling is the emotional thread — a fascination of the 'vital matter' of the object — of what philosopher Jane Bennett refers to as the 'thing power,'

whereby the "sense of a strange and incomplete commonality with the outside may induce vital materialists to treat non-humans — animals, plants, earth, even artefacts and commodities — more carefully, more strategically, more ecologically" (Bennet, 2010).

The handling of the materials to manifest outcomes, some presumed and others unforeseen, consists of trial and error using various methods of experimentation for ideation and reflection, giving value to the origin of the material and the intent of the designers.

KEYWORDS:
Sense of place; Local markers; Human experience; Education; Storytelling.

Introduction

Materials, through provenance and process, are signifiers of cultural narratives, acting as markers of time and place. While globalisation and increased technology have created an environment of rapid change across all design sectors, a return to hyper-local processes and authenticity of materials within products and environments has continued to counter. Sharing narratives, traditions, and resources which harken to a specific place creates a strong connection of what the geographer Yi-Fu Tuan coined as *topophilia* — the "affective bond between people and place or setting" (Tuan, 1974, 1990) — which can be stimulated within creative pursuits directed by socially responsible designers through identifying natural resources, promoting local assets, and preserving cultural narratives.

Local Materials as Markers of Place

Place-based pigments, the foundations of dyestuffs, paints, and inks, have been the source of increased research and studio practice in recent years, as Caroline Forde states in *Chromatic Geography: Natural Dyes in the 21st Century,* "interest in natural dyes is undergoing a global revival, fueled by a growing awareness of the harmful by-products of the industrial dye process" giving rise to "bioregionalism as an expression of a sense of place and cultural origin." (Forde, 2017). Heidi Gustafson's *Early Futures Ochre Sanctuary* (Lasane, Colossal, 2019), Kayla Powers hand-dyed textiles from local plants, *Colours of Detroit* (2019), and Tilke Elkins' *Wild Pigment Project*, promote discussions on ecological balance through "a passion for wild pigments, their places of origin, and their cultural histories" (Elkins, 2020). A final precedent, the modern ink-ologist Jason Logan, references historical processes, while his alchemical narratives are infused by ink-making from "the flimsiest of ideas and the unlikeliest of materials" (Logan, 2018) including materials foraged from the urban landscape — *cigarette butts mixed with rust and stinging nettle* — are romanticization of often overlooked moments in time and place.

Project 01: Point of Origin

As a researcher and maker, a series of experimentations focused on professional and artistic discovery regarding the nature, provenance, and abilities of local materials for pigments were conducted (2019-20). As a result, *Point of Origin* developed as a two-part exhibition that included

1) a practice-based research project exploring the materiality of pigments through first-hand communication with local resources through collecting, making, and curating; and 2) an interactive installation for the purpose of a shared social and educational experience with an the local, international-diverse, visiting community.

The methods for experimentation included gathering, processing, making, and assembling organically occurring pigments, which were later apportioned to form a palette that mapped a sense of place, mimicked terrestrial landscapes, and evoked emotional connections. The palette of 32 pigments were collected from natural environments while living and travelling between the cities of Detroit, San Francisco, Yogyakarta, and Doha. The hierarchy of materials was defined by their provenance, materiality, hue, fastness, and their natural ability to create a material connection through a subject/object model. Sources for each pigment were, when possible, neighbourhood-based, which elevated the unique qualities of the materials. The hyper-focus on *hyper-local* materials created a natural constraint, constructing within a boundary to identify the perimeters of a shared material narrative.

Methods and Materials

The manipulation of the materials to manifest the pigments consisted of trial and error, using various methods of extracting, reducing, precipitating, levigating, drying, and grinding to produce powdered dust for experimentation. The selection of materials for binders were specific to the material, including natural forms of gum, shellac, tempera, or honey. The assemblage strategy included strategically layering the pigments between two 16-inch diameter, half-inch thick transparent acrylic plates, in order to observe the colored pigments both in their raw form and interacting with adjacent materials. While the pigments were placed with intent, the fluidity of the material structures, chemical interactions, and the weight of the transparent plates created a chromatic, kinetic dispersion, requiring an openness to the random, the *'thing power'* that is outside of the maker's control.

Each of the eight material landscapes consisted of four pigments with their own origin stories, linked together in a single narrative (fig 3.3.1a). For example, *The Architect of Place* includes pine wood ash and horsehair plaster from a 150-year demolished home in Detroit, burnt clay brick, and vinegaroon — a solution of vinegar and iron to turn leather black — to form a material snapshot of *home* through the concepts of time, loss, corrosion, and rust.

"In the same house as the horsehair plaster were beams dampened and damaged by water over time. The wood was removed, burned, and left in the pit for weeks, later covered by snow. After the melt, the ashes were collected and placed into the maker's hands. During the levigation process, the wood — still soaked by snow water — transformed into a thick and lustre-like paste. The texture was transfixing, imagining early cave painters dipping their fingers to create zoomorphic outlines. The pigment has been put through washes and mixed with binders, but the maker's favourite is when it is left just as it is."
(*Point of Origin I*, 2020)

The interactive installation was designed to share the material origins of pigments, connecting with the visitors through a similar iterative process, in which the participants created a smaller, individual landscape (fig 3.3.1b) from the collection of 32 inks made from: sugar starfish ("blood" and shell), sea urchin shells, blue-green algae, bone, purple cabbage, crustose lichen, oyster shell, red maple, mulberry, Palo de Brazil, black walnut, apatite, eucalyptus (bark and seed), Nag Champak ash, avocado, padauk sawdust, verdigris, anthracite, pomegranate skin, turmeric, Palo Santo ash, 150-year old pine ash, horsehair plaster, vinegarroon, burnt clay, marigold, pink peony, bearded iris, and grape vine ash. These material landscapes were placed within a grid (fig 3.3.1c) to unite through a larger representation of collective storytelling. This process of iteration, as Jane Norris states in *Making Polychronic Objects*, "is an attempt to map through making," (2016) giving value to the origin and intent of the local-global markers. As a result, the participants shared like materials, yet elected personal colour strategies through proportion, which lead to unique interpretations while still feeling connected to the collective material archive.



Fig. 3.3.1a: *Point of Origin I*, VCUArts Gallery, Doha, Qatar



Fig 3.3.1b and 3.3.1c:
Visitor Material Landscapes

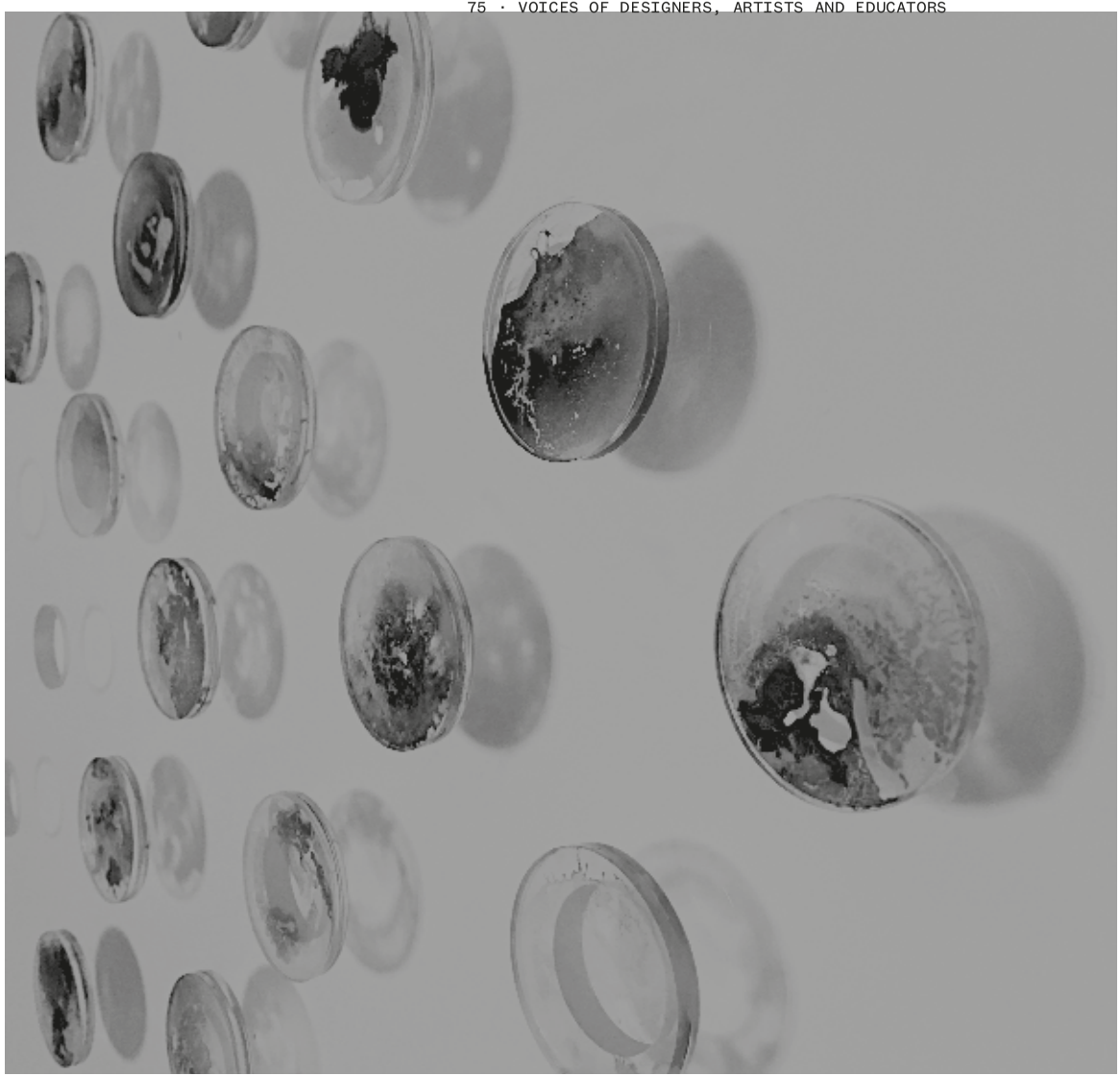




Fig 3.3.1d: Interactive Installation.
(Photos courtesy of VCUArts)

Project 02: Local Markers as Material Connections

In March of 2022, while leading a workshop with a group of cross-disciplinary design students, *Material Connections,* at the Escuela Superior de Diseño de la Rioja (ESDIR) in Rioja, Spain, they were asked two questions: 1) "How *do* materials connect?" and 2) "How does their connection affect their function, human interaction, lifespan, and disposal?" These questions were meant to be answered on both a functional and emotional level. During the course of the week, the students worked individually, and then in pairs, to observe and document how materials connect within their local surroundings, including specifically 1) the school (interior landscape); 2) their home (interior/exterior landscape); and 3) their immediate natural environment (exterior landscape).

Participants in the *Material Connections* workshop included twelve fourth-year undergraduate and graduate students from the disciplines of fashion design, graphic design, interior design, and product design. Each one-day exercise incorporated an hour of observation and photo-documentation of objects and surfaces within a specific environment, presented on the day, followed by two hours of material experimentation, and ending with an hour of open discussion of findings on feasibility, functionality, climate-positive initiates, sustainable practices, and the role of designers as change makers.

Methods and Materials

The workshop was designed to include a series of four one-day exercises followed by an exhibition of work. During each exercise, the students observed and photo-documented nine connections, formatting the images into a grid (fig. 3.3.2), and presenting their findings for analysis and discussion by the group. From the nine material pairings, students selected several on which to iterate potential physical samples, experimenting with a variety of *bricolage* materials — those materials found within their immediate environment — to brainstorm new ways of joining, attaching, binding, integrating, and embedding materials.

The decision to use bricolage materials was intentional as a way to *link to the locale* through bricolage thinking. Bricolage thinking, when used to solve problems, is more constructive than analytical thinking, and encourages solutions through experimentation and play (Keisuke, 2017). This way of creating, coined by the French anthropologist Claude Lévi-Strauss in 1962, introduces the immediate and the random, by which he positions,

"The process of artistic creation therefore consists in trying to communicate (within the immutable framework of a mutual confrontation of structure and accident) either with the model or with the materials..."
(Lévi-Strauss, 1962).

The students were given an hour each day to collect the bricolage materials, which included visiting studios within the school to gather small samples of scrapped materials (wood, metals, textiles, plastics, paper, etc.). In the case of the third exercise, the *natural environment,* the students worked in pairs to collect natural materials within a two-block radius outside of the university. These locally-sourced materials were used alongside the processed materials to create hybrid outcomes.

During the final, fourth exercise, the collection of material samples was used as inspiration to ideate products and environments that demonstrated best practices, design for disassembly, reuse, repair, and reassembly. Every effort was made to find sustainable ways to join the materials without the use of toxic adhesives. Final concepts were selected and visualised digitally through the lenses of fashion design, graphic design, interior design, and product design.

The week culminated on the fifth day in a final exhibition of the work, including a montage of the photographic grids connecting to nearly 100 material experimentations and the final curated collection of outcomes (fig 3.3.2). The students verbally presented their findings to their peers, faculty, and administration. The resulting response from the students was a new outlook to materials, within varied social contexts relating to function, appropriateness, sustainability, connections, and disposal.

The outcomes from the students initially were of an expected nature, putting materials together that felt *appropriate.* Through repeated critique and continued exercises, students began to embrace a greater openness to the materials. One industrial design student noted, "Balsa wood x low density polyethylene foam: taking a look at the past as a form of inspiration with a twist in the materials connected together (fig 3.3.2b). A second student from interior design wrote of the natural study, "Only in one leaf can we discover many different shapes, textures, colours, and stories. These samples are the connection between all of them." Using bricolage thinking, students simultaneously showed *consideration* and explored *chance* when playing with the combinations of materials existing next to one another, and finally generating inspired outcomes that included options for disassembly and self-generated textures for surface design.

Fig 3.3.2: From top to bottom: Fig 3.3.2a: Students selecting and critiquing final work, including material grids, material experimentations and final outcomes. Fig 3.3.2b: Material Connection outcomes 1) Magnolia leaf, cut and inverted, natural study; 2) honeycomb kraft paper x double-stacked acrylic sheets; and 3) low density polyethylene foam x painted balsa wood.

Conclusion

As artists, designers, and educators with a lens on materials, finding new ways to work with local resources, whether they be extracted or bricolage, is instrumental to connecting materials as markers of place. Success has been shown in design projects in which designers have had first-hand experience with materials, specifically the selection of materials in which to define cross-disciplinary subject-object narratives. Through interactive exercises, including observation, experimentation, and assemblage, designers are able to generate uniquely considered outcomes that link collectively to a sense of place.

The material connections represented in these examples are singular and collective experiences within a shared local-global narrative. Such narratives have the potential to produce new material results that can be defined as both emotional and functional, the development of material connections made through human inquiry and experience.

As evidenced in both the curated, interactive project and the process-led material workshop, an awareness of the provenance of materials strengthens the connection of the designer to the outcomes, thereby increasing the chances of utilisation in future products and environments, and ultimately promoting greater adoption within their design communities. In addition, promoting cross-disciplinary collaborations with local and international design teams allows for new perspectives on local materials, encouraging the potential discovery of the overlooked, and fostering new constructs for future material markers.

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3.4

OCEAN PLASTIC: Towards New Experimental Making and Material Outcomes.

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ABSTRACT

The material culture of beachcombing in island communities offers a rich narrative backdrop for the exploration of socially responsible engagement with ocean plastic. Estimates vary widely, but a much-cited 2015 study by Jambeck et al. gives figures of between 8m to 12m tonnes of plastic entering the world's oceans each year. Later studies highlight the challenges of gaining more specific figures, given the near impossibility of measuring micro-plastic particles on a global scale (Boucher and Billard, 2019; Watt et al., 2021).

The island of Scarp, just off the Isle of Harris, was until 1972 home to a community of around 200 people. A treeless isle, the inhabitants relied on ocean currents to bring timber for building repairs, making furniture and even coffins. For today's inhabitants, the owners of four holiday homes, the sea brings myriad plastic objects that are often reclaimed for domestic use. This plenitude of plastic has led to three connected design explorations that foster and promote socially responsible community engagement in response to the problem of ocean plastic.

The first exploration is a cultural examination into the way in which islanders have utilised materials and objects as both practical and decorative objects. This has given rise to conversations about something seen as an environmental

catastrophe to many, a source of material to some, albeit from a highly randomised commodity supply chain, or to others a simple inevitability (Lambert, 2019).

In seeking to emphasise the potential of the plastic as a viable and abundant material source for forms of micro--manufacture, the second exploration conducted experiments and workshops in using ocean plastic as 3D printing filament. The distributive power of this form of digital fabrication might allow for more practical outcomes in remote communities (Vones et al., 2018; Lambert & Vones, 2019).

The third exploration attempted to adapt a mass production technique — injection moulding — for use on the beach. This in-situ craft production brings the manufacture to the source of the material in remote communities (Lambert, 2017).

The heritage of beachcombing in remote parts of the Highlands and Islands offers lessons in recycling and reuse, and through these material experiments serve as a reflective counterpoint to mass consumption and disposal in more populous areas of the industrialised world.

KEYWORDS:
Ocean-plastic; Making; Material-culture; Beachcombing; Design.

Introduction

The small and little known island of Scarp lies just a short boat ride from the north western edge of the Isle of Harris in the Outer Hebrides, 50 miles off Scotland's Atlantic coast. Abandoned by permanent residents in 1972, the island is now only used in summer by owners of four private holiday homes.

Ethnographic and oral histories collected from a number of people either born on Scarp or descended from *Scarpochs* revealed daily life on the island in its heyday and pointed to a rich narrative of resourcefulness in remote communities and a material culture of beachcombing (MacLean, 2015). Those who still use the island as a summer retreat have also provided valuable insights into life on the island some 50 years later. Both ex and present Scarpochs reveal much about their relationship to the sea in their use of materials washed up amongst the flotsam and jetsam of the island's south west facing beach, the *Mol Mòr* (Gaelic for "big beach"; see fig. 3.4.1).

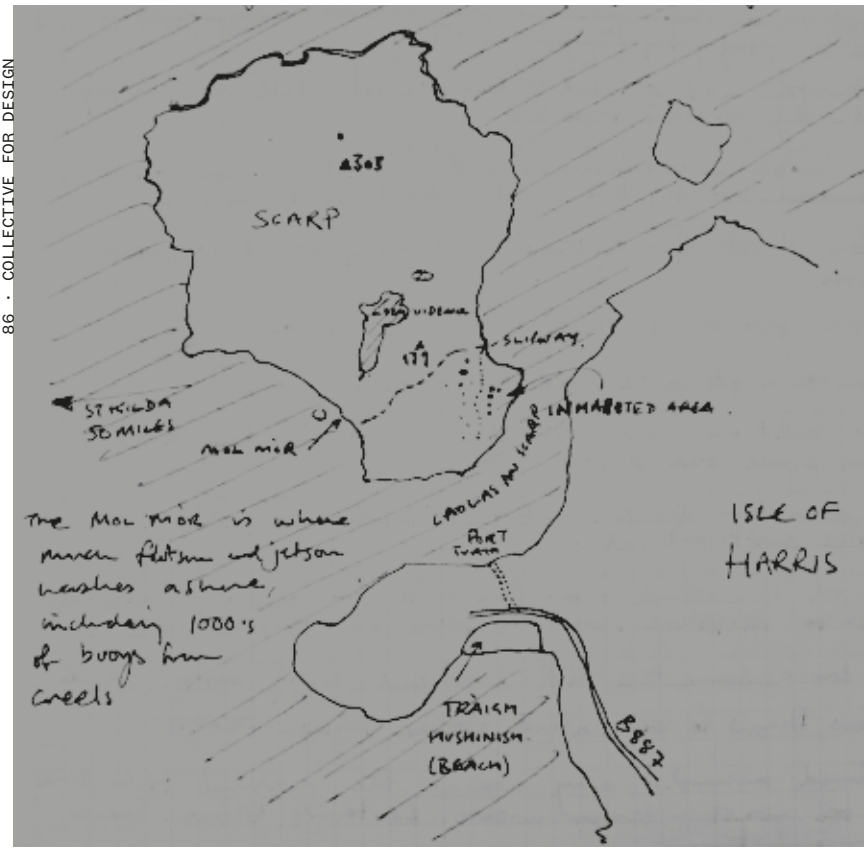


Fig. 3.4.1: Map of Scarp, copied from OS map (Ian Lambert 2015)

Today, much of the detritus found on the beach is plastic, including polypropylene rope, nets, crates, and trawl floats, HDPE and PET bottles, polyester pallet binding, polystyrene, and nylon rope, rubber boots, PVC pipe. Aluminium, steel and timber was also abundant.

Ocean plastic pollution has gained increasing public notice in the last ten years or so (Lambert & Vones, 2019). Estimates of the amount of plastic entering the oceans each year range from 5m tonnes to 13m tonnes (Jambeck et al., 2015), although "[...] no rigorous estimates exist of the total amount and origin of plastic debris in the marine environment" (2015, p.768). Later studies cite this research, but highlight the acute challenges of measuring micro-plastic pollution (Boucher and Billard, 2019; Watt et al., 2021). As far back as 2010, an episode of BBC Radio 4's Costing the Earth (Roberts, 2010) provided a detailed report on the Pacific Garbage Patch. This is a mass of plastics floating on or just below the surface that has collected in the north Pacific Ocean, and is rapidly growing (Lebreton et al., 2018). It was estimated to be twice the size of France in 2014 (Callan, 2014), and 50 percent bigger again four years later (Lebreton, 2018). It is in fact one of five gyres (Cózar et al., 2014).

☞ The final episode of the BBC's Blue Planet II in 2017 with Sir David Attenborough marked a high point of recognition of the problem (Lambert, 2019).

☞ The study by Jambeck et al. is widely cited stating that reports of ocean plastics started to emerge in the early 1970s with estimates of around 6 million in 1975 (p.768). From this we could make a calculated guess exceeding 200 million tons in total today. However, this is wildly different to other estimates of surface plastics only that are much lower at 7,000 to 35,000 tons (Cozar et al., 2013, p. 10239), although they say that plastic that has sunk cannot be accounted for (p. 10243).

☞ One each in the north of south Pacific, and north and south Atlantic Oceans, and one in the Indian Ocean (cf. Ocean Clean Up, 2022).

There are multiple challenges in returning the plastic to large scale manufacturing, not least cost-effective retrieval: much of the plastic (up to 60%) in the ocean consists of particles smaller than 1mm in size (Roberts, 2010), although again, this figure is difficult to pinpoint (Boucher and Billard, 2019; Watt et al., 2021). National Geographic estimated that up to 70% of the plastic forming the large gyres sinks to the ocean floor (Bawden, 2014). If retrieved, the plastic needs to be cleaned of salt and microorganisms that will contaminate recycling, but even then, ocean plastic photo-degenerates in ultraviolet light after many years floating around. This, along with continuous contact with salt makes the ocean plastic brittle (Lambert & Vones, 2019). It can be returned to the recycling stream if mixed with plastic retrieved on land and a certain percentage of virgin plastics (Corbin, 2014; Hurst, 2012).

The investigation of the material culture of Hebridean islanders foregrounds the environmental threats that the sea debris brings today, and the possibility of recycling and repurposing plastic objects. This paper comprises three studies; the first on the material culture of beachcombing; the second emphasises the potential of ocean plastic as a material for digital micro-manufacture; the third, highly experimental, attempts the adaption of a mass production technique — injection moulding — for localised use on the beach.

Documented accounts from the Outer Hebrides point to a heritage of beachcombing dating back centuries (MacLean, 2015). There is a narrative of an historical resourcefulness and self-sufficiency which has changed as the use of sea-faring trade routes have advanced within a globalised economy. This distribution of an abundant waste material gives a narrative of the easy availability of many items in the industrialised world.

For islanders, the relationship with the sea is materially important and culturally defining. The sea can be seen as the bringer of 'gifts' and, with Scarp being treeless, driftwood was historically important for the building and repair of homes and furniture; making creels, and even coffins (MacLean, 2015). Other flotsam and jetsam washed ashore continues to be used by islanders in crafts and other forms of income generation.

Many homes across the larger neighbouring isles of Harris and Scalpay will have buoys and trawl floats hanging on fences and gate posts as decoration. PVC pipe, which is in plentiful supply from wrecked fish farms, is often used for drainage under footpaths, and sometimes filled with concrete and used as fence posts. Larger pipes can be split lengthways to make feeder troughs for livestock. Rope has obvious re-use potential and netting used as windbreaks or to prevent ground erosion. Many islanders have fish boxes — plastic crates from fishing industries — for storage and transportation. There is also a small craft industry repurposing found objects as tourist souvenirs, including floats made into bird feeders, and plastic fragments refashioned as buttons (fig. 3.4.2).



Fig. 3.4.2: Repurposed items at the Handmade Harris Craft Market in Tarbert by Lorna Wheeler. (Ian Lambert, 2019)

The Mol Mòr on Scarp is today littered with plastic, including polypropylene rope, nets, crates, and trawl floats, hundreds of HDPE and PET bottles, tangled masses of polyester pallet binding, polystyrene, and nylon rope, rubber boots, PVC pipe, as well as other materials including aluminium, steel and timber (see fig. 3.4.3). Such sights are not uncommon in other remote parts of the Scottish coastline.



Fig. 3.4.3: Plastic debris on the Mol Mòr, Islet of Scarp, near the Isle of Harris (Ian Lambert, 2015)

In a 2015 interview, one couple who had a holiday home on the island from 1980 to until recently, told how they improvised with many items retrieved from the Mol Mòr over the years, for repairs and making things. A tour of their home revealed examples of adapted objects and materials, which included PVC pipes to repair plumbing and irrigation systems; trawler floats, about 200mm in diameter appropriated as toys (they had a set of six orange and six yellow floats used for playing Petanque, with a smaller green float as puck); a nylon plastic board cut down for fish preparation; rope and string re-used in a number of ways; and an array of decorative objects, including a shark fishing lure.

☞ David and Lesley Cuddugan; interviewed by Diane MacLean with additional questions from Ian Lambert (recorded), Scarp 15 July 2015.

Startlingly, the couple told how the variety of objects washed ashore on Mol Mòr had diminished in the last 25 years, since New York had stopped dumping garbage in the sea in the early 1990s. They even recalled that in the 1980s their children used to return from the Mol Mòr with odd pairs of flip-flops, the same size. After a visit to the Mol Mòr to survey the plastic, it was put to them that it might be appreciated if the beach was cleaned up and the materials recycled. They were somewhat aghast at the idea. "Where would we get all our supplies?" one of them asked, the Mol Mòr being their very own "B&Q" ☞ B&Q is a major chain of British hardware stores. hardware store. It was also pointed out that the cost of recovery from such a remote place would be prohibitive. There are, arguably, grounds to preserve the site with all of its flotsam and jetsam in the heritage of beachcombing that has sustained island life for many years.

Either way, with such abundance of plastic, many questions arise about what else could be done with this material at a local level.

3D Printing with Ocean Plastic

The team started to consider ways in which the material could be used in digital micro-manufacture. A series of experiments were set up to explore how different types of plastics retrieved from the ocean would perform in 3D printing, and samples were collected for laboratory testing.

Close up photography magnified the material x5 and revealed how, to varying degrees depending on its type (e.g. polypropylene, HDPE, etc.), the plastic had become brittle after years of exposure to UV light and salt water, and had start to fragment into micro particles. It also showed contamination with biological material that had attached itself to the object. Technical data and formal identification of plastic types with the assistance of a polymer scientist informed experiments in creating filament and determining its performance (strength, printability and melt-flow). 3D printing filament is made relatively easily with inexpensive equipment for granulating plastics and a thermal extruder. In some cases, the resultant filament retained some of the contaminants, in spite of efforts to remove them, but also retained a smell of the sea. This smell was generally received positively and served as a reminder of the origins of the material.

Polypropylene mixed 50:50 with PLA was found to perform well and was used in a series of public engagement workshops at schools on the Isle of Harris and in Mallaig on the mainland, and at a research conference in 2019. Blue polypropylene mixed with white PLA gave rise to a filament that

had an aptly watery appearance. At one workshop the group chose to print simple rings (fig. 3.4.4), as they were small and quick to produce, and, as jewellery, had a symbolic value. One of the designs had "26.8kg", written on the side, from a conceptual narrative based on the amount of plastic each person in the world (7.6bn at the time of the workshop) would have to collect in order to retrieve all of the plastic estimated to have entered the ocean in the last 25 years (Lambert & Vones, 2019).

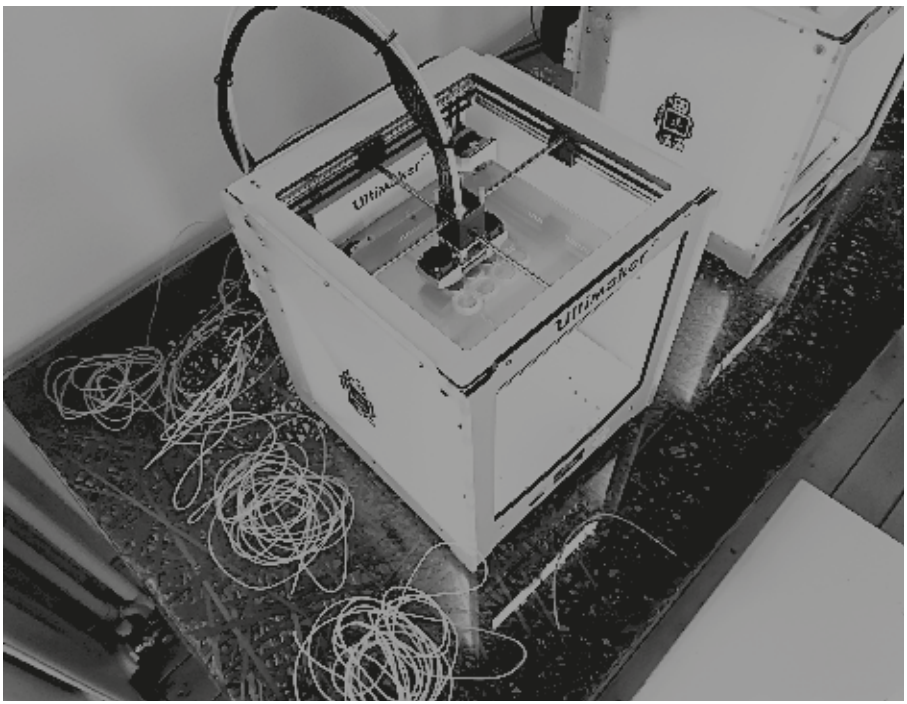


Fig. 3.4.4: Digital Crafts: 3D Printing Filament, Kathy Vones and Ian Lambert, 2019.

3D printing has become increasingly widespread and accessible, with some filament printers costing only a few hundred euros. This and the other equipment mentioned above are economically accessible and simple to use in a localised redistributed digital fabrication network, where some ocean plastic can go directly from beach to manufacture, not only for rings, which might seem like "crap jects" to some (Smith, 2012, np), but with utility objects and components printed from open-source STL files: "In such a [digital manufacturing] context, manufacturing may be presented as a network of contemporary cottage industries" (Newson, Suggett and Sudjic, 2016, p. 113), a form of artisanal economics and manu-digi-fractured objects which "offers digital artisans a position from which to oppose mass manufacturing" (Norris, 2016, p. 45).

3D printing is not without problems: as a process it can use 50 to 100 times more electrical energy than injection moulding to make an item of the same weight (Arieff, 2014, np). Injection moulding, a quintessentially mass production process, was explored as a craft process, with ocean plastic as the raw material. Inspired by Max Lamb's location specific process of casting pewter stools on the beach (2005), and, and Studio Swine's Sea Chair (2013), made aboard a fishing boat with the plastic retrieved from fishing nets, the fabrication was brought to the beach as an off-grid process. Washed-up polypropylene rope was easy to cut, and melted over a fire of driftwood to make a utility object, bearing the name of the location where the plastic has been retrieved, hence, *The Isle of Harris Fish Slice*. Here, an industrial material and process are adapted as hand-guided craft. However, the implementation of the process had particular challenges. Injection moulding normally occurs in factories with advanced machinery and carefully controlled temperatures. In this case, the making of the injection moulding tool (the cavity into which the molten plastic is injected) utilised 3D digital models and CNC cutting technology readily available in public maker spaces. A sealant gun was adapted as the means to inject the plastic (see fig. 3.4.5). Both were warmed on the fire to aid the flow of the molten material, while the polypropylene rope was melted in a saucepan to be poured into the injection device. While the temperature for injection moulding polypropylene, approximately 220°C, is easily controlled in a factory, on a beach over an open fire, the maker has to use tacit judgement on the viscosity and flow of the material. In the first attempt, the plastic was too hot and when solidified was brittle and snapped. At the second attempt, the plastic set with more flexibility, but failed to flow fully, because the vent holes, essential for displacing the air in the space in the moulding tool, hadn't been cleared after the first use. On the third attempt, the plastic boiled and when solidified it was so brittle it crumbled. At this point, the experiment was abandoned as, although outside and on a breezy day, this proved inadequate protection against the toxicity of the fumes. A respiratory mask with specialised filters is essential for all future experiments.

This novel inquiry used improvisation to explore the feasibility of an off-grid industrial process as a means of crafting meaningful objects in situ for local use. For this to be viable in future, greater sophistication in the technology is required for both temperature control and the capturing of fumes. However, the process and resultant artefacts provide a material narrative that indicates potential viability.

