



Ca' Foscari
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of Venice

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Design Thinking in education: the case of Active Learning Lab

Supervisor:

Prof. Vladi Finotto

Graduand:

Giordano Vettoretto

860522

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Introduction

One of the first courses attended at Ca' Foscari University was about design and innovation management. In these classes was studied the concept of Design Thinking and from that moment was born the interest about this approach. The following year was created the Active Learning Lab, which was based on Design Thinking approach. The laboratory represented a great chance to examine how this kind of method is applied in higher education. According to this, the purpose of the research is to analyse how Design Thinking is implemented and to understand which are its potentials, but also its downsides.

In the first chapter it is revisited the history of design and Design Thinking from their earliest phases. In addition, it is analysed the role of creativity which is a fundamental component of Design Thinking. Subsequently, it is seen why this approach should be implemented in higher education, in particular in business and management faculties. Moreover, it is defined what are the different models used to describe the process of Design Thinking. In this chapter was used a theoretical basis in order to comprehend the subject at hand.

The second chapter describes the Active Learning Lab case study. First of all, it is analysed the first important experiments of Design Thinking implementation in higher education, from the Stanford d.school to the HPI School of Design Thinking. Subsequently, the chapter describes in detail the activities made by the students and how it is implemented the Design Thinking approach during the weeks. Furthermore, it is defined the actors involved in the laboratory and their role. Importance is given in specifying what are the company partners of the lab and what are the challenges the students have to solve.

Finally, after having analysed Design Thinking and the case study the third chapter represents the cornerstone of the entire work. The research followed a qualitative method with semi-structured and unstructured interviews. The analysis of the data collected takes in consideration both the information acquired by the interviewees and the information grounded on theory, which allows to understand the informant's answers.

1. What is Design Thinking and why it should be implemented in modern education

1.1 The history of Design Thinking

In 1969 H. Simon tried to identify what design is, in his work he wrote about the concept of design and its primary stages. He stated that the design process is a universal method which can be used extensively in “professional training”. In fact: “Schools of engineering, as well as schools of architecture, business, education, law, and medicine, are all centrally concerned with the process of design”¹. In this example, according to H. Simon, design plays a central role in education and it is viewed as the main differentiator between the professions and the sciences. As a matter of fact, design is an essential part of all kinds of academic classes that train in the core professional skills, because design is interpreted as every action which creates an “artifact”. “The intellectual activity that produces material artifacts is no different fundamentally from the one that prescribes remedies for a sick patient or the one that devises a new sales plan for a company or a social welfare policy for a state”².

Another step in academic research within the realm of “design sciences” was made by Brian Lawson in 1980 when he published “How designers think”. In this book, he describes the design process and the thought processes which are needed to recognise and understand those design problems and create design solutions. The latter is the most important of the two because he hereby established the basis for what we call today Design Thinking. In this section of the book he starts with an overview of the different theories from the behaviourist theory which tried to explain thinking in terms of the direct association between stimulus and response, to the cognitive theory that recognises the presence of executive controlling function in the mind. “Since cognitive psychology accepts that information is actively reorganised and reconstructed in memory rather than passively recorded and recalled, it follows that something must control this process”³.

¹ Simon, H. A. (1969). The sciences of the artificial. MIT Press. Cambridge, MA.

² Simon, H. A. (1969). The sciences of the artificial. MIT Press. Cambridge, MA.

³ Lawson, B. (1980). How designer think. Architectural Press.

1.2 Creativity matters

As mentioned before the design process concerns a variety of subjects and one of the most important reasons is that design is rife with creative thinking, as affirmed by Lawson: “Creativity and creative thought can be applied just as much in science, medicine, philosophy, the law, management and many other fields of human endeavour”⁴. There is a large amount of literature about creativity, however it is beyond the purpose of this thesis to cite academic research about creativity. However, there is one particularly interesting model which shows the steps of the creative process and it is generally recognised as being the most reliable. Furthermore, this model will be useful to fully understand the Design Thinking approach. J. W. Young found five points in the creative process⁵:

- 1) Immersion: Include the general research about the topic or the problem to be solved
- 2) Digestion: Analysing the information
- 3) Incubation: This stage refers to the unconscious process behind the birth of ideas.
- 4) Illumination: When the idea or the solution of the problem appears.
- 5) Reality or verification: the final definition of the idea and evaluation of its feasibility. This is the conscious development of the idea.

Therefore, the creative process is made by periods of intense work focussed directly on the solution and moments in which the lateral thinking⁶ is predominant. This means that mingling of different subjects is very important, as will be demonstrated in the second chapter. Furthermore, a solid base of knowledge in a specific field could enhance creativity, with regards to this last statement there is an interesting study on design education in schools⁷. Laxton created a three-stage model in which the design learning process is represented and in each phase, specific skills are identified and strengthened:

- 1) The ability to initiate or express ideas, which depends on having or not having a certain level of knowledge.
- 2) The ability to evaluate and discriminate between ideas.
- 3) The ability to transform or interpret ideas to give them significance.

⁴ Lawson, B. (1980). *How designer think*. Architectural Press.

⁵ Belch, G. E., & Belch, M. A. (2004). *Advertising and Promotion: An Integrated Marketing Communications Perspective*, 6 Th. New York: NY: McGraw-Hill.

⁶ The term is coined by Edward de Bono and refers to the indirect approach used to solve problems. It requires a type of reasoning that is not strictly correlated to the problem and it does not follow a conventional step-by-step logic.

⁷ Laxton, M. (1969). *Design Education in Practice: Attitudes in Design Education*.

This model is described below with the original metaphor of the hydroelectric plant.

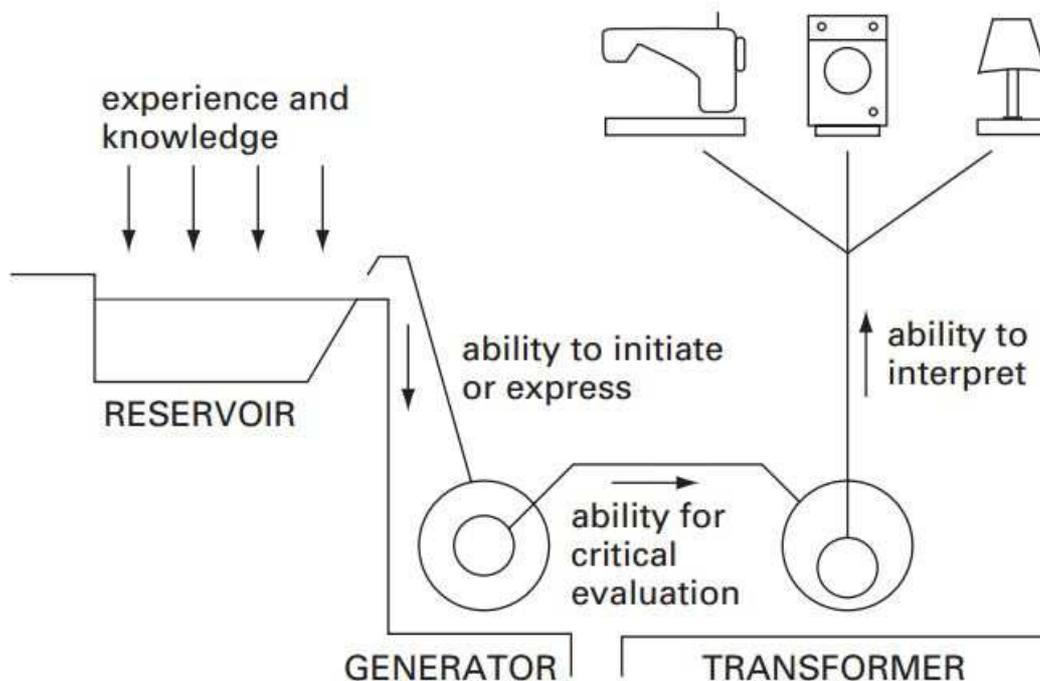


Figure 1: The three-step design learning process represented with the metaphor of the hydroelectric plant.

Source: Laxton, M. (1969). *Design Education in Practice: Attitudes in Design Education*.

What is worthy of note is that the conclusion of this study illustrates what has been mentioned earlier about the degree of knowledge necessary to achieve an adequate level of creativity. In other words, the children who were subjects of this research: “[...] cannot expect to be truly creative without a reservoir of experience”⁸. We will see in the third chapter the role played by knowledge in different disciplines in increasing creativity.

⁸ Lawson, B. (1980). *How designer think*. Architectural Press.

1.3 The role of design in education

Until now it has been discussed the beginning of research in relation to general concepts of design, but now it will be examined in greater detail the role of design as a cardinal player in the field of education. The first who to give design the right to occupy a place in the world of education is N. Cross when in 1982 he published the article “Designerly ways of knowing”. Here he began to analyse the classification of education made by the Royal College of Art⁹, where all knowledge is divided into three main categories: the first two are well established and they are the sciences and the arts or humanities. The “third culture” is design but it was not recognised or rather it was ignored until now. Cross stated the definition of design promulgated by the Royal College of Art in which is given more relevance to the process and the experiential and practical aspect: “The collected experience of the material culture, and the collected body of experience, skill and understanding embodied in the arts of planning, inventing, making and doing”.

To clarify the place that design occupies in relation to the other two “cultures” we propose a framework that is the outcome of what Cross described in his work. As you can see below the comparison is made on the basis of three aspects, which are the object of study, the method used and the leading values.

	Sciences	Humanities	Design
Phenomenon of study	Natural world	Human experience	Artificial world
Methods used	<ul style="list-style-type: none"> • Controlled experiment • Classification • Analysis 	<ul style="list-style-type: none"> • Analogy • Metaphor • Criticism • Evaluation 	<ul style="list-style-type: none"> • Modelling, • Pattern-formation • Synthesis
Values	<ul style="list-style-type: none"> • Objectivity • Rationality • Neutrality • A concern for “truth” 	<ul style="list-style-type: none"> • Subjectivity • Imagination • Commitment • A concern for “justice” 	<ul style="list-style-type: none"> • Practicality • Ingenuity • Empathy • A concern for “appropriateness”

Table 1: The comparison of the features of the “three cultures”. Source: Cross, N. (1982). *Designerly ways of knowing*. *Design studies*, 3(4), 221-227.

⁹ Royal College of Art (Great Britain), Archer, B., Baynes, K., Langdon, R., & Roberts, P. H. (1979). *Design in General Education: The Report of an Enquiry Conducted by the Royal College of Art for the Secretary of State for Education and Science*. Royal College of Art.

The table allows to see better the gap that existed before the introduction of design as an integral part in education. In the second chapter, it will be looked at each of the three aspects in practice.

To understand the position design occupies in education it must be clarified the difference between specialist and general education. According to Cross the former is more related to training in specific tasks and jobs, therefore it has an extrinsic feature. In fact, the aim of the transmission of knowledge is directed to create technical skills that will be directly implemented. At the contrary, general education has an intrinsic aim, it does not prepare students to fulfil a duty, but something which is more universal, that is the “training of intellect”¹⁰. Design is a science which has to do with each of these two types of education and the study of Peters, the Royal College of Art and N. Cross attempts to justify the presence of this subject more on the side of general education, since it has already gained credibility and acknowledgement in specialist education even before 1982.

The three main reasons why design should be included in general education are the following¹¹:

- 1) “Design develops innate abilities in solving real-world, ill-defined problems”. For example, the problem-solving method is more solution-focused than other disciplines like scientific one, which has a more analytical method that can be called problem-focused.
- 2) “Design sustains cognitive development in the concrete/iconic modes of cognition”. This assertion can be summarised with the words “learning by doing”. This mode of acquiring knowledge permits to contextualise the object of study and making a practical experience facilitate memorising and retrieving information.
- 3) “Design offers opportunities for development of a wide range of abilities in nonverbal thought and communication”. In fact, designers distinguish themselves from other professionals or researchers through the employment of mood-boards, storyboards, cognitive maps, sketches, post-its during brainstorming, and other graphic tools. These methods are used to communicate both externally as in brainstorming for example, and internally with cognitive maps which allow to enhance internal thinking and reasoning in general.

¹⁰ Peters, R. S., & Archambault, R. D. (1965). Philosophical analysis and education.

¹¹ Cross, N. (1982). Designerly ways of knowing. *Design studies*, 3(4), 221-227.

1.4 From design to Design Thinking in education, a way to improve student's skills

Once it has been approved the existence of design and Design Thinking in education it must be seen how it can be implemented.

In our rapidly changing society the educational system is not allowed to be static, there is the need to transform some old patterns that last since the education was born. The world in which we are living is not the world our parents or grandparents lived in, hence we cannot expect that the learning methods remain exactly the same. We are increasingly hearing about the so called "21st century competencies" which include a set of skills that are at the centre of political debate. This because they are viewed as the main constituent of university and career preparation. There are several lists proposed by different scholars, but the most relevant framework is proposed by J. A. Bellanca in "21st century skills: Rethinking how students learn"¹². In this work, an interesting classification of learning and thinking skills is presented i.e.:

- 1) "Critical-thinking and problem-solving skills": The first term is meant as mental processes characterised by selection and discrimination, analysis and assessment which are directly linked to problem-solving skills. As previously reported design and Design Thinking approach help to develop a solution-oriented method.
- 2) "Communication skills".
- 3) "Creativity and innovation skills": These will be vital in the next decades. In fact we are going to witness a moment in history in which the demand for "routine jobs" will dramatically decrease due to the progress in the implementation of the automatization processes. As a direct consequence, this will determinate the rise of the number of occupations more closely linked to creativity and innovation, i.e. where machines and algorithms will be able to arrive.
- 4) "Collaboration skills": determined by team work, that is when people with different skills work together in a coordinated fashion in order to solve a problem that could not otherwise be resolved exclusively by the individual alone.
- 5) "Contextual learning skills": Are developed when the knowledge is not entirely acquired from theoretical notions but fruit of a dynamic trial, but it is the active participation of a

¹² Bellanca, J. A. (Ed.). (2010). 21st century skills: Rethinking how students learn. Solution Tree Press.

subject within a context, given by the interaction with the other members and the environment.

- 6) “Information and media literacy skills”: They are particularly important nowadays, indeed we are living what is called the digital transformation. This phenomenon includes not only the technology but also the systems around it, involving managerial practices, society and more in general culture as well.

Another detailed conception of the 21st century skills is provided by the Organization for Economic Cooperation and Development (OECD), which is divided into three competencies categories, as you can see below in the table 1.2.

Using tools interactively	Interacting in heterogeneous groups	Acting Autonomously
Use language, symbols and texts interactively	Relate well to others	Act within the big picture
Use knowledge and information interactively	Co-operate, work in teams	Form and conduct life plans and personal projects
Use technology interactively	Manage and resolve conflicts	Defend and assert rights, interests, limits and needs.

Table 2: Classification of the 21th century skills by the OECD. Source: oecd.org.

The Design Thinking approach, if well applied in education, it can enhance all these skills, primarily thanks to its nature that can be considered constructivist. However, before speaking about constructivism it must be taken a step back and understand where it originated.

J. Piaget and Lev Vygotsky during the 1950’ies and early 1960’ies elaborated the constructivist theory which underlines the fact that knowledge is the result of personal experience¹³.

According to E. Ackermann this theory has three main implications in education, the first two are most useful to help to understand the importance of Design Thinking in higher education:

- 1) “Teaching is always indirect”: Students don’t take theoretical notions for granted but rather try to understand and implement them in order to experience them first hand.

¹³ Ackermann, E. (2001). Piaget’s constructivism, Papert’s constructionism: What’s the difference. Future of learning group publication, 5(3), 438.

- 2) “The transmission model, or conduit metaphor¹⁴, of human communication won’t do”: J. Piaget thought that knowledge is acquired through the interaction with other people, physical objects, or more in general with the external world. Hence, the learning process is not only made by the classical “information to be delivered at one end, and encoded, memorized, retrieved, and applied at the other end”¹⁵.
- 3) “A theory of learning that ignores resistances to learning misses the point”.