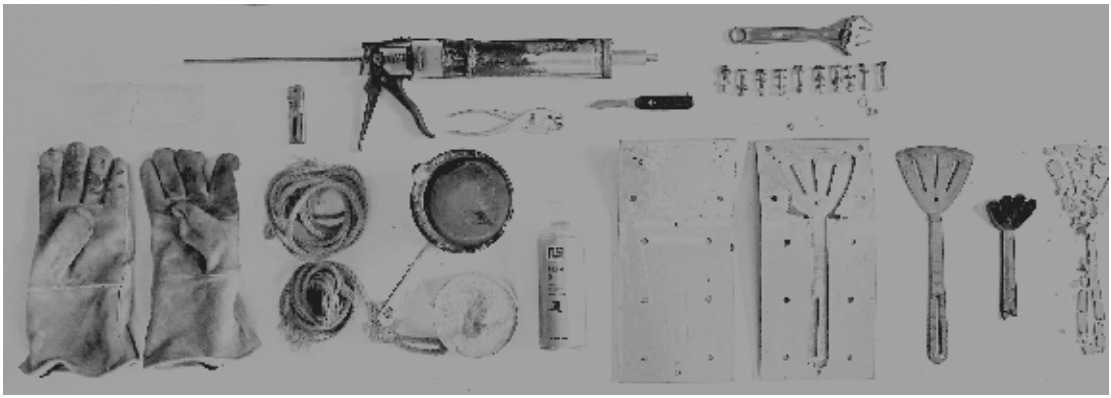


Fig. 3.4.5: In-situ Manufacture: The Isle of Harris Fish Slice. (Ian Lambert, 2017)

Conclusion

Beachcombing and the re-use of lost objects and materials chimes with a *freeganesque* local sustainability, but does not scratch the surface of the problem of ocean plastic. Much of the larger plastic items on the beaches comes from maritime industries, particularly fish farms, but are in some ways the least of the problem. Smaller fragments of plastic that are difficult to collect, more likely to be absorbed into nature, or drawn back into the sea, or mistaken as food by wildlife. Storm water that cut away at streambanks on Scarp and Harris revealed an alarming stratification of plastic fragments in the soil several feet down.

No claim is made for this work as being a solution — indeed, experiencing the extent of the ocean plastic problem in remote places such as the Outer Hebrides first hand has emphasised that individuals can only have a relatively limited impact. This work is a small gesture intended to bring further understanding to the wider public.

The inquiry into the beachcombing and the survey of plastic debris gave rise to explorations into the potential of ocean plastic as a raw material. Utilising ocean plastic is a narrative on it as a catastrophe and contributes to a much larger community of activism that can demonstrate impact, and its potential to be returned to manufacturing cycles: responses to the problem can multiply accordingly.

Retrieving the plastic will be a vexing problem that will be with us for centuries. It is a pernicious material reality requiring a multitude of multidisciplinary teams working from many different perspectives, including the prevention of plastic entering the ocean. Political and corporate will has yet to emerge to a satisfactory degree.

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3.5

WHY IS CRITICAL ANALYSIS ESSENTIAL TO DESIGN PROCESSES?

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ABSTRACT

Analysis can be understood as an action of divergent thinking when positioned inside a problem-solving situation (Koberg & Bagnall, 1991). Analysis involves gathering facts and axioms to deal with the problem being attacked intelligently. Prominent authors on design process theory (Muratovski, 2022; Kumar, 2013; Jones, 1980; Koberg & Bagnall, 1991) advise that it is wise to become deeply informed on a situation before taking action to change it and avoid the temptation to skip analysis and jump into proposing solutions. Challenging problems are complex problems (wicked problems) that tend to be less accepted and thus be analysed. Therefore complex problems are ideal candidates to be subjected to analysis instead of fundamental everyday routine task problems. Analysis precedes synthesis, which can be understood as a data reduction, cropping, and a filtration activity to arrive at a cohesive information structure (Kolko, 2011). Opposite to analysis, synthesis is an act of convergent thinking inside a problem-solving situation. Thus, analysis requires a critical mental posture or thinking to study evidence from a dispassionate position devoid of emotional judgement. Therefore, critical analysis is an act of deconstruction or disassembly of existing held knowledge, self-inspection of thoughts, removing previously held biases, and dispassionately studying the problem from opposing perspectives. It may

require the analyser to adopt a second-order understanding (Krippendorff, 2006) of the problem under study. Critical analysis hinges on critical thinking, a method for analysing ideas to arrive at an unbiased solution (Think.design, n.d.). In order to execute a project, a designer must possess the ability to critically think and analyse because these competencies promote the identification of knowledge gaps and assumptions. Think.design also alerts that critical thinking isn't necessarily implicative of undertaking a fault-finding mission criticising third-party ideas but rather an exercise of goal definition, expectation management, (mental) conflict resolution, and decision making.

KEYWORDS:
REASONING; Creativity; Problem solving; Analysis; Design process.

1. Introduction

In this article, the authors will examine critical thinking and its extension into critical analysis from a position of contrast between moral fundamentalist thinking (Fesmire, 2019) versus wicked problem thinking (Rittel & Webber, 1973). Fesmire warns that problem-solving cannot be approached from an oversimplified perspective of casting a problem mentally in such a manner that essentially discards opposing points of view and rejects any neutral rationalisations devoid of biases. Such a mental posture compromises the problem solver to adopt a trajectory of oversimplification, hides unnoticed parts of the problem and positions the problem as a result of "others" not understanding the problem. Rittel (1973), therefore, suggests an alternative mental posture of wicked thinking that assumes that optimum solutions do not exist and problems, especially social problems, have no objective or definitive solutions.

Critical thinking and critical analysis are indispensable to a design process. Mastering those skills is essential for any creative problem solver. Without analysing facts, observations, and evidence about a creative problem's social, cultural and political context, no insights can be gained, and no final objectives can be envisioned. This process is decisive for abductive reasoning. This reasoning technique abductively promotes envisioning scenarios (Kolko, 2015). Different possible outcomes based on an incomplete, contradictory or vague set of requirements are at the core of how a design process evolves and creative output can be achieved.

For novice designers, it is important to understand that a design process cannot start out of the blue sky. The authors will structure the arguments presented here by bridging analysis (critical analysis), critical thinking, creative problem solving, abductive thinking, and the design process for painting the journey of the designer and artist from the problem space to the solution space of any given situation needing change.

2. Problem Solving

Traditional problem solving is a cognitive process based on three consecutive activities: perception, thinking and action. Descriptions of this linear process date back more than 2000 years (Pappus, 300 BC) and can be best explained with a mathematical problem: first identify and define the problem, generate and evaluate approved methods to solve the problem, and decide and implement the solution. If correctly identified, a simple square root equation can

be solved using a recognised sequence of steps, always leading to two different outcomes. Traditional problem solving is thus a process where knowledge (routines) and experience are crucial for efficiency and effectiveness. Design problem solving, however, is quite a different process (Jones, 1980; Dorst, 2015; Rittel & Weber, 1973). There is seldom a single solution, sometimes alternative solutions, and other times a solution can create new problems to deal with.

Simplified problem-solving is a process where the WHAT, i.e. components, and the HOW, i.e. a pattern of relationships, lead to an OUTCOME, i.e. observed phenomenon (Roozenburg and Eekels, 1998; Dorst, 2015). Depending on which one of these three elements is unknown, three different forms of reasoning may be applied. Deductive reasoning — solid reasoning from cause to effect leading to a guaranteed solution; Inductive reasoning — discovering patterns through direct observation leading to likely but not certain conclusions; and abductive reasoning- based on what one knows and based on incomplete information draws the most straightforward likely conclusion (Roozenburg and Eekels, 1998; Dorst, 2015; Think design, n.d.).

Deductive reasoning is most applied in mathematics and logics, inductive reasoning is most used in natural sciences and humanities, and abduction in medicine, history and law sciences. Rozenburg and Eekels (1995), as well as Dorst (2015), consider a fourth form: design abduction. In this derivative of reasoning, only very little about the nature of the outcome is known, and objectives need to be defined by the problem solver. While no problem-solving process exclusively hinges on any one of these reasoning forms singularly, when considering a design process, in particular, it is a complex mixture of different kinds of reasoning.

While the overall design process can be considered abductive, induction and deduction are applied at different moments. This is solution-based thinking as opposed to problem-based thinking. Understanding of the problem and the solution evolve simultaneously, captured in a phrase by Shön (1991) as reflection-in-action or perception-in-action (Tschimmel, 2011). Dorst (2015) defines this process of design practice as framing, which is reasoning from a standpoint of desired outcomes via speculative frames to conceptualise possible design solutions in an iterative manner. This strategy is essential, when dealing with paradoxes and conflicting statements, characteristic of higher order design problems like wicked problems. Kolko (2015) defines a frame as the constraints of the design problem and the personal mental model of the designer.

A deeper consideration about reasoning as a structured, objective goal-directed type of thinking will be elaborated on in section 4.3.

3. Design Problem Solving

"A problem is a condition or situation in need of change or repair" (Koberg & Bagnall, 1991).

Creative or design problem solving may be understood as the act of dealing intelligently with situations that can be controlled (Koberg & Bagnall, 1991).

Cross (1990) states that the kind of problems that designers solve are ill-defined and unstable (Jones, 1980, p10) as opposed to well-defined. Well-defined problems have a clear path to a solution with one correct answer, whereas ill--defined problems can change according to their framing, contextualisation, and even the proposed solution. In other words, ill-defined problems can be formulated in multiple ways as per the perspective and mental posture of the designer. Here design problems present a challenge to designers, and the design process as a common departure point must be found before problem space exploration. The nature of problems which designers solve thus also renders designing difficult as an activity. Jones (1980) elaborates that a designer must envision the future while studying a problem that exists in the present and proposes a solution, to create a speculative scenario which often changes by the time the solution arrives.

Design problems are rarely explicitly stated and are impossible to solve based only on routine, past experience or intuition. Design problems are open-ended, and the designer's task is to identify an optimal solution amongst multiple alternatives through systematic analyses. A design process evolves around an iterative process where design involves the constant development and refinement of requirements, the synthesis of intermediate design solutions and the emergence of new concepts from what has already been partially designed. Knowledge about the problem changes during the design process, learning occurs because new knowledge is gained and old knowledge is restructured through critical thinking and analyses.

The nature of design problems makes designing difficult. The act of designing creates change in the current situation, which the designer is trying to resolve or improve. The exact dynamics or the nature of this change is difficult to predict, which may enact itself to improve the situation as predicted or instead may introduce further entropy. Consequently, predicting the future while acting in the present, can only be accomplished by drawing assumptions and making decisions on incomplete information (Jones, 1980).

A wicked problem, while not exclusively applied to design problems, are the kind of problem which are difficult to describe, an essential first step in traditional problem-solving. Requirements for wicked problems are often incomplete, contradictory, difficult to recognise, or changing during problem-solving. Every design problem is further novel and unique. A design process must also consider many interdependent factors and deal with stakeholders with radically different world views (Dorst, 2015). Therefore, a design problem is never completely solved (Vermaas & Pesch, 2020).

Professional designers are fully aware of the nature of design problem--solving and effectively apply a goal-oriented approach to experimentation in an iterative process. Novice designers, on the other hand, tend to adopt a conventional approach, working backwards from a clear vision of a possible solution, applying pure analysis and convergent thinking in an attempt to comply with given and self-imposed constraints and requirements (Christiaans, 1992; Gedenryd, 1998; Dorst, 2015).

4. Thinking and Analysis

4.1 Analysis and Synthesis

Analysis is breaking a problem into pieces, and synthesis is re-ordering these pieces into a recombined composition (Dubberly, 2004, p. 22). Examination of the situation (problem) is analysis, and restructuring the situation into an improved assembly (solution) is the synthesis. The examination of the problem at hand is analysis and the act of resolving the problem through the knowledge gained by studying the problem is synthesis (Koberg & Bagnall, 1991). Koberg and Bagnall explain that the actual advantage of reducing problem solving to this basic two step analysis-synthesis process is to convert the designer's energy more towards addressing the solution rather than wasting energy worrying about the problem.

Kolko (2015) in developing his theory of synthesis presents this activity as making sense of chaos. Synthesis is about arranging, reducing and clearing the mental picture of the problem at hand he says. Whereas analysis is objective based on critical thinking, reasoning, and easily externally visualised, synthesis is often "mysterious" (Kolko, 2015) intuitive, and difficult to visualise externally. Therefore the value of analysis is agreed in the commercial industry (Think.design, n.d.) the value of synthesis is often suspected by non-designers in industry due to its largely invisible nature. Engineers may find synthesis especially frustrating because they operate on objective testing and measurements. Whereas analysis may lean

towards deductive and inductive reasoning, synthesis may lean more towards abductive reasoning. Thus synthesis when not externalised through a design process may remain in the domain of the "black box" as discussed by Jones (1980). How a designer frames a design problem has a large influence on the success the designer meets in synthesising a solution. The more experienced the designer, the better the framing (Kolko, 2015).

4.2 Creative Thinking

To explain creativity in the field of Design, it is important to adopt a systemic perspective on creativity to recognise the emergence of creative ideas and the underlying mechanisms of the design process. Creative ideas are the result of complex dynamic interaction between elements of a system and a multiplicity of processes. This is labelled systemic emergence (Tschimmel, 2011) and is based on logical and associative thinking patterns while processing information. This makes creative thinking difficult and unnatural. Creative thinking is the cognitive ability to deliberately conceive, within a specific area, novel thoughts, processes or products corresponding to predetermined objectives (Tschimmel, 2022). In the field of Design, this activity is named design thinking, a multiplicity of cognitive processes contributing to Design Creativity. Consolidation of research in this area evolved into Design Thinking (DT), a creative method structured as a cross-disciplinary activity for conceiving novel realities and applying the designer's mindset and culture for creative exploration. DT may also be applied in other fields besides Design (Tschimmel, 2022).

4.3 Structure of Thinking: Imagination, Reasoning, Creativity and Problem Solving

Lawson (2005) argues that thinking is a skill which needs training and regular practice, much like a sport or instrumental ability; therefore, needs appropriate attention. Design is a complex skill intricately linked to a certain level of ability to think, Lawson argues. He elaborates that thinking itself is divided into reasoning and imagination. Whereas reasoning is more goal-directed and focused toward an end purpose and therefore structured, imagination is more like aimless self-reflection drawing from personal experiences and therefore more like aimless wandering. Concept generation and problem-solving are closer to reasoning, while creative thinking is closer to imagination (Lawson, 2005).

Citing several theory schools of thinking (behavioural — associative thinking, gestalt psychology — organisational thinking, and cognitive

psychology — information processing thinking), Lawson presents the concept that if science could actually decode how humans apportion and deploy attention, then design process science could be demystified. Therefore it emerges that design thinking and design process share a solid connection.

Lawson goes on to argue, citing Murphy (1947), that the mental processes related to thinking itself are pressured by bipolar mechanics of the external world and internal needs. How an individual juggles these influences decides their unique thinking style. Problem-solving, for example, is influenced by the external world, while creativity is subject to the influence of inner needs. Therefore reasoning and problem-solving are directed to the external world, while imagination and creative thinking are directed to the self's internal needs.

Elaborating further, Lawson cites Wertheimer (1959) to claim there is a distinction between productive thinking and wandering. Productive thinking is goal-oriented directional thinking quite tied to an outcome. Wandering, on the other hand, is undirected and can be arbitrarily altered as per the mental state of the thinker with liberty. This is the crux of the differentiation between design thinking and artistic thinking. Productive or directional thinking is tied to problem-solving, while wandering or nondirectional thinking is not tied to direct aim or outcome. Regardless, Lawson claims that people use a mix of both, and so extending from this we can deduce that the ratio of each possibly dictates the thinking profile of an individual.

4.4 Convergent Thinking and Divergent Thinking

The concept of productive thinking can further be divided into convergent and divergent thinking. Convergent thinking is objective and rational (Lawson, 2005). Divergent thinking is more intuitive and imaginative and, therefore, more biassed toward creativity. Design requires a mixture of both convergent and divergent thinking. When discussing the design process and thinking modes in a design process, it is possible to understand that convergent and divergent thinking may be deployed in discrete moments within a process. The analysis phase may be more appropriate to deploy divergent thinking, whereas the synthesis phase may demand convergent thinking to simplify and resolve the design project at hand. The insight generation phase of the process located between the transition of the analysis and synthesis phase may demand a mixture of both convergent and divergent thinking. Therefore, a design process needs a mixture of both divergent and convergent thinking modes (Lawson, 2005).

The link of convergent and divergent thinking with intuition and objectivity may create an interesting bridge between engineering and design training. Cross (1990) claims that intuition is very central to the act of designing and designers employ intuition regularly to arrive at a solution inside a design process. While engineers also use intuition to a certain degree, their tendency is to justify the decisions taken to arrive at a solution through testing and measurements. This discussion may be extended to claim that while designers lean more on divergent thinking with a sprinkling of convergent thinking, engineers may be the opposite — leaning more heavily on convergent thinking with some support from divergent thinking.

4.5 Critical Thinking and Critical Analysis

Critical thinking is a goal-directed structured thinking method suitable for evaluating the merits and demerits of an idea, concept, situation or data set. The purpose of this evaluation is to appreciate a specific entity devoid of emotion and personal prejudices and remove bias (Think.design, n.d.). From this description, one can position critical thinking as a method to perform analysis from a sceptical posture. Analysis, as discussed in section 4.2, is an activity of dismantling a problem and studying its constituent elements. Therefore it can follow that analysis performed with a critical or sceptical posture is critical analysis.

Critical thinking may be understood as a type of thinking closer to reasoning, problem-solving, and convergent thinking rather than imagination, creativity, and divergent thinking. It follows therefore that critical thinking employs deductive reasoning to stay completely objective and disciplined (Think.design, n.d.) rather than inductive reasoning. Within a design process, critical thinking may be useful in every stage (Think design, n.d.) therefore, its utility may be valuable both in the analysis and synthesis phases. In fact, regularly applying critical thinking as the design project progresses may assist the designer in remaining unbiased and dispassionately spot weaknesses in the concept design as well as the final detail design, much like a course correction mechanism. SWOT analysis, in fact, is often used for this purpose in design project framing for this purpose.

5. Design Process (what, why and for whom?)

The generation of a design through a process is somewhat of a mystery (Cross, 1990). Jones (1980, p46) frames that the contribution of process

theory is to externalise or give visual expression to the internal working of the designer's mind while developing an output, thus changing the understanding of creativity from a black box model to a rational model. An interesting insight which emerges here is that a design process helps turn a designer's work from the realms of imagination, creative thinking, and wandering into problem-solving, reasoning, and goal-directed activity. Existing literature (Koberg & Bagnall, 1991) alerts the readers that one need not adopt a false impression that introducing a much-structured design process thus reduces creativity and spontaneity in the designer's work as, on the contrary, much opportunity still remains to improvise and select across various strategies of project development to offer sufficient freedom to the designer.

Both Cross and Jones cite that designers oftentimes find it difficult to explain the reasoning or the mental decisions taken for arriving at the final solution, which we may also understand as intuition. It is the dispelling of this mystery around intuition that current design process literature explores heavily. Though a singular definition of the design process does not exist, this article has positioned the design process as a creative problem-solving activity based on mental reasoning requiring both convergent and divergent goal-directed thinking. The word creativity can be understood through the perspective of unusual behaviour (Koberg & Bagnall, 1991), that which is different, unexpected and atypical. They identified creative behaviour as constructively different from ordinary behaviour, that which is normally expected; therefore, Koberg & Bagnall deduce that creativity is, in fact, constructive extraordinary behaviour.

The purpose of a design process is to make the act of creation and its decision-making (creativity) more structured and replicable. Even though design novices may imagine design through its result, i.e., artefacts, design experts imagine design as a process (Blackler, 2021).

In this article, the authors adopt the following definition: a process is a path of a problem-solving journey" (Koberg & Bagnall, 1991, p. 30).

From these statements, we can understand the who, what, and why of the design process's purpose.

5.1 Different Thinking Modes During a Design Process

Jones (1980) discusses that the act of designing needs the designer to adopt a mentality of a scientist, artist, and mathematician at the same time. Scientists are trained to dispassionately describe the phenomenon under observation unfolding. Such a posture helps designers to understand the

present (i.e. problem identification through critical analysis), which is a solid path to predicting the future. An artist is trained to act quickly on intuition and select a solution amongst a wide range of alternatives. Artistic thinking helps a designer pick a concept for further development and push the process forward toward a solution. A mathematician's mental posture is one that exists relationally, is precise, and represented symbolically and therefore very appropriate to adopt when the design problem is stable and only needs optimization (synthesis).

Lawson (2005) supports Jones' concept of a designer's mental posture by elaborating that a designer is influenced by art, science and technology in operating their craft.

When undertaking creative thinking for problem-solving activity Jones (1980) says that three patterns emerge: incubation, insight, and transformation. Incubation is when the designer gestates the problem mentally without directly studying it. The constant mental rotation of the problem suddenly changes the perception of the problem in the designer's mind. The exact moment this phenomenon occurs is called an insight. Once the insight is born, a transformation follows where the designer no longer pictures the problem as before and has simplified and essentially restructured it into a new entity.

The main opposition to creative thinking emerges from a rigid mind and preconceived notions (Jones, 1980).

5.2 Basic Considerations About the Design Process

Existing literature does discuss that design is a "complex and sophisticated" skill (Lawson, 2005) requiring specialist training. Design itself is a rather recent profession (Rampino 2018, p. 27) when compared to scientific and artistic disciplinary areas. It is only at the onset of industrialised societies which caused design to be accepted as a specialised skill (Cross, 1990).

The lack of an agreed definition of design (Blacker, 2021) may have some contribution in the divergence around an agreed definition of the profession of design. The lack of consensus around design as an entity and an activity also extends into the classification of design as a knowledge area between art and science, or rather an entirely new third pillar of human knowledge (Buchanan, 1992). Therefore, what is common to see in published literature is that authors often frame their own definitions and ideas of design.

The World Design Organization (WDO), renamed so in 2017 from the International Council of Societies of Industrial Design (ICSID), framed a

definition of industrial design in 1957 and suitably modified it in 2017 to keep up with the changing perspectives and pressures (Rampino, 2018) which have emerged since the transition from Industry 2.0 to Industry 4.0. No specific definition of design will be presented here since it is so debated, and one may adopt an author may adopt any definition which suitably defends to the posture of the literature being presented. Rather the authors here look into some seminal literature on design process theory from Jones (1980) to present the effect that designing produces — "to initiate change in man-made things."

This discussion serves to highlight the matter due to the lack of a clear, unified global picture of design as a profession and a knowledge area that, consequently, design process definition also suffers from a lack of a single, unified, pointedly located definition. Published literary evidence and anecdotal evidence easily captured from discourses in academia present the design process as an enigmatic knowledge area with a wide variety of definitions and agreements to its utility and purpose.

Ultimately design process literature presents the value of the design process of turning this complex and sophisticated activity more understandable, structured and replicable. "Everyone designs," says Dubberly (2004, p. 3), "designing is easy when you know how to do it" (Munari, 1992, p. 7), and everyone designs who devises courses actions to change existing situations into preferred ones (Simon, 1988), therefore it would appear that paradoxically design is also a highly diffused activity not needing specialist training and insight into its inner functioning would grant humanity some global ability to dominate its creative power.

Though Dubberly (2004) compiled such a vast variety of process models that one could conclude no commonality exists, the concept of a problem space and solution space can help to simplify their understanding. The problem space is the search space (Jones,1980), therefore divergent in nature and demanding analysis, and the solution space is the final output space and is therefore convergent in nature, demanding synthesis. The Four-stage process model of Nigel Cross (2000) cited by Dubberly (2004) claims that essentially all design process models must converge or synthesise towards a design project proposal even though, at moments, the designers may be compelled to seek alternatives. The design path may therefore revert from synthesis to analysis by diverging and then returning back to convergence once again.

The final synthesis or convergence may be looked upon as a general movement towards simplicity which may be an effective manner to

discharge problems — "the main principle in dealing with complicated problems is to transform them into simple ones" (Jones, 1980, p. 30).

Since this article presents design as a structured goal-directed thinking activity, the classical and basic two-step analysis-synthesis process model (Koberg and Bagnall, 1972) may be a suitable departure point to get a conceptual hold on process theory. This basic model also conveniently postures analysis-synthesis as a problem-solving activity, therefore not mental wandering but very much reasoning. Analysis-synthesis are overlapping phases, passing from incubation to transformation in terms of creative thinking. The junction of these phases is where the insight moment resides.

6. Conclusion

This article connects reasoning, imagination, critical analysis, critical thinking, convergent thinking, divergent thinking, design thinking, creativity, and creative problem solving through the perspective of a design process. Ultimately a design process can be regarded as a strategy to apply creativity toward achieving a specific speculative outcome. Designers are cultural agents, and all present and future design projects need to consider meta-constraints as described by the UN Goals for a Sustainable Future (2015). It follows from there that designers need to master both strategy and culture. The quote "culture eats strategy for breakfast" attributed to Peter Drucker (The Jabian Journal, 2019) is quite apt here. Prejudgement and fundamentalist arrogance have no place in innovative design discourse.

This article discussed the mental skills paramount for the contemporary designer to achieve a creative edge. Both seminal and contemporary references on design theory cited in this article (Burdek 1991, Jones 1981, Lawson 2005, Maeda 2018, Rampino, 2018) have voiced their concern that design is increasing in complexity both in terms of the scale of the problems it is addressing and the level of technology it assumes. 20th-century contemporary design literature advises the designer to think of the user (Jones, 1980, Lawson 2005) while designing to understand how the user understands or perceives, i.e. second-order understanding (Krippendorff, 2006). The 21st-century contemporary literature instead emphasises increasing weightage being attributed to social and environmental factors due to the transition of the industrial economy to the knowledge and transformation economies (Rampino, 2018) have necessitated the search for new processes or at least updating of the classical processes.

Jones (1980, p. 9) presents the matter of ethics in the context of the power which designers possess while developing new design projects. A designer may reveal or withhold knowledge of specific solutions towards the client or society at large as per their personal judgement of good and bad effects of their invention.

These are the pressures and demands that act on a contemporary designer's mental reasoning and critical analysis capability, which they must be trained to address.

This article concludes with an open reflection towards design education. How to train next-generation designers in processes, mental reasoning and analytical capabilities who can participate and generate value in the 21st-century paradigm which will emerge post this transition?

Ultimately (perhaps), the role of the designer is to act as an integrator (Rampino, 2018, p. 29) in the intersection of art, science, technology, i.e. engineering, and even culture. Neither a specialist nor a mere generalist, but one who holds a fundamental knowledge of various disciplines and dominates at least one. The training thus imparted must inculcate this capability.

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3.6

DIMENSIONS OF CREATIVITY.

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ABSTRACT

This research comprises the experimental and genuine thinking processes of art and design information in terms of workplace scenarios regarding the topic 'Creativity' which is present in the learning output of PiCoDe education method; it covers this analysis within the context of its dimensions. In this regard, it aims to address and answer the following questions: 'What is creativity?', 'Who is the creator?', 'How does creativity come into existence?', 'What are the specific characteristics of creative individuals?', 'Why does the business world place importance on creativity?', 'What are the dynamics of creativity?', 'What kinds of techniques and methods exist to enhance creativity?' The answers to these questions are addressed under the topics demand for creativity, thinking with a question and searching for a muse.

This research also aims to explore the definition of creativity within creative design problem solving methods. In this context, the search focuses on a design workshop titled "From Sound to Image' which took place at an Erasmus+ international week in Escuela Superior de Diseño de La Rioja, showing emergence and the development of instant creative works. Studies show that creativity is the result of intelligence, accumulation of knowledge, sensitivity to problems, need to succeed, risk-taking, demographic features,

conditional factors and organisational factors in the business world. Environmental awareness and level of consciousness in creative individuals perceiving by using all their senses and learning by trial-and-error method is high. However, personality features of the individual have a significant effect on utilising the potential and development of creativity. Among the dynamics of creativity, inner enthusiasm, extensive curiosity and constant question-asking are included. Creativity is associated with an active personality, being imaginative, innovative, finding new paths, trying the unaccomplished and discovering new methods.

KEYWORDS:
CREATIVITY; Creative methods; Cultural intelligence; Collective method.

Demand for Creativity

In our modern-day world, creativity which is identified with innovation is a very outstanding feature sought for in every discipline and sector, enabling us to be one step ahead of others. Creativity can be stated as the emergence of a rare, interesting and new idea in different circumstances. The word creativity is derived from the verb 'to create' and to create means to make something new or exist, to invent something. The dictionary definition of creation is, "to bring into being or form out of nothing." Boden (1996) regards creativity as a puzzle, paradox whereas others see it as a mystery. Eceoğlu (2015) defines creativity as having a critical regard, taking precautions in order to encounter designated needs and being able to present new approaches.

Everyone has creative potential, in order to reveal this power with the right work, individuals have to be either guided or an awareness should be created. Creative thinking leads to unforeseen conclusions and sometimes the goal of creative thinking is to reach the innovative and unknown. In this context, design workshops play an important role in uncovering creativity.

PiCoDe workshops conducted in Poland, Portugal and Turkey between 2021-2022 aimed to develop the creative potential of students under various conditions in a prospective workplace scenario. Creativity is a condition emerging in different environments and processes. In this sense, it can be said that among the expected educational learning outputs of the PiCoDe Collective method 'Creativity' outcome is the effect produced by new locations and different cultures in the idea generation process of students from different geographies. At PiCoDe Collective Design workshops, students searched for answers by using Alex Osborn's brainstorming technique with question patterns like 'for whom, why, for where and when'. On the basis of finding a creative idea lies developing an idea in accordance with asking correct questions and finding their answers. Creative individuals have a natural ability to bring different solutions to problems and to think uniquely through a spontaneous energy. In this context, creativity is the ability to relate past, present and future, to imagine and to generate out of nothing. The key point here is to use the past and assimilated personal experiences of the present. Reading a lot, researching a lot, having a good observation power, travelling, relating events or objects through connections form the basis of producing creative ideas. Albert Einstein's words about creativity emphasise that creativity is valued above everything: "Imagination is more important than knowledge. Knowledge is limited. Imagination encircles the world."

In our modern-day world of the 21st century where the population has reached eight billion, being educated from an eminent university or having a notable grade point average isn't sufficient to find employment. Among thousands of applicants, human resources prefer individuals with know-how and experience along with creative power. Individuals with a capacity of producing unique and innovative ideas are regarded as significant sources in uplifting corporations. Creative individuals generating different ways of solutions bring them while distinguishing them from others.

There is a general belief that creativity exists solely in people active in art. This belief is incorrect; creativity is observed in varying disciplines from art to psychology, gastronomy to philosophy, engineering to sociology being encountered sometimes in objects and sometimes in thoughts and ideas regarding all aspects of life.

An artist, scientist or inventor is seldom conscious of how the unexpected ideas emerge. Osborn (1953) said that not all individuals are aware of their creative potential and this condition inhibits them. Dr. J. P. Guilford from University of Southern California has the opinion that creativity like many other behaviours is the representation of acquired skills. Although the limitations of some of these skills are hereditary, they can be attained through learning. Osborn who brought the term brainstorming to our lives stated that civilization has been established as a result of creative thinking. One of the basic properties that differ human beings from animals is that they can produce creative solutions to complex problems by means of their imagination. John Masefield says: "The body of the human being is faulty, his mind is untrustable, the only specialty that makes him attractive is his imagination." Thanks to the imagination of humankind, we are able to communicate with distant acquaintances or lead comfortable lives in smart homes.

Thurstone has the opinion that being highly intelligent isn't the same thing as having creative talent at work. The scientific tests related to creativity have shown that there are no differences between individuals who aren't college graduates. In this regard, although it can be concluded that education has no vital importance on creativity, it is believed that creativity can be enhanced with education and training. As an example, we observe that people with reminiscence problems are able to gain their recollection power with various exercises. Exercise is necessary for a powerful mind and body development (Osborn, 1953). Just as the muscles of an individual develop with sports, mind exercises are essential for the progress of creativity. In his book *Creativity and Innovation*, Yıldırım (1998) suggests

that the development of creativity is correlated with the improvement of various brain characteristics. The left and right brain hemispheres possess different functions. As the right hemisphere deals with creative functions such as imagination, painting, music, emotions, the left hemisphere is responsible for duties which demand high analysis like mathematics, language and logic. These two hemispheres are physically related with each other functioning as a whole.

In their book titled *Creative Confidence* David and Tom Kelly (2013) point out to educator Ken Robinson's 2006 TED talk. As an answer to the question 'do schools destroy creativity?' Robinson states that creativity is as important as literacy in education and it should be treated in the same status. In the business world creativity stands out as an innovation. Technology stars Google, Facebook and Twitter have liberated the creative senses of their employees in order to change the lives of millions. Nowadays new solutions are experimented in all sections from customer relations to finance departments which makes companies in need of employee insights and new ideas. Whether in Silicon Valley or in Shanghai, Munich or Mumbai, the traumatic effects of the market are perceived everywhere. An Adobe Systems survey conducted among five thousand individuals in three continents demonstrated that eighty percent of the people regard the release of creative potential as the secret of economic development. At the moment the business world is aware of the fact that innovation is the key to development and survival (Kelley, 2013). In our present world, designer teams, artists, architects and other creative professionals are continuously working to invent, develop and rectify products (Cox, 2018). Especially with the features of smartphones being renewed each year, a tremendous competitive environment is created worldwide. As an example, more light sensitive camera sensors, batteries with longer lasting powers, lighter and more ergonomic designs competing with each other are presented to customers. Behind all these works are the ideas of creative individuals. Everything is born from an idea. In today's world individuals with the most innovative and unique ideas come into prominence. New ideas which enrich life are developed in line with curiosity and creativity making companies with new ideas and broad visions one step ahead of the rest.

Robinson (2008) stated that national governments, business corporations and other organisations are placing more emphasis than ever on the basic need to support creativity and innovation. New technologies change the nature and quality of the work and new business lines demand higher levels of know-how, creativity and modernism. In order to survive in a

competitive market environment, new products along with new ideas are being continuously developed. As an example, we can take a look at the renewal and change process of mobile phones which are released yearly to the market presenting a different feature. An innovation in the industrial design of the device regarding the development of the camera feature is of interest to millions of users. During the 21st century, technology giants are trying to make life easier and more practical with an effort to reach 'always the better' with the innovations they make each year. From mobile phones communicating with home appliances to VR glasses, technology attracts people with creative innovations and develops at a tremendous rate.