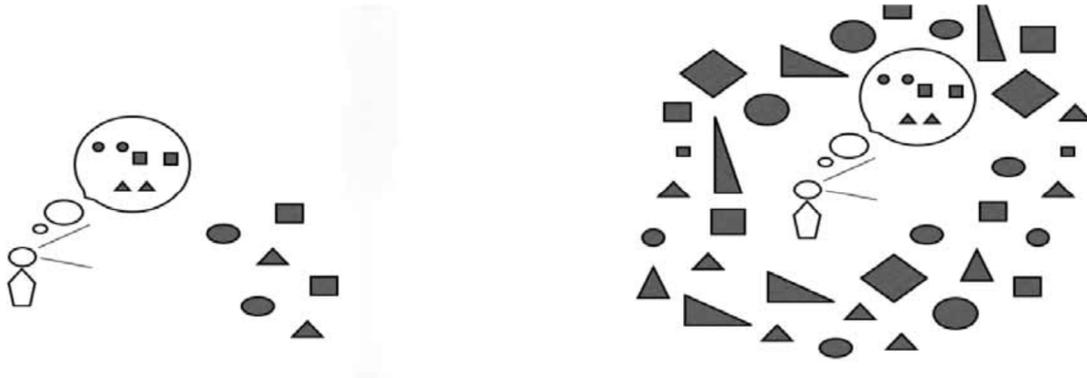


Figure 2: Lerner perspectives: the first outside the context and the second inside the context.

Source: Ackermann, E. (2001). Piaget’s constructivism, Papert’s constructionism: What’s the difference. *Future of learning group publication*, 5(3), 438.

Getting to the practice, how constructivist learning theory can be implemented in the best way? Scheer, Noweski and Meinel suggested three simple criteria to implement Design Thinking as a good method of constructionist learning, which are: involvement of students, experience space and balance of instruction and construction¹⁶. The third point is essential since in a higher education environment the subjects are in most cases specialists and require solid theoretical basis. For this reason, there must be an initial part of instruction in which the students can learn how to experience, in other words how to construct their knowledge.

¹⁴ In linguistics, the conduit metaphor is a dominant class of figurative expressions used when discussing communication itself (metalanguage). It operates whenever people speak or write as if they "insert" their mental contents (feelings, meanings, thoughts, concepts, etc.) into "containers" (words, phrases, sentences, etc.) whose contents are then "extracted" by listeners and readers. Thus, language is viewed as a "conduit" conveying mental content between people.

¹⁵ Ackermann, E. (2001). Piaget’s constructivism, Papert’s constructionism: What’s the difference. *Future of learning group publication*, 5(3), 438.

¹⁶ Scheer, A., Noweski, C., & Meinel, C. (2012). Transforming constructivist learning into action: Design thinking in education. *Design and Technology Education: An International Journal*, 17(3).

1.5 Design Thinking in business schools

The problem in current education is that there is no balancing between the two learning methods described in the previous section, especially in faculties in which the practical experience is an important requirement for the student who one day will be dealing with real business-like tools. To make an example nowadays business and management faculties cannot afford to have only theoretical courses. There is a need to better combine theory and real cases in which students can implement what they learned during traditional lectures.

There are several reasons why business schools must integrate Design Thinking in their courses, not only for the connection between theory and practice, which is only partially implemented with the obligatory internship. In fact, as stated by R. Glen: "In the existing system of business education compulsory internships in some way address the need of exposing students to the real-world business problems in an unstructured manner wherein they do get regular feedbacks on their approach to the problem. However, a 2 month internship program does not suffice or eliminate the need of more such opportunities to be created for students in order to direct them towards Design Thinking system"¹⁷.

In the last fifteen years, the Design Thinking approach has been widely adopted by managers in large multinationals, across different sectors, like Procter & Gamble, Google, LEGO, PepsiCo, GE, and many others. Since practice and theory are two faces of the same coin, they influence each other, in this way if the academic research makes a step ahead practitioners don't be still, but they will try to gain as much as possible from it. The same is for scholars and students as explained by R. Martin¹⁸: "What has implications for managers ultimately will affect business schools. As managers become more interested in design methods, business students will need to develop competency and business schools will, in turn, be expected to provide courses in these approaches"¹⁹.

In an interview of 2006 R. Martin enunciated some critiques directed to the education in MBAs and more in general in business schools. He stated that "business education has to be made more like design education". From his point of view this sentence can be explained mainly

¹⁷ Glen, R., Suci, C., & Baughn, C. (2014). The need for design thinking in business schools. *Academy of Management Learning & Education*, 13(4), 653-667.

¹⁸ He was the Dean of the Rotman School of Management at the University of Toronto from 1998 to 2013 and he has been recognized as one of the most important tinkers in the business field.

¹⁹ Dunne, D., & Martin, R. (2006). Design thinking and how it will change management education: An interview and discussion. *Academy of Management Learning & Education*, 5(4), 512-523.

with three points. Firstly, that MBAs must add abductive skills to the already existing deductive and inductive reasoning. For abductive skills²⁰ he meant that logical inference in which the premises, on the contrary of deductive reasoning, do not pledge the conclusions, in other words: “the logic of what might be”²¹. This is a meaningful definition, but in the design field the semantic area which occupies the concept of abduction is better explained by J. Kolko: “Abduction can be thought of as the argument to the best explanation. It is the hypothesis that makes the most sense given observed phenomenon or data and based on prior experience”²². In contrast to deductive and inductive reasoning the abduction originates new knowledge and this is fundamental in business and management especially when the aim is to create something new, like a business model, a strategy, a marketing campaign, and so on. Furthermore, abduction is an essential part of synthesis, which is the backbone of the Design Thinking process. In fact, according to C. Peirce and P. Johnson-Laird: “Abductive reasoning is related to insight and creative problem solving, and it is this creative problem solving that is at the heart of the design synthesis methods”^{23 24}.

The second reason why Martin stated that business education must be more like design education is that the improvement of collaborative skills in business higher education. Indeed, the abductive thinking will foster curiosity and listening capabilities, in contrast with what Martin described as the actual situation in traditional MBAs, in which collaboration was limited to find someone which is aligned to your own ideas and work with him. Everything without the curiosity to know different points of view, but it is undeniable that heterogeneity can bring to the development of innovative breakthrough ideas. At this point, an obvious question comes to mind: is it possible to train people to improve curiosity? The answer given by Martin is simple: “If business schools can help students have experiences that cause them to find other people useful, then I think they will be more open to learning the skills they need for this”. The last critique that he made concerns the absence of what it is previously called

²⁰ Abductive reasoning is a concept developed by the philosopher Charles Sander Pierce, who defended that no new idea could be produced by deduction or induction using past data. Abductive thinking is thinking in new and different perspectives and about future possibilities, which do not fit into existing models.

²¹ Martin R. (2011, June 11). The logic of what might be. Retrieved from www.futureready365.sla.org/06/12/the-logic-of-what-might-be/

²² Kolko, J. (2010). Abductive thinking and sensemaking: The drivers of design synthesis. *Design Issues*, 26(1), 15-28.

²³ Peirce, C. S. (1998). *The essential Peirce: selected philosophical writings* (Vol. 2). Indiana University Press.

²⁴ Johnson-Laird, P. N. (2005). The shape of problems. *The Shape of Reason: Essays in Honour of Paolo Legrenzi*, 3-26.

human-centred approach. In fact, he declared that design schools are more oriented to the study of user needs and user experience. Hence in this last case the skills that a good business school must impart to its students are observation and inquiry.

According to D. Dunne there are also two critiques that are made by academics and practitioners about the practices in management education²⁵:

- 1) The “Values” critique, exemplified by Ghoshal, Pfeffer and Fong, that management education does not foster in its graduates an appropriate set of ethical values. From Ghoshal: “By propagating ideologically inspired amoral theories, business schools have actively freed their students from any sense of moral responsibility.”
- 2) The “Relevance” critique, exemplified by Bennis and O’Toole, that business schools produce research that has little relevance to management practice and consequently teach students concepts with little such relevance: “Some of the research produced (by business schools) is excellent, but because so little of it is grounded in actual business practices, the focus of graduate business education has become increasingly circumscribed—and less and less relevant to practitioners”.