Cox (2018) suggested that great ideas are in relation to taking risks; each idea that changed the world initiated with the idea of an individual. As an example, Mahatma Gandhi and Martin Luther King are remembered as different-minded leaders who changed the world with their peaceful approaches. Rhetorical speaking is also a strong creative method of expression. Gandhi's "Be a part of the change you want to see in the world" statement reflects his peaceful vision and depth. As reported by Cox (2018), creative thinking leads to unforeseen conclusions and sometimes the goal of creative thinking is to reach the innovative and unknown. On the basis of finding a creative idea lies developing an idea in accordance with asking correct questions and finding their answers.

Thinking with a Question

The starting point of most design projects is a problem, it is either the development of a product or a logo or the indication of an idea. Designers and clients generally think very limited at the start which restricts the success of the outcome. At the first stages of the creative process, designers use the time to define (and question) the problem. As methods like brainstorming and mind mapping help designers constitute basic concepts, others (interview, focus groups and brand mapping) try to illuminate the problem by asking the request of the users or previous actions. Most of these techniques may be placed in any phase of the project. Brainstorming is the first step in the process of many designers and it is essential for almost all thinking tools therefore we placed it on top (Lupton, 2011).

Clegg and Birch (2010) suggest asking 'What's the question?' and 'What's the answer?' in instant creative techniques. 'What's the question?' defines what the problem is and 'What's the answer?' designates solution proposals. Accurate questions are necessary for understanding the problem

and finding solution suggestions. In order to reveal the problem statement, Clegg and Birch (2010) advise directing questions patterned like 'how to...' and 'why' as in the compass guidance technique.

In the book *Instant Creativity,* a solution to 'What is the question' is found by using the techniques obstacle map, the level chain, aerial survey, destination, do nothing, shorts, adventure, outside in, up and down, time slices, thesaurus, crystal ball, web wandering, excellence, army of a thousand, solve a different problem, restatement, whiteboard, mudslinging and questions race. Creative techniques push individuals to a different point of initiation, present chances to build new relations and aid in gaining a new point of view conclusively leading to revealing a completely different thing. Most of the techniques require an association with something and then relate these combinations to a problem or necessity.

Another dimension of creativity is the courage to create. Rollo May (2010) grounds creativity to different perspectives based on courage, confrontation and unconscious processes. May affirms that living in an unsteady era where radical changes from education to technology, family structures to manner of life are witnessed, courage is required to live sensitively. May categorises courage to three parts as physical, moral and social. In his view courage is a foundation that lies beneath all other virtues with individual values bringing authenticity to them. He associates social courage which he defines as the opponent of apathy, confronting two different fears. "Creative courage" addressed by May from a philosophic and psychoanalytic point of view also covers uprising, mistrust hence alteration. As Paul Cezanne believed that he discovered a new form of space which would radically affect the future of art, he was also sceptical. May demonstrated that the relation between self-commitment and doubt is never irreconcilable; that self-commitment is reliable despite doubt. Scepsis is as essential as creative courage in the formation of new forms, new symbols and new models. May believes that brave people who reveal this alteration are predominantly artists, play writers, musicians, painters, dancers and poets (May, 2010).

As we observe created art, we perceive the artist's view of life, resistances, courage and life stance. Creative works awaken unique and different feelings that have never been heard, seen or read. The anxiety, sadness, hopelessness, passions, quest and query of a person who composes a poem, a painting, a sculpture or a thought from nothing, lead him to create internally. During this creative process the intuition, imagery, research abilities also play an important role.

Searching for Muse

The concept of muse is used for searching an artistic inspiration source. As I was undergoing my undergraduate education, some of my teachers advised me not to wait for a muse but to go out in order to find the solution of a problem which was incomprehensible to me at that time. I would sometimes sit under a tree listening to music or visit the Bilkent library, spending hours at the magnificent art collection department and doing research. The simple sounding task of walking in fresh air always helped me discover interesting and unique ideas along with relaxation and mental liberation. As I think of creative techniques, I can admit how inspiring changing locations and listening to instrumental music, chill out, ambient music styles help me in concentrating deeply, my belief is that they stimulate different brain parts motivating creativity.

Cox (2018) regards music as the purest manifestation of creative thinking being neurologically one of the most complex ones and defines it as an indispensable bridge between work and play. He adds that operating rooms have all sorts of music from heavy metal to Mozart emphasising that music is a crucial element in the works of artists or designers. Music is the sole activity that stimulates all main fields of the brain, getting both hemispheres into action and utilising the cortex and the limbic system. Varying music styles affect different parts of the brain as a discordant tone may stimulate 'fight or run' reaction at the amygdala, a pea-sized structure situated inside each cerebral hemisphere. As in jazz music where unexpected changes occur, high vigilance at the awareness parts of the brain might be stimulated (Cox, 2018).

ESDIR (Escuela Superior de Disena de La Rioja) La Rioja Design High School organised an international workshop as part of the Erasmus education mobility between November 25-29, 2019. The design workshop titled 'From Sound to Image' which I conducted, prepared an environment for students to experience a creative process with an experimental approach (fig 3.6.1: From sound to image workshop, 25-29.11.2019, ESDIR). The participating students originated from different disciplines and this fact was important in stimulating more creative and unique works. During the first day, about 20-30 various environmental sounds were played for one hour to students from different departments and class levels. These were, among others, the sound of a car motor, a laughing person, a crying baby, knife and fork sounds from a dining table, sound of a locomotive, thunder sounds, car brakes and a departing aeroplane.



Fig 3.6.1: From sound to image workshop, 25-29.11.2019, ESDIR.

The students were asked to rapidly express these sounds with stains on a paper using the material of choice and mixed technique (mix media) in accordance with the rhythm and decibel of the music. In this experimental study where there is no right or wrong, the rhythm or decibel of the music directed the dimension, colour and shape of the stain. The students listened to each sound separately for multiple times and after the second or third time they transformed what they heard to papers in the form of stains with the material of preference. As a result of this one-hour session; independent, different and interesting experimental stains were formed in front of the students with various weights and tonal values.

The stains created with the sound audition were laid on long tables and examined with the students. Among the most expressionist stains of every student, the one resembling a typeface or the texture with a transformation potential was selected. The students were then asked to prepare an alphabet design from the stains they created based on sounds. These stains of different weights were designed as the Latin alphabet from A to Z in accordance with the anatomical structure of the letter, in accordance with basic design principles such as contrast, movement and emphasis. As some students created letters on graphic programs by digitalizing the form they generated, others used the mixed technique they utilised in the sound study to create typefaces. The students revealed experimental approaches in the leg, arm, ear, shoulder, tail and spines and the ascender, descender parts of the letters due to the fact that they weren't able to master the anatomical rules of typography as they originated from different disciplines. The designed typeface was then digitised in accordance with the structure of the letter and the whole alphabet was organised. Along with this design, a word defining this typeface was requested from the students. This word was designed on a separate page along with the alphabet

design. In this process, which I named as a journey from a point to another universe, the only starting place was sound. This design study was the journey in which the students transformed the free stains of different environmental sounds created without thinking perceived only with their senses, into letters (figs 3.6.2/3/4/5: Various experimental typography processes, ESDIR, 2019).



Fig 3.6.2: Christina Loma's experimental typography process 2019.





Fig 3.6.3: Niurka Urretxa's experimental typography process, ESDIR 2019.

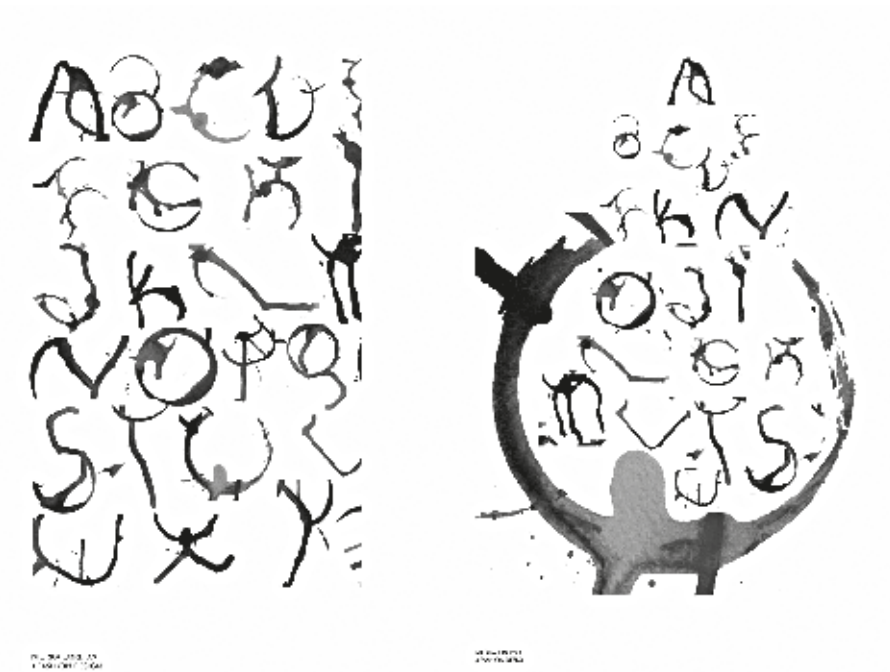




Fig 3.6.4: Sheila Ramón's experimental typography process, ESDIR 2019.



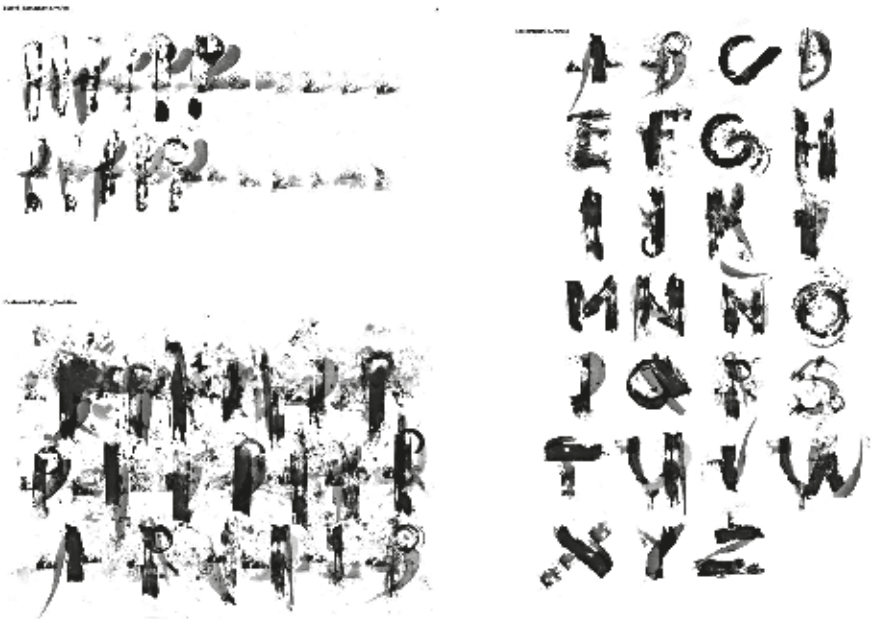


Fig 3.6.5: Sofía Fernández experimental typography process, ESDIR 2019.



In today's world where inspirations from the internet world are frequent, this sound study revealed the creative potential within the students. Textures generated from any sound turned into an alphabet and then into a word corresponding to the content of the typeface. In ESDIR, La Rioja Design School, design students were able to discover their inner creative potential and experience the transformation of an ordinary sound into a letter. In this study, it was observed that the students transferred their inner potential more comfortably due to the fact that all senses were used simultaneously, the sound study was transient, there was no wrong or right during the transformation of sounds into forms and they were technically let free.

Design workshops, limited with a specific time, are great attainments for future challenges to be faced in the business world where designers have to work day and night in order to catch up with the deadline. Simulation of workplace scenarios at the design workshops, the challenges faced, limited time have all been an informative experience. In design workshops where creative ideas compete with each other, there can be moments where the conclusion and initial idea might be different. Unforeseen disruptions or new ideas might evolve the initial design. Design workshops are participant oriented design forms which connect creative common design methods with organised sessions so that the participants can work with design team members.

Conclusion

"Curiosity is the key to creativity" (Akio Marita)

Sungur (1992) stated that the features of a creative person are: continuously occupied with something, high awareness, interested in mystery, in possession of a different hierarchical value, desire for excellence, energetic, fault finding, strong kindness, positive criticism, fond of loneliness, individualistic, intuitional, making mistakes, curious, discordant, having absurd habits, questioning, not suppressing feelings, having sense of humour, internally oriented, free in thoughts, decisively aimed, self-confident and self-sufficient. Additionally, these individuals who are open to other ideas and external stimulants are opinionated, sincere, self-educated in every field, simple, emotional, have a strong visual perception, value diversity, eager for risks and don't place emphasis on power and status. For instance, creative teachers don't work for power nor status, they are fond of working alone and being accepted. In fact, they develop qualities which challenge the conformity of the team, they are self-sufficient, finding and making mistakes, exhibiting childish behaviours (Sungur, 1992).

A creative person leaves a positive trace for the present or the future by utilising past involvements for a better purpose. Eceoğlu (2015) declares that the fundamental principle of creativity is the action to change ourselves and the environment or even the world. According to her, the development of an individual's creative process arises from the past involvements, personal progress, summation of knowledge, analysis of environmental cases, experiences gained from subconsciously constructed imaginative incidents. In this sense, San (2003) suggested that the creative process depends on previously acquired knowledge and the association of new experiences with the old ones. The creative course is formed of "fulfilment and formation", formation is a change; it is the figuration of something nonexistent until now. As creation can be to bring something into form out of nothing, it is generally and mostly the readaptation, reuse of an existent material. As to Landau, creation is to build relations between formerly unbound connections, the ability to present new lives, experiences, new ideas and new products within a thinking schema (San, 2003).

During a creative resolution, a physical activity is recommended as well as imagination techniques in order to relax the body. Sometimes when I assign my students a design project, I leave them free to drink coffee and take a breath of fresh air and walk in the woods of the campus so that they can find their 'muse'. As some of them return with authentic ideas, I believe that fresh air and change of location is of benefit. My belief is that the act of thinking comes comfortably to a flow with pen and paper. In my lessons, I strongly advise my students to read books, magazines, articles, to go to film festivals, concerts, museums, to follow current art, design, dance, music etc. festivals, to study at least one semester abroad with Erasmus+ exchange programs, to attend voluntary work programs and art-design workshops in order to develop their versatile intellectual and visual intelligence and broaden their horizons. In this way, the life experiences and summations they gain will enable them to go one step ahead of their competitors and to create unique and creative ideas.

Art and design have an important mission in triggering people's emotions. In pursuit of accomplishing this creativity; nourishment from literature, art, music, science, culture and history is required. Creative ideas come into being when this accumulation and experiences are presented in a way that hasn't been thought before by acting in accordance with self- intuition, emotions, insight, and awareness. So, we can say that behind the creative ideas there is a broad imagination and desire to explore. Imagine, explore, be intuitive, be aware and create!

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3.7

LEADERSHIP AND PARTICIPATORY MODELS IN DESIGN.

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ABSTRACT

The issue of leadership in organisations is generally about the impact of leaders' choices and decisions, their interaction with work groups and management dynamics. Given the importance of the management of companies and their leaders in the economy, research shows perspectives that come from various areas and reflect the complexity of the subject. Leadership assumes particularities in the area of creativity, and it is noteworthy that the studies consulted indicate shared or participative leadership dynamics as the most suitable models for this field of work. We ponder on organisational models with a project-oriented structure that promotes a collaborative and empowering culture. About team-based work and its challenges, high-performing teams can generate creative solutions to complex issues while having socially meaningful and rewarding experiences.

KEYWORDS:
SHARED leadership; Management; Design; Team; Empowerment.

Introduction

From the neuroscience perspective, the human brain has undergone various adaptations over thousands of years, adjusting to challenging situations. Neuroplasticity is at the origin of innovation and thinking in response to perceived need. Kozlowski (2013) states that the history of humanity is primarily the story of individuals who survived in groups, and who, with unity and leadership, built and achieved common goals. If group life was a condition of evolution, it is known that its dynamics are complex, because both the coexistence with the other and the positioning in the hierarchy, can significantly affect the lives of individuals (Hogan and Kaiser, 2005).

Given its importance, leadership has been studied by neuroscience, whose results have shown that the most relevant qualities focus on social skills and emotional intelligence (Gilles, 2016). Good leaders motivate individuals to self-organise, promote connection and a sense of belonging, show openness to new ideas and experimentation, and are committed to the professional and intellectual growth of their employees. Moreover, the issues of leadership in the implementation of business projects are interconnected with themes of adaptive biology: organisational resilience, the ability to change attention effortlessly and resistance to change are common themes in both areas, as well as the mediation of neuronal substrates in professionally relevant behaviours, namely role-taking, moral aspects, empathy and reciprocal cooperation (Mason et al., 2009).

In a study of leaders (15 countries, 195 leaders and 30 global organisations), Giles (2016) found that the most commonly listed qualities were high ethical and moral standards and the ability to clearly communicate expectations. A leader who manifests high ethical standards conveys a sense of fairness, instilling confidence in teams. Leaders who clearly communicate their expectations prevent people from feeling cheated (Giles, 2016).

In the early 21st century, studies have shown (Goleman and Boyatzis, 2008) that when leaders reveal empathy and attune to the mood of the other, their own brain chemistry and that of their team is affected. The leader--employee relationship is not a case of independent brains reacting to each other, as individual minds assume a single brain interconnecting system. Thus, a socially inept leader will not succeed. Similarly, behavioural neuroscience defends the existence of mirror neurons, that is, a class of cells that, in a network, mirrors and imitates what another does, facilitating social interaction. By detecting the other's emotions through their actions, mirror neurons reproduce those emotions.

Collectively, these neurons create an instantaneous sense of shared experience. Mirror neurons are of particular importance in organisations because leaders' emotions and their actions lead employees to mirror feelings and actions (Goleman and Boyatzis, 2008). The connection between neuroscience and business reveals the importance of social interaction dynamics and productivity. The cognitive and organisational neuroscience is interested in understanding knowledge systems in their natural socialisation systems (Lee et al., 2012). On the connection between leadership and cognitive neuroscience, it is intended to understand whether neurophysiological adaptations can influence human behaviour in response to leadership and its manifestations. In this regard, recent studies on the Creative Leadership model are cited (Gheerawo et al., 2020), associating this style with encouraging creativity in the creation of new business strategies. Creativity is a quality of human thought and behaviour (Limb & Braun, 2008), whose definition is complex. Limb and Braun's (2008) studies pointed out that specific brain areas are activated when participants are assigned creative tasks or innovation projects, and that these activations correlate with aspects of cognition, such as reflective thinking and decision-making (Fink and Benedek, 2019). In the creative industries, CL is synonymous with visionary thinking and pioneering a creative project or field, and three determining aspects are considered, namely empathy, clarity, and creativity. Neuroscientist Melanie Flory (Gheerawo et al., 2020), states that these concepts can be learned and that they positively correlate with wellness values and behaviours of individuals and groups. When the cognitive and emotional are identified and understood in their behavioural aspects, a cycle of learning and experiential development that the author calls Learn-Hold-Apply can begin (Gheerawo et al., 2020). This process can be transformational because individuals tap into their innate creativity, leveraging the potential to lead themselves and others to fulfil the goals and vision of the project or organisation. Gheerawo (2020) further states that neuroscience and research evidence postulates a strong case for collaboration between neuroscientists and designers in developing a body of theory, with content and education and training materials, that enable the activation of neural networks associated with targeted leadership behaviours. The concept of CL lies in the premise that all individuals can be leaders and that life experience provides opportunities to develop this capacity. For Melanie Flory (Gheerawo, 2020), empathy, clarity and creativity, will be vital in addressing a reality under the threat of death, collapse and chaos. On these challenges, it follows that creative professionals deal with change in an apt and relevant way, assuming that leadership in these

areas will be more dynamic and differentiated from traditional ones, since the latter validate, above all, the business status quo (Amabile et al., 1996).

Transformational, Transactional, and Shared Leadership

Kurt Lewin, in 1939, opened doors to research on leadership and other work dynamics (Billig, 2014). From these new approaches, the concepts of co-leadership and empowerment would come to redefine organisational practices. At the end of the 20th century, two genres of leadership were pointed out: transformational and transactional. The first is about the power to motivate individuals toward a greater good, turning them into promoters of those same values. Transformational leaders actively seek change, manifesting unique qualities of empathy and, with their vision, seek to lead individuals toward personal transformation. Regarding the transactional leader, Burke (1986) compares him to the manager, since he promotes the exchange, the prize, the reward, being, at the same time, a more operational leadership, focused on teamwork.

In the 21st century, shared leadership, reflecting the empowerment of teams, fits the nature of projects, and is a common model in the areas of digital technologies, creativity, health, and services (Pearce, 2004). As for leadership in Research & Development (R&D) laboratories, it is shared with people who have knowledge and skills appropriate for the task (Pearce, 2004).

The adoption of different leadership models can vary depending on the nature of the task, such as the hybrid model of vertical/shared leadership. In the automotive industry, Pearce (2004) states that the introduction of a new model requires greater coordination and integration of the knowledge of team members in the development of various vehicle components. On the other hand, the introduction of one-off changes to a model that is already in production can be streamlined as a single project and therefore involves less integration effort. In teams with creative tasks, participative leadership seems to be the most appropriate model, since creativity thrives on multiple inputs, opening up other possibilities. Also in the field of high-tech and cutting-edge scientific research, the participative leadership model seems to be the most suitable, where the active participation of team members may be a success factor (Minaee, 2014). Shared leadership is also applicable when teams have competencies for specialised tasks and where communication and collaboration among members is critical — areas of pharmaceuticals, electronics, chemicals, computer applications (software) and fast moving consumer goods industries (Pearce and Manz, 2005).

From a social perspective, leadership should lead the employee to experience his own social interdependence on the other, an expansion of his own living space (Freiherr von Fircks, 2021). The concept of group work has undergone profound changes since the industrial revolution, and nowadays work is organised around teams, seeking faster, more flexible and adaptable responses to rapid and unexpected changes. Kozlowski and Ilgen (2006) in their definition of team, state that it may include two or more individuals who interact, in person or at a distance, and who come together because they have one or more common goals, having different roles and responsibilities and that they incorporate organisational systems. Aware of the importance and effectiveness of working in a team-based format, the authors report that the process of developing a team and the quality of its results is often a matter of 'faith', that is, leaders and their teams are driven to find their way to the goals (Kozlowski and Ilgen, 2006).

On leadership and team-based work, one should mention the issue of individualism and the identification of the design process with the artistic one. On the authorial side, design thrives on originality and individuality, advocating values culturally rooted and appreciated by westernised societies, such as autonomy and individualism. Despite this valorization focused on individual skills and talents, it is believed that it is possible to align teamwork, as long as it is anchored in an effective leadership (Kozlowski and Ilgen, 2006). From Brush's (2020) perspective, human-centred design accentuates individualism because it is less deliberative. The author states that five of the world's most valuable brands follow the principles of customer personalisation and human-centred design. The interests of communities are diluted by the needs of individuals, as change may require sacrifices by individuals (e.g. climate change). Addressing the global problems of societies — sustainability, circularity, inclusiveness, accessibility, and representation — will require a non-permeable ethic, so that designers' choices do not have dire consequences in the future. On empowerment, it is mentioned that it is widely accepted that innovation and creativity in organisations can be achieved by empowering employees (Amabile et al., 1996). Empowerment has been recognized as a determining factor for creativity, as it is assumed that individuals are more creative when they have greater personal control over how to perform certain tasks.

Design and Leadership

Schon (1992) considers that design practices escape methodological, technical and rational paradigms, pointing out that the essence of the process is an action-oriented knowledge (Valkenburg and Dorst, 1998). Assuming that all design tasks are unique, one of the basic problems in design is how to approach this uniqueness — the core of design practice. According to this theory, the basic elements of design activities are actions, so decision making will have to be significantly judicious. We consider that the hybrid leadership model — vertical and participatory, taking into account management and action strategies and decision making — may be crucial to the success of the task. Thus, to design and its action is linked the concept of management, which is central to the management process itself (Boland et al., 2008). In the 1970s, Simon (2001) saw management as an area whose training should be similar to that of the applied sciences, the manager being a trainer who in organisations and economic processes gave body to the social with the aim of creating value. Unlikely, the author found a common denominator in areas, such as engineering, medicine, business, and the arts, stating that they all aimed at change (Simon, 2001). Emphasising decision making in management issues, the author saw it as a multifaceted and noble action, expecting the conscious manager to make decisions through a sound process of gathering and interpreting information, designing possible courses of action, and testing multiple ideas. On management and design, Frank O. Ghery wondered why there is so much mediocrity in the urban landscape, and why the world at large doesn't realise it. In the study on the Peter B. Lewis building by Gehry, the importance of design practices and their implications for design and management are highlighted (Boland et al., 2008). As a manager of a complex project, Gehry simultaneously assumed transformational leadership, energising participatory leadership, using his methods to elevate (transform) employees, urging them to pursue their dreams and hopes, inviting them into the process as inventors of forms in the construction of unique structures. In a cognitive and emotional dialectic, Ghery's leadership process allowed multiple views to compete with different aspects of the human experience (Boland et al., 2008). By inspiring individuals to dream new possibilities, design can be a catalyst in management processes, bringing emotional energy to the centre of the work, invoking the hopes and dreams of those involved (Boland et al., 2008).

Conclusions

Since leadership is a relevant issue for humanity, it is noted that the most important qualities of leaders are centred on social skills and emotional intelligence. Neuroscience research has highlighted that good leaders are committed to the professional and intellectual growth of their collaborators, motivating them to self-organisation, promoting connection and a sense of belonging, revealing openness to new ideas and experimentation, assumptions that seem fundamental to us in creative areas. We highlight the creative leadership model, since it seeks to identify and understand aspects of the cognitive, emotional, and behavioural scope, in a learning logic that can be transformational, leading individuals to leverage their own capabilities, leading themselves and others, even in scenarios of significant changes. Regarding the area of design, and despite the specificity of its practices and management, we understand that the cognitive and emotional dimensions will be relevant aspects in leadership models that promote participation and self-organisation, motivating, empowering, and giving autonomy to individuals. Finally, we highlight the importance of the development of a whole theoretical body of content and educational and training materials on leadership and creativity, solid arguments coming from the collaboration between neuroscientists and designers.

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3.8

RESILIENCE AS A FUNDAMENTAL SOFT SKILL IN DESIGN: Teaching–Learning Process and Innovation Achievement.

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ABSTRACT

This article deals with resilience as a vital soft skill in individual and collaborative processes, within the academic context and in the labour market, in the achievement of innovation, and as a way of being in the design. To this end, it became fundamental to understand the term in a broader sense and in particular in design. The research on the subject was supported by an extensive literature review, a professional experience inside and outside academia, testimonials obtained through semi-structured interviews with designers from the academic and professional universe, and also by the observation of working groups inside the classroom. This analysis allowed us to conclude that school has the power to teach resilience and how to be resilient, that there is still much to be done in this area and that teaching responsibility in design is fundamental to building a better world. Resilience, when taught, trained and routine within the academic context, migrates into organisations, making them more robust and strengthened in the face of constant change and in achieving innovation.

KEYWORDS:
Resilience; Soft skill; Design; Teaching-learning; Innovation.

Resilience

Resilience can be understood as the physical capacity of a stressed body to recover its original size and shape after deformation caused by external forces (Definition of resilience, nd), as a way of achieving successful outcomes in the face of unexpected, change, difficult, challenging, complex or circumstantial experiences, which takes advantage of mental, emotional and behavioural flexibility and plasticity (Resilience, nd). Psychology describes it as a phenomenon closely associated with the individual's suffering and the way they react and adapt to the adverse situations in which they are placed (Wessells, 2009). As an agent that influences and affects the personal, social, professional, and academic sphere of each individual.

The world we live in is in permanent mutation, with only one constant: change, and where problems tend to become increasingly complex and inserted in increasingly fast cycles of problem-answering. An example of this we have Artificial Intelligence and disruptive technology, which increasingly demand transversal and critical human skills that are difficult to reach now, by machines (Chamorro-Premuzic & Frankiewicz, 2019). Felman, states that those who can face life's difficulties with courage and perseverance, tend to maintain a positive outlook in difficult circumstances, enjoy close bonds and a wider social circle, express empathy and compassion for the misfortune of others, promote industry and a sense of working for the long term (Feldman, 2020). The ability to recover quickly from setbacks and move on without losing positivity is extremely important for personal success and a resilient mindset, which immediately sees problems as opportunities for learning, for strengthening self-confidence, where obstacles are understood as temporary and are part of a process of growth and refinement of individual and collaborative characteristics.

Teaching — Learning and Resilience

Learning today is also impacted by a complex number of factors that tend to bring change to the school context (Harrison & Hutton, 2013). Each teacher has the natural concern to build learning situations that determine the acquisition of the required and expected level of skills, universal, valid, and able to ensure full success teaching models and effective training strategies, which may be subjective and circumstantial because they depend on the psycho-social characteristics of teachers, educators, training time, location, scientific content, teaching and learning methods,

teaching aids, forms of organisation and training. The abundance and ease of access to information influence learning, where the transfer of knowledge and competencies from teacher to the student can quickly become secondary because access to this knowledge allows the student to assume an increasingly autonomous role in the development and acquisition of knowledge competencies.

This vision of an active, reflective and conscientious student, able to collect information and use it in different contexts, who learns through action and reflection, creation and problem solving, it is up to the teacher to construct operational objectives, according to specific objectives and general results, select the information content according to the psychosocial characteristics of the student group, taking into account their interests and concerns, characteristics and not only the school curricula (Landøy et al., 2020) and based on the idea that universities are privileged places for the exploration and technical, conceptual and personal empowerment of all those who attend it and that resilient teaching, according to Rebeca Quintana, is that which simulates and integrates real cases from the labour market, anticipates breaking points, facilitates and allows access to learning experiences designed in conditions that are adaptable and at the same time flexible in the face of complexity and that occur in a dynamic learning context, with new forms of interaction between teachers, students, content and methodologies (Laying the Foundation for a Resilient Teaching Community | Inside Higher Ed, no date) thinking about inducing resilient practices thus becomes pressing and urgent.

The question that arises is: are the university programmes, decision-makers, lecturers, and students aligned with the training and conscious application of resilience in design, taking into consideration the gap identified in the labour market, which reveals the increased demand for professional profiles with high levels of emotional intelligence, resilience, empathy, and integrity (Chamorro-Premuzic & Frankiewicz, 2019).

The most recent event that impacted teaching and required resilience in the teaching-learning process, at a global level, was the recent case of the Covid-19 virus, whose external constraints imposed, at all levels of education and in particular on the teaching staff and students, required from everyone greater flexibility and agility for the adoption of new tools and strategies, namely the migration from face-to-face teaching to digital, where for this, it was necessary to find and fix new ways to communicate, stimulate, involve and pass content to students. This particular case demanded from teachers the reconstruction of programmatic contents,

more adapted to distance learning, asked for a more student-centred action, an emotional mediator performance, closer contact with students, to induce their strategies for overcoming limitations, without loss of content and for the achievement of objectives in a successful way. There were many results of this condition, as there were teachers and students who quickly adapted to the new variables and demands, showing a great capacity for flexibility, adaptability, and empathy, but there were also many examples that increased the gap between teacher and student, immediately conditioning the learning and retention of contents. There were serious difficulties in establishing a virtual link, either because of the technical constraints imposed on it, lack of network, cameras, among others or because many disconnected from the teaching-learning process. But other cases of resilience were observed, for example, the digital work sessions in small groups, in an almost real simulation of the classroom, which the students organised, to keep themselves motivated and to reinforce their technical and conceptual skills. The teachers, in turn, were able to pass on content in a slightly more individualised way, stimulating the students' prior preparation of the content, found in the contact points, the classes, a way to discuss the different perspectives and visions making the classes more attractive, interactive and stimulating. Being resilient, in this situation, became fundamental, but not unique in overcoming the obstacles. Flexibility, adaptability, empathy, solidarity, availability, and eloquence in communication have shielded the success cases in the teaching-learning process, but these are reactive initiatives and not a conscious training of resilience.

Today it is possible to find in ELISAVA Barcelona School of Design and Engineering a master's programme: Design for Resilience, whose aim is to train professionals for positive changes through Design, believing that it has a transformative, ethical and fair role for the planet and society. From it, training in specific adaptive and agile management skills stands out, including collaborative and empathetic leadership techniques, for this, students are enabled to recognise the main contexts and approaches where resilience flourishes, apply critical and autonomous thinking, to imagine a better world and formulate projects for resilience; transform problems into opportunity; work in teams understanding motivations and the different roles for the development of innovative initiatives in uncertain environments (Master in Design for Resilience, nd). This reveals the awareness and emergence of training designers with a mindset aligned with the external challenges facing schools and design itself, where resilience is seen

not only as a soft skill but also as an agent of social and planetary change. In the design of its programme, the emphasis placed on human characteristics, such as creative, critical, and autonomous thinking, stands out.

In the classroom context, real work proposals tend to captivate students more in general, because they feel the tangibility of their work, and explore other individual or group skills, which go beyond the technical and where resilience has a fundamental role, because real cases bring more constraints, more parties involved, from the human, technical, vision, sociability and execution point of view, which implies and induces in the designer, who is still in training, an opportunity to strengthen and test their critical and autonomous perspective. Patience, belief, expectations, vision, empathy, and frustration tend to be more actively tested and simulated in these cases, offering students a real experience, even if they are within academic comfort. The role of the teacher in these cases tends to be that of mediator, facilitator, and even translator between the owners of the project and the visions established by the students.

It is normal for individual blockages to be observed in situations of presentation of ideas, where these have been deconstructed or realigned with the objectives; when unexpected constraints have been encountered; their expectations are not met; or when some external element is unexpectedly added to the project. The vast majority of students faced with these obstacles become blocked and frustrated at first, but when they overcome this stage, the preceding result, motivation, and overcoming undoubtedly reinforce resilience skills, and better results are achieved. Another example is the shortening of deadlines, which for many acts as an ignition factor for faster decision-making, greater objectivity, and reinforcement of this soft skill under study. When acting in work groups, this tends to be the moment when a real group spirit, effective collaboration, where everyone works for the same purpose, taking advantage of their best characteristics, is gained. But, it is also at this moment that fragmentation, overvaluation of ego, lack of empathy, inflexibility, and lack of resilience can be observed and verified.