It is important to see how the implementation of Design Thinking in management education can fill these gaps. As regard the first point also Martin thought that MBAs prepare students to focus on only certain kind of stakeholders, but he added that designers tend to look at the global picture including all types of actors involved such as consumers, shareholders and society more in general. This because designers are creative in most of the cases and they are used to think “outside the box” in a systemic way. Systemic thinking is defined by R. Espejo as: “[...] an understanding of how the parts relate to each other and constitute larger wholes, that is, of self organizing processes”²⁶. Indeed, Martin added that: “designers would think about the system as a whole and thereby envisage the consequences of their actions”. In the second chapter, it will be analysed how the designers do this and with which kind of tools of Design Thinking. Proceeding to the second critique, Martin stated that the management research is reaching a point of diminishing returns caused by the reluctance of practitioners to adopt new models proposed from other people. However, with Design Thinking approach we will consider managers like designers, and as such they should be open to a plurality of

²⁵ Dunne, D., & Martin, R. (2006). Design thinking and how it will change management education: An interview and discussion. *Academy of Management Learning & Education*, 5(4), 512-523.

²⁶ Espejo, R. (1994). What is systemic thinking?. *System Dynamics Review*, 10(2-3), 199-212.

perspectives and ideas. Hence, this new open-minded vision of the modern manager will certainly give back strength to the research.

Design Thinking can be applied to a broad range of courses in business schools, both using tools that are typical of Design Thinking and employing innovative models which belong to the business field. To make an example, in the first case in entrepreneurship courses it is useful to prototype solutions in order to have feedbacks to avoid possible future errors. In the second case Design Thinking can be integrated with other models which can work together symbiotically and this is the example of Business Model Canvas. In management and business strategy courses, the combination of these two approaches inevitably bring to an improvement of both analytical and creative skills. Moreover, Design Thinking goes hand in glove with all courses of marketing for several reasons. The first of them is that in both disciplines the consumer's needs are firstly considered.

1.6 What Design Thinking really is and which are its elements

From its birth until today the term Design Thinking has passed through different definitions. Initially the research was focused on finding and studying the cognitive process of designers, that were perceived for the most part as architects, urban planners and engineers, as described in Peter Rowe's 1987 book "Design Thinking". Now the key point of the investigation is more related to how Design Thinking can be implemented effectively in the most disparate fields. Indeed, according to K. Tschimmel: "Today, Design Thinking is understood as a complex thinking process of conceiving new realities, expressing the introduction of design culture and its methods into fields such as business innovation"²⁷. Therefore, actual research is interested in particular to business area, and as explained in the previous paragraph, business and management academics are always affected by practitioners and vice versa. Then, the contribution of design in the business world must be studied from the two sides: education and practice, which become a whole in many cases.

Taking into account practice, in 2008 T. Brown²⁸ published the famous article "Design Thinking" and gave a definition that includes the three main pillars of Design Thinking, which are human-centered approach, technology and business: "[...] it is a discipline that uses the designer's sensibility and methods to match people's needs with what is technically feasible and what a viable business strategy can convert into customer value and market opportunity".

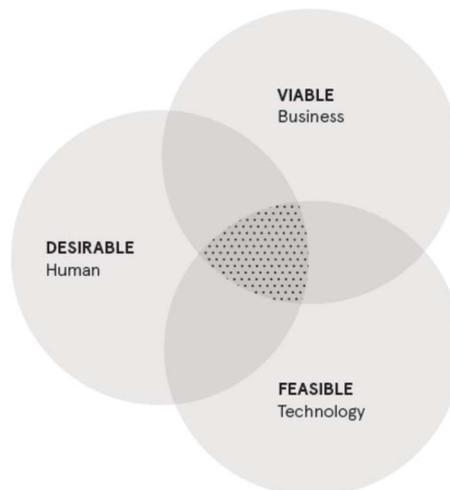


Figure 3: Intersection of the three areas of Design Thinking. Source: IDEO.org

²⁷ Tschimmel, K. (2012, January). Design Thinking as an effective Toolkit for Innovation. In ISPIM Conference Proceedings (p. 1). The International Society for Professional Innovation Management (ISPIM).

²⁸ Tim Brown is the CEO and president of IDEO, which is an international design and consulting firm founded in Palo Alto, California, in 1991.

The integration of these three parts allows the designer or any person involved in the process to assume opposite skills at the same time, such as analytical and empathic or emotional and rational. This type of double thinking is called “abductive thinking” as mentioned before²⁹. The three macro areas are treated in different moments during the process. For example, when a designer has to create a new concept, in the first phase he probably makes a research of which are the needs of the end user. This is the same in the marketing field, in NPD the basis from which the firm starts are the market researches and therefore target analysis.

However, Design Thinking process is not linear. Previously it has been described the creative process in a linear way, but in Design Thinking creativity is fragmented across the iter into several parts, they are not analogous. In fact, as affirmed by T. Brown and J. Wyatt: “Instead of process phases or stages, most of these models describe the Design Thinking process as a “system of overlapping spaces” and as an iterative process”³⁰. To understand better how the process is composed it will be analysed different models

²⁹ Tschimmel, K. (2012, January). Design Thinking as an effective Toolkit for Innovation. In ISPIM Conference Proceedings (p. 1). The International Society for Professional Innovation Management (ISPIM).

³⁰ Brown, T., & Wyatt, J. (2010). Design thinking for social innovation IDEO. Development Outreach, 12(1), 29-31.

1.6.1 The 3 I model by IDEO

The 3 I model (inspiration, ideation, implementation) was developed by IDEO during the early nineties when the company was working on social innovation projects. As mentioned above the process must be thought like a system of spaces rather than a linear order of sequences. For this reason, at first sight it might be perceived as chaotic and not effective. But following the methodology in an appropriate manner, people who are experiencing it can see in the early moments the results and the efficiency achieved. During the process there are alternately divergent and convergent phases, where the firsts consist in originating ranges of options and the latter are essentially the tightening of the ray of action, hence selecting the valuable options.

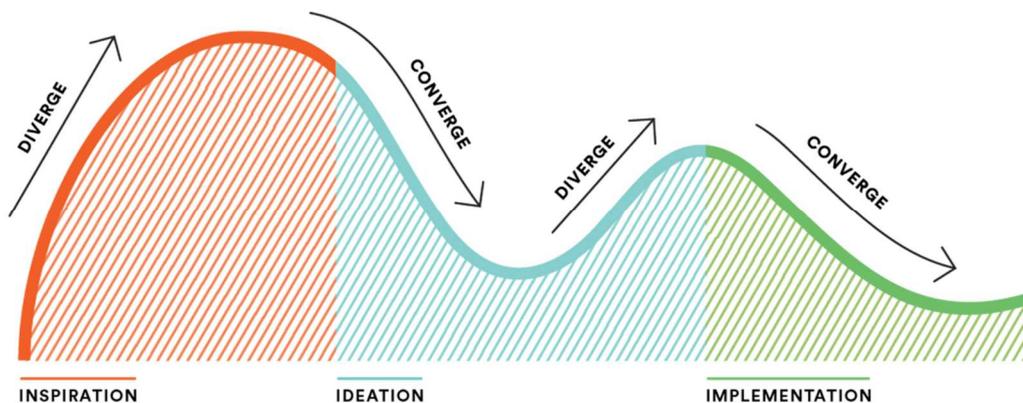


Figure 4: Divergent and convergent process along the three spaces.

Source: IDEO.org

The first space is inspiration, in which the designer makes a research, understand the thematic and the problem that he must solve, looking at the opportunities and at the recent and possible future changes. Then he observes what the target people do in everyday life, what they think, and what they want. From my point of view this kind of observation can be conceived similarly to the participant observation, that is one type of ethnographic research focused on a long permanence and participation of the researcher to the activities of the social group being studied. This methodology was made famous by B. Malinowski³¹ during the first half of twentieth century and it is used particularly in anthropology and ethnology but it can be also find in sociology and communication studies. There are different types of participant

³¹ (7 April 1884 – 16 May 1942) He was a polish anthropologist and he was well-known for his pioneering studies in the field of ethnographic research. He is considered the father of the modern ethnography, of which he modified the methods and the practical approaches.

observation according to the level of involvement of the researcher. Clearly B. Malinowski meant this observation as a complete participation, through this the researcher is completely immersed and integrated in the population being studied. Obviously in the Design Thinking process the designer cannot be part of the target groups as intended in ethnographic research, but he can look closely at the habits and behaviours to understand their needs.

According to B. Malinowski the aim of the anthropological research is:

“[...] to grasp the native's point of view, his relation to life, to realise his vision of his world. We have to study man, and we must study what concerns him most intimately, that is, the hold which life has on him. In each culture, the values are slightly different; people aspire after different aims, follow different impulses, yearn after a different form of happiness”³².