A recent graduate in product design mentioned that in a specific school year and with a teacher less intervening in project decisions and the launching of more open and abstract work proposals, without a specific objective, induced in first phase some demotivation and relaxation in the students, where some let themselves go in that current and others had the opportunity to explore and apply their critical and resilient skills, thus proceeding with their intentions and wills in the teaching-learning process, building

the projects from the idea to the delivery having the opportunity to build by themselves, identify and overcome the normal obstacles within the process of design and product development.

But it is important to mention that it is uncommon to find schools introducing and training non-academic skills necessary for creativity enhancement in professional design practice (Malinin, 2017). But for this to happen, it is essential to design resilient pedagogies, to intentionally induce productive rupture practices, spaces that include discomfort and dissent and that challenge fixed forms of knowledge, for this, teachers and students need to be open to change, seek multiple perspectives and that challenge dominant narratives, suggesting that ideal pedagogies can remain functional. In design, an excellent way to simulate and train resilience is undoubtedly to bring real cases and their complexities into the classroom context (Buyserie et al., 2021).

Innovation and Resilience

Innovating is not a new phenomenon, it is a natural and intrinsically human process. The Oslo Manual defines it as the implementation of a product, good or service, marketing or organisational method, other business areas, workplace reorganisation, or external relations in a completely new or significantly improved way (Oslo Manual, 2018). Today, it is an activity that involves funding, for the research and development of new products, requires new technologies, and the creation of distinct production, development, and marketing processes. Companies and institutions that carry out innovative activities consciously and successfully, need to understand that the whole process involves barriers, risks, and gains, and requires talent, work, motivation, and resilience to successfully achieve the implementation and acceptance of innovations in both industries and markets. It allows them to solve or anticipate problems, empower the organisation, and remain competitive and sustainable in designing new products and services (McCaffrey & Pearson, 2015). Innovating is not solely restricted and linked to creative teams, it is a cultural process that must be rooted and upheld throughout the organisation, so that contributes with ideas aimed at new visions, interpretations, and solutions (Verganti, 2009).

Innovation can materialise in different types, according to the degree of change, dynamics, or effect it produces in the market. At the level of products and services, it can be: incremental carried out in significant improvements at any stage of its development: process, design, material,

among others; design-driven innovation, which touches essentially on the symbolic coefficient of products and services; radical or disruptive, which breaks, changes and introduces something radically new into the market, which may be by way of technology or creation of new needs. It is in the latter that greater resilience is required, both from organisations and work teams, since the attribution of new meanings, and the introduction of radically new technologies, among others, are associated with greater risks, but also with greater returns.

Innovating is not an easy task, it varies from company to company, requires a special and favourable pro-innovation environment, and can be a serious activity if the limitations involved are not taken into account and the advantages are not anticipated. The barriers and risks may originate from different factors: human, physical, social, political, and environmental, among others, and in their prevention and circumvention, organisational and human resilience becomes fundamental, as well as their prior knowledge and training, facilitating decision making and the adoption of the best procedures.

The role of the innovator is undoubtedly central to the resilience of innovation, as this is someone who can generate original ideas, dares to take risks, inspires others, can articulate and question their ideas, resists and persists, and is a curious, creative, courageous, convincing, open-minded human being and above all a resilient optimist. But we know that companies and their leaders work increasingly in hostile and uncertain environments, to measure the impact generated by Covid-19 and the recent war confrontation — Russia/Ukraine. In business and trade flows, failures can be more common than successes, which points to the emerging need to design more and more organisations capable of managing, mitigating, and learning from them. These can waste money, destroy motivation, anger customers, and damage reputation and careers, but it is inevitable in uncertain environments. If well managed, it can be very useful, as it induces overcoming, resilience, and the achievement of other opportunities, which financial comfort often blinds decisions (McGrath, 2011).

There is an urgent need to build a resilient, flexible, and aware workforce to armour organisations to thrive and innovate, making them successful during good times, but also solid and able to excel in times of crisis (Binyamin, 2022). The ability to bounce back from setbacks is often described as the difference between successful and unsuccessful people/organisations and resilience has been shown to positively influence job satisfaction and engagement, as well as overall well-being, and can help lower

levels of stress and ill-health. It is not a purely individual trait, as one can build it through a wide variety of interactions with people in our personal and professional lives, help us to (re)define the demands of the job, change the magnitude of the challenge we face, provide empathy or simply help strengthen our resilience by changing perspective and reminding us that we are not alone (Cross et al., 2021). Building resilient organisational and corporate cultures presupposes the empowerment of all who operate in it with a pro-growth, skilled, precise, creative mindset that ensures the necessary conditions for objectives to be achieved calmly and originally (Wu, 2020). Its absence has a direct impact on the resilience of the organisation and work teams, which according to Shonna Waters, resilience can not only help people recover from challenging experiences but also play a key role in their self-growth and development, drastically reducing health problems associated with work stress and in limit cases of burnout (How to Build Resilience in the Workplace, 2021)

For all this and the constant need to innovate and evolve organisations, increasing resilience should be a strategic and fundamental priority, considering that innovation is a good thing for any leadership, an opportunity to generate business and leverage companies in the future. However, resilience beyond an individual soft skill should also coexist at the level of organisational culture, to avoid risks and overcome constraints, resulting from the course of all processes, focus on avoiding interruptions in productivity when possible, establish recovery strategies, quick action and respond effectively to any crisis (Zawada, 2022).

Key to this dynamic is that employees have a sense of realism and a high degree of control over their choices, understand the limitations of that control, see change as an opportunity or challenge, collaborate with and encourage coworkers, maintain and pursue personal goals, have a strong sense of responsibility, patience, are highly tolerant of difference and negative feedback, are optimistic and have a strong sense of adaptability (How to Build Resilience in the Workplace, 2021). To this end, it is crucial that employees have strong emotional self-regulation, that they can carry on even when they are the target of difficult or upsetting situations, that they stay away from problems, that they observe and acknowledge their emotions, that they start the best strategy to carry on with their activities and that they approach the problem with the necessary calm and logic. They should also have high self-compassion, and low self-criticism, be kind to themselves, be able to calm difficult emotions, and find sources of motivation. Finally, they have strong mental agility, which allows them

to keep working, regardless of the situation, positive or less positive, considering all possible aspects of the situation.

Taking into account the radius of action of designers within organisations, who usually join and reinforce multidisciplinary teams, it is understood that being resilient and aware of resilience becomes, without doubt, an asset in work/professional development, as this ability often directly impacts on problems and constraints that determine the nature and implementation of projects, activities and project goals.

From professional and market experience, numerous cases have been identified, both within and outside design, of a lack of resilience, especially about receptivity to change, leaving the comfort zone, and confrontation with leaders who are not very resilient, which tend to limit and compromise the result, for example in terms of innovation.

A personal case can be recalled, which occurred within a collaboration with a company, whose functions included the conception and development of new products for the home. Due to the demands of an external market, it was required to integrate ceramic mosaics in the composition of furniture, a situation that was already being implemented in competing companies. To overcome the competition and innovate, a Spanish company was identified as a producer of this type of ceramic product and, in addition to standard slabs, had some solutions for decorative pieces with three-dimensional shapes. The identification of this differentiating product, the three-dimensional pieces, triggered the development of some product lines, with great commercial interest and viability, which initially impacted on the lack of communication and even some disregard on the part of the raw material company, as it was not used to working directly with furniture companies. This situation was only unblocked when a trip and visit to the factory were scheduled, products already developed were shown and products were ordered. The belief and visualisation beyond the obvious, the resilience in pursuing the ideas, and the empathy established in the meeting were fundamental to achieving this synergy and delivering these products to the market. This determination was not only entrusted to the decisions of the design and designers but the leadership and management of the company were also oriented towards its viability and were fundamental for the positive outcome of this case.

Another real case is that of a fellow designer, who, within the company he represents, had the purpose of integrating artisanal techniques of Portuguese basketry in a new piece for the home area, whose design was daring and presupposed innovation. He had to work directly with a

craftsman, with decades of experience in the area, but with huge resistance to change. He stated that the first meetings and presentations of the products to be executed were extremely difficult and full of obstacles, as both did not know each other personally and there was a mutual lack of knowledge of the tasks and techniques that each one used and could bring to the project. The designer colleague, by the suggestion of his superiors, had some meals with the craftsman to get to know each other better and allow empathy, as the capacity to place oneself in the other's role, to help make the project viable.

But this alone did not allow the positive outcome of this professional relationship, resilience — the ability to resist and overcome stubbornness — was also decisive in overcoming the barriers encountered

Conclusion

Taking into consideration the way the learning process flows inside the academy, where more and more students have the main role in their evolution and acquisition of skills and facing the global complexity in which we live, resilience seems to become basilar for everyone in general and in particular in the life of a designer and consciously or unconsciously, it has a strong correlation with innovation and design, because design in a broad sense induces a vision, long before materialisation, change, planning, balance, disruption, definition, and materialisation.

From a pedagogical point of view, it is recognised that working and training conscious skills of disruption, can lead to potential discomfort, for teachers and students, taking into consideration that some prefer to work within organised processes, as those who constantly put themselves in discomfort. Thus, we might mention that resilient pedagogies should seek disruption and question how practices, in the classroom, are perceived as desirable, equitable, and inclusive.

The design process is often not linear, although it can unfold within pre-established, studied, and documented models that facilitate and guide the designer in achieving something new or significantly changed, we can conclude that this often results in hybrid or organic models, which impact directly with the imposed constraints, which may arise in the most diverse forms: project, material, productive, social, cultural, human, political, geographical, among others. It is up to the designer to find strategies to deal with complexity, difference, discomfort, and lack of empathy, with the balance between individual and global goals, and micro and macro needs.

The school has, therefore, the power to teach resilience and to be resilient. To teach responsibility in design is also to make people understand that, in the same way, we design this world, we also design the problems it faces. It imposes the design of change and this is not possible without resilience.

Design is a practice that implies empathy, resilience, flexibility, and objectivity. It is altruistic and activist and should not only point out problems but also formulate solutions, materialising them. In other words, it is a form of resilience per se.

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3.9

RESILIENCE AND DESIGN

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ABSTRACT

The term *resilience* is a widely used word nowadays. But, does resilience have anything to do with design?

The text explores the relationship between resilience and design in its different sectors. Areas such as graphic design, product design, packaging design, fashion design or interior design, among others, approach resilience from different perspectives, generating a kind of map that makes us reflect on the durability, adaptability and sustainability of certain designs.

KEYWORDS:
Resilience; Design; Timeless design; Design classics.

Motivation

Does resilience have anything to do with design?

The term resilience is defined as the ability to adapt to a disturbing agent or an adverse state or situation. The word resilience comes from the Latin *resilire, resilio,* which translates as "to jump back, to bounce back". During the 17th, 18th and 19th centuries, the term was used in the scientific field, especially in physics. It was not until the 1950s that it began to be utilised in the fields of ecology and of psychology (Graveline, 2022). Nowadays, primarily, resilience applies to human beings, to their willingness to resist and thrive in the face of hardship. However, when we talk about design we have to take into consideration that certain designs also adapt, resist and even prosper over time. How many times have we read or written about “design classics”, “iconic designs", or even “design basics”?

Development

In this regard, in the realm of furniture design we can cite as examples the No. 14 chair, a delicate piece of wood turned and bent by a steam and glue process that stands out for its curved forms, designed in 1859 by Michael Thonet and still in production today. The LC4 Chaise Lounge, product of a collaboration between Le Corbusier, Pierre Jeanneret and Charlotte Perriand, dates from 1928 and continues to form part of many rooms. The famous Barcelona chair designed by Mies van der Rohe in 1929 is still in use today, produced by the German firm Knoll. Ray and Charles Eames have numerous furniture designs dating from the 1950s to their credit, such as the replicated Plastic Chair, which is now published by Vitra. The Tulip series of tables and chairs by designer Eero Saarinen dates from 1956 and is also produced by Knoll. In fashion design, the trench coat was commissioned by Thomas Burberry in 1914, and continues to be replicated by a multitude of fashion brands today. La petite robe noire, also known as the little black dress, which Coco Chanel conceived in the 1920s, is designed to be durable and versatile, and to this day is still in force. So, in the light of the aforementioned cases, enduring designs have a character of their own that makes them equally relevant at any time. As product designer Ramón Benedito said when analysing the relationship between design, innovation and business, “design can make the difference between an object being enduring or not being able to withstand the fashions of the time in which it was created. And that is fundamental to the evolution of a company”

(Gutiérrez, 2010). Those designs that, despite the passage of time, trends and styles, maintain their useful life, become timeless. Somehow, these classic or iconic designs remain, and therein lies their resilience. The digital publication *Domestico Magazine* refers to timeless design as follows: "A timeless design has the power to remain, to maintain unchanged in its form and essence. A piece of furniture that evolves into an icon is in a way already born as a classic. It was not created to be temporary and it was never considered as something that clung to an eventual aesthetic. Its forms were carefully studied, the materials used in its conception were meditated upon, and it's why was reflected upon... Nothing was left to chance in its design, perhaps that is why this piece of furniture, admired and adored, has a well-deserved place in the Olympus of the great classics of yesterday and tomorrow" *(Doméstico Magazine, 2022)*. It should be noted that if some of the characteristics common to the most iconic or enduring designs were to be highlighted, it would be the use of harmonious proportions, pure lines, clean structures and production processes that combine traditional and modern materials and are also cost-effective. Their use remains current and their usefulness is beyond doubt when they continue to be convenient, comfortable and efficient designs, which makes them timeless.

Remaining timeless is what MUJI, whose wide range of products from stationery to home and fashion accessories of all kinds, seems to be aiming for, employing values such as simplicity and functionality. Naoto Fukusawa, a Japanese industrial designer who has been working for MUJI since 1999, states that "People feel that the products at MUJI are basic, not 'Design'. There are many design objects that people feel are 100% designed, but usually, these objects will be over-designed. MUJI offers 'non-designed' objects, to help people understand the object's function better" (Minimalissimo, 2022). Fukusawa's position on understanding the function of the object is linked to examples of designs that have to do with durability, perdurability and timelessness. Examples include the book, one of the objects that has accompanied human beings for centuries or, at least, for two millennia; the wheel, a clear example of product design, like the spoon, or the aforementioned chair, which bear witness to what Umberto Eco defends in his text *This is Not the End of the Book,* "the book is like the spoon, scissors, the hammer, the wheel. Once invented, it cannot be improved. You cannot make a spoon that is better than a spoon... The book has been thoroughly tested, and it's very hard to see how it could be improved on for its current purposes" (Eco, 2012). In this respect, the bowl is another example of timeless design that fits both Fukusawa's and Eco's postulates. "The bowl is one of the

simplest and most basic forms that potters make. According to archeologists, it may also be the first functional ceramic object ever made" (VV.AA., 2003), writes John Britt. The essence of the object is perpetuated, but the need to innovate and experiment means that, through design, an element as apparently elementary as a bowl can change its shape, texture, material or colour. Naoko Fukusawa points out: "Timeless design does not always stay popular because I think after a while, people can become bored with it. But the timelessness of a design object also means you can very easily fall in love with it again later. It happens naturally, like a returning trend" (Minimalissimo, 2022). In this framework, circular design, and therefore the circular economy, establishes links between designers, producers and companies, where resilience plays a major role. Recycling and sustainability are factors inherent to resilience, as we understand resilience in the field of design means maintaining, adapting and perpetuating over time. Several of the works of the French architectural studio Lacaton & Vassal bear witness to this way of doing things. For example, their intervention in the Grand Parc neighbourhood in Bordeaux, where they transformed 530 social housing units by applying conservation and recycling strategies that won them the European Union Prize for Contemporary Architecture — Mies van Der Rohe Award in 2019. The jury judged that this project by Lacaton & Vassal used minimal means to maximum effect. Instead of demolishing the buildings, the architects transformed three existing buildings, improving the lives of their inhabitants. Today, comfortable and resilient buildings are being designed, where the performance and quality of materials contribute to improve the health and well-being of their occupants. Energy savings through sustainable and durable thermal solutions and the use of existing building components are the basis of architectural and interior designs that prioritise resilience, providing innovative solutions at the urban and territorial level, and working with cooperation and corporate social responsibility.

In the field of graphic design, it is necessary to mention the concept of enduring design, referred to by the late graphic designer Paco Bascuñán, who argued that certain graphic creations should have continuity over time, such as, for example, the graphic design used in official institutions. A city council, a health department, needs to communicate with graphic identities and visual systems that are easily understandable, functional, coherent, precise, rigorous and that are maintained over time so that they become recognisable and appealing to the population. In this respect, one aspect of marketing also advocates the durability of brands and their ability

to capture the attention of the observer through repetition and omnipresence. A brand such as Coca Cola works to ensure that its logo, despite the successive restyling and retouching to which it is periodically subjected to adapt to new fashions and trends, appears unalterable, remaining as a constant and everlasting identification of the famous drink. Furthermore, when addressing the aspect of the relationship between graphic design and resilience, we should not overlook the numerous graphic codes that remain unalterable because they represent an important source of communication for humanity: Typography, which has its roots in the use of ideographic and mnemonic symbols that could transmit information and which, after centuries of evolution, has evolved into what we know today as the alphabet, an ordered system of graphic signs with which we write and communicate. Signage, which informs and orientates us geographically and whose application began in a normative manner in Napoleonic France when in 1853 copper plates started to be used to indicate routes and territories. And pictograms, such as those of the Olympic Games, which have their origin in those designed in 1964 by Yoshiro Yamashita and Masaru Katzumie, also constitute international communication systems and codes through which we can locate each other, decipher messages and understand each other.

Conclusion

We see, then, how areas such as graphic design, product design, fashion design or interior design, among others, approach resilience from different perspectives, generating a kind of map that makes us reflect on the durability and adaptability of design. Resilience affects all disciplines and aspects of design. One of the many cases that exemplifies it can be seen in the fashion industry, where slow fashion is opposed to fast fashion; that is, the model of mass production and consumption that favours flash fashion is confronted with slow fashion, which sponsors a practice that has to take into account the social and environmental impact (let's not forget that the fashion industry is the second most polluting industry on the planet) and that takes care of the production processes, seeking to ensure that the garments and products are long-lasting, of high quality and sustainable. In this sense, actions such as programmed obsolescence are opposed to resilience, negatively influencing consumer habits from the point of view of sustainability and respect for the environment. So resilience has to be taken into account in both the creative and productive phases of any design process. Hence, design, due to its formal, aesthetic and economic

implications, among others, is one of the areas where resilience must be considered, as it presupposes creations committed to the environment, to the regeneration of urban landscapes, to the ideation of eco-sustainable and innovative transformative projects from a socially just and economically viable point of view. Any design process should have resilience as a starting point to, through critical thinking and creativity, implement adaptive, durable and flexible designs and productions that have the strength to contribute to the improvement of our habitat and our daily lives. Thus, resilient design must work to find relevant, functional and high-impact solutions to achieve a positive renewal of our environment, to adapt and evolve in an agile and sustainable way, and to act as an active agent of an increasingly necessary and urgent change. This is a challenge that we must all bear in mind because, as advocated by Paola Antonelli, senior curator for the department of Architecture and Design at the Museum of Modern Art (MoMA), "it's resilience that I like best. You learn a lot from the challenge" (Halman, 2020).

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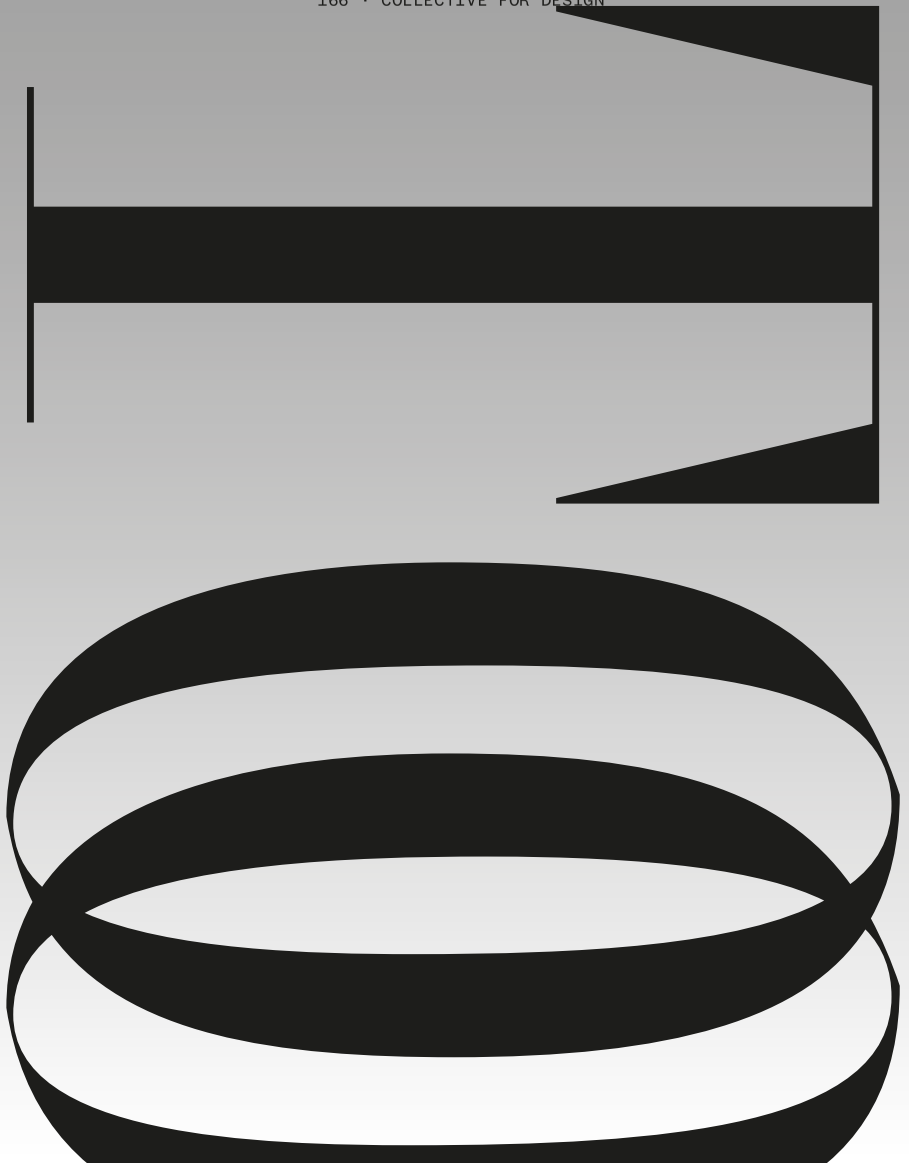
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Creating the tools for the Collective Design Method was a fundamental exercise for the research project, for building the pillars that would support this teaching-learning methodology and its objectives. Initial discussions between researchers resulted in identifying four key components (fig. 4.1: Collective Design Method — Tools and expected teaching-learning results, visual discussion), that served as a foundation for the Collective Design Method and the workshop structure that would drive it: hosting institution (where); participants (who); briefing (why and what); schedule (when and how).

4.1 Hosting Institution

The hosting institution played an influential role in providing comprehensive local resources to perform the **Collective Design Method** and the workshops, with higher-education (first and second degree cycles) courses in art and design disciplines, facilities and potential local partners in service, business or industry. To research and test this teaching-learning method, three institutions were used for this purpose from Poland, Portugal and Turkey, selected from the universities and colleges which employed four of the six project researchers. Each location provided common attributes to host the workshops, offering: rooms for the students to work, lecture theatres, making and testing spaces; gallery or exhibition areas; technical demonstrations and factory visits; sustainable materials and transformation equipment; cultural, community and industry incentives.

In the workshop held in **Poland (October 2021) at Lodz University of Technology**, led by Marta Miaskowska from the Visual Arts department, it had the following local attributes:

MATERIAL — Natural wool, producing products on the Jacquard and digital embroidery machinery;
TECHNICAL PARTNER(S) — Institute of Architecture of Textiles and Südwolle Group;
PRODUCT THEME — Promotional products for interactive tourism about local street art and film.

In the workshop held in **Portugal (May 2022) at ESAD — College of Art and Design**, led by Jeremy Aston from the Product Design department and Marta Varzim from the Digital Arts and Multimedia department, it had the following local attributes:

MATERIAL — Natural cork and cork composites in raw, sheet and block forms;
TECHNICAL PARTNER(S) — Amorim Top Series and Amorim Cork Composites;
PRODUCT THEME — Promotional stands for Churchill's, wine and Port Wine producer.

In the workshop held in **Turkey (September/October 2022) at Eskisehir Osmangazi University**, led by Bilge Kinam from the Visual Communication Design department, it had the following local attributes:

MATERIAL — Sepiolite (also known as Meerschaum, Sea Foam or White Gold);
TECHNICAL PARTNER(S) — Tourism and Promotion Association and Sepiolite craftsmen;
PRODUCT THEME — Promotional products for Phrygian Valley, symbols of Anatolia.

The workshops performed in each hosting institution uniquely shaped the results and product outputs of the three events, due to their different local resources, collaborative incentives and unique challenges (see 5 Testing, for more details).

4.2 Participants

From the initial discussions about this research project, it was observed and suggested the *need* to improve international career learning experiences for near graduating (or newly graduated) students, studying first or second degree cycles in art and design courses. Also, this *need* aligned well with the Erasmus+ Programme, *supporting the educational, professional and personal development of people in education, training in Europe and beyond. Contributing to sustainable growth, quality jobs and social cohesion, to driving innovation, and to strengthening European identity and active citizenship. Promoting learning mobility of individuals and groups, as well as cooperation, quality, inclusion and equity, excellence, creativity and innovation at the level of organisations and policies in the field of education and training (erasmus-plus.ec.europa.eu).*

Student candidates were invited, interviewed and selected to participate in one of the three **Collective Design Method** workshops, introducing different nationalities and course disciplines, forming multidisciplinary groups of six to eight students for each workshop event in Poland, Portugal and Turkey. The final candidate selection was based on the student's collaborative potential (cv, portfolio, motivation and spoken English), representing their art and design discipline, institution and country.

The student group for the workshop in Poland were: Aleksandra Kosztownniak (Polish, 1st Cycle Study, Textiles Design); Barbara Florczyk (Polish, 1st Cycle Study, Fashion Design); Julia Lewik (Polish, 1st Cycle Study, Visual Communication Design); Julia Niedbat (Polish, 1st Cycle Study, Visual Communication Design); Marta Vieira (Portuguese, 2nd Cycle Study, Product Design); Guilherme Matos (Portuguese, 2nd Cycle Study, Product Design); Aslı Çetin (Turkish, 1st Cycle Study, Visual Communication Design). In general, the student group had a Polish participant bias and showed discipline strength in Visual Communication Design.

The student group for the workshop in Portugal were: Catarina Miranda (Portuguese, 2nd Cycle Study, Product Design); Gabriela Fragueiro (Belgium, 2nd Cycle Study, Product/Furniture/Interior Design); Guilherme Simões (Portuguese, 2nd Cycle Study, Product Design); Isabella Andrade (Brazilian, 2nd Cycle Study, Graphic Communication Design); Ivan Garcia (Portuguese, 1st Cycle Study graduated, Fashion Design); Julie Clercq (Belgium, 2nd Cycle Study, Product/Furniture/Interior Design); Ada Wychota (Polish, 1st Cycle Study, Visual Communication Design); Simge Tunç (Turkish, 2nd Cycle Study, Visual Communication Design). In general, the student group had a Portuguese participant bias, and showed discipline strengths in Furniture and Product Design.

The student group for the workshop in Turkey were: Batuhan Yeşildağ / Orhan Uğurluel / Sena Çan / Yağmur Özlem Yılmaz (Turkish, 1st Cycle Study, Visual Communication Design); Michal Kühnel (Polish, 1st Cycle Study, Visual Communication Design); Júlio Teixeira (Portuguese, 2nd Cycle Study, Product Design); Bárbara Morais (Portuguese, 2nd Cycle Study, Fashion Design); Sarah Craven (American, 1st Cycle, Color & Materials Design). In general, the student group had a Turkish participant bias and showed discipline strength in Visual Communication Design.

The objective of these workshop groups and the global purpose of the **Collective Design Method**, was to combine project researchers (educators and professionals) with art and design students, collaborating together on an interdisciplinary challenge, therefore simulating labour market dynamics for designers and artists, and preparing them for future international careers.

4.3 Briefing

The briefing was structured by the researchers and written by each **Collective Design Method** workshop organiser, as an informative tool for starting each of the three events, to inform students about the theme and objectives of the challenge, favouring the participant's art and design backgrounds, incorporating local assets, describing the product requirements, using sustainable resources within or near the institution and addressing a real world need or problem. This document evolved as the workshops progressed, from the first event in Poland (October 2021) to the third event in Turkey (October 2022), adding and adjusting the information to benefit the **Collective Design Method** and the students' learning experience. As a result, the final briefing document consisted of six parts, outlining the following:

1 **Workshop locality**. Informed the students about the objectives of the **Collective Design Method** research and the locality of the workshop they were participating in, inspiration from the local history, culture, customs and identity of the town, city, region and country;
2 **Workshop challenge**. Introduction and explanation of the needs and inspirations supporting the workshop challenge and the third-parties (industrial companies, cultural entities or social incentives) involved in the workshop theme. Including a description of the local facility, indigenous materials and methods the students should consider within their art and design processes. In all workshop cases, this briefing was also supported by an additional document written by the workshop organiser(s) or third-party collaborator(s), giving additional technical detail about the material, techniques, brand and marketing incentives;
3 **Workshop motivation**. Represented by a short phrase or sentence to capture the main values of the workshop challenge, and the 5 W's and How *(who, what, why, when, where, how)* to identify user context and *reason,* promoting the local economy and community through ethical and social awareness;
4 **Workshop schedule (timetable)**. A simplified version of the official detailed schedule, highlighting important dates, activities and deliverables. This included making a prototype that should be physically and/or digitally represented, therefore tangible, together with visual and interactive materials that embody the themes and objectives specified in the workshop briefing.
5 **Workshop location**. The address(es) of the academic institution, department buildings and room(s) where the workshop would take place;
6 **Workshop participants**. A list of names and contacts of all teachers and students participating in the workshop.

To compare the briefings from each workshop (Poland, Portugal and Turkey), we can analyse the characteristics of the locality, challenge and motivation:

Briefing for the workshop at Lodz University of Technology, Poland:

LOCALITY — Lodz University of Technology. Lodz was formerly known as a textile-manufacturing hub in the 19th century. Lodz means boat!. There is a legend about a fisherman that was in a boat and when the weather changed, he faced the thunderstorm, rather than running away;
CHALLENGE (THIRD-PARTY) — Not specified in the briefing, although lecturers from the textiles design and technical department within Lodz University were invited to introduce and interact with the students, and assist in the workshop activities;
CHALLENGE (MATERIAL) — Natural wool based fabrics using a Jacquard weaving machine;
CHALLENGE (PRODUCT) — The type of product and its function was not specified in the briefing. Students were open to investigating a new product based on the capacity of the material and local user needs;
MOTIVATION (SENTENCE) — A workshop to create innovative products for promoting native raw materials and/or transformations, fostering real world issues and engaging audiences through a virtual portal;
MOTIVATION (WHO) — Someone who is socially motivated, environmentally aware and digitally informed;
MOTIVATION (WHY) — The product should motivate the stakeholder to be part of something bigger than themselves, promote awareness and inclusion within the community.

It was observed that after the first workshop in Poland, the briefing challenge was too open for the

designated time (two weeks) allocated for this event. Students spent too much time discovering and identifying potential stakeholders (who) and justified reasons (why) for needing a new product made from these specified local assets. Although prototypes were produced, diversity in the exploration phase and the quality of the final prototypes could have been improved if these parameters had been defined or given by the project researchers/workshop teachers earlier within the workshop's design process.

Briefing for the workshop at ESAD — College of Art and Design, Matosinhos/Porto, Portugal:

LOCALITY — Matosinhos/Porto (northern Portugal). The coastal city of Porto lies in the beautiful valley of the Douro River, near the river's mouth to the Atlantic Ocean. Derived from the Latin name 'Portus Cale', meaning 'Warm Port', it shares these origins with the name of its country 'Portugal'.

CHALLENGE (THIRD-PARTY) — Churchill's boutique wines and Port Wines (commercial incentive), ATS (Amorim Top Series) and ACC (Amorim Cork Composites) from the cork producer Amorim (technical incentive).

CHALLENGE (MATERIAL) — using natural cork in raw or transformed states, and other local materials that are compatible with cork.

CHALLENGE (PRODUCT) — to design a portable point-of-sales structure for Churchill's wine brand, for wine tasting public venues (vineyard or cellar) and internal events.

MOTIVATION (SENTENCE) — 'A workshop to create an innovative product for promoting native raw materials and/or transformations, fostering real world issues and engaging audiences through art/design processes'.

MOTIVATION (WHO) — Churchill's brand purpose was 'Crafting personal wines with maverick simplicity for every generation', therefore attracting a broad consumer group with different wine products.

MOTIVATION (WHY) — The brand visual language needed to extend into the PHYSICAL SPACE by incorporating materiality in an UNCOVENTIONALLY SIMPLE way that elevates the wines.

Unlike the first workshop in Poland, the second workshop in Portugal had third-party industrial and commercial incentives, and more students participating. As a result, the briefing defined valuable information about the user and product needs earlier within the design process, therefore investing time and resources better in the later stages of the workshop schedule.

Briefing for the workshop at Eskisehir Osmangazi University, Turkey:

LOCALITY — Eskisehir Osmangazi University College of Art & Design. Eskisehir was one of the oldest settlements (3500 BC) in this region of Anatolia. It was founded in the 1st millennium BC by the Phrygians. Eskişehir province was a city known as the Greek Dorylaion and Latin Dorylaeum in the Ancient and Middle Ages. In ancient sources, Dorylaion was mentioned as a Phrygian (Phrygia) city famous for its hot springs at the junction of important roads and enriched by trade, and Doryleos of Eretria was shown as the founder of the city;

CHALLENGE (THIRD-PARTY) — Not specified in the briefing, although the President from the local tourist board and a Meerschaum mastercraft person, were invited to introduce, interact with the students and assist with the orientation of the work;

CHALLENGE (MATERIAL) — Sepiolite / Meerschaum (Sea Foam & White Gold);

CHALLENGE (PRODUCT) — The type of product and function was not specified in the briefing. Students were open to investigating a new product based on the capacity of the material and the local user needs;

MOTIVATION (SENTENCE) — A workshop to create an innovative product for promoting a native raw material and/or transformation, fostering real world issues and engaging audiences through art/design processes;

MOTIVATION (WHO) — No stakeholders or final users were specified in the briefing. Students were open to investigating a new product based on the capacity of the material and local commercial opportunities;

MOTIVATION (WHY) — to create a product for promoting Eskisehir's local cultural values, based on the Phrygian Valley, Symbols of Anatolia, Yunus Emre and the importance of the Meerschaum stone.

Briefing observations

The briefing was a valuable tool for the researchers to describe the main objectives of each workshop and for the students to refer to as they progressed through work. It can be clearly observed that the information presented in each briefing document evolved as the three workshop events progressed. Also, in the briefings from Poland and Turkey, the product and stakeholder were not clearly defined as they were in the workshop in Portugal, leaving students to identify these parameters for themselves. In practice, this liberty was interesting for the students to discuss and discover these parameters, but in both cases, the schedule was delayed. However, this did not jeopardise the final results of the workshops, even though initial activities were extended a few hours in the schedule to accommodate this.

4.4 Schedule

From these four **Collective Design Method — Tools**, the workshop's schedule document was the most referred to during the workshop activities and had the most time invested in creating it. This schedule was

a program that described and organised all the workshop activities required to reach the final product prototype, and accomplish the expected teaching-learning results suggested by the **Collective Design Method**.

The development of this schedule started with an online discussion between the researchers, discussing and suggesting strategic content on a digital wall (fig 4.2: Digital wall and result of the workshop schedule discussions) that would meet the suggested teaching-learning objectives for the **Collective Design Method**, inspired by the work from the project researchers and guest authors (see 3 — Voices of Designers, Artists and Educators).

Expected teaching-learning results for the Collective Design Method:

Communicative (develop constructive discourse and interaction within a project group) — ***DRAWING AS A DESIGN MEDIATOR OF CROSS-CULTURAL COMMUNICATION.*** By Jeremy Aston and Marta Varzim, PhD;

Collaborative (productive participation within the group) — ***THE NEW COLLECTIVISM:*** *Individualism and teamwork in art education against the background of social and systemic changes.* By Marta Miaskowska, PhD;

Responsible (socially and ecologically aware) — ***LOCAL MARKERS:*** *Material Narratives Through Place-Based Design Research.* By Melanie McClintock — ***OCEAN PLASTIC:*** *Towards new experimental making and material outcomes.* By Ian Lambert, PhD;

Critical (analyse problems and suggest solutions) — ***WHY IS CRITICAL ANALYSIS ESSENTIAL TO DESIGN PROCESSES?.*** By Shujoy Chakraborty, PhD and Dirk Loyens, PhD;

Creative (demonstrate art and design methods, through experimental and authentic thinking processes) — ***DIMENSIONS OF CREATIVITY.*** By Bilge Kınam, PhD;

Leading (self-oriented and developing team motivation) — ***LEADERSHIP AND PARTICIPATORY MODELS IN DESIGN.*** By Ana Duque, PhD.;

Resilient (professional attitude under pressure, accept criticism and adjust to new criteria) — ***RESILIENCE AS A FUNDAMENTAL SOFT SKILL IN DESIGN:*** *teaching-learning process and innovation achievement.* By Luciana Barbosa — ***RESILIENCE AND DESIGN.*** By Mónica Yoldi López, PhD.

These expected teaching-learning results were constructed in order to foster competitive and disruptive moments within the work-flow, encourage participant interaction, agility and deepen students' curiosity through practical activities, all of which simulated a professional working scenario within the art and design workplace.

The schedule was based on the *Double Diamond,* a design process model popularised by the British Design Council in 2005 and illustrated the divergence-convergence of two parts: Research (discover, explore and define) and Design (develop, test and deliver). This was considered an ambitious, but necessary strategy, therefore a minimum of two consecutive weeks (one week per part) was suggested to conduct the necessary stages and practical activities. Like this, the program could be introduced to art and design course curricular programs, an Erasmus mobility event or a summer school incentive.

With the *Double Diamond* model in mind, the schedule for each workshop was planned in two weekly parts (1. Research and 2. Design), divided into seven stages *(climatisation, familiarisation, informatisation, contextualisation, conceptualisation realisation and formalisation)* for implementing different practical activities (team building, field trips, lectures, training, brainstorming, making, testing, presenting and disruptive moments), in order to tackle the workshop briefing challenge and introduce the **Collective Design Method** objectives.

Practical activities and objectives:

TEAM BUILDING (developing new relationships through formal and informal activities);

FIELD/STUDY TRIPS (visiting cultural and informative locations, companies or industries);

LECTURES/SEMINARS (art and design theory and knowledge);

DEMONSTRATIONS/TRAINING (practising new methods and techniques);

BRAINSTORMING (creative discourse and visual representation);

FEASIBILITY (design analysis through testing);

FORMAL PRESENTATIONS (public speaking);

REVIEWS (pitching ideas and directions);

DISRUPTIVE MOMENTS (overcoming unforeseen obstacles).

The schedules for each workshop were written and organised using an online platform, therefore inviting all project researchers to input their ideas and suggestions, to improve the teaching-learning experience, and workflow.

These seven stages and activities were developed over the three **Collective Design Method** workshop experiences. Therefore, each workshop brought adjustments to implement and test in the subsequent workshop. For example, these seven stages were not clearly specified in the first workshop schedule in Poland, although the programmed structure was similar to the other workshops. These seven stages were only defined concluding the first workshop and implemented in the schedules for the workshops in Portugal and Turkey. Also, it was observed that more time was necessary for participants (teachers and students) to settle into their workshop location, meet each other and develop relationships, therefore introducing more *'climatisation'* and *'familiarisation'* activities at the beginning of the schedule. Lastly, the 'conceptualisation' stage, which concluded the first week of

the workshop, was reported as too short to achieve ideas into design concepts. Therefore, this stage was extended over the weekend period for *reflection* and given an extra day (Monday of the second week) to identify and visually represent product concepts from the ideation process. This allowed the students' work to move more confidently to the design and development activities in the *'realisation'* stage.

Concluding the final workshop in Turkey it was observed, during and concluding the event, that these four **Collective Design Method — Tools** had matured to a point that the expected teaching-learning objectives were made easier to implement, manage and assess results.



Fig 4.1: Collective Design Method — Tools and expected teaching-learning results, visual discussion.


PARTICIPANTS
Multicultural Team
WHO
Art+Design Courses
PRODUCT
GRAPHICS
FASHION
Resilience
SCHEDULE
Timetable
Activities
Double Diamond
Design process
WHEN+HOW
DISCOVER
DEFINE
DEVELOP
DELIVER
Make
Context
Ideation
Realize
Test
Disruption

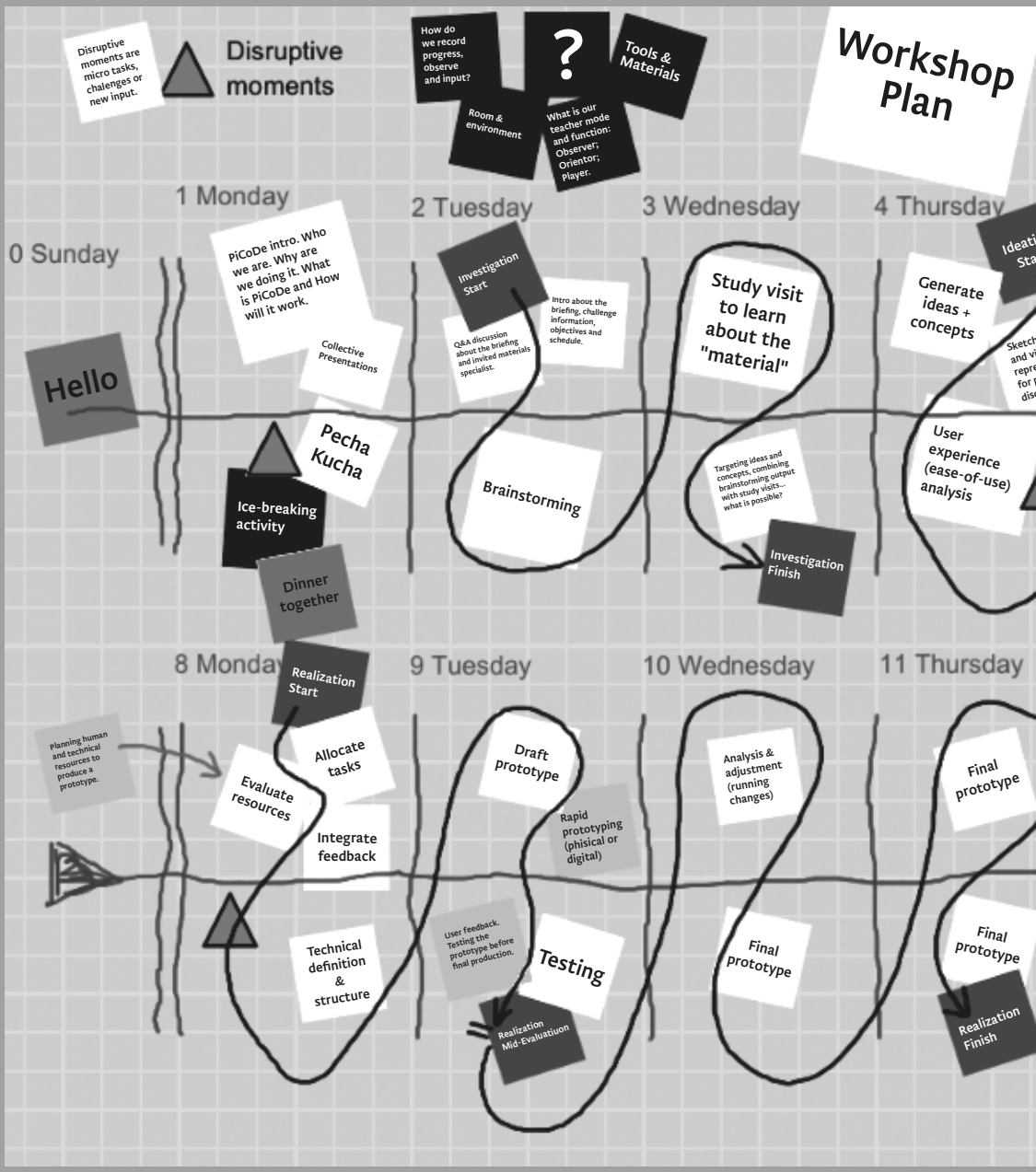
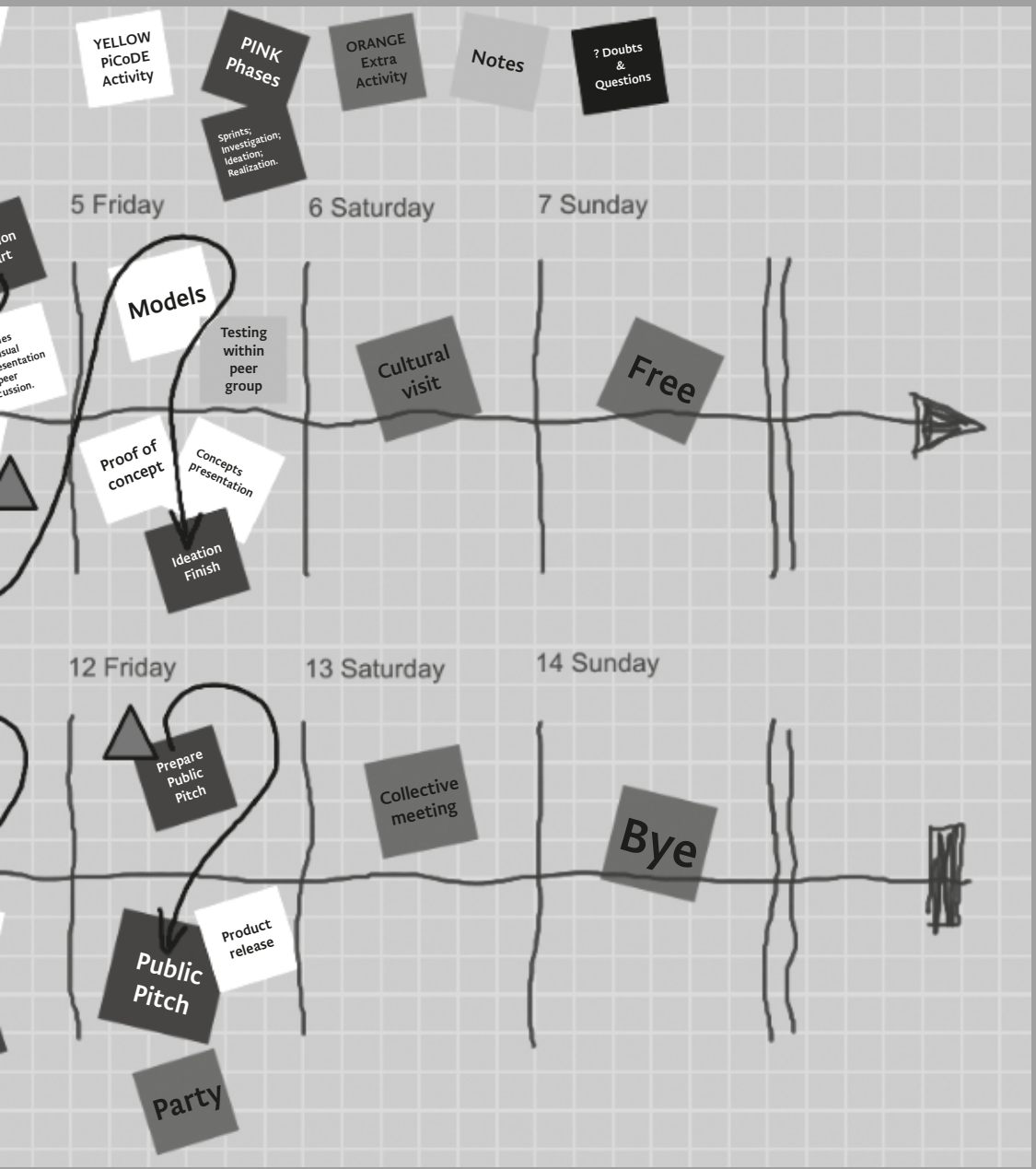


Fig 4.2: Digital wall and result of the workshop schedule discussions.


YELLOW PiCoDE Activity
PINK Phases
Sprints; Investigation; Ideation; Realization.
ORANGE Extra Activity
Notes
? Doubts & Questions
5 Friday
6 Saturday
7 Sunday
Models
Testing within peer group
Cultural visit
Free
Proof of concept
Concepts presentation
Ideation Finish
12 Friday
13 Saturday
14 Sunday
Prepare Public Pitch
Collective meeting
Bye
Product release
Public Pitch
Party

Hours	Sunday, 3 October	Monday, 4 October	Tuesday, 5 October	Wednesday, 6 October	Thursday, 7 October	Friday, 8 October	Saturday, 9 October
9:00 9:30		**PiCoDe intro** Marta M. + Marta V.	**Investigation start** Brifing Q+A	**Visit in EWS** Spinning ul. Lodowa www. suedwollegroup.com	**Ideation start** Lecture sketching Jeremy	**Concept review** Eval & testing	
9:30 10:00		**Teacher intro** Jeremy Melanie Bilge Marta V. Marta M.					
10:00 10:30					**Sketching 01** Product + Branding Concepts *(disruptive moment split into teams)*	**Concept** **Visual** **representation 01**	**Cultural visit in manufaktura** ul. Drewnowska 58 10:15 **museum of the factory** guided tour about 45 minutes. 12:00 - ms2 **museum of art** guided tour about 2 hours
10:30 11:00			**Introduction to materials** Lecture Marcin Barburski				
11:00 11:30		**Visit Uni** Guided tours around the campus		Return + Lunch			
11:30 12:00			**Machines** Visit to laboratories Work samples				
12:00 12:30							
12:30 13:00		Lunch		**Brainstorming 2**			
13:00 13:30			Lunch		Lunch	Lunch	
13:30 14:00		**Student intro** (distruptive moment) 1) preparation of a presentation Pecha Kucha 2) students prezentation					
14:00 14:30			**Our possibilities** Marta M. presentation		**Sketching 2** Product + Branding Concepts	**Concept** **Visual** **representation 02**	Teachers meeting
14:30 15:00			Brainstorming introduction Melanie + Jeremy				
15:00 15:30							
15:30 16:00		Crossing to Piotrkowsk	**Brainstorming 01** *(disruptive moment change room dyn)*	**Investigation finish** Student Presentation			
16:00 16:30	Teacher meeting	**Visit local area** Guided tour of Piotrkowska					
16:30 17:00							
17:00 17:30						**Ideation finish** Student Presentation	
17:30 18:00				Teachers review			
18:00 18:30		**Dinner** Pop'n'art			**Sports activity** Climbing wall - classes with instructors	Teachers review	
18:30 19:00							
19:00 19:30							

Fig 4.3: Schedule for the workshop at Lodz University of Technology, Poland.

Hours	Sunday, 10 October	Monday, 11 October	Tuesday, 12 October	Wednesday, 13 October	Thursday, 14 October	Friday, 15 October	Saturday, 16 October
9:00 9:30		**Iteration start** Eval resources Distribute tasks	**Technical dev 03** Prototype building	**Final product** Eval resources Distribute tasks	**Final product 03** Hall testing	**Exhibition 02**	
9:30 10:00							
10:00 10:30		**Technical dev 01** *(disruptive moment change room dyn)*		**Final product 01**			
10:30 11:00							
11:00 11:30							
11:30 12:00							
12:00 12:30			Prototype evaluation		**Iteration finish** Student presentation	Exhibition evaluation	
12:30 13:00							
13:00 13:30		Lunch	Lunch	Lunch	Lunch	Lunch	
13:30 14:00							
14:00 14:30		**Technical dev 02**	**Technical dev 04** Prototype testing	**Final product 02** *(disruptive moment announce vip pres)*	**Exhibition** Eval resources Distribute tasks	Exhibition check	
14:30 15:00							
15:00 15:30					**Exhibition 01**	**Exhibition open** Student + teacher presentation	
15:30 16:00							
16:00 16:30							
16:30 17:00							
17:00 17:30			**Iteration review** Student Presentation	Final product Prep hall testing		Teachers meeting	
17:30 18:00							
18:00 18:30			Teachers review		Teachers review		

Workshop phases start / review / finish
Teacher meeting / review
PiCoDe workshop product activity
PiCoDe workshop exhibition activity
Extra curricular activity

	Climatization	Familiarization	Informatization	Inform. / Contex.	Contextualization	Conceptualization	—
Hours	Sunday, 15 May	Monday, 16 May	Tuesday, 17 May	Wednesday, 18 May	Thursday, 19 May	Friday, 20 May	Saturday, 21 May
9:00 9:30			**(Informatization Start)** Metro to Churchill's V. Gaia (Jardins do Morro + walk). COLLECTIVE.	**Travel** Bus from ESAD to ACC Mozelos Santa Maria da Feira. COLLECTIVE.			
9:30 10:00		**(Familiarization Start)** **PiCoDe intro/objective/schedule.** MM/MV+JHA.	**Brifing (local product)** ATS in Chruchill's Lodge, R. da Fonte Nova 5, 4400-156 V.N. de Gaia. www.drinkchurchills.com Ana Pinho – Marketing Manager and Communications. COLLECTIVE. *DM on- time.*		**Brainstorming 02** Investigation. Use wall and Jamboard. STUDENTS.	**(Conceptualization Start)** lecture about drawing styles and fidelity. JHA MV	
10:00 10:30		**Teacher Intros** (15 mins each) 5W's & How. TEACHERS.		**Guided visit** **(local material)** ACC Factory Rua Comendador Américo Ferreira Amorim, 260 4535-186 Mozelos, Santa Maria da Feira www.amorim.com Raquel Laranjeira - Head of Design. COLLECTIVE.		**Ideation 01** Generating ideas. Sketching Marathon based on pre-ideation boards. STUDENTS. *DM design thinking resistance.*	
10:30 11:00							**Cultural visit 01 (local product inspiration)** Fundação Serralves www.serralves. pt Guided tour about the foundation, portuguese culture, art, design and architecture. Educational Service: ser.educativo@serralves.pt (Diana Cruz).
11:00 11:30			**Guided visit** Churchills Cellars. COLLECTIVE.				
11:30 12:00		**Guided visit** ESAD installations and departments. COLLECTIVE.					
12:00 12:30				**(Informatization Finish)** Travel Bus from ACC to ESAD Matosinhos. COLLECTIVE.	Work review. COLLECTIVE.	Work review. COLLECTIVE.	
12:30 13:00		**Lunch** in ESAD. COLLECTIVE. (Booked)	**Lunch** in Casais de Gaia. TEACHER / STUDENTS.	**Lunch** in/near ESAD. TEACHERS / STUDENTS.	**Lunch** in/near ESAD. TEACHERS / STUDENTS.	**Lunch** in/near ESAD. TEACHERS / STUDENTS.	**Lunch** in Serralves. COLLECTIVE. (Booked)
13:00 13:30							
13:30 14:00							
14:00 14:30		**Student Intros** (Pesha Kusha) 5W's & How - 6 slides per student. MM BK + STUDENTS. *DM Formal introduction under pressure.*	**Travel** Bus from Churchills to ATS Argoncilhe. COLLECTIVE.	**(Contextualization Start)** **Lecture** Visual investigation methods (JHA MMc).	**Lecture** Pre-ideation boards. LB BK.	**Ideation 02** **Generating ideas.** Sketching Marathon based on selected output from ideation 01. COLLECTIVE.	**Cultural visit 02 (local product inspiration)** Fundação Serralves www.serralves.pt Visit the contempory art exhibitions, gardens, tree-top walk and villa. Educational Service: ser. educativo@serralves.pt (Diana Cruz).
14:30 15:00				**Brainstorming 01** Investigation. Define key-directions. Use wall and Jamboard. COLLECTIVE. *DM group organisation with phyical and virtual tools.*	**Brainstorming 03** Pre- ideation boards (i.e. Catarina/Ivan; Guilherme/Isabella; Julie/Ada; Gabriela/Simge + teachers). Objective to create 16 boards (printed) with info: brand values; tech considerations; stakeholder + scenario + environment; inspirations; vision. STUDENT PAIRS. *DM pair co-operation.*		
15:00 15:30			**Technical lecture (local material)** - ATS Factory R. Central da Vergada 1055, 4505-006 Argoncilhe www.amorimtopseries.com Hugo Mesquita - Sales & Marketing Director.				
15:30 16:00							
16:00 16:30	**Project meeting.** TEACHERS. In esad— idea.	**Travel** Metro from ESAD to Porto. COLLECTIVE.	**Guided visit** ATS Factory Catarina Costa - Head of Design and Sarah Pontes - Head of New Prodcut Development. COLLECTIVE.			Work review. COLLECTIVE.	
16:30 17:00		**(Familiarization Finish)** Guided visit with Antonio. Porto walk: Metro to São Bento; Porto Cathedral; Luis Bridge; Miradouro da Serra do Pillar; Cais da Gaia; Cais da Ribeira; Ribeira do Porto (refreshment). COLLECTIVE.				Client work review with Churchill's, ATS ACC. COLLECTIVE. *DM pitching pressure.*	
17:00 17:30	**(Climatization Start/Finish)** Welcome meeting with teachers and students in esad— idea Investigação em Design e Arte (R. França Júnior 214, 4450-136 Matosinhos) at 17h00. COLLECTIVE.		**Travel** Bus from ATS to ESAD. COLLECTIVE.	Work review. COLLECTIVE.			
17:30 18:00				Work review. TEACHERS.	**(Contextualization Finish)** Work review. COLLECTIVE.	**Sports activity** COLLECTIVE. Team building activity.	
18:00 18:30							
18:30 19:00							
19:00 19:30							

Fig 4.4: Schedule for the workshop at ESAD — College of Art and Design, Matosinhos/Porto, Portugal.

	—	Conceptualization	Realization	Realization	Realiz. / Formaliz.	Formalization	—
Hours	Sunday, 22 May	Monday, 23 May	Tuesday, 24 May	Wednesday, 25 May	Thursday, 26 May	Friday, 27 May	Saturday, 28 May
9:00 9:30	Things to do in Porto:						
9:30 10:00	Palacio da Bolsa www.palaciodabolsa. com	**Ideation Review** Discuss concept dev and tasks. TEACHERS.	**(Realization Start)** Product dev and prototype. TEACHERS.	**Final product 01** Make final prototype. COLLECTIVE.	**Final product 03** Make and assemble final prototype. COLLECTIVE.	**Exhibition 02** Produce and install exhibition material. COLLECTIVE.	
10:00 10:30	Portuguese Centre of Photography www.cpf.pt	**Concept Dev 01** Basic representation (sketches and diagrams). STUDENTS. *DM split group into* *2 competitive teams:* *Alfa; Bravo.*	**Technical dev 01** Product development, technical definition and virtual prototype. STUDENTS.				
10:30 11:00	Tram Museum www.stcp.pt						
11:00 11:30	Alfandega Museum www.ccalfandegaporto.com						
11:30 12:00	Press Museum www.museudaimprensa.pt				**(Realization Finish)** Present prototype, final test and review. COLLECTIVE.		
12:00 12:30	www.getyourguide. co.uk/porto-l151/porto-6- bridge-s-cruise-t183308/	Work review. COLLECTIVE.					
12:30 13:00	**Lunch**	**Lunch** in/near ESAD.	**Lunch** in/near ESAD.	**Lunch** in/near ESAD.	**Lunch** in/near ESAD.	**Lunch** in/near ESAD.	
13:00 13:30							
13:30 14:00							
14:00 14:30	Project meeting. TEACHERS.	**Concept Dev 02** Advanced representation (physical or virtual models, rendering or illustration). STUDENTS.	**Technical dev 02** Product development, technical definition and virtual prototype. STUDENTS.	**Final product 02** Make and assemble final prototype. COLLECTIVE.	**(Formalization Start)** Discuss exhibition plan + material production. COLLECTIVE.	**Exhibition 03** Check installation. COLLECTIVE.	
14:30 15:00					**Exhibition 01** Collect work and prepare display panels for printing. COLLECTIVE.		
15:00 15:30						**(Formalization Finish)** Exhibition open, student + teacher presentation. Buffet and refreshments. COLLECTIVE. *DM Formal presentation.*	
15:30 16:00							
16:00 16:30							
16:30 17:00							
17:00 17:30		**(Conceptualization Finish)** Work review. COLLECTIVE.	Virtual prototype test and review. COLLECTIVE.				
17:30 18:00		Work review. TEACHERS.		Work review. COLLECTIVE. *DM announce vip.*	Work review. COLLECTIVE.	Project meeting. TEACHERS.	

Workshop phases start / review / finish

Teacher meeting / review

PiCoDe workshop product activity

PiCoDe workshop exhibition activity

Extra curricular activity

Hours	Climatization Sunday, 25 September	Familiarization Monday, 26 September	Informatization Tuesday, 27 September	Inform. / Contex. Wednesday, 28 September	Contextualization Thursday, 29 September	Conceptualization Friday, 30 September	— Saturday, 1 October
9:00 9:30			**(Informatization Start)** Bus from ESOGÜ Faculty of Art and Design (A&DF) Odunpazarı	Bus from ESOGÜ Faculty of Art and Design (A&DF) Odunpazarı			
9:30 10:00		(Familiarization Start) PiCoDe intro/objective/ schedule. BK	**Cultural visit 02: Guided Visit to Phrygian Valley (Civilization of King Midas)** Gerdekkaya, Han Underground City, Pişmiş Castle, Yazılıkaya, Kırkgöz Cliffs, Cisterns, Aslankaya, Üçlerkayası, Ayazini Church and Lion Temple. www.goturkiye.com	**Cultural Visit 04: Eskişehir Eti Archeology** Guided Museum Visit	**Meerschaum workshop** by Talat Ürersoy	**(Conceptualization Start)** Lecture about drawing styles and fidelity. JHA MV	
10:00 10:30		**Teacher Intros** (15 mins each) 5W's & How. TEACHERS.				**Ideation 01** Generating ideas. Sketching Marathon based on pre-ideation boards. STUDENTS. JM	
10:30 11:00							**Activity:** Museum of Contemporary Art Glass and Eskisehir Urban Memory Museum www.muze.gov.tr www.eskisehir.bel.tr
11:00 11:30		**Lecture** **"Culture of Eskişehir"** by İrfan Ongar					
11:30 12:00							
12:00 12:30				**(Informatization Finish)**		Work review. COLLECTIVE.	Bus picking from Contemporary Art Glass to Kentpark Kırım Börekçisi
12:30 13:00		**Lunch** in Ayten Usta Aynalı Kahve Odunpazarı (Close to the faculty) COLLECTIVE. www.aytenusta.com	**Lunch** in Frig Valley TEACHER / STUDENTS	**Lunch** in Kafkasör Döner Kebap COLLECTIVE TEACHERS / STUDENTS.	**Lunch** in/near ESOGÜ A&DF TEACHERS / STUDENTS.	**Lunch** in/near ESOGÜ A&DF TEACHERS / STUDENTS.	**Lunch** at Kentpark Kırım Börekçisi COLLECTIVE www.eskisehir.ktb.gov.tr
13:00 13:30							
13:30 14:00			**Cultural visit 02: Guided Visit to Phrygian Valley (Civilization of King Midas)** Gerdekkaya, Pişmiş Castle, Yazılıkaya, Kırkgöz Cliffs, Cisterns, Aslankaya, Üçlerkayası, A yazini Church and Lion Temple. www.goturkiye.com	**(Contextualization Start)**			
14:00 14:30	**Project meeting.** TEACHERS. Odunpazarı Modern Museum (OMM) cafe www.omm.art	**Student Intros** (Pesha Kusha) 5W's & How - 6 slides per student. OGU VCD Asistants + STUDENTS.		**Meerschaum workshop** by Talat Ürersoy	**Brainstorming 01** Pre-ideation boards. scenario + environment; inspirations; vision. STUDENT PAIRS.	**Ideation 02** **- Generating ideas.** Sketching Marathon based on selected output from ideation 01. COLLECTIVE	
14:30 15:00							
15:00 15:30	**(Climatization Start/ Finish)** Welcome meeting with teachers and students Modern Museum (OMM) cafe **Visiting Modern Museum (OMM)** **www.omm.art**						
15:30 16:00							
16:00 16:30		**(Familiarization Finish)** **- Eskisehir Cultural visit 01:** Guided visit with İrfan Ongar Odunpazarı Traditional Houses, Meerschaum Museum Külliye, Meerschaum and Glass craftmen shops COLLECTIVE.	Cultural visit 03: Guided Seyyid Battal Gazi Külliyesi ve Türbesi (Seyitgazi)			Work review. COLLECTIVE.	
16:30 17:00							
17:00 17:30							
17:30 18:00					**(Contextualization Finish)** Work review. COLLECTIVE.		
18:00 18:30	Dinner at Casaba Modern (teachers) https://cassabamodern.com. tr/ or Kafkasör Kebap House		**Travel** **Bus from Frig Valley to ESOGÜ A&DF** **COLLECTIVE.**	Work review. COLLECTIVE.		Culturel activity Porsuk Boat Tour	
18:30 19:00							
19:00 19:30		**(Familiarization Finish)**				Dinner in VARUNA GEZGİN KANTIN (TEACHERS)	

Fig 4.5: Schedule for the workshop at Eskisehir Osmangazi University, Turkey.

Hours	—	Conceptualization	Realization	Realization	Realiz. / Formaliz.	Formalization	—
	Sunday, 2 October	Monday, 3 October	Tuesday, 4 October	Wednesday, 5 October	Thursday, 6 October	Friday, 7 October	Saturday, 8 October
9:00 9:30	Things to do in Eskişehir: Kentpark and Sazova Science Culture and Art Park www.eskisehir.bel.tr						
9:30 10:00		**Ideation Review** Discuss concept dev and tasks. TEACHERS.	**(Realization Start)** Product dev and prototype. TEACHERS.	**Final product 01** Make final prototype. COLLECTIVE.	**Final product 03** Make and assemble final prototype. COLLECTIVE.	**Exhibition 02** Produce and install exhibition material. COLLECTIVE.	
10:00 10:30	Büyükşehir Belediyesi Sabancı Uzay Evi Sabancı Planetarium Show www.sabancivakfi.org	**Concept Dev 01** Basic representation (sketches and diagrams). STUDENTS.	**Technical dev 01** Product development, technical definition and virtual prototype. STUDENTS.				
10:30 11:00							
11:00 11:30	Eskisehir Urban Memory Museum www.muze.gov.tr						
11:30 12:00					**(Realization Finish)** Present prototype, final test and review. COLLECTIVE.		
12:00 12:30		Work review. COLLECTIVE.					
12:30 13:00	Independence Museum www.kurtulusmuzesi.com Büyükerşen Wax Museum www.eskisehir.bel.tr	**Lunch** in/near Anadolu University Taş Bina TEACHERS / STUDENTS. www.anadolu.edu.tr	**Lunch** in/near ESOGÜ	**Lunch** in Fahrettin Usta Kebap COLLECTIVE TEACHERS / STUDENTS.	**Lunch** in/near ESOGÜ	**Lunch** in/near exhibition place Atilla Özer Karikatürlü Ev Exhibition Hall	
13:00 13:30							
13:30 14:00							
14:00 14:30	Project meeting. TEACHERS. Bilge's Home or Haller Youth Centre	**Concept Dev 02** Advanced representation (physical or virtual models, rendering or illustration). STUDENTS.	**Technical dev 02** Product development, technical definition and virtual prototype. STUDENTS.	**Final product 02** Make and assemble final prototype. COLLECTIVE.	**(Formalization Start)** Discuss exhibition plan + material production. COLLECTIVE.	**Exhibition 03** Check installation. COLLECTIVE. Atilla Özer Karikatürlü Ev Exhibition Hall	
14:30 15:00					**Exhibition 01** Collect work and prepare display panels for printing. COLLECTIVE.		
15:00 15:30						**(Formalization Finish)** Exhibition open, student + teacher presentation. Buffet and refreshments. COLLECTIVE. *DM Formal presentation.*	
15:30 16:00							
16:00 16:30							
16:30 17:00							
17:00 17:30		**(Conceptualization Finish)** Work review. COLLECTIVE.	**(Virtual prototype test)** Design review. COLLECTIVE.				
17:30 18:00		Work review. TEACHERS.		Work review. COLLECTIVE. *DM announce vip.*	Work review. COLLECTIVE.	Project meeting. TEACHERS.	