This statement is useful to understand why it was made a simile between the anthropologist and the designer. Both have to observe the studied subjects in order to understand their point of view and mentality in their own context, as underlined by K. Tschimmel in describing the role of the designer: “[...] observation of the behaviour of the target group in their daily living environment”³³. Moreover, like an anthropologist tries to understand different cultures, the designer attempts to grasp different target clusters of people, always trying to contain their ethnocentrism³⁴.

According to different levels of involvement of observation we can affirm that the more the researcher is in contact with the target studied, the greater is the ability to establish rapport, to immerse in the field and to gain fruitful information.

After having identified the context and gathered insights the space of ideation takes place. To generate ideas the working group, which is multidisciplinary summarise the insights and generates, develops and successively tests the ideas. The method used to do this is brainstorming and later it will be analysed how it is used and structured. During this moment are identified problems and opportunities, and to do this the designers are used to employ graphic representations, also to simplify complex concepts. In this space, most of the times the final solution comes up.

³² Malinowski, B. (2002). *Argonauts of the Western Pacific: An account of native enterprise and adventure in the archipelagoes of Melanesian New Guinea*. Routledge.

³³ Tschimmel, K. (2012, January). *Design Thinking as an effective Toolkit for Innovation*. In *ISPIM Conference Proceedings* (p. 1). The International Society for Professional Innovation Management (ISPIM).

³⁴ Ethnocentrism is judging another culture through the values and standards of one's own culture. it is considered a natural proclivity of human psychology in everyday life.

The third point of this model is implementation, in which the best ideas are implemented through prototyping. The solutions are tested and thanks to the feedbacks they can be improved. Rapid prototyping is essential to avoid possible future costs that derive from the market launch of a product that doesn't match the needs of consumers and it is not accepted by the market. The last part includes the marketing and communication plan, but this must be made only when the product or service has been created. As mentioned before the entire process is not linear, and for this reason: "Projects will loop back through these spaces – particularly the first two – more than once as ideas are refined and new direction taken"³⁵.

1.6.2 The second model by IDEO: HCD

Over the years the 3 I model has been used in various sectors and for this reason there was the need to rethink a model dedicated only for social field, in particular for NGOs which worked in the developing countries. The model is similar to the previous one in fact, it is based on three spaces which are: Hearing, creating and delivering. In this case the consumer participates to the design process and he is helped by activities such as building listening skills, running workshops, and implementing ideas. In 2015 IDEO.org³⁶ launched an updated version of the HCD Toolkit called "The Field Guide to Human-Centered Design" in which it is stressed the role of the end user in the problem solving: "[...] people who face those problems every day are the ones who hold the key to their answer"³⁷.

It differs from the previous model mainly because it provides a set of different activities and exercises to improve the "design skills" of the reader and to accomplish in the best way possible the design challenge. To make an example, in the guide are described some real cases in which are used different tools and activities, like behavioural mapping to create segmentations.

Comparing the two models of IDEO the HCD guide is more ample, complex and detailed. It explains step by step every passage of the process in which are described materials needed, average time per action and difficulty level. Even for activities that are simple and not so structured like for example brainstorming, as it is shown in figure 6.

³⁵ Brown T. (2008). Design Thinking, Harvard Business Review.

³⁶ It is a non-profit organization launched by IDEO in 2011 with the mission of improving lives of poor and vulnerable communities through design.

³⁷ IDEO. org. (2015). The Field Guide to Human-Centered Design.

STEPS

TIME

5 minutes for review before a Brainstorm

DIFFICULTY

Easy

WHAT YOU'LL NEED

Print out the Brainstorm Rules

PARTICIPANTS

Design team, any partners or people you're designing for who are relevant

- 01 | **Defer judgement.** You never know where a good idea is going to come from. The key is to make everyone feel like they can say the idea on their mind and allow others to build on it.
- 02 | **Encourage wild ideas.** Wild ideas can often give rise to creative leaps. When devising ideas that are wacky or out there, we tend to imagine what we want without the constraints of technology or materials.
- 03 | **Build on the ideas of others.** Being positive and building on the ideas of others take some skill. In conversation, we try to use "yes, and..." instead of "but."
- 04 | **Stay focused on the topic.** Try to keep the discussion on target, otherwise you may diverge beyond the scope of what you're trying to design for.
- 05 | **One conversation at a time.** Your team is far more likely to build on an idea and make a creative leap if everyone is paying full attention.
- 06 | **Be visual.** In Brainstorms we put our ideas on Post-its and then put them on a wall. Nothing gets an idea across faster than a sketch.
- 07 | **Go for quantity.** Aim for as many new ideas as possible. In a good session, up to 100 ideas are generated in 60 minutes. Crank the ideas out quickly and build on the best ones.

Figure 5. Guidelines to make a proper use of brainstorming.

Source IDEO.org.

1.6.3 Hasso-Plattner Institute model

Another Design Thinking model comes from the educational environment through a collaboration between two universities: design school of the Hasso-Plattner-Institute at University of Potsdam in Germany and Stanford University.

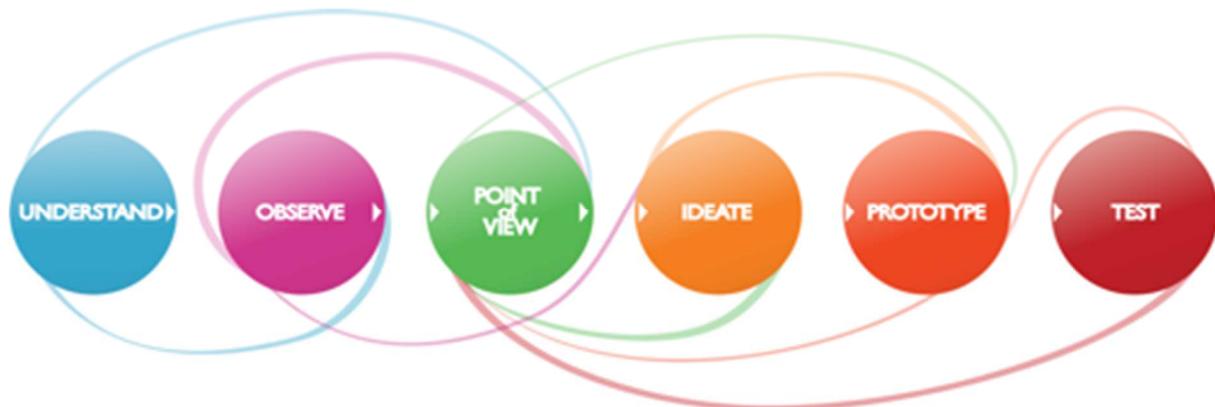


Figure 6: Hasso-Plattner Institute model. Source: hpi.de

The process is represented by six steps, which are connected by semi-circles to explain the iterative nature of the method.

Compared to the first two models the Hasso-Plattner model is more detailed. In fact, as depicted in figure 6 we can notice that the understanding and observing phases are the inspiration of the 3 I model or the Hearing of the HCD model. In the “understand” step the designer or anybody who is using the methodology starts to conduct research to create background knowledge to address the design challenge. Then he passes through the observation as explained previously and after there is the point of view phase in which the focus is to understand the needs of the people. To do so are used several tools, like for example the “how might we...” question that is useful to give a direction to the possible solutions.

At this point we can notice that also in this model can be observed the alternation between the divergent and convergent thinking. Throughout the “understand” and “observe” phase there is a prevalence of divergent thought, whereas during the “point of view” or definition stage the designer tries to assemble the information collected, hence there is a convergence. In ideation it is used brainstorming as a tool to leverage creativity and touch a wide range of subject matters and for this reason it can be considered a divergent step. To conclude, in prototyping and testing the process is clearly convergent since the ideas must be merged together into a final and concrete output.

1.6.4 Conclusions about the variety of models

There are several other models used to describe the process, like the 4 D Model (Discover, Define, Develop and Deliver), also known as the “Double Diamond” because it is graphically represented rhombus in order to clarify the divergence and convergence. It was developed by the Design Council through the study of eleven different companies, all market leaders in their sector and all with a special commitment in the use of Design Thinking to improve brand strength and NPD³⁸. Some of these firms are already famous in the world of design like the already-cited LEGO and Alessi, but some others are less connected to this field, like for instance Virgin Atlantic Airways and Starbucks.