Workshop phases start / review / finish

Teacher meeting / review

PiCoDe workshop product activity

PiCoDe workshop exhibition activity

Extra curricular activity

TES

The assumptions of the Collective Design Method were tested in laboratory conditions at three different higher education institutions in Poland, Portugal and Turkey, with groups of multidisciplinary art and design students, collaborating together on a locally inspired design challenge. These events were observed and data collected from each of the workshops, therefore developing the concept of the teaching-learning method into a mature and more usable form.



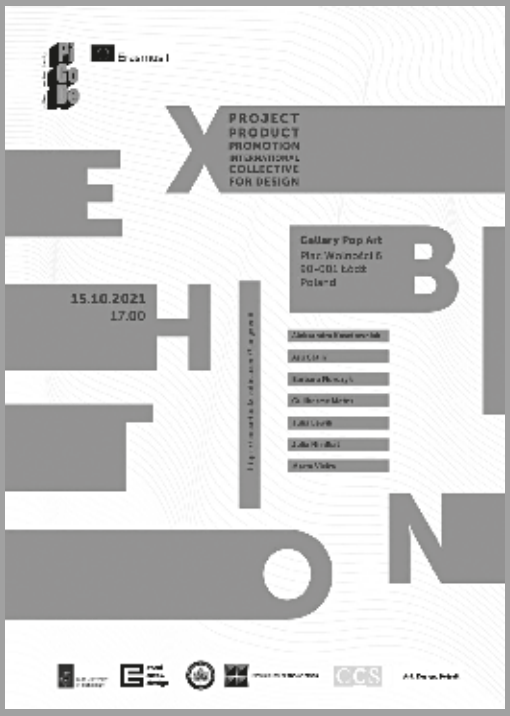


Fig 5.1.1: Workshop and exhibition poster.

5.1—1ST WORKSHOP IN POLAND

Lodz University of Technology, Poland

The following report reflects on the experiences, challenges and results of the first **Collective Design Method** workshop, hosted by Lodz University of Technology in Poland, between 4th and 15th October 2021, about the: planning; stages; moments; outputs and conclusions.

Planning

Hosting Institution

The first workshop took place in Poland, at the Faculty of Materials Technology and Textile Design of the Lodz University of Technology, and whose traditions were closely related to the textile history of the city. The industrial textile history of Lodz was the foundation of contemporary designers in the region, therefore textile and clothing design were naturally incorporated in the educational program of Lodz universities.

The equipment within this department was unique, and made it possible to create conditions for the workshop to use wool based textiles as the local material, from the machines that transform the raw materials to the finishing. Also, within the faculty there were classrooms prepared for manual and digital design work.

External collaborators were also invited to assist initial activities, supporting the preparatory process. The local company called East West Spinning, with a long history in the textile industry, introduced the secrets behind yarn production.

Participants

As a priority in selecting participants, the project researchers agreed that the workshop participants, as a group, should be multicultural and multidisciplinary in the art and design area. Therefore, students from the cooperating universities in Poland, Portugal and Turkey received information about the planned workshop in Poland, its objectives and application procedure. Potential candidates should have at least three years undergraduate education on an art and design course, present a CV and portfolio, speak and understand English, and show good motivation.

With this, the project researchers (also known as the workshop teachers) selected seven students from the collaborating universities, four from Poland, two from Portugal and one from Turkey, representing different skills in product, interior, clothing, textile and graphic design (fig 5.1.1: Workshop and exhibition poster).

Briefing

Participants were presented with a briefing at the beginning of the workshop, containing information about the challenge, local materials and resources. This document described the goals of the workshop,

the path they should follow, and the tools they should use to solve problems (see chapter 4 Tools — Briefing, for details).

Schedule

The program for the workshops was prepared by the researchers, conducting a two-week workshop, seven stages, and with various practical activities. In practice, the activities started on Monday of the first week, and ended on Friday of the following week. The weekend was also included in the workshop plan, with cultural activities, which were both leisurely after an intensive first week, but also included a research dimension, thematically related to the workshop challenge (see chapter 4 Tools — Schedule, for details).

Stages and activities

The program of the first workshop was written by the project researchers and the activities sourced locally by the workshop organiser, to fit the design process: discover, design, test and deliver. On the first days of the workshop, meetings between the researchers were devoted to developing this teaching-learning concept, and suggesting a new framework for the **Collective Design Method**, being seven stages: climatisation; familiarisation; informatisation; contextualisation; conceptualisation; realisation and formalisation.

Although the program for the first workshop was not precisely adjusted to these seven stages, the implementation was intuitive and was formally introduced to later workshops in Portugal and Turkey.

Meeting the participants

Day 1 (Monday, 4th October).

The teachers and students met for the first time at the university to discuss the workshop procedure. Firstly, the schedule for participants to know about the assumptions of the research project and the objects of the workshop, together with a detailed itinerary of activities during the two weeks. This was followed by a guided visit around the university campus, meeting the dean and other administrative departments, and being shown the laboratories where the forecasted new product from the workshop would be prototyped. In the afternoon, the students prepared short presentations in the *Pecha Kucha* format, based on a *storytelling slideshow,* formally introducing themselves to the other participants.

Discovering the location

In the late afternoon, less formal activities were planned to discover the locality in and around Lodz. The tour around the city was supported by a local guide, and the group was shown the popular sights and secrets of the area. The main avenue was called Piotrkowska Street that took the group on a journey through the textile history of Lodz industry, murals and the legacy of Polish cinematography (fig 5.1.2: Mural paintings in Lodz city streets and buildings).

The first day concluded with refreshments and dinner in the restaurant belonging to the gallery, and where in two weeks time, the results from the workshop will be displayed and shared publicly.

Investigation

Day 2 (Tuesday, 5th October).

In the morning, the students were introduced to the workshop challenge and given lectures by specialists in the textile area, and to reveal relevant knowledge about the available materials, before design activities started.

The briefing was presented to the students by the teachers, creating discussion about the challenge, objectives, variables and the processes to consider to achieve good results.

Briefing challenge

To design, prototype and promote with visual media, a new product that used a local material, production and sustainable methods;

Natural wool was the local material, commonly used by local textile industry, yarn manufacturing and weaving technologies;

To orientate design thinking towards products that would promote cultural tourism for street art and film in Lodz.

Concluding the briefing presentation, students were introduced to a spectrum of materials (including wool) and visited the laboratories, guided by the workshop organiser. This was supplemented by a technical lecture by a professor from the The Faculty of Materials Technologies and Textile Design, who presented the origins, properties, processes and applications of various types of fibres. Natural wool was selected as the local material for the workshop and design purposes (fig 5.1.3: Different types of fibres).

In the afternoon, the training activities were continued, together with an initial *brainstorming* session to discuss observations from these experiences.

This training focused on the Jacquard and embroidery machines, which were reserved for the duration of the workshop. Students were shown how the machines worked and the technical procedures necessary to set-up the machines and operate them. Also, it was exceptionally useful to estimate the time required to make the prototypes towards the final days of the workshop (fig 5.1.4: Jacquard machine).

Day 3 (Wednesday, 6th October).

Both of these machines used yarn in either their weaving or embroidery production methods, therefore the process of turning the natural fibre into yarn was not explained. For this, on the morning of the third day (Wednesday), the students and teacher visited a local spinning mill company, called East West Spinning, who have cooperated with the university for many years. The factory tour introduced the participants to the details of the wool manufacturing processes



Fig 5.1.2: Mural paintings in Lodz city streets and buildings.



Fig 5.1.3: Different types of fibres.



Fig 5.1.4: Jacquard machine



Fig 5.1.5: East West Spinning factory.

(fig 5.1.5: East West Spinning factory), but also allowed them to understand the differences between materials and their place in the contemporary textile market.

As a result of this stage, these experiences brought the students closer together through practical activities, and gave first-hand knowledge of the local working mechanisms of the local material and industry.

Ideation

Days 4 and 5

(Thursday and Friday, 7th and 8th October).

The discovery of the location and the training from the previous stages, provided information that guided students' design thinking towards the objectives of the workshop and the design challenge.

These activities focused on design and sketching ideas, and through a selection process, ellorate on these ideas into product concepts. Through this process, students collectively addressed the challenge by implementing the 5Ws and How (Who, What, When, Where, Why and How). This method is commonly used by journalists for report writing, but serves as an robust enquiry tool for designers to research who the users are, *what* the users do, *how* they perform the task, *where* and *when* they perform the task, and *why* they need it.

From this study, three design proposals emerged from the work, of which, two were selected. This selection was the result of a debate between the participants, critically analysing the work and collectively agreeing on solutions to follow. With this, students were divided into two teams (A and B), each to pursue one of the selected proposals. This division in the group was unprogrammed in the schedule, but it was agreed by the project researchers to follow this opportunity, therefore creating a competitive scenario, and ultimately, producing two products from the workshop experience. Unknown at the time, this formula worked so well that it was continued as an important teaching-learning component for the subsequent workshops in Portugal and Turkey.

This activity finished on late Thursday afternoon, with pitching the design concepts from both teams, presented to the workshop teachers and technical staff from the university, showing the developed user profile and scenario, with images, illustrations and sketches of the proposed product.

On Friday morning, students continued to design their products and represented them in a more persuasive format, making computer renderings and test samples in textile, to show the potential aesthetic and demonstrate material feasibility.

Team A worked on the concept of a map made from textile, indicating the famous murals around the city. This pattern was woven with coloured wool yards on the Jacquard machine and featured abstract graphics to test the legibility and physical usability of the product (fig 5.1.6: Designing a map concept).

Team B designed a poncho, a wearable blanket for

open-air cinema in the city, featuring graphics and QR code links from historic Polish film classics (fig 5.1.7: Designing a Polish film concept).

At this stage, students still communicated insecurities with their chosen design concepts, and reported a lack of practical data and contextual inspiration to support their ideas. So, in the afternoon, students went into the city to study the contextual variables their products and users would be faced with.

Team A walked the routes they had indicated on their mural map, to analyse their accuracy, approach to the mural, and discover alternative routes for faster modes of transport (i.e., bicycle or electric scooter). This experience played an important part of the process and influenced the design to include a protective case and shoulder strap.

Team B visited the cinematography museum and the local film school in search of inspiration for the main visual themes of the apparel product. With this, the students discovered a collection of old posters from popular Polish cinema, which influenced the visual message decorated on the product.

In both cases, this new data mobilised the student teams to refine their products and presented more confident work to the teachers. The presentations were relatively formal and required digital tools (fig 5.1.8: Designing patterns), to visualise each concept in motion, which provoked constructive discussion to improve certain areas of their designs. This activity concluded the first week of the workshop.

Over the weekend, students and teachers visited local museums, and spent casual time together, discussing product issues and preparing for the following week.

Iteration

Days 8 to 11

(Monday to Thursday, 11th to 14th October).

This stage started early on Monday morning with a group meeting, to plan the time for developing and prototyping each of the products. With this, the student teams divided themselves into smaller groups to do the tasks necessary to achieve this stage, some to test the materials and designs with the Jacquard weaving machine and computer embroidery, and others to work on the visual communication and multimedia aspects of the product.

Testing and experimenting with the machines revealed certain technological and physical limitations that forced both teams to make changes to their designs. The mural map, from team A, had to increase the yarn thickness used by the embroidery machine, for the cord around the rectangular woven map page. Team B, had problems with the repetitive pattern on their poncho and had to adjust the digital files to accommodate the Jacquard machine's weave capabilities.

Even though the two teams had defined products to develop and prototype, they collaborated together to overcome these problems by sharing their technical experiences with each of the machines, therefore



Fig 5.1.6: Designing a map concept.



Fig 5.1.7: Designing a Polish film concept.



Fig 5.1.8: Designing patterns.



Fig 5.1.9: Working with the Jacquard machine.

saving time and increasing their efficiency to find solutions (fig 5.1.9: Working with the Jacquard machine).

However, even with this efficiency, the Jacquard machine failed in mid-production due to incompatible yarn changes. The specified natural wool yarn broke frequently during the weaving process and the machine had to be stopped. The technicians informed the students that these machines require yarn with some elasticity for their constant tension during the weaving process. Therefore, yarns with synthetic additives were more reliable. With this, the decision was made to use polyester-blended yarns for the prototypes to meet the workshop schedule. However, in the future, it would be possible to make these products in natural wool, but with more time for testing and other machines sourced for this process.

This was a very stressful period for the students and teachers. Both prototypes were stopped until new yarn material was purchased from a local supplier and the machines setup to work again. With this, the students, teachers and machines worked up to the last hours of the last day of the workshop, to produce these prototypes and deliver them to the final exhibition.

Exhibition

Day 12 (Friday, 15th October).

The exhibition was the final presentation to a public audience and the conclusion of the **Collective Design Method** workshop in Poland. Despite the fact that the prototype production was still in progress within the university, controlled by two dedicated students and technicians, the other teachers and students prepared the gallery space for this event.

All graphic material was collected from each team, with designed logos, branding and other visual elements, printed and fitted into large picture frames, and mounted on the gallery walls. In parallel, this was reinforced by two video projections, showing films and slides from each design process, art and multimedia elements, and the visual aspect of each product.

The strongest multimedia work was produced by team A with their mural map. The students made a digital application for smartphones, which was accessed by using the physical textile map product, making it possible to hear an audio guide about the murals shown on the map. This was setup in the gallery on a computer with headphones, where visitors could interact with part of the map experience in four different languages: English; Polish; Portuguese and Turkish.

The exhibition area displayed each team's work separately on the left and right walls, and the physical prototypes and wool materials were clustered in the centre of the room, supported on various tables and mannequins to demonstrate each product.

The exhibition of the final work opened to the public late Friday afternoon and allowed the workshop teachers (project researchers) to explain the research objectives, and for the student teams to formally present their work and collective experiences. Also, students autonomously interacted and accompanied interested visitors around the work, giving commentary and backstage experiences.

Moments and supporting activities

Teachers meetings and workshop reviews

During the workshop period, teachers accompanied the students' progress and assisted the activities. The workshop schedule had several key meeting-points throughout the process, when teachers played a client role and critically analysed the students' work. This interaction and proximity allowed teachers to respond to the students' needs and support unplanned difficulties. Also, due to the pressure of producing the prototypes in the final stages of the workshop, teachers' support for the exhibition was fundamental.

Disruptive moments

Unrevealed to the students, the project researchers planned disruptive moments throughout the workshop schedule, to create changes in their workflow and confront problems.

In the first week, students were moved around between different groups during various activities. They had to cope with making cooperative relationships faster to achieve current activity objectives, therefore communicating and adapting to new circumstances. Also, timed activities and exposing students to formal speaking in front of an unfamiliar audience, built resilience in the way students performed and presented themselves.

However, the most disruptive moment was the Jacquard machine's failure to weave using natural wool yarn, which almost ruined the intention of producing prototypes. This was unplanned by the project researchers, but served as an important moment to test everyone involved in the workshop.

Also, due to a combination of illness and undeveloped English speaking skills, one student had difficulty participating in the group activities. This was difficult, but tolerated by the other students, and in the second week there was some improvement in their participation and performance.

Sports activity

This activity served as a team-building exercise by doing an emotionally stimulating sport. The university featured a comprehensive sports facility, including an indoor rock-climbing wall twenty metres high. Initially, this activity was to observe and test performance fabrics, but later it was decided wool-based fabrics were the better option for this workshop. However, this activity was interesting to see the participants' reaction to this strenuous climbing sport, some getting involved, and others preferring not to participate for personal or physical reasons. For those that did participate, the group activities the following day were more communicative due to this sports activity. Therefore,

breaking away from the normal work routine to exercise other cognitive, physical and emotional moments brought some participants closer together and improved cooperation.

Cultural visits

Visiting the city and getting closer to local traditions were key learning components in the process of designing products based on local opportunities and promoting the cultural values of the region.

In addition to the scheduled visits to cultural centres and industries, which directly influenced the workshop theme, extra-curricular activities were suggested by the workshop organiser for the middle weekend, with guided visits to the Textile Museum, Factory Museum and the Museum of Art, which significantly increased students' awareness of the history of the textile industry, the history of Łódź and the legacy of the avant-garde city (fig 5.1.10: Visiting the Museum of Art).

Freetime

The Polish students from Łódź were very hospitable with the foreign students' visitors, taking them most evenings to restaurants and introducing them to the local student life. However, the schedule was very busy, starting work at 9h00 and finishing after 18h00, so there was little time to explore or suggest other informal activities, since most participants were tired. The project researchers did discuss this point in the transitional meeting, and it was agreed that future workshops would allow more freetime for student autonomous activities and should be part of the Collective Design Method.

Output

The results of students' work

The workshop resulted in students designing and prototyping two products made from local materials and production methods, and producing all the visual communication to demonstrate and promote them.

Team A produced THE ART OF HUNTING, a guide to Łódź murals, on a rolled-up textile map woven on the Jacquard machine and finished on the embroidery machine, showing various sightseeing paths and accessing an digital audio guide application. The idea was for tourists to use the map for finding the city's murals, and on returning home, use the map as a commemorative picture to hang on the wall. (fig 5.1.11: THE ART OF HUNTING digital application prototype).

Team B produced a poncho called POKINO. A warm wearable blanket woven on the Jacquard machine, with embroidered patterns and motifs referring to the avant-garde film tradition of Łódź city in the early 20th century. The idea of the product was to promote classic Polish cinematography and have embroidered QR codes to access film trailers and information about each of the classic films. Pokino could play a practical role during many Łódź open-air film festivals in the cooler evenings (fig 5.1.12: POKINO prototype).

The results of work on the teaching method

The first workshop in Poland was the first experience with the **Collective Design Method** and revealed six weaknesses within the program, which helped project researchers to assess the teaching-learning method, draw conclusions and suggest changes for improving the subsequent workshop in Portugal.

1. All future workshop participants should have good English speaking experience and demonstrate this capacity during the interview selecting process.
2. Introduce a systematised workflow, broken down into seven stages: climatization, familiarisation; informatization; contextualization; conceptualization; realisation, and formalisation. These stages encourage important time for participants to meet and informally interact, before entering the design process.
3. There was some inconsistency with the teachers' orientation to the students' work, which in some cases, caused confusion. Teachers should have identified roles within the workshop and increased awareness of other teachers' actions. Ideally, students should have more autonomy to approach teachers when assistance is necessary.
4. Teachers should not impose their ideas or make final decisions, but have an advisory and supportive role.
5. More free time was necessary for personal maintenance. Shorter working days, or even a day off.
6. During the workshop, other creative activities for stimulating ideas should be planned, such as: a drawing marathon, experimenting with local materials and seeking opinions from local specialists.

Conclusions

Despite many unproven assumptions, the planned workshop was successfully completed. As expected, the student participants developed new product prototypes, together with their visual communication and materials necessary for their public demonstration.

Most importantly, the first workshop allowed the project researchers to test and adjust the first assumptions of the **Collective Design Method**. Some adjustments were implemented as running changes in this workshop, and others were developed and tested in the next workshops.



Fig 5.1.10: Visiting the Museum of Art.

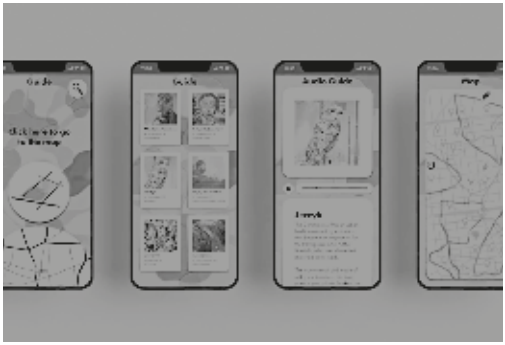


Fig 5.1.11: THE ART OF HUNTING digital application prototype.

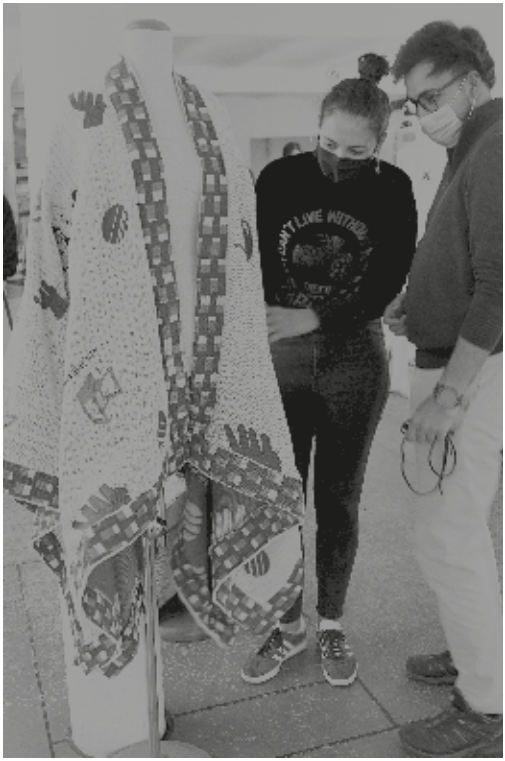


Fig 5.1.12: POKINO prototype.



Fig 5.2.1: Poster for Workshop in Portugal.

5.2 — 2ND WORKSHOP IN PORTUGAL

ESAD — College of Art and Design, Portugal

This report reflects on the experiences, challenges and results of the second **Collective Design Method** workshop, hosted by ESAD — College of Art and Design, in Portugal, between 15 and 27 May 2022, about the planning, activity stages, moments, outputs and conclusions.

Planning

Hosting Institution

ESAD — College of Art and Design is a private college of higher education, located in the north of Portugal, near Porto city, the Douro river and on the Atlantic coastline. Here was the setting for the second workshop, organised by Jeremy Aston and Marta Varzim, both professors at ESAD and coordinators for Product Design and Digital Arts/Multimedia courses respectively. As the hosting institution, ESAD provided rooms and facilities for the workshop activities, including materials and equipment to design, develop and make potential products from this workshop.

In addition to ESAD's internal facilities, external collaborators were invited to participate in this workshop and research incentive, companies supplying the local material, technical knowledge and the briefing challenge. These local companies were Amorim Top Series, Amorim Cork Composites and Churchill's, a boutique Port and Douro wine company (fig 5.2.1: Poster for Workshop in Portugal).

Participants

During March and April 2022, the workshop was publicised within each higher academic institution in Portugal, Poland and Turkey, to attract potential student candidates, informing them about the objectives of the project, curricular prospects and career incentives. Eight students were selected from the interview procedure, analysing their curriculums, portfolios and discussing their motivations to participate in this workshop in Portugal. All students had at least three years of art and design higher academic studies, third year undergraduate or first year postgraduate, with different nationalities, Portuguese, Belgian, Brazilian, Polish and Turkish, from various course backgrounds in product, interior, furniture, fashion, graphic/visual communication and multimedia design.

Briefing

A written briefing for the workshop was developed by the project researchers, which listed the parameters of the art and design challenge. This was formally presented to the students starting the *informatisation* stage of the workshop, together with representatives from Amorim and Churhill's (see chapter 4 Tools — Briefing, for details).

Schedule

Based on the workshop schedule structure developed by the project researchers, this timetable was adjusted

by the ESAD workshop organisers to accommodate the workshop challenge and program activities (see chapter 4 Tools — Schedule, for details).

Stages and activities

Climatisation

Day 1 (Sunday, 15th May).

Teachers and students met in esad—idea, ESAD's research centre in Matosinhos for informal introductions, adjusting to the environment, relaxing after travelling and preparing for the workshop. This first meeting was a casual occasion with table discussions, presentation of the workshop schedule, followed by refreshments, a tour of the Matosinhos locality and initial social interaction (fig 5.2.2: First meeting in ESAD's research centre esad—idea).

Familiarisation

Day 2 (Monday, 16th May).

The morning started with formal introductions to the research project and the teachers behind the research, each presenting their art and design backgrounds and specialities. This was followed by a tour of ESAD's College, visiting all the departments (fig 5.2.3: Visiting ESAD's art and design departments) and having lunch in the glass gallery, where the public exhibition for the workshop results would be held.

In the afternoon, it was the students' opportunity to formally present themselves, in Pecha Kucha format, taking turns to say who they are, where they came from and what they do, before taking the metro to Porto city centre for a guided tour.

Making acquaintances and encountering the environment in which the workshop would operate, played an important role in encouraging good dynamics between the students and provided local cultural context to support the workshop challenge.

Informatisation

Days 3 and 4

(Tuesday and Wednesday, 17th and 18th May).

Three meetings were planned with Churchill's, Amorim Top Series and Amorim Cork Composites, to learn about the client needs, local materials and processes necessary for this workshop challenge. On day 3, in the morning, the students and teachers met at the Churchill's cellars on the south bank of the Douro river in Vila Nova de Gaia. The visit started with a guided tour around the cellars, where they witnessed the history of the brand and the whole wine making process from the winery at Quinta da Gricha to the Lodge where the boutique Port and Douro wines were stored and distributed. The tour finished in the Churchill's lounge, where participants were greeted by their marketing representative who presented the future vision of the brand and the objectives behind the design challenge.



Fig 5.2.2: First meeting in ESAD's research centre esad—idea.



Fig 5.2.3: Visiting ESAD's art and design departments.



Fig 5.2.4: Amorim Top Series production and assembly.



Fig 5.2.5: Brainstorming presentation.

Design challenge — Point of sale (POS) stand. *Churchill's visual language needed to be extended into a physical promotional space by incorporating materiality in an unconventional, but simple way, that elevates its wines. This POS stand should visually and physically represent the brand in the lodge and/or wine fairs, with furniture elements and uniforms that bring the 'maverick' spirit to the Churchill's team and customers. The design should be compact and versatile for installations and/or exhibitions, easy to transport, assemble and use. Storing, displaying and cooling wine bottles, and serving wine within an environment of colours, shapes, textures and materials that complement the brand and product.*

The visit concluded in a constructive discussion about the challenge, followed by an inevitable wine tasting to compliment the experience.

In the afternoon, students and teachers travelled by coach to the Amorim Top Series company at Argoncilhe, about thirty kilometres south of Porto. Amorim Top Series is a specialised unit dedicated to the design, engineering and production of exclusive capsulated cork closures for bottled spirits and supplies some of the world's most celebrated brands. The visit included an informative presentation about the Amorim group, how they harvested and transformed the natural cork material from the tree into various innovative applications and products. This was followed by a tour of the factory, where the students saw the production and assembly of the cork closures, and demonstrated the technical considerations of the material when designing for the beverage and food markets (fig 5.2.4: Amorim Top Series production and assembly).

In the morning of the following day (Day 4, Wednesday, 18th May), students continued their training experience with Amorim Cork Composites at Mozelos, near the Amorim Top Series company. Amorim Cork Composites specialises in innovating new products and applications using the key properties of natural cork, and they collaborate with: aerospace; construction; flooring; footwear; home, office and leisure; mobility; panels and composites; power industry; sealing; and energy. Here the students had contact with the cork material in its natural state and with representatives of their Research and Development department, learnt about the cork transformation processes, mixing other materials for border application opportunities and increased performance.

Contextualisation
Days 4 and 5
(Wednesday and Thursday, 18th and 19th May).

Students and teachers returned from company visits, full of ideas and ready to start on the workshop challenge. This stage was divided into three brainstorming activities: 01, reflect on the *informatisation* stage, the workshop challenge from Churchill's and the technical input from Amorim about the cork material to define research directions; 02, build a visual research wall based on the needs of the workshop challenge and the 5Ws and How; 03, develop pre-ideation boards to summaries the research and justify design directions.

This stage started with a short lecture from the teachers about *brainstorming* and its function as a cognitive, decision and visual method within the design process.

The first two brainstorming activities were performed collectively and they were left alone to organise the work between themselves. Analogue and digital methods were suggested by the teachers, and students adopted these visually interactive tools to propose, discuss and arrange research content between them.

The third brainstorming activity was to prepare visual pre-ideation boards, summarising content from the previous brainstorming activities, in order to define and justify a design direction. In order to create quantity and diversity of ideas the student group was divided into four pairs, mixing art and design disciplines and creating more competitive teams.

This stage concluded with students presenting their pre-ideation boards with various contextualised ideas and illustrating: brand values; technical input; stakeholders; scenario; inspirations; and a sketch of the product vision (fig 5.2.5: Brainstorming presentation).

Conceptualisation
Days 6 and 9
(Friday and Monday, 20th and 23rd May).

Students moved into the ideation and concept development stages, where students explored ideas and identified concepts based on the foundation of outputs from the previous contextualisation stage. This stage was divided into four phases: 01 and 02, ideation activities through collective sketching exercises; 03 and 04, concept development activities with rendering and model making to visually represent and physically demonstrate each concept.

The morning started with a short presentation from the teachers about drawing styles and sketching for design purposes, therefore indicating the ideal method, technique and material for these idea generating and concept communication activities.

Activities *Ideation 01 and 02* were made collectively in the form of a drawing marathon, a timed exercise where each student sketched ideas from the pre-ideation boards, therefore building on each other's ideas to promote collaborative design thinking. In the afternoon, these ideas were analysed, grouped and presented to Churhill's for commercial orientation.

Concluding the first week of the workshop, it was apparent at this stage that eight concepts had emerged from this process and the marketing representative from Churchill's acknowledged the originality and potential of each idea (fig 5.2.6: Sketching wall from the ideation process).

Activities *Concept development 01 and 02* were activities to study the technical feasibility, produce

superior visualisation and explanation of each idea in the form of renderings and models. On Monday morning 23rd May, the students and teachers reviewed the work from the previous week and identified two underlying modes within the eight concepts, connecting them to: Quinta da Gricha, the farm in the Douro river valley where the wine is produced; Diamond, the brand icon that originated from the brand DNA and Graham family iconography. At this stage it was planned to make two competitive student groups with the same concept direction, but since through this design process two concept directions appeared that were equally interesting to the client, it was decided to pursue both in the same competitive format.

Concluding this stage, the concepts were presented to the design representative from Amorim Top Series for design and technical analysis, giving orientation about the shape, material and assemblies of each proposal, and advising how the cork material could give value to the designs structurally, aesthetically and ecologically.

Realisation

Days 10 to 13

(Tuesday to Thursday, 24th to 26th May).

This stage was divided into five parts: *technical development 01 and 02, product definition and virtual prototype; final product 01, 02 and 03, making the prototype.*

In order to make these tasks for the *realisation* stage, two product groups and two satellite teams with connectivity between them, were organised: Product team (A) Diamond Tree; Product team (B) Gricha Earth; CMF and Wearables team; Graphics, Branding and Multimedia team. Each group had individual objectives, but participants from each team were allocated to consult with other teams to align common goals and employ art or design specialties.

The teams proceeded to develop each product concept, together with the technical, visual, graphical, wearable, colour, material and finishing components, into virtual and tangible prototypes. However, due to the predicted size of the final products and the limited time to make them, it was agreed to produce scaled prototypes to achieve the workshop schedule and objectives (fig 5.2.7: Making prototypes in the woodworking studio).

The prototypes were tested to gain insight, concluding the technical development (virtual format) and final product prototype (physical format) phases, to evaluate their performance in achieving technical feasibility, market needs and user experience.

Formalisation

Days 13 to 14

(Thursday to Friday, 26th to 27th May).

This stage prepared the students' work for public exhibition in the form of three phases: *Exhibition 01, collect material, prepare the gallery space and design boards for printing; Exhibition 02, production and installation within the gallery space; Exhibition 03, check installation and open to the public.*

The reality of this transition from the *realisation* to *formalisation* stage, was not as smooth as the workshop organisers originally planned. The two product teams were still finishing their prototypes, so student resources for preparing the exhibition was fifty percent, therefore multitasking was inevitable to meet the planned schedule.

This stage started with a meeting to discuss the layout of the gallery space, displayed content and allocated tasks to each team. With this agenda, progress was monitored by the teachers, reviewed after each phase and assisted where necessary to facilitate the action.

The gallery space was a dedicated room within the ESAD college, purposely built for exhibitions. Like an aquarium, all four sides of the gallery had tall glass windows, enabling visitors to see the exhibition from the exterior and interior. With this, students produced and fixed design boards facing out to the exterior, visually summarising the workshop experience, design process and activities. On the interior, a large central table displayed the prototypes, video projection, material studies and two large monitors explaining each design proposal.

The exhibition was open to the public in the afternoon, Friday 27 May, when the students presented their finished work to their teachers, representatives from Amorim and Churchill's, forty invited guests and the ESAD community (fig 5.2.8: Workshop exhibition in ESAD's gallery).

Moments and supporting activities

Teachers meetings and workshop reviews

There were three teachers meetings and two review meetings throughout the workshop schedule in order to introduce, monitor and orient various aspects of the **Collective Design Method**, to better serve the workshop activities and the expected teaching-learning outcomes. Also, teachers were active throughout the workshop, discussing project issues, observing and adjusting content when anomalies occurred.

Disruptive moments

Several planned obstacles were implemented during the workshop to test students' responses to certain disruptive situations that commonly occur in the workplace. These disruptive moments were planned by the teachers and only shown on the teachers version of the workshop schedule, therefore known to the students.

Admittedly, there was familiarity between some of the ESAD students, although they had not worked so closely together before, but the majority of personal relationships between the students were new.

Generally, the students coped well with the disruptive challenges. However, some of the younger



Fig 5.2.6: Sketching wall from the ideation process.



Fig 5.2.7: Making prototypes in the woodworking studio.



Fig 5.2.8: Workshop exhibition in ESAD's Gallery.



Fig 5.2.9: Visiting Serralves Foundation.

students showed insecurities and let the older and more experienced students lead certain tasks (i.e., final group decision making and public speaking).

In addition to the planned disruptive moments, none planned moments occurred naturally during the time of the workshop. One of the students became ill beginning the second week of the workshop, forcing isolation from the other students. Some of the tasks within the group could be achieved online, but assisting in making the prototype and participating in the exhibition was unfortunately impossible. Losing a member of a project team due to illness is also common in the workplace and does cause stress within the team to cover additional responsibilities. In this case, the student group adjusted well to the situation and honourably acknowledged the missing student within the final work and public presentation.

Sports activity

This was an activity that occurred on Friday evening, concluding the first week of the workshop. Teachers and students gathered on the nearby beach in Matosinhos to informally meet, take some refreshments and play *Petanca,* or *Boule* in French. The purpose of this activity was to encourage informal social interaction and competitiveness through play, and resulted in a gratifying way to end the first week of hard work.

Cultural visits

There was very little time in the working day schedule to visit local cultural attractions, therefore the middle weekend of the workshop was used for this purpose.

On Saturday morning the teachers and students gathered at the Serralves Foundation in Porto, for a guided tour to the Museum of Contemporary Art, Park, Treetop walk, Casa do Cinema Manoel de Oliveira and Serralves Vila. The visit had a diversity of inspirations that developed the students' cultural knowledge, some of which could influence aspects of the workshop challenge (fig 5.2.9: Visiting Serralves Foundation).

Freetime

Learning from the workshop experience in Poland, the workshop schedule for Portugal allowed more free time for teachers and students. The workshop started later in the morning (9h30/10h00) and most evenings were free to organise personal needs, activities, social encounters and explore the Porto region. For Sunday, the workshop schedule suggested some places of interest within the locality, and students visited local museums, made city walks and tried surfing lessons.

Output

Design process posters (photos and drawings)

The workshop's experience and design process was documented, graphically arranged, printed, mounted on craft cardboard panels and shown in the public

exhibition on the last day of the workshop. These panels were divided into four sections to explain the principle activities: (1) Informatisation, visit to Churchill's and Amorim; (2) Contextualisation and Conceptualisation, ideation and design concept stages; (3) Realisation, Product team A *Diamond Tree;* (4) Realisation, Product team B *Gricha Earth.* These panels were exposed to the exterior of the glass walled exhibition space in a 'clockwise' configuration to communicate the art and design process behind the final Churchill's POS stand proposals.

Colour, Material and Finishing (CMF) studies

Local materials were studied to create various CMF landscapes, suggesting combinations of colours and finishes to apply throughout the POS stand products. Cork was the main material influence, both in its natural and transformed state, but other local materials such as slate, granite, olive wood and ceramics were also introduced (fig 5.2.10: CMF landscape).

Wearable models

Apron garments were designed and prototyped for both POS stand proposals, together with jewellery accessories, to dress staff operators and incorporate their appearance into each stand proposal (fig 5.2.11: Apron garment for *Gricha Earth* POS stand proposal).

POS stand models

Two scaled prototypes were produced to physically represent the final stand proposals made by the students: *Diamond Tree* (fig 5.2.12: Diamond Tree POS scaled prototype); *Gricha Earth* (fig 5.2.13: Gricha Earth POS scaled prototype). These models demonstrated the materials, components and assemblies of each design, and analysed the interaction between the brand, product and users.

Conclusions

The adjustments for improving the **Collective Design Method** suggested in the conclusion of the previous workshop in Poland, made for a more successful workshop experience in Portugal. Generally, students could understand and cooperate better through improved English speaking skills, and were more resourceful and confident in their decision making.

It was also observed that the strong client presence with local business and industry, motivated the students to perform better, therefore practising a professional attitude and increased responsibility towards the work.

Representatives from both Amorim and Churhill's commended the project, workshop and the students for their high quality, professionalism and commitment towards the work, and showed interest in developing the designs further for future promotional activities.

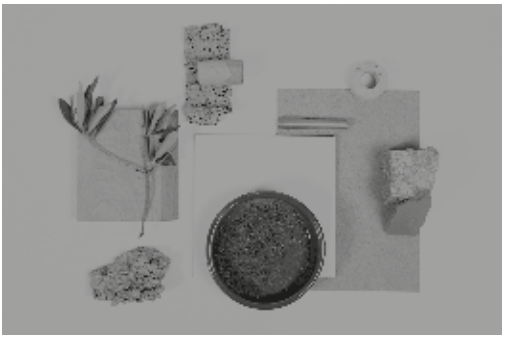


Fig 5.2.10: CMF landscape.

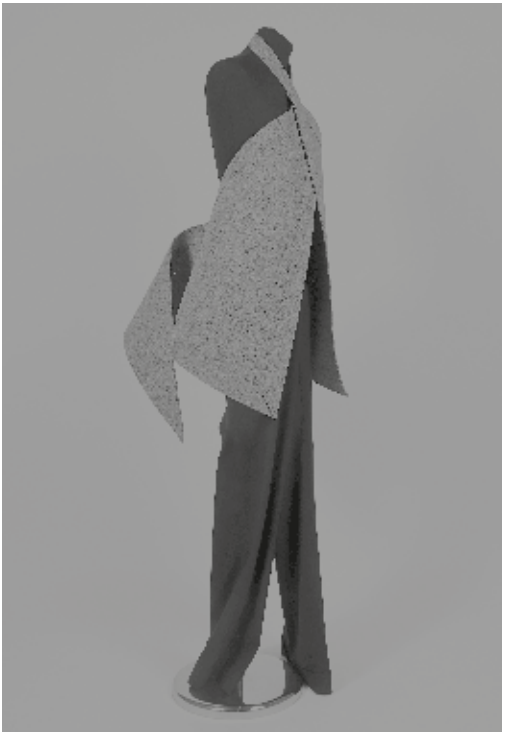


Fig 5.2.11: Apron garment for *Gricha Earth* POS stand proposal.

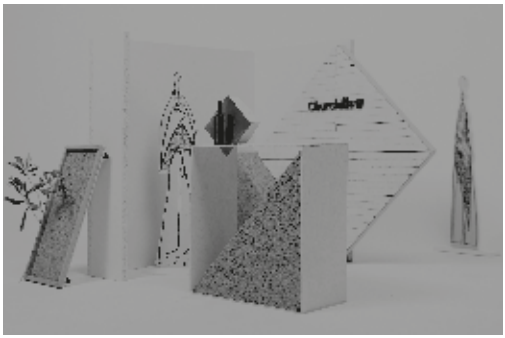


Fig 5.2.12: *Diamond Tree* POS scaled prototype.

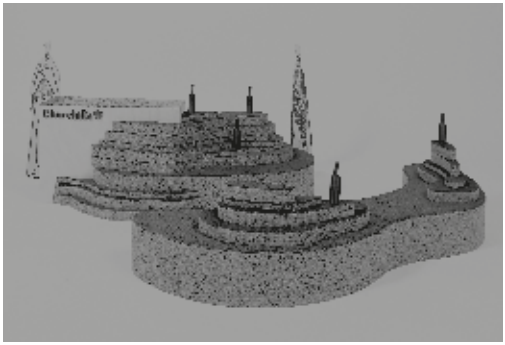


Fig 5.2.13: *Gricha Earth* POS scaled prototype.



Fig 5.3.1; Workshop poster.

5.3—3RD WORKSHOP IN TURKEY

ESOGÜ College of Art & Design, Turkey

This report reflects on the experiences, challenges and results of the third workshop, hosted by ESOGÜ College of Art and Design, in Turkey, between 25 September and 7 October 2022.

Planning

Hosting Institution

The third and final workshop took place in Eskişehir Osmangazi University with a group of students and teachers from Turkey, Poland, Portugal and USA, who worked on the design of a new product, primarily made from a local material called Meerschaum. This workshop was organised by Bilge Kınam, Associate Professor from Visual Communication Design Department. As the hosting institution, ESOGÜ provided a large classroom and facility for the workshop activities, including materials and equipment to assist the designing of a potentially new product.

The workshop took place on the University campus, located near the old part of the city. This location within such a historic neighbourhood, with a traditional atmosphere full of craft shops and artists making Meerschaum artefacts, contributed to the success of this workshop.

In addition, external collaborators were invited to give lectures about the culture of Eskişehir and technical information about the local material Meerschaum, with the Chairperson from Eskişehir Tourism, İrfan Ongar, and Meerschaum master and artist Talat Ürersoy.

Participants

Similar to the previous workshops, the student recruitment took place several weeks before the event. The workshop was advertised within each cooperating institution and received student candidates for interviews.

The criteria for selecting students were common to previous workshops and, according to the **Collective Design Method** *tools;* a minimum of three years undergraduate art and design studies; good CV; strong portfolio and personal motivation. In addition to these requirements, emphasis was given to the students' level of English. In past workshop experiences, some students suffered misunderstandings with initial lectures and training, which caused some delay in their participation and project workflow.

Potential candidates were interviewed online, together with all the project researchers, and asked several questions to stimulate conversation about themselves, their work, art and design skills, creative experiences, and expectations from the workshop (fig 5.3.1; Workshop poster).

Briefing

A briefing for the workshop was developed by the researchers and written by the workshop organiser,

which listed the parameters of the challenge. This was formally presented to the students starting the *informatisation* stage of the workshop.

An important element of the briefing was the involvement of local specialists, Chairperson from Eskişehir Tourism, İrfan Ongar, and Meerschaum master and artist Talat Ürersoy, who shared their experience and expertise about the Eskişehir region and the local material Meerschaum stone (see chapter 4 Tools — Briefing, for details).

Schedule

The workshop schedule was based on the structure developed by the researchers, and was adjusted by the workshop organiser to accommodate product research, design and development activities.

Unlike previous workshops, the scheduled time of the *informatisation* stage was extended by almost a day, due to the travelling by bus to nearby historical locations. Also, an afternoon training was also introduced by an expert Meerschaum artist, which was important for the students to experiment with the raw material using modelling tools (see chapter 4 Tools — Schedule, for details).

Stages and activities

Climatisation

Day 01 (Sunday, 25th September).

Students and teachers met for the first time at an informal location outside the university, which marked the official opening of the workshop. It was observed that a less formal start outside the university setting allowed all participants to overcome formal barriers more efficiently. Therefore, this first meeting was organised at Odunpazarı Modern Museum (OMM) in the social-coffee area, where students and teachers welcomed each other and discussed more casual issues. During this meeting, the workshop schedule was also presented, therefore informing the students about future activities and the key assumptions from the **Collective Design Method** (fig 5.3.2: First meeting in OMM social-coffee area).

The introductory meeting ended with a guided tour of the Museum with modern art, sculpture and multimedia from local and international artists, which was informative towards the workshop. Afterwards, students were encouraged to meet together and explore the city of Eskisehir, guided by the local Turkish students.

Familiarisation

Day 02 (Monday, 26th May).

Teachers and students gathered at the university to learn about the workshop location, facilities, meet the directors and other teachers from the art and design department and eventually, start activities.

In the morning, each of the teachers coordinating the workshop presented themselves to the



Fig 5.3.2: First meeting in OMM social-coffee area.



Fig 5.3.3: Lecture by İrfan Ongar,
"In the world of design Eskişehir Traces".



Fig 5.3.4: Meerschaum artist Talat Ürersoy talking to the students.

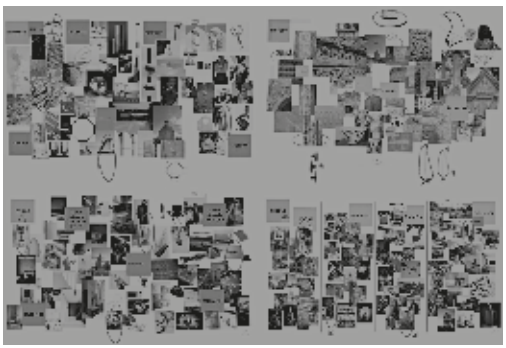


Fig 5.3.5: Research boards.

students, showing their art and design work, professional experiences, and specialist contribution within the workshop. At this point, external collaborator Mr. İrfan Ongar (Chairperson, Eskişehir Tourism and Promotion Association) joined the workshop to talk about the history of the region and presented the research visits for the next days (fig 5.3.3: Lecture by İrfan Ongar, "In the world of design Eskişehir Traces"). A local Turkish translator was also invited to aid communication issues.

Lunch time was used for an informal meeting with the faculty authorities and teachers at a nearby restaurant famous for its traditional cuisine. Such a gesture allowed for local and foreign academics to interact and discuss the **Collective Design Method** project and various other teaching-learning issues.

In the afternoon, students formally presented themselves in *PechaKucha,* a timed 'storytelling' format that has been proven successful in previous workshops, taking turns to say who they are, where they came from and what they do. Afterwards, teachers and students went on a tour of the university and local area, visiting the Eskişehir Kurşunlu Mosque, Meerschaum Museum and Külliye, and Odunpazarı graveyard to learn about the tradition and culture of the local Turkish community.

Informatisation

Day 3 and 4

(Tuesday and Wednesday, 27th and 28th September).

A large proportion of the schedule was assigned to the *informatisation* stage, due to the research into the potential key influences of the region's history on the newly designed products.

Before setting out on the research visits, the briefing was presented by the workshop teacher, so that the students were mindful of the workshop's objectives, art and design challenge, and the importance of collecting data.

The research visits consisted of five guided locations: Seyyid Battal Gazi Complex and Tomb; the ancient monument and civilization of King Midas; Han Underground City; the Phrygian Valley and Eti Archeology Museum. The extraordinary landscape and serene atmosphere of Phrygian Valley spread over a region within the borders of Eskişehir, Kütahya, and Afyon provinces today, and was home to historical ruins and ancient artefacts bearing traces of the Phrygian civilization.

On day 4 in the afternoon, the students started with a *hands-on* activity with the Meerschaum material, a porous white stone, also known as Sepiolith, White Gold and Sea-Foam. The activity was led by Meerschaum artist Talat Ürersoy (fig 5.3.4: Meerschaum artist Talat Ürersoy talking to the students), who gave a lecture about the history and uses of Meerschaum in making traditional smoking pipes, cigarette holders, rosaries, trinkets and other ornaments. The artist also demonstrated how to carve the small Meerschaum damp blocks with simple handmade tools, and allowed the students to experiment.

During this laboratory activity and working with the Meerschaum material, students understood the craft, the provenance and sustainability, and time necessary to become a skillful Meerschaum master artist. Therefore, assessed and proposed alternative methods (i.e. computer modelling and rendering, and 3D printing) to represent and prototype final products.

Contextualisation

Day 5 (Thursday, 29th September).

This stage converged the research of the *informatisation* stage with two brainstorming sessions (1, collectively in the morning, 2, pairs in the afternoon), to discuss and identify design directions. An introduction was made by the teachers to inform the students about this process and to align their *design thinking* towards common goals. With this, the first brainstorming session required students to collectively gather and select information from the visited locations and practical experiences with the Meerschaum material, connect data, form keywords and select pictures, to analyse this informative material with the context, user and scenario. This was discussed and constructed on an online digital wall, which visually displayed and organised the work as it progressed (fig 5.3.5: Research boards).

The second brainstorming session in the afternoon was performed in smaller groups, pairing students with complimentary skills and different art and design backgrounds, to analyse the research material and produce pre-ideation boards that selected informative, contextual and inspirational content, to form the first product ideas.

Concluding these sessions, the ideas were *pitched* by the students to the workshop teachers and other teachers from the university's art and design department, in order to analyse and critically discuss the content of the work. The purpose of this meeting was to identify original design modes to take to the *conceptualisation* stage. Through this process, eight ideas were selected: headphones; tattoo gun; plant pot; watch; spectacles; secret box; handbag and jewellery.

Conceptualisation

Day 6 and 9

(Friday and Monday, 30th September and 3rd October).

The objective of this phase was to further explore the design ideas generated by the previous *contextualisation* stages, and through a process of justified and diplomatic selection, chose design concepts for development and prototype.

Designing through sketching is one of the most effective and efficient ways to explore ideas and visually represent them as design concepts. As such, teachers presented this method and drawing

technique to the students, and suggested a *sketching marathon,* which was a none-stop, around-the-table sketching activity, taking turns to interpret and suggest design concepts for each of the eight ideas discovered (fig 5.3.6: Collective sketching). This was an effective way for each student to propose, share and build on each of the ideas as they developed, therefore creating a diversity of design opinion, concept range and quantity of material to choose from (fig 5.3.7: Eight sketching design concepts).

This intensive activity lasted for three hours and concluded in hundreds of sketches being produced and displayed together on the classroom wall. This moment was very satisfying for all participants, especially coming to the end of the first week of the workshop. The Friday afternoon concluded by reviewing this work, and through a voting process involving teachers and students, they selected four design proposals: tattoo gun; plant pot; watch and spectacles. Before leaving for the weekend, teachers and students agreed four teams (pairs) for each of the design concepts, ensuring fair distribution, art and design relevance and participant skills.

The following Monday of the second week, students continued with the design of each of the four selected concepts, making elaborate sketches, computer models, rendering and models. This stage concluded with the student pairs formally presenting each of the design concepts to an audience, including the external collaborators, Mr. İrfan Ongar and Mr. Talat Ürersoy, who assessed the work from a commercial and technical perspective. The objective was to choose two final design concepts and, without any disagreement, they enthusiastically selected the tattoo gun and plant pot. Their justification (and ours, coincidentally) was based on their originality. The tattoo gun opened new global consumer markets and the plant pot, used waste Meerschaum, which had never been done before.

The *conceptualisation* process was planned for two working days (Friday and Monday) and it was a very beneficial activity for the workshop. Also, it was interesting to observe that during the weekend students took the initiative to deepen their knowledge by visiting a tattoo parlour, glass-making shops and traditional stonemason studios. This extra-curricular activity was evident in the progress of their design work and created enthusiasm among the student groups.

Lastly, it was a great surprise for the students to hear that the external collaborators highly appreciated all the innovative ideas generated using Meerschaum, and generously took the time to answer questions that would technically orientate the two selected design concepts, tattoo gun handle and plant habitat pot. With this, the four groups agreed to merge into two groups of four students, and were prepared to advance to the *realisation* stage of the workshop.

Realisation

Day 10 to 13

(Tuesday to Thursday, 4th to 6th October).

This stage focused on the two products being developed, prototyped and visually represented with all the promotional material necessary for public appreciation in the next stage. The two student groups, allocated to each product, after so many days of working together, collaborated easily, which benefited the general workflow, making the visual communication, product development, renderings, material samples and prototypes, simultaneously.

The autonomy within and between the groups was surprisingly constructive and went beyond the workshops' initial assumptions. Students shared special skills and knowledge, especially when it came to technical issues with using softwares, programs and 3D printing.

In common with the other workshops, the last day of the *realisation* stage of this workshop was positively frantic. However, the students were responsible and showed good time management, delivering material within the planned schedule, for printing and other production services.

Formalisation

Day 14 (Friday, 7th October).

The final stage of the workshop was the preparation and participation of a formal presentation to a public audience, promoting and demonstrating the results of the workshop. This event was held at the Tepebaşı Atilla Özer Karikatürlü Art House, an exhibition area and gallery, located in the heart of Eskişehir city and an iconic location of urban culture with a legacy to the brick industry.

The display of the work was designed and planned by the teachers and students, and resulted in five distinct areas, representing the final intrinsic products, material studies, design process and experiences within the Eskişehir locality.

Posters were graphically prepared and printed, representing each of the five areas of the workshop, and displayed in sequence around the gallery space to communicate the art and design processes, and results from the various practical activities.

The exhibition opened on Friday afternoon at 4pm, inviting all workshop participants, the academic community from the university, external collaborators and colleagues, representatives from the city hall, and was open to the general public. Introductions were made by the workshop teachers and main researcher, speaking about the project, followed by student presentations and explaining their work using local inspirations and materials. The presentation was also supported by video animations of the final products, together with physical demonstrations of the prototypes.



Fig 5.3.6: Collective sketching.

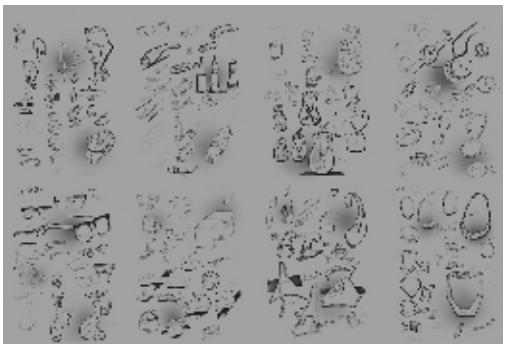


Fig 5.3.7: Eight sketching design concepts.



Fig 5.3.8: Exhibition, Tepebaşı Atilla Özerli Karikatürlü Art House, Eskişehir.

Moments and supporting activities

Throughout the workshops in Poland and Portugal, the teachers accompanied students at every stage of their work, taking part in some of the activities and helping them. However, in this workshop, the teachers pushed this boundary by suggesting more autonomy for students to work and make decisions by themselves, which resulted in developing multi-dimensional concerns and stronger responsibilities to the work and their team. Thanks to this, teachers had more time to observe students' reaction to certain workshop activities and discuss refinements to the Collective Design Method.

Free time

Unlike previous workshops in Poland and Portugal, the foreign students coming to Turkey organised accommodation together. Therefore, this proximity and convenience benefited their free time and interpersonal development. Also, the Turkish students who participated in the workshop helped the foreign students with the local facilities, public transport and other social activities. This time together was important to develop unity within the participants and brought them together, within and outside the workshop hours.

Disruptive moments

In general, the disruptive moments indicated in the schedule (i.e. changing the workspace or combining students for different activities) did not hinder the students' progress or morale, therefore they adapted well to these circumstances. Unplanned, there were two illnesses in the group, a situation common to the other workshops in Poland and Portugal. However, these situations were accommodated by other participants and the workflow continued.

Output

From this workshop, two new and original products were designed, developed and prototyped using the white Meerschaum stone, influenced by local resources and traditions, but inspired by new markets and sustainable opportunities.

A tattoo gun called **MIDAS**, named after the mythical King whose touch turned everything to gold, was a product partly made from Meerschaum stone. The handle surface pattern was inspired by the motifs and symbols from the Phrygian valley. **MIDAS** is a product that represents Turkish history and aims to travel around the world to make artistic tattoo patterns on the human body (fig 5.3.9: **MIDAS** Tattoo gun).

A plant growing habitat called **YAŞAM**, which means **LIFE** in Turkish, was a product that uses recycled Meerschaum flakes within its assembly. The overall shape was inspired by the Phrygian hat and traditional Turkish tea glass. Recycled Meerschaum was used in the plant holder, root binder and base, which was decorated with motifs coming from Phrygian antiquity.

The product was a hydroponics device, supporting ornamental plants and flowers (fig 5.3.10: YAŞAM Plant growing habitat).

Material experiments

Through experimentation with Meerschaum, the students were intrigued by the incomplete use of such a valuable material. In making conventional artefacts, Meerschaum artists scrape the white stone blocks to make shapes, therefore producing waste flakes. These remains were normally thrown away, therefore to recycle or reuse this Meerschaum waste became an inspiration for designing new products and applications.

Also, to explore composites with Meerschaum, mixed with other binders or materials (i.e. glycerin, wood glue, Arabic powder, water, gelatine) to create new materials with different consistencies and colours, opened new possibilities. Both of the resulting products from the workshop used uniquely developed Meerschaum composites. The MIDA tattoo gun had a protective case made from turquoise jelly Meerschaum, and the YAŞAM plant growing habitat used compressed recycled Meerschaum within its components.

Conclusions

In preparation for this workshop, the researchers suggested three changes, based on experiences from the previous workshops in Poland and Turkey:

— To increase the English speaking level of the participants and invite a translator. It was noted in previous workshops that some student participants had difficulty understanding initial lectures and training, and therefore suffered with later activities;
— To encourage student responsibility. In previous workshops, some younger students had difficulty making decisions without the teachers' orientation;
— To intervene less as teachers and a continuation of the previous suggestion. By creating more freedom between teachers and students for certain activities, promoted better student autonomy and confidence.

Lastly, the external collaborators from Eskişehir Tourism and Promotion Association and the Meerschaum Crafts Association, stated that "reinventing Meerschaum, a local commodity from Eskişehir, within the context of this international and interdisciplinary meeting, opened their imagination and increased its otherwise forgotten worth".

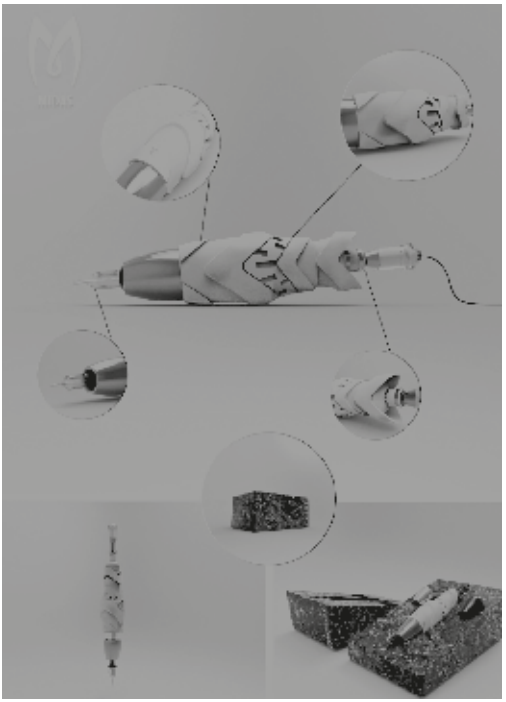


Fig 5.3.9: MIDAS Tattoo gun.

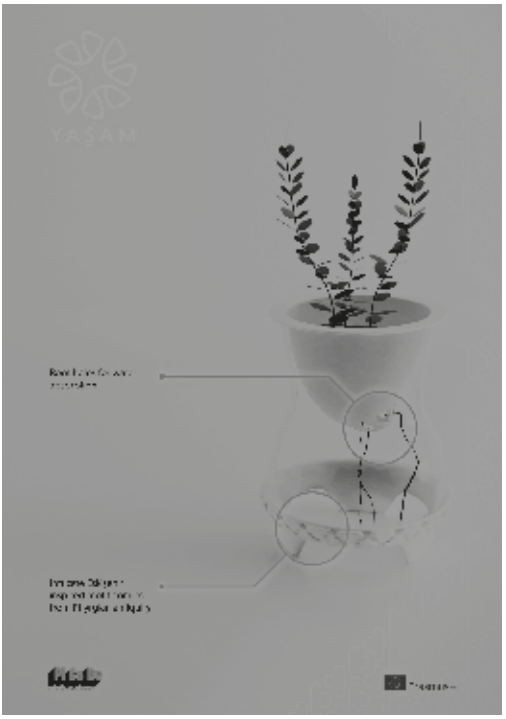


Fig 5.3.10: YAŞAM Plant growing habitat.





6.1 Assessment and Results

Two student surveys were conducted, one before and one after each workshop, and a final meeting with all participants from the three events held in Poland, Portugal and Turkey. These actions helped to assess the expectations and results of the implemented teaching-learning method and to understand to what extent the students' participation in the events was truly beneficial for their lives and careers.

A first survey was sent to the students one week before the start of the workshop events. At that time, they did not know with whom they would be working, they did not know the method or the brief of the challenge. They only knew that they would be participating in an international event and that they would have to develop a project.

The questions asked in the first survey served to make a pre-assessment of the student's profile, both in terms of their technical and transversal competences. It was with this information that the groups were defined by the teachers, whenever the project required the division of tasks.

Students were asked how they preferred to work within academic projects. 36% said they preferred to work individually, 41% percent preferred to work in small teams, and one said they liked to work in larger teams of ten or more.

While this project was built on collective principles, it was still important to have some leadership roles within the team to guide through moments of thought fatigue, disagreements, and indecision. Prior to the workshop, students were asked to complete this survey, in which they were asked whether they considered themselves leaders or followers.

Within the first workshop in Poland, only 1 of the 7 participants indicated an interest in leadership. The remaining students were divided equally among preferring to "listen to initial ideas from the group to fulfil a supporting role" and preferring to "have duties delegated to me." It was also important to note all but one — the outlier, not the leader — identified themselves as introverts. In the second workshop in Portugal, again, only one student indicated an implicit preference for leadership, two identified as preferring a supportive role, and the remaining four identifying themselves as 'other' in which they found themselves open to leadership depending on the size of the team. For the final workshop in Turkey, again, there was a single student who identified themselves as a leader, four students who preferred a supporting role, one who preferred duties to be delegated, and one who preferred a group discussion to decide the leadership role, which they were willing to fulfil if necessary. In both the Workshops in Portugal and Turkey, the ratio of extroverts to introverts was 5:2.

In the first survey, students were asked to assess their current skill level among ten listed skills, both technical and soft skills. These included problem solving, sketching, conceptualising, photo editing, rapid prototyping/making, finishing details, storytelling, layout, visual presentation, and verbal presentation. Of these skills, the twenty-three (23) student participants from all three workshops identified their skill level as excellent, proficient, or in need of improvement. Of these skills, some results were highlighted as the primary focus of the project. In problem solving, 73% of the students felt they were proficient, 23% needing improvement, and one identifying as excellent in problem solving. In sketching, 36% of the students felt they needed improvement, 55% felt they were proficient, and one student identified as having excellent sketching skills. When asked how they assessed themselves in conceptualizating, 32% stated they needed improvement, 59% were proficient, and one stated excellence in conceptualization. When self-evaluating visual and verbal presentation skills, the results were within a 5% difference of 50% needing improvement, 40% proficient, and one stating excellence. Presentation skills were therefore at the forefront of the teaching goals, which included visual skills (sketching, digital visualisation, composition) and verbal skills (communication, confidence, storytelling).

Students were asked prior to the workshop how they managed time under pressure. The majority of the students (64%) responded that they "know how to prioritise activities within the design process to meet a deadline" and 55% said they knew how to " break down tasks." Half (50%) of the students said they felt "comfortable delegating work to others in the group if they are able to assist." Where students signalled low percentages were "creating a strict schedule to budget my tasks within an allotted time frame" (23%); focusing "on what was working and let go of the things that are not" (32%); and the ability to "focus on the task at hand why mindful of the scope of the project" (32%). When asked about their ambition, 36% said that they were "usually ambitious in [their] goals, which leaves less time for execution" while another 36% said they are "realistic about [their] goals within a given timeframe.

As the project has an intended focus on locality in both materials and processes, students were asked prior to the workshop if they felt it was important to highlight local initiatives in design. The majority of the students expressed a range of positive responses that revolved around preserving cultural identity, re-evaluating design processes, evolving pricing strategies, awareness of raw materials, impact of material usage, relationships to a circular economy, and the prevention of waste. Marta Alexandra Luz Vieira, a product design student from ESAD in Portugal, replied, "Yes, I think it's important to rethink design processes to think about long-term pricing. The environmental impact of products must be present from product development, raw materials, production, packaging, distribution, sale, consumer use, product maintenance and repair and end of use, in order to minimise the impact of that product, and oriented towards a circular economy rather than a linear economy." Aleksandra

Kosztowniak, a graphic design student from Lodz University in Poland replied, "It is important if we feel a connection to the city... and want to promote our local goods." Fashion design student from ESAD, Ivan Hunga Garcia responded, "According to the context, the design process should fit its own specifications by respecting its surroundings in a vernacular, research-driven material way." Simge Tunç, a graphic design student from Eskisehir Osmangazi University, stated, "Yes, I do because I think our culture reflects our point of view. It is culture that shapes what we do." There were a few students who did not see the importance of using local materials and processes, for example, Yağmur Özlem Yılmaz, graphic design student from Eskisehir Osmangazi University, replied, "I think it will be more important that it is universal. It can be local depending on the work done, but in general, universal motifs should be more common in use."

Students were asked openly what they hoped to learn from this project. The responses ranged from design thinking, design skills, collectivism, multicultural and international teamwork, interdisciplinary instructors and team mates, design experience, professional growth, networking, making long-lasting relationships, and confidence in communication through language and presentation. Of the twenty-three students, 48% of students stated learning from multicultural and international students and instructors as a hoped outcome; 44% were focused on increasing their design skills, 35% were interested in working with interdisciplinary design teams, 30% hoped to expand their design thinking and professional growth, and 26% were interested in ideas around collectivism. Surprisingly, given the soon to be revealed outcomes, only 13% expressed a direct interest in increasing their confidence in language skills for better communication.

6.2 Expectations and Student Feedback

A second survey, carried out one week after the workshops had ended, included questions to assess which skills were specifically successful and which did not have a desired effect or development. The students demonstrated the willingness to learn how to work in an interdisciplinary team, develop design skills and go further into deeper thinking. Working smarter with natural, local materials provided alternative solutions to wasteful, over-consuming societal behaviours, as well as soft skills such as becoming more confident when speaking in public.

As positive points, the students highlighted experiencing active learning, getting a better understanding of a project's scope, the teamwork in interdisciplinary and intercultural cooperation, and the capacity to think by sketching, making, and presenting. The direct interaction with the client, being able to have constant follow-up and feedback was also crucial, where linguistic barriers had to be broken down so that an understanding was well established among all participants. When students were asked about their overall view of the workshop, 87% of the students found the experience a *5 out of 5-Very Useful,* based on a five-point scale, citing the most positive aspects of the workshop by one student as "getting quickly acquainted with a diverse group of designers while working together to achieve a final outcome and getting to explore and experience a new country;" while another commented"...the short time in which we had to realise the project, as it gives you no time to doubt and you experience how efficient your process can be in this situation;" and another spoke about overcoming the language barriers, "Organising a space for effective communication is always a challenge. No one wants to be misunderstood. Although, I believe the support and a welcoming smile that we gave each other overcame all communication gaps..." Some students stated that while it wasn't their first time engaging in a *sprint* project, it was new to work with a multidisciplinary team with different languages and cultures in a completely new environment.