³⁸ Council, D. (2007). Eleven lessons: Managing design in eleven global companies-desk research report. Design Council.

Another model is the Service Design Thinking and it is also made of four steps: Exploration, Creation, Reflection and Implementation³⁹. This, differently from the previous three it is not so detailed to be adopted by new users.

It has been seen different types of models and in conclusion it can be stated that there isn't a standard or universal model that can be adapted to the vast number of fields in which Design Thinking is recently been employed. For this reason, the method could not be defined in a precise way because it has to be evaluate first of all the sector in which we are operating. Moreover, there is a need to evaluate its efficiency and effectivity, because until the last years it has been presented only for its positive aspects, without a deep understanding of its downsides or its lack of efficiency in certain fields.

³⁹ Stickdorn, M., Schneider, J., Andrews, K., & Lawrence, A. (2011). This is service design thinking: Basics, tools, cases. Hoboken, NJ: Wiley.

1.7 When Design Thinking does not hold

After having clarified which is common agreement around Design Thinking and its processes it is interesting to examine different points of view about its implementation and cases in which the approach in question does not bring to an improvement.

Recently, Natasha Jen⁴⁰ in a 99u conference held in New York from 7th to 9th of June made some critics to Design Thinking⁴¹. She started observing the five steps model of Design Thinking, the one provided by the Stanford d.school.

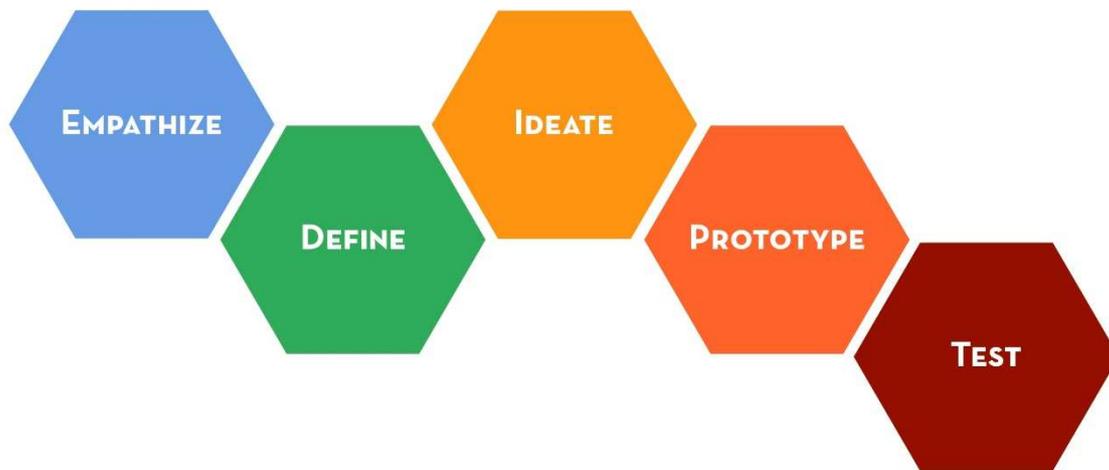


Figure 7: Design Thinking model by Stanford d.school.

Source: IDEO.org

She initially stated that the five steps go linearly, but as explained previously the process is not linear, it is iterative. We showed in figure 7 that Stanford d.school create another model in which there are curved lines that represent graphically the iterative nature. As regards the last model it is only a graphical representation of the process and it is implied that in every stage there is an assessment about the accuracy of the of progress.

Secondly, Jen affirmed that there is a lack of criticism, only because it doesn't appear on this specific model, and this is the main critique that she moved to Design Thinking. However, the critique component is present in every single step, and it is both the cause and the consequence of the iterative process. In fact, in every step if some information is lacking,

⁴⁰ Natasha Jen is an award-winning designer and educator, in 2014 she was acclaimed by Wired magazine as one of nine 'Designers Who Matter'.

⁴¹ Jen N., Talk at 99U's Conference. Retrieved from www.99u.com/videos/55967/natasha-jen-design-thinking-is-bullshit.

incomplete or wrong the designer or who is working with Design Thinking goes back to the previous or even to two or more spaces and restart the process. As affirmed by the designer Lee-Sean Huang: “There is space for critique and feedback throughout the entire Design Thinking process, even if it’s not written in a hexagon”⁴². He also claimed that in empathising with the users there is space to be open-minded to what people say but also very critic to set in an appropriate way the research and the interviews. In defining the problem, the designer must have a critical thinking about the understanding what the real problem is and how should be analysed. This dynamic is present also in the ideation phase, in fact after the brainstorming the team judge which are the most valuable ideas and which are useless. As regards the final two steps, they can be considered the embodiment of critique, since the prototype is made for this reason, that is feedback. Even the test is the concrete representation of critique, because here the feedbacks are given both internally from designers, and externally by the end users.

Another important point to consider is that Design Thinking has been contaminating more and more different fields, for this reason it must be analysed from the point of view of the area in which we are working. Therefore, we do not totally disagree with Jen when she provocatively stated: “Design Thinking is bullshit”, because there are some conditions in which it does not hold. As we affirmed above the more the method contaminates different fields the more it needs to be adapted and integrated, in better words the more the field of contamination is distant from the design epicentre the more Design Thinking must be linked to field-specific tools.

The second reason why Jen was right in her critics, is that this method to be effective must be implemented by experts, otherwise it will bring to poor results. Like in every subject matter a beginner does not have the experience and the skills to solve problems with a new approach, and this is another instance in which Design Thinking should not be employed. Lee-Sean Huang in his recent article⁴³ made a simile in which he referred to Design Thinking as a recipe, asserting: “Even if a Michelin-starred chef were to reveal their best recipes to us, we as amateur cooks would not have the capacity (skills, technique, craft, intuition, expertise) to be

⁴² Huang L. S. (2017, August 24). Yes, Design Thinking Is Bullshit...And We Should Promote It Anyway. Retrieved from <https://www.linkedin.com/pulse/yes-design-thinking-bullshitand-we-should-promote-anyway-huang>.

⁴³ Huang L. S. (2017, August 24). Yes, Design Thinking Is Bullshit...And We Should Promote It Anyway. Retrieved from <https://www.linkedin.com/pulse/yes-design-thinking-bullshitand-we-should-promote-anyway-huang>.

able to make the same quality of food". In this way Huang claimed that the results are in function of two variables, that are the method (recipe) and capacity, the last one is mainly intended as experience.

It has been usually referred to Design Thinking as a method, in other words according to the Oxford Dictionary: "A particular procedure for accomplishing or approaching something, especially a systematic or established one". Clearly the word method is not describing Design Thinking in the right way. It cannot be considered a standard procedure to accomplish something. As mentioned before the range of action of Design Thinking is very broad and in every field in which it is applied has different facets, hence it is a mixture of approaches rather than a standard method to follow to the letter. There are lots of critiques about its level of creativity and the way it is assessed, in fact another issue raised by Jen was: "Let's put cartoons on the wall. Do you really need Design Thinking to actually do that? Isn't it a little bit obvious?". She was referring to a Design Thinking project made by GE, in which the company created a MRI machine with funny graphics in order to not sedate the young patients which were scared by the machine. Even this critique is not valid because the efficiency and the effectiveness of Design Thinking cannot be assessed only through the level of creativity. There are several ways to evaluate its effectiveness, but according to H. Plattner: "The strongest measuring theme is customer feedback and satisfaction"⁴⁴, which in this particular case is equal to a 90% of patient satisfaction score⁴⁵.

To conclude it can be stated that there is a huge amount of practices called Design Thinking, which are used in a variety of fields, as a consequence it makes really difficult analysing if this approach is valid or not. In any case, it must be considered a good starting point in problem solving: "Design Thinking gives people the tools to think creatively, work collaboratively, and imagine and prototype potential future states"⁴⁶. Therefore, it can be affirmed that Design Thinking is a mindset which derives its tools from the design field, but can be adapted with the right level of expertise to almost every discipline and every sector.

⁴⁴ Plattner, H., Meinel, C., & Leifer, L. (Eds.). (2015). Design thinking research: making design thinking foundational. Springer.