As points for improvement, the students identified the communication between the various actors was not always clear, and that initially caused some tension and frustration; that their degree of autonomy towards the teachers was not always clear and that the fact that the whole experience was so intense and condensed into an extensive schedule did not give much room for reflection and better achievements. The least positive aspects of the workshop were mixed, and included such feedback as "...the most and least positive aspects link in the way that the extensive schedule compressed the timeframe. Not only was expected less time and space [for] conclusions and achievements, but also the sense of having everything felt more intensive and stimulated thinking;" while another student made the connection that "The pressure for [the] student project was comparable to a professional project." Several students felt that they should have more autonomy, and at times the feedback from several instructors caused confusion. All students felt the lectures were beneficial to understand the perimeters of the project, design expectations, skill building, and which instructor to speak to for assistance.

Of all the skills that were goals for learning outcomes, students identified the most important as being 1) the ability to work with timelines and challenging work flow (70%); equally, 2a) better understanding of a project scope (65%), 2b) active learning, autonomous from a teacher orientation (65%), and 2c) teamwork interdisciplinary and intercultural cooperation (65%); followed by 3) the use of design methodologies (60%), 4) social and environmental impact (57%), and 5) the capacity to think by sketching, making and presenting (52%). Entrepreneurship, considered here as the willingness or ability to idealise, coordinate and carry out projects, was highlighted by 35%. Of the activities

within the workshop, which included participating in an international project, interacting with experts, networking, and cultural experiences, the activities that were most important to the students were interacting with experts (78%), participating in an international project (70%), and cultural experience (70%), showing the importance of local connections, shared cultures, and design expertise.

Upon completion of the project, available alumni and faculty met virtually to review content for feedback. During the discussion, the students expressed an increase in confidence in their communication skills, increased networking skills, and enjoyment of cross-cultural interactions. Students from each project had found the project beneficial, sometimes instrumental, in securing employment following graduation or in pursuing further education. Alumni from the project who have since gone into the labour market have seen an increase in their personal and professional development, felt more prepared to work under pressure, and were better at presenting themselves in front of an international, interdisciplinary audience. Additionally, they shared greater confidence in conveying their ideas through sketching, increasing their workflow, and feeling prepared for the rhythm of the labour market.

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When designing for a world that is complex in its needs and dimensions, several concerns arise regarding the standards of educational systems and its implication on the training of the next generation of designers and artists. To that extent, we — educators, researchers, artists and designers — are faced with the responsibility of keeping up with the ever-shifting reality and the ever-growing need for initiatives to create and evaluate working methodologies to propose new teaching-learning solutions whenever, and wherever, necessary.

In line with recent research done on the need to improve art and design education (Kwitok, 2016; Friedman, Ken 2019; Brown, Tim 2020; Jorge Frascara, 2020; Meyer, Michael W., Norman, Don 2020; Redström, Johan, 2020; Swanson, Gunnar 2020; among others), the International Design Collective Project (PiCoDe) was created from a collective reflection that brought together professionals from Poland, Portugal, Turkey, Spain, and the United States. As a result, the **Collective Design Method** was conceived with the aim of preparing art and design students for the international job market through a teaching-learning methodology prepared and improved for that purpose.

The method — implemented and tested during three workshops that took place in Poland, Portugal and Turkey, with teachers and students of different nationalities, art practices, and design disciplines — provided students with fundamental opportunities of which the most important were to 1) experience the challenges of a professional workplace held in an academically controlled environment; and 2) to practise a set of skills which, commonly at this stage, are still underdeveloped within interpersonal communication, interdisciplinarity relationships, social responsibility, critical analysis, creativity, entrepreneurship, self-regulation, and resilience. While technical skills are fundamental requirements for professional practice, these competences related to human behaviour are the ones that employers currently value most during a job interview as a guarantee of future efficient work activity (Asbari et al., 2020; Getachew et al., 2020).

The idea of developing a project bringing together different disciplines of art and design, creating a studio environment and simulating work realities, through collaboration, team building, trust, courage, making strong first impressions, building relationships, and being responsive to social and global awareness, is therefore what we believe can help businesses and careers be more successful and more sustainable. Our intention is not to redesign the design process, but to study the methods within the process, and to adapt some methodologies in order to improve entrepreneurship, develop design knowledge, and deepen soft skills necessary for the demands of professional design practice.

Throughout the three workshops, the application of the method was subject to some adjustments in order to improve each stage and its specific objective. Following a predefined scheme, containing the phases of (1) Climatization; (2) Familiarization; (3) Informatization, (4) Contextualization; (5) Conceptualization; (6) Realisation, (7) Formalization, the activities were carried out and the quality of the interactions between the working groups was analysed in detail.

From the teachers' point of view, some discrepancy was observed regarding the students' knowledge and work processes, which required an explanation of the design process, in a preliminary phase of the workshops. The limited time frame relative to the level of expectation also led to the implementation of a rigorous schedule, defined instructions, and limitations on materials and processes to serve the project's objectives.

Several factors regarding communication challenged the effectiveness of the process, the most challenging being the language barrier. Lack of communication due to language deficiencies, or misunderstandings due to cultural differences, created disruptive moments, which occasionally generated tension among the group. It was also observed that a drawing or an image had the power to dissolve misunderstandings and make communication between groups clearer and less ambiguous, regardless of nationality, culture or design discipline. With this experience we have learned that for actions that rely on collective projects or multicultural teams, the way artists or designers communicate with each other can determine the efficiency and effectiveness of the project's outcome. For that reason, it is vital to invest in quality and clarity of communication, as it is through that, information is exchanged, trust is built and profitable relationships are maintained.

Organising a two-week workshop with various academic calendars among several international schools does pose a challenge in coordination. Academic calendars at each institution start and end at different times. Summer break seems like an ideal time for both faculty and students, although summer schedules may also be different for each institution. If the project is to be conducted during the school year, a one-week timeframe may be more manageable for both faculty and students. If this were to be the case, the schedule and expectations for the final deliverables would need to be adjusted accordingly.

The short duration and unfamiliarity of the students to one another before the workshops raised several challenges that were used for the benefit of the students' development and growth. In the first two workshops, the students lived in separate accommodations, while in the third workshop, a house was provided for the visiting international students. In the third instance, it was observed that communal living resulted in faster team building, a better adaptation to overcoming cultural and language barriers, a greater receptivity to diversity, and a higher cooperation in finding solutions that benefited the group over the individual.

The project has the potential to scale through increasing the length of time and/or the quantity of participants. The length of the project as a two-week workshop was a topic of great discussion, for while it allowed for a greater immersion, it also required a heavy commitment from the participating graduate students and faculty currently studying or teaching within a rigorous academic schedule at their home institutions. To balance these expectations, oftentimes working across different time zones, students and faculty were allowed to leave the project to meet their responsibilities in a designated space within the host institution. Two weeks at this level of expectation was challenging the limitations of creative exhaustion, therefore any suggestion for a longer duration would justify the consideration of academic credit as substitution for participating students. To organise the **Collective Design Method** project, five instructors from different higher-education institutions, nationalities and art/design backgrounds collaborated in selecting six to eight graduating students to join the international team, thereby participating in the workshop and representing their respective institutions and disciplines.

Besides the information collected and analysed within the three workshops, the Project researchers collaborated with external expert contributors in the field of artistic pedagogy to present a reflection on each of the seven principles behind the **Collective Design Method**. Together, with the work of two prestigious reviewers, their academic achievements and professional experience were invaluable in terms of an objective view of the solutions developed so far.

In conclusion, given the need to find solutions that are increasingly effective and have an universal validity (Schadewitz 2009), co-creation and multicultural dimensions in art and design projects has emerged, and are compelling schools to prepare their students to be more flexible and adaptive to environmental changes and to market uncertainty, providing them not only skills to know how to design but also how to communicate different needs for, and with, different cultures (Meyer & Norman, 2020; Sohmen, 2001).

The **Collective Design Method** is an exercise open to the need to re-evaluate current teaching-learning methods and an invitation to all those who believe it is possible to educate students with a more focused consciousness on collectivity, locality, material provenance and sustainability.

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RESEARCHERS

8.1 Editors

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Multimedia artist, PhD in Fine Arts, from 2018 permanently associated with the Lodz University of Technology where she runs the Studio of Multimedia Activities at the Department of Visual Communication. She was a guest teacher at other art academies and universities in Poland, Spain, Bangladesh, Portugal, Norway, Turkey and Italy.

Author of texts on new media art. Leader and implementer of national and international projects in the field of artistic education. Awarded in art and film competitions. She is a scholarship holder of the Kulczyk Family Chapter and the Department of Culture of the Marshal of the Wielkopolska Region. She participates in exhibitions and shows in Poland and abroad. She made multimedia visualisations for various theatres in Poland. For many years associated with the media and film production market. As Artistic Director, she produced eighteen documentaries commissioned by DiscoveryCanal + in the period 2016-2018. In 2020, during the pandemic, she created a film production of six theatre performances for the Dramatic Theater in Warsaw.

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Born in the United Kingdom (1971), Jeremy has both British and Portuguese citizenship, and currently lives in northern Portugal. He is the Course Director for Product Design at ESAD — College of Art and Design; member of the Technical/Scientific Council and Strategic Council; Product Design Researcher at esad—idea; Coordinator and Teacher for Masters in Product Design, Post Graduation in Mobility Design and Furniture Design; and Teacher for Bachelors in Product Design, Drawing, Sketching and Rendering. Jeremy has four superior qualifications in Design: Specialist Title in Industrial Design (2016) from Porto Polytechnic; Masters in Vehicle Design (1996) from the Royal College of Art; Bachelors in Design for Industry (1994) from Northumbria University; and BTEC Diploma in Industrial Design (1990) from West Notts Vision. He has previous employment as an: Assistant Professor at Porto Polytechnic (2016) and IPCA Cávado/Ave Polytechnic (2014); founder and partner of Simpli Design (1997/2012) working on projects with Grundig International; WorldSpace Satellite Radio; Adico Metallic Furniture; TEV2 Automation/Electrical; and VRC Warehouse Technologies. Jeremy has achieved design recognition with: Guilherme Awards (2017); EISA Award (Grundig, 2000); Triplex Award (1996); and RSA Design Award (1993). Through investigation, Jeremy has worked on projects and publications for: Project International Collective for Design (Erasmus+, 2019/2023); iSea Science Communication R+D Project (FCT, 2020); The Car as a Transformer (IHSI 2020, Springer); Porto Metro (2017/2019); FACS Future Automotive Cockpit & Storage (PSA/Simoldes/2020 PT funding, 2017/2020).

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Born in Portugal, Marta Varzim holds a PhD in Art Studies from the University of Aveiro (2014); a Master in Digital Arts — Multimedia (2001) and a degree in Visual Communication Design from ESAD — College of Arts and Design of Matosinhos (1995).

At ESAD Marta is the Director of the Arts Degree; Course Leader and Teacher of the Digital Arts and Multimedia Course and Vice coordinator of the Erasmus Programme. Marta is a member of the Scientific Council at ESAD; member of the Scientific Committee of Avanca-Cinema: International Conference of Cinema, Art, Technology, Communication; member of the Scientific Committee of the Journal Art Culture Design; and member of the Editorial Board of the International Journal of Design Principles and Practices. In 2016 Marta became a juror at the Cinema and Audiovisual Institute (ICA), a public institute supervised by the Secretary of State for Culture in Portugal, whose mission is to support the development of cinematography and audiovisual activities.

Marta develops scientific work in the field of science communication, animation and cinema and collaborates in projects and publications for: "The role of illustration in paediatric hospitalisation. A collaborative project between ESAD and Pedro Hispano's Hospital of Matosinhos" (*Convergences — Journal of Research and Arts Education,* 2022); "Citizen social science for the communication and sustainability of the deep sea in the decade of ocean science" R+D Project (PTDC/COM-OUT/3231/2021) ; PiCoDe — "Project International Collective for Design" (2020-1-PL01_KA203_081456); I SEA — "Virtual reality to evaluate audience attitudes about science communication" R+D Project (UTAP- EXPL/CD/0106/2017).

8.2 Contributors

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Born in Izmir/Turkey in 1978, Bilge Kınam is a full-time instructor as an Associate Professor in Eskişehir Osmangazi University, Faculty of Art and Design, Visual Communication Design Department. Her field of study is graphic design, with a focus on multidisciplinary art & design works; Bilge Kınam teaches Graphic Design Studio, Desktop Publishing Design, Art Concepts, Portfolio Design, Visual Communication Project, Socially Responsible Design and Sustainable Design. Kınam has worked on different social responsibility design projects for NGO's and local municipalities. Since January 2021, she has been conducting at PiCoDe (International Collective for Design) — KA203 Erasmus+ Project as a strategic partner representing ESOGÜ Faculty of Art and Design.

In 2000, Kınam received her BA from Faculty of Fine Arts, Design and Architecture, Graphic Design at Bilkent University in 2000. She studied further from 2008 to complete her MFA from Dokuz Eylül University, Institute of Fine Arts, Graphic Design for two years. In 2015, she received her Proficiency in Arts degree in Graphic Design in Anadolu University. During her master's degree, she worked as a designer in Santex Moden, in Aachen/Germany with the Erasmus Training Program. She volunteered for EVS Action 2 project and worked at Plas Lluest Daily Centre with mentally disabled people for 12 months in Aberystwyth/Wales. Since 2000 she has worked as a graphic designer and art director in advertising agencies, and between 2006–2009, she gave courses at the graphic design department in Izmir University of Economics. Assoc. Prof. Bilge Kınam continues to teach, work and research in Eskişehir Osmangazi University, Faculty of Art and Design, Visual Communication Design Department since 2013.

Multidisciplinary designer, researcher, maker, and educator. MFA in Color and Materials Design, College for Creative Studies (2018); BFA in Fashion Design, Virginia Commonwealth University (1996). Currently Chair of the Color and Materials Design in Graduate Studies at the College of Creative Studies (CCS) in Detroit; Associate Professor, Color and Materials Design. While at CCS, worked on projects with industry leaders including Lear, Oakwood Group, and Harley Davidson. Previously Assistant Professor, Fashion Design, VCUarts, Qatar (2010-12, 2015-16). Project Director, *Indoartamiks,* Jogjakarta/Bayat, Indonesia, social art project/vocational education/local craft/textiles/ceramics (2012-2014, funded by Vodafone/Reach out to Asia). Most recent paper, *Ruderal Material Project,* presented at Cumulus (2022), funded grant, College for Creative Studies. Her work has been exhibited locally and internationally, including *Color Lab* (2020), materiality of colour to create interactive landscapes through point-of-origin pigments. Affiliations/Boards: Midwest Biodesign Hub, Detroit River Coalition (DRC), and the Metropolitan Museum of Design Detroit (MMODD). Research interests: objects and experiences with a Sense of Place, the Materiality of Color, the Found Object as Art (Seeing), Creative Archiving, Making as Research, Re-imagining Waste Materials through Biodesign, and Trend Futures.

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Educator, researcher and lecturer in Graphic Design. PhD in Fine Arts (University of Barcelona); Degree in Humanities from the University of La Rioja. From 2017 to 2021 director of the Escuela Superior de Diseño de La Rioja. Currently Head of the Graphic Design Department at the Escuela Superior de Diseño de La Rioja. She has published numerous specialised articles on contemporary art and design in magazines such as *Goya, Dardo Magazine, Artyco,* EME *Magazine, Codal* or *Beis Magazine,* and she has written chapters in books and catalogues as *Una propuesta* or *Una rosa amarilla.* She has given lectures on contemporary art in initiatives such as *Mujeres en el arte en La Rioja* or in exhibition spaces such as the Sala Amós Salvador in Logroño. She has participated as speaker in several congresses on design and pedagogy, such as the Postgraduate Seminar held in 2017 in Barcelona on Postgraduate Teaching and Research in Plastic Arts and Design. She has been in charge of the Jornadas de Diseño (https://esdir.eu/es/c/actividades-y-proyectos/jornadas-de-diseno/) at the Escuela Superior de Diseño since 2002, which has given her a broad vision of contemporary design. She is member of numerous juries such as that of the Muestra de Arte Joven en La Rioja or the Premio de Grabado y Vino Pedro Vivanco. As an artist she has exhibited her work in both solo and group shows.

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Ana Lucia Duque has a PhD from the Universitat Politècnica de València (UPV — Spain) and she is an educator, designer and researcher in the area of Design. The doctorate thesis is titled "Arte de Escribir — Exemplares de Diversas Sortes de Letras de Manuel Barata, 1590-92". The main theme of scientific research has been on Calligraphy, specifically, 16th century Portuguese calligraphy and rare editions in Portugal. She has participated in international conferences on design and typography and published a facsimile copybook from 1592, publishing articles on the work of the 16th century Portuguese calligrapher, Manuel Barata. With a Master's degree in Design and Graphics Multimedia Production from the Facultad de Bellas Artes de la Universidad de Barcelona (UB), she's graduated in Industrial Design at Escola Superior de Artes e Design (ESAD) after completing a Bachelor's Degree in Artistic Drawing at Escola Superior de Artes do Porto (ESAP).

She also has joined national and international research teams (Lab2PT UM — Universidade do Minho, ESG — Escola Superior Gallaecia) on the topic of Design for Sustainable Development, Heritage and Territory. She participated in Project 3D Tempus — Design for the Sustainable Development of Artisan Productions in Tunisia, an european financed project that involved multiple universities, namely, UNIFI — Università di Firenze; ESSTED — Ecole Supérieure Des Sciences et Technologies du Design (Tunisia); POLITO — Politecnico di Torino (Italie); UB — Universitat de Barcelona (Spain); ISAMKAS — Institut Supérieur des Arts et Métiers de Kasserine (Tunisia); ISBAS — Institut Supèrieur des Beaux-Arts de Sousse (Tunisie). Ana Lucia Duque has been an invited guest professor at the School of Architecture of University of Minho (EAUM) and at the Escola Superior Galleacia (ESG). Currently, she is a professor at the School of Arts and Design of Matosinhos (ESAD).

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Dirk Loyens holds a PhD in Architecture. Professor at ESAD responsible for the Curricular Units of Project, Product Strategy and Design Practices. He is a senior researcher at esad—idea with expertise in product design and development. His research focuses on the intersection of technology, design and circularity in the context of Climate Change. He collaborates as a design consultant on projects in the area of advanced manufacturing technologies at INEGI. He is one of the authors of the D-Think Toolkit-Design Thinking Applied to Education and Training. Member of ESAD's Technical-Scientific Council since 2009.

A maker-researcher, designer, and theorist, Ian Lambert has worked in both practice and academia for over 30 years. He is the Dean of Graduate Studies and Research at the College for Creative Studies in Detroit. Prior to this, he taught at Edinburgh Napier University in Scotland (2001-19), and was a visiting lecturer at the Zhengzhou University of Light Industry, China (2006-17).

Ian has exhibited work widely across the UK, as well as in China and the USA. He was an independent designer of furniture throughout the 1990s, and has undertaken freelance work in London, Hong Kong, and mainland China. His first degree was in Furniture Design at Birmingham Polytechnic, which included a semester on the University of Montreal's Industrial Design programme; he holds an MA from Central St. Martins College of Art and Design, London; and a PhD from the University of Edinburgh. He is a Fellow of the Royal Society of Arts, and Senior Fellow of the Higher Education Academy, UK.

Ian's research interests lie in climate action, redistributed (re)manufacture, and making-as-thinking. He recently co-led the d.Tree Studio in collaboration with Charles H. Wright Museum of African American History in Detroit, using urban lumber for making cultural artefacts that advanced social justice narratives. His work with ocean plastic has been widely published, and he is currently developing projects on plastic pollution in the Great Lakes and the Detroit River.

He was co-chair of the Research Through Design Conference 2017, and is co-chair and submissions chair of the *Cumulus Conference 2022: Design for Adaptation.*

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Born in the Paredes (1983), Luciana lives and works in Portugal. She is a Design Specialist (IPP), MA in Product Design (ESAD), Postgraduate in Furniture Design (ESEIG), Degree in Equipment Design and BA in Interior Design (ESAD). Between 2006 and 2018 she worked as designer in charge at SME's ABrito — Mobiliário and MAB, where she developed different furniture products for contract and home areas, on display at the biggest fairs in the sector: Maison et Objet (Paris), I Saloni (Milan) and Habitat Valencia (Spain). She works as a consultant and freelance designer in projects in the areas of furniture, metalworking, home, textile, sustainability and innovation. In 2012, she was awarded with the 1st and 2nd prize in the development of knives for Herdmar and, in 2014, with the 1st prize for the creation of kitchen knives for ICEL. Since 2018 she has been a lecturer at ESAD of Furniture Design, Product Management, Branding and Product Strategy, Perceptual theory and Contextual Studies. Studies and is interested in innovation, sustainable design, creative thinking and the new roles of design in the world and in business. Passionate about revolutionary and provocative products, she loves the paradigm of tradition and technology in creative development and manufacturing.

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Born in New Delhi, India (1983) Shujoy pursued his advanced university formation and scientific career development in Italy and Portugal.

Currently Shujoy is appointed as the Course Director of both the Bachelor and Master's in Design Degree Programs at the University of Madeira, Portugal.

His current affiliations include Assistant Professor of Product Design at the University of Madeira and Faculty Researcher with the ITI — LARSYS research unit.

Shujoy has lectured in international Industrial Design Programs across Europe and India: National Institute of Design, NID (India), Indian Institute of Technology, IIT — Delhi (India), Indian Institute of Technology, IIT-Guwahati (India), School of Planning and Architecture, SPA — New Delhi (India), Poli.Design-Milan (Italy), Domus Academy — Milan (Italy), Industrial Design Centre HOWEST — Kortrijk (Belgium), ESAD — Matosinhos (Portugal), and the University of the Aegean — Spyros (Greece).

Shujoy's teaching and research intersects classical design and computational design. His product design expertise spans academia-industry applied research / product innovation / product experience / virtual reality (VR) / parametric design / design process models / design thinking and creativity theory.

Shujoy holds a Phd in Design (Summa Cum Laude) from Politecnico di Milano specialised in Product Semantics and Shape Coding focusing on the design of next generation home appliances. His doctoral studies were funded through research fellowships sponsored by the Italian Ministry of Universities, Scientific Research and Technology and the School of Doctoral Studies (INDACO) at the Politecnico di Milano.

LODZ UNIVERSITY OF TECHNOLOGY

Poland

Lodz University of Technology is one of the best technical universities in Poland in terms of its educational offer for secondary school graduates and research prospects for young researchers. The university is listed in the most prestigious and widely commented international rankings. It was ranked among 19 Polish universities in the international Times Higher Education World University Ranking 2021, among 19 Polish universities in the QS World University Ranking 2022 and among 24 Polish universities in the US News Best Global Universities Ranking 2021.

Economy-oriented science and technology are the strategic objectives of Lodz University of Technology. The university conducts research in the fields of environmental energy and IT infrastructure, production management systems, advanced materials technology, industrial biotechnology and biomedical engineering.

Researchers from Lodz University of Technology are the creators of many cutting-edge solutions and innovative projects at a global level. Numerous agreements with global companies, as well as small and medium-sized enterprises, make it possible to better utilise the scientific potential of the university and at the same time strengthen the development and competitiveness of the economy.

Lodz University of Technology comprises 9 faculties: Faculty of Mechanical Engineering, Faculty of Electrical, Electronic, Computer and Control Engineering, Faculty of Chemistry, Faculty of Biotechnology and Food Sciences, Faculty of Civil Engineering, Architecture and Environmental Engineering, Faculty of Technical Physics, Information Technology and Applied Mathematics, Faculty of Organization and Management, Faculty of Process and Environmental Engineering and Faculty of Material Technologies and Textile Design. The latter is coordinating the project 'Project — Product — Promotion. International Collective for Design'.

The Faculty of Material Technologies and Textile Design at Lodz University of Technology has a tradition of over 70 years of educating specialists in the fields of textiles and design. Established in 1947, it functioned for many years as the Faculty of Textiles, contributing to the development of the textile industry in war-ravaged Poland. Thanks to it, among other things, the city of Lodz experienced a wonderful boom from the 1970s onwards. The constantly changing political and economic situation was a stimulus to start training specialists in design and industrial design.

Today, the Faculty of Material Technologies and Textile Design at Lodz University of Technology offers several fields of study: Textile Engineering, Textiles and Fashion Industry, Design, Industrial Design Engineering and majors conducted in English: Design, Textile Engineering and Textiles and Fashion Industry. In addition, the educational offer also includes postgraduate studies: Garment Construction, Occupational Health and Safety, E-commerce in Textiles, New Technologies in the Light Industry. Transformation to a Circular Digital Economy.

Graduates of the Faculty have a unique combination of skills: technical knowledge and artistic sensitivity. This makes them excellent specialists on the labour market, as they are able to take a holistic approach to the challenges awaiting them in their professional lives.

The further development and richer cooperation offer of both the Faculty and the entire Lodz University of Technology is supported by a number of projects.

Lodz University of Technology (TUL) participates in numerous international projects which aim to increase the quality of the mobility, graduate employability and innovation in higher education, among others Erasmus+ and NAWA (Polish National Agency for Academic Exchange). Example for this can be coordinating two international projects: strategic partnership "ActiveD2–Active Double Degree Implementation of the joint studies model based on active methods of education and learning" and Katamaran project "Implementation of joint second-cycle studies in the field of Electronics and Telecommunications by Lodz University of Technology and the Frederick II University of Naples".

In addition to international projects, over the past 10 years, Lodz University of Technology has been a partner or coordinated more than 20 nationwide projects.

ESAD — COLLEGE OF ART AND DESIGN

Portugal

In 1989, a group of teachers created an art and design college with a new vision, responding to the current needs of education and the demands of a transforming industry. Today, ESAD — College of Art and Design, is a reference in Portugal and throughout the world.

Since its foundation, ESAD has adopted internationalisation as a strategy for scientific and pedagogical affirmation, which is fundamental to its educational project. This concerns mainly the ERASMUS+ exchange and the mobilisation of students (for study cycles and internships), of teachers and collaborators. ESAD has bilateral partnerships and contracts with several higher education institutions from the five continents.

From the beginning, ESAD was based on three vectors: education, improvement and innovation. ESAD wanted to educate students with the ability to intervene and engage nationally and internationally, keep pace with the growing demands of the art and design professions, and promote the evolution of skills necessary for creative, critical and technological competitiveness. ESAD now offers undergraduate degrees in art and design, a masters' in design, various post-graduate courses, technical and higher professional courses (CTESP) and a programme of short courses, and every year awards scholarships to bachelor and master's degree candidates.

Over the years, many national and international distinctions have been awarded to ESAD, by work made by students and teachers, and seminars, conferences, workshops, exhibitions and meetings guarantee the formative extension and dissemination of our art and design work in an active and critical environment.

ESAD's daily life is diverse and productive. The classrooms, workshops and studios are open to transversal or specific activities and to interdisciplinary or specialised tasks. The objective is for students, assisted by teachers and technicians, to explore, analyse and prototype their ideas into various forms. The college also provides student services to support the needs of the academic community, defending student rights and interests, assisting employment and psychological needs.

ESAD–IDEA, Research in Design and Art was founded in 2014, and is ESAD's R&D unit dedicated to fundamental and applied research, consultancy, cultural programming and the provision of services in the area of design. This research centre took on the mission of contributing not only to the development of teaching, but also to the advancement of research, culture and science in the fields of design and art, and in partnership with Matosinhos City Council, provides a service to the local community, managing cultural spaces and entrepreneurial offices and equipment.

In 2021, ESAD became part of the BLUE DESIGN ALLIANCE, a consortium of higher education institutions whose mission is to contribute to the enhancement of water, ocean and river resources towards social, environmental and sustainable needs through design. Linked to the 'blue' economy, this training and research is integrated into the Youth and Adults Impulse of the Recovery and Resilience Plan (PRR). The training programme includes post-graduate courses, CTESP, summer courses and the Water Design Views cycle of conferences and workshops.

ESAD plans to continue building a robust and diverse future for its art and design community, through its original values of education, improvement and innovation. From foundation knowledge to advanced research, ESAD and its partners intend to create opportunities and influence art and design education towards the needs of the next generation.

ESKISEHIR OSMANGAZI UNIVERSITY

Turkey

Eskisehir Osmangazi University was founded based on the Law Number 496 passed on August 18, 1993, and Faculties of Engineering and Architecture, Medicine, Science and Letters, and the University Hospital were separated from Anadolu University and affiliated to Osmangazi University. Health Services School, Eskişehir Health Services Vocational School; Institutes of Science and Technology, Medical Sciences, Educational Sciences and Social Sciences and the newly opened Faculty of Economics and Administrative Sciences was restructured under the name "Osmangazi University". The name of Osmangazi University was changed as "Eskisehir Osmangazi University" based on Law Number 5379 passed on July 1, 2005.

Although legally established in 1993, the year 1970, when Eskişehir State Engineering Architecture Academy (EDMMA) is founded, is used as the "foundation year" with a decision of the Senate. Sivrihisar Vocational High School was established in 1994, Faculty of Agriculture and Faculty of Theology were established in 1995, Faculty of Education was established in 1998 and Faculty of Dentistry and State Conservatory were established and were added to our units. Mahmudiye Horse Breeding Vocational School started its education in the 2007/2008 academic year, and the Faculty of Art and Design was established in 2009. The Faculty of Health Sciences has started student recruitment in 2016/2017 academic year. Lastly, the faculty of Tourism was established in 2013, and the Faculty of law was established in 2018, and they all have been added to the structure of our University which has been growing and developing rapidly.

Eskişehir Osmangazi University has a total campus area of 2.880.830 m2, and 80.000 m2 of this area is used as classroom-laboratory-office, 50.000 m2 of this is used as social facility-library, and 62.000 m2 of this is used as heath area. Eskişehir Osmangazi University continues its education, R&D and health care activities at Meşelik, Bademlik, Çamlık, Ali Numan Kıraç, Sivrihisar, Sarıcakaya, Mahmudiye, Çifteler and Organized Industrial Zone Campuses. Eskişehir Osmangazi University, a strong and long-established university with 50 years of scientific experience, continues to produce knowledge with 12 Faculties, 2 Schools, 5 Vocational Schools, 4 Institutes and 35 Application and Research Center, and progressing steadily towards modern science.

COLLEGE FOR CREATIVE STUDIES (CCS)

USA

The College for Creative Studies (CCS) is a nonprofit, private college authorised by the Michigan Education Department to grant Bachelor's and Master's degrees. CCS, located in midtown Detroit, strives to provide students with the tools needed for successful careers in the dynamic and growing creative industries. CCS fosters students' resolve to pursue excellence, act ethically, engage their responsibilities as citizens, and learn throughout their lives. With world-class faculty and unsurpassed facilities, students learn to be visual communicators who actively use art and design toward the betterment of society. The College is a major supplier of talent to numerous industries, such as transportation, film and animation, advertising and communications, consumer electronics, athletic apparel, and many more. Its graduates are exhibiting artists and teachers, design problem solvers and innovators, as well as creative leaders in business.

Founded in 1906 as the Detroit Society of Arts and Crafts, CCS plays a key role in Detroit's cultural and educational communities. A private, fully accredited college, CCS enrols more than 1,400 students, pursuing Master of Fine Arts and Master of Arts degrees in Art Education, Color and Materials Design, Design for Climate Action, Motion Design, Transportation Design and User Experience Design and Bachelor of Fine Arts degrees in Advertising Design, Art Education, Art Practice, Communication Design, Craft and Material Studies, Entertainment Arts, Fashion Design, Film, Illustration, Interior Design, Interdisciplinary Art & Design, Photography, Product Design and Transportation Design. The College also offers free art education for more than 4,000 Detroit youth annually through its Community Arts Partnerships program. In addition, the College's University Prep: Art & Design is a public charter middle and high school enrolling more than 800 students in a high-performance academic curriculum with a special focus on art and design.

COLLEGE OF DESIGN-LOGROÑO ESDIR

Spain

Our College is an institution created in 1886. Its origin is rooted in the best tradition of artistic education born in England in the mid1850s with the aim of improving the design of daily objects. The beautiful building in which ESDIR is located, with typology of cloister plan, was projected in 1914 by Antonio Rubio and Luis Mosteiro, following the eclectic style that prevailed in Madrid at that time. The treatment and variety of materials and spaces make it an outstanding example of integration of decorative arts and architecture.

Since then we have been the only institution devoted to the teaching of arts in La Rioja. For decades, the college has trained craftsmen and professionals in different artistic occupations.

From 1963 onwards, successive educational systems have been including this college in formal teaching in each historical moment. In 1973 Decoration was introduced as a study field. In 1990 Secondary Education in Arts was included. And in 1996 vocational training (middle and upper studies linked to graphic design, interior design and artistic ceramics) were also taught.

In 2010, once approved the law which sets the organisation of artistic upper studies, the college offers upper studies in design equivalent to official university degrees and organised under the ECTS credit system set by Bolonia decree in the fields of graphic, product, interior and fashion design.

Since then we are the Escuela Superior de Diseño de La Rioja (ESDIR).

With more than 450 students, ESDIR is a dynamic college in which a great number of activities are organised during the academic year: workshops, lectures, publications, exhibitions, visits to companies and all types of events related to design. Besides, we are part of Erasmus+ program in which we welcome students from a variety of countries and at the same time our students can make part of their studies abroad.

Our accredited trained teaching staff is deeply involved in the teaching task as well as in the daily follow up of our students' work.

Our wonderful building is in the city centre with the perfect facilities for the teaching and practice of design. The fact of providing training in four design fields makes us a unique college in the north of Spain and makes transversality and exchange among studies easier.

In the year 2016/2017 started our first official Master studies: Master in Packaging design for the food and wine industry; in the year 2018/2019 the Master in Footwear design and innovation and in the year 2022/2023 the Master in Retail and Exhibition Design for Fashion.

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This book addresses the need to re-evaluate current teaching-learning methods and aims to contribute to the preparation of art and design students for the international labour market, placing the issue of collectivity, locality, material provenance and sustainability, at the centre of reflection.

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