⁴⁵ Kelley, T., & Kelley, D. (2013, October 18). Kids Were Terrified of Getting MRIs. Then One Man Figured Out a Better Way. Retrieved from http://www.slate.com/blogs/the_eye/2013/10/18/creative_confidence_a_new_book_from_ideo_s_tom_and_david_kelley.html.

⁴⁶ Huang L. S. (2017, August 24). Yes, Design Thinking Is Bullshit...And We Should Promote It Anyway. Retrieved from <https://www.linkedin.com/pulse/yes-design-thinking-bullshitand-we-should-promote-anyway-huang>.

2. The case study: Active Learning Lab

“There has been a dramatic change in our conception of learning. We have moved away from behaviourist notions of teachers as purveyors of knowledge and learners as passive receivers”⁴⁷.

2.1 The first experiments: Stanford and Potsdam

So far, it has been seen the possibilities and the positive points of a feasible introduction of Design Thinking in modern education. Now we will analyse more in detail real cases in which this kind of mindset is adapted to didactic purposes.

In 2005, the “Hasso-Plattner-Institute” of Design at Stanford University, also called d.school, started to provide courses in which the Design Thinking approach was taught to students. The German businessman H. Plattner founded this school in collaboration with D. Kelley⁴⁸, by giving a donation of 35 million dollars⁴⁹. Later, in 2007 he also founded the School of Design Thinking at the “Hasso-Plattner-Institute” in Potsdam, Germany. The latter, is more oriented towards IT systems engineering. In fact, in a recent interview he declared: “In Germany we have the best engineers but much too often our ideas and inventions vanish in drawers instead of being embedded into innovative business models. This is why it is my concern to prepare the next generation for this. I integrated the German version of the d.school directly into the HPI in Potsdam where IT engineers are educated. Because quality made in Germany is useless unless somebody is able to see it, right?”⁵⁰. The philosophy with which these two design schools were founded can be summarised in these sentences: “The d.school helps people develop their creative abilities. It’s a place, a community, and a mindset. We believe everyone has the potential to become an innovator. No matter what field or industry you’re in”.

According to what we said in the previous chapter about the multifaceted nature of Design Thinking, these schools educate different people coming from different disciplines like business, medicine, engineering, humanities and so forth. Collaboration is put first, less importance to individual achievements, the opposite of what was depicted by R. Martin in business schools and particularly in MBAs.

⁴⁷ Lewis, L. H., & Williams, C. J. (1994). Experiential learning: Past and present. *New directions for adult and continuing education*, 1994(62), 5-16.

⁴⁸ He is founder, chairman, and managing partner of the design firm IDEO and a professor at Stanford University.

⁴⁹ Nussbaum, B. (2005, October 03). SAP founder gives \$35 million for Stanford D-School. Retrieved from www.bloomberg.com/news/articles/2005-10-02/sap-founder-gives-35-million-for-stanford-d-school.

⁵⁰ Köppen E. (2016, August 18) Ten Years of Support for Design Thinking – An Interview with Hasso Plattner. Retrieved from <http://thisisdesignthinking.net/2015/08/ten-years-of-support-for-design-thinking-an-interview-with-hasso-plattner/>

There are various principles upon which these innovative design schools are based⁵¹:

- 1) Show don't tell: Communicate your vision in an impactful and meaningful way by creating experiences, using illustrative visuals, and telling good stories.
- 2) Focus on human values: Empathy for the people you are designing for and feedback from these users is fundamental to good design.
- 3) Craft clarity: Produce a coherent vision out of messy problems. Frame it in a way to inspire others and to fuel ideas.
- 4) Embrace experimentation: Prototyping is not simply a way to validate your idea; it is an integral part of your innovation process. We build to think and learn.
- 5) Be mindful of process: Know where you are in the design process, what methods to use in that stage, and what your goals are.
- 6) Bias toward action: Design thinking is a misnomer; it is more about doing that thinking. Bias toward doing and making over thinking and meeting.
- 7) Radical collaboration: Bring together innovators with varied backgrounds and viewpoints. Enable breakthrough insights and solutions to emerge from the diversity.

The objective of these schools is to prepare a generation of students to solve the complex challenges of today and tomorrow. These difficult tasks can be seen in two different ways, first of all they are about the increasingly specific and complicated problems which arise in every discipline, as human knowledge advances. Secondly, the challenges the designer or the people involved in the process of Design Thinking face are imbued with indeterminacy, that is the condition in which there are no specific and precise limits to design problems. This concept is very close to the idea of “wicked problems” developed in a first step by W. J. Rittel and later proposed by R. Buchanan, which defined them as a “Class of social system problems which are ill-formulated, where the information is confusing, where there are many clients and decision makers with conflicting values, and where the ramifications in the whole system are thoroughly confusing”⁵²⁵³.

The method used to train students in solving “wicked problems” is the so called “learning by doing”. The Design Thinking apprentices start learning on the field, where they develop

⁵¹ Plattner, H. (2010). Bootcamp bootleg. Design School Stanford, Palo Alto.

⁵² Rittel, H., & Webber, M. (1972). Dilemmas in a general theory of planning (Institute of Urban and Regional Development Working Paper No. 194). Berkeley, CA: University of California.

⁵³ Buchanan, R. (1992). Wicked problems in design thinking. *Design issues*, 8(2), 5-21.

empathy with the people for whom they must design (human-centred approach). Therefore, there is a high propensity to action, in other words an inclination towards experience. For this reason, the evaluation of the process must take into consideration the iteration of the process/experience, that is the number of possible cycles in a process. Hence, a good assessment of a Design Thinking employment must observe not only the final output but also the critical approach established by the team members.

The schools collaborate with companies, non-profit organisations and non-governmental organisations to develop the projects. It can be considered as a learning loop in which students work on real cases and companies get innovative ideas through an innovative approach that can also be used also in other projects.

To give a practical example, the School of Design Thinking at University of Potsdam provides a one-year program divided into two semesters: the “Basic Track” and the optional “Advanced Track”. The first allows students to understand the concepts of Design Thinking, furthermore this semester foresees the application of the methodology to real projects. In the “Advanced Track”, there is the opportunity to put into practice the knowledge and skills acquired previously adapting the Design Thinking to business, with partner companies in a 16-week project. There are 80 places in the Basic Track and 40 in the advanced one, in each two full days of attendance per week are expected. The courses are open to both students and professionals.

Another example of Design Thinking in higher education is given by the “Design Thinking Bootcamp” at Stanford University. It is a 4-day workshop that is not addressed to students but to executives and managers who are involved in strategic challenges in their companies. Also in this instance, the participants can attend both short lectures as well as work on real cases guided by teachers. The student/teacher ratio is very high, it is 1 to 5 and this allows to the didactic flow to be more fluid and dynamic. Thanks to this fast but intense workshop attendants can improve their skills such as: interview and observation techniques, better understanding the customer’s point of view and needs; “just-try-it mentality” thought rapid prototyping and iteration; to manage different opinions inside a heterogeneous team to extrapolate the best design concepts and finally to correctly implement Design Thinking in a company.



Figure 8: The beginning of a d.bootcamp at Stanford University.

Source: Srinivasan L. (2015). *d.school promotes Design Thinking on campus*. Retrieved from www.stanforddaily.com/2015/02/26/d-school-promotes-design-thinking-on-campus/.

To understand better in which industrial sector the Design Thinking will be mainly implemented, and in which business function it will gain more traction we must look at the past participants' profiles. With regards to the highest qualification level, in the first place with the 27% we find MBA followed by BS (19%) and BA (17%)⁵⁴. Having said this, it is important to underline that according to the business function fulfilled, in the first places there are General Management (29%), Marketing and Sales (15%) and Research and Development (9%). This is a clear indication that the Design Thinking mindset is particularly useful in the planning of business strategies and in the field of branding and communication. It is important to notice that despite the fact that Design Thinking comes from design and therefore from the creation of what H. Simon called the artificial world, the participants who work in the R&D function represent only 9%.

Furthermore, the industry most involved in the Design Thinking mindset is surprisingly Financial Services and Insurance (18%), followed by Telecommunications and Information

⁵⁴ Source: the official website of Stanford University, <https://www.gsb.stanford.edu/exec-ed/programs/design-thinking-bootcamp/participant-profile>.

Services (13%) and by Manufacturing and Consumer Products (9%). Education occupies only the sixth place (5%). One may think that Design Thinking is particularly related to industries which are permeated with creative processes but that is not always the case, in fact the Advertising and Marketing Services industry is one of the lowest ranking (2%). To conclude we affirm that the past participant profiles are not the right variable to evaluate how much Design Thinking is used in different sectors and business units and how much it is employed, but it is useful to understand in broad terms the direction that this mindset is going to take. It is difficult to demonstrate where Design thinking is mostly used for several reasons, the first of these is that this methodology is not a real method but a mindset, as explained in the first chapter. Hence, there are a huge amount of ways in which it could be implemented and a variety of tools with which it could be used. Therefore, these intrinsic characteristics make Design Thinking a malleable tool that works in a lot of disciplines and fields and this makes it difficult to continue to call it Design Thinking. Moreover, giving too much attention to this variable to evaluate the use of Design Thinking in firms is illusory and misleading because we are not sure that managers will implement this method once they have concluded the workshop.

It is given importance to this data because it represents the way that are taking managers and more in general companies, this because it is taken into account practitioners and not students with little or even no experience in the labour world.

2.2 The lab

The first edition of Active Learning Lab started in September 2016 at Ca' Foscari University of Venice. It represents one of the first examples in Italy of innovative teaching that uses Design Thinking approach as a tool for higher education. It is a multidisciplinary laboratory open to students of all master's degree programmes. In every edition 40 students were selected and these were divided into groups of approximately 5 people, depending on the number of companies that joined the programme. During the lab participants had the possibility to work very closely with companies in Veneto. The firms in question belong mostly to the SME category, but there were also large companies which decided to join this innovative laboratory. Hence, there is a big variety of firms in terms of size and sector in which they work. The lab was made possible thanks to the cooperation of different people, both internal and external to Ca' Foscari University. The professor responsible for the laboratory is V. Finotto⁵⁵ and Fondazione Università Ca' Foscari⁵⁶ runs the entire organisation and administration. The external actors, include Azzurro Digitale⁵⁷ and various partner companies, henceforth the innovators.

Every term was divided in two periods and every period was made up of six weeks. During the academic year 2016/2017 four laboratories were carried out with different themes:

- 1) From 19th September to 28th October 2016: Sustainability
- 2) From 9th November to 16th December: Agri-food
- 3) From 6th February to 17th March: Design Excellence and Made in Italy
- 4) From 19th June to 28th July: Urban Innovation

The various themes were decided according to the different problems and innovation challenges the partner companies were facing at that moment. To channel the activity of the students and to solve the right problems, the company together with the product designer of Azzurro Digitale D. Boschiggia defined what is called the design challenge. It is a document that contains the key information of the firm and what the students must solve and design. Clearly, this kind of guide should be written very accurately because if it is too broad the

⁵⁵ Researcher of the Department of Management at Ca' Foscari University of Venice. Role: Delegate of the Rector for Intellectual Property Policies, Entrepreneurship and Technology Transfer.

⁵⁶ It is the instrumental body of Ca' Foscari University. It promotes the interaction between the University and the city of Venice and the adjacent areas.

⁵⁷ It is a digital consultancy firm that unite the methodologies of strategic consultancy with the creativity of digital firms. It uses the Design Thinking approach to consulting and to create new products and services.

students may fail to reach the objective. On the other hand, if it is drawn up in a too specific manner the educational aim of the lab and the Design Thinking may be lost. Effectively, the role of the design challenge is strike a balance between the innovators' needs and the students' needs, that leads to a good educational experience.

Active Learning Lab can be seen as a virtuous cycle in which every participant involved contributes to reinforce the entire structure. The University provides its students with an innovative education which on one hand can improve the students' skills and learning experience and on the other hand the university gains in terms of reputation and prestige. The participants of the laboratory have the chance to put into practice what they have learnt in a "safe environment", they can make small mistakes without the fear of being fired. Students learn by doing in a trial and error process typical of the Design Thinking approach. On the other hand, innovators gain high quality solutions to their challenges and give students the opportunity to see how a structured company works in a fast-changing market.

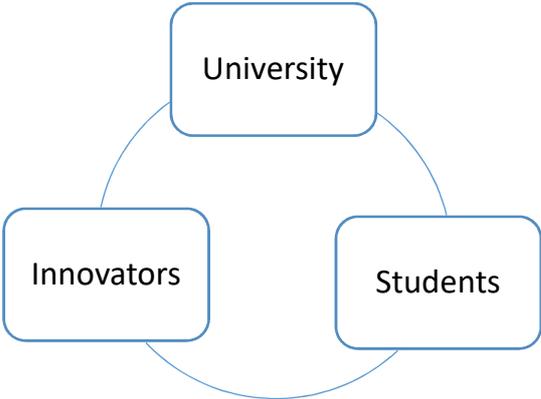


Figure 9: The virtuous cycle of Active Learning Lab.

2.3 Innovators and their design challenges

In the various periods there were a minimum of three to a maximum of four innovators. The design challenges were presented to the students at the end of the first week, precisely during the beginning of the hackathon which is called “Blue Wave”, it will be illustrated how the programme of the lab is structured in the next section. The students during the first week do not know the innovators and their challenges, this is because it may interfere with the educational process of Design Thinking. In the next paragraph it will be described the innovators which took part in the different editions of the lab in order to understand better the work carried out by the participants.

2.3.1 Sustainability

The laboratory started with a very current global issue, that of sustainability. In this edition innovators faced different aspects of sustainability: economic, social and environmental. As described previously, the companies are very heterogeneous, both in terms of size and in terms of sectors in which they are active.

One of the first firms that decided to join the programme was Favini. The company has been active in the field of paper manufacturing since 1736. Moreover, its business includes the “design and production of textures and finishing solutions for eco-leather for fashion, luxury, design, IT and technical sportswear sectors”⁵⁸. In this case the challenge set by the innovator was:

“How can we communicate our know-how in R&D to stakeholders in order to create new production opportunities, starting from the use of by-products originated by the food processing? Furthermore, we want to imagine new areas of application for the coffee silver skin (giving a second life to this biomass)”.

The second partner firm was the Stevanato Group, the world’s largest, privately owned designer and producer of glass packaging for the pharmaceutical industry. The firm has two different divisions: pharmaceutical and engineering. “From the outset, Stevanato has been self-sufficient in developing the necessary technology and machinery required to ensure the highest standards of quality and innovation throughout the production process”⁵⁹. This last

⁵⁸ Source: the official website of the company, www.favini.com

⁵⁹ Source: the official website of the company, www.stevanatogroup.com

statement shows just how important innovation is to this group. In this respect, openminded companies are more likely to join this kind of laboratories and programmes.

Stevanato Group represents a particular case because they asked to students to design something which was completely different from its core business:

“How can we publicise the planning process of a modern teaching space through an innovative communication project? The educational space has a high technology value and the teachers could experiment new educational methodologies by involving the territory in order to have a positive social impact on the community”.

Finally, the last company was Gruppo Argenta which is active in the sector of vending machines. It produces different types of machines for the different possible uses. In this case to the contrary of the Stevanato Group, the challenge was about its core business, in fact its mission claims: “Since our birth, in 1968, our objective has always been to transform a simple break in a special moment. For everyone, whenever and wherever”⁶⁰. It is congruent with its related design challenge which focussed on finding a solution to improve the relationship between the user and the vending machine with a sustainable approach and using the most innovative technologies. In this way the machine would become a valuable object with a positive social impact.

2.3.2 Agri-food

In the second edition of the Lab the central concept was the food and beverage market, the three firms wanted to innovate their products and services. Above all they wanted to change the meaning that their products represented to consumers.

La Donatella bases its business mainly on the production of frozen bakery products, but also on fresh pastries for local markets. It exports all over the world, particularly in Germany, France and North America. The principal challenges that the company was facing were the communication of the made in Italy brand and the communication of the quality of its products, this last point was crucial because consumers tend to associate frozen food to low quality. In this particular case it was the contrary because in fresh pastry different kinds of preservatives are used, e.g. alcohol, which lowers the quality. Whereas, in frozen pastry products the only preservative is the low temperature.

⁶⁰ Source: the official website of the company, www.ilgustocol sorriso.it

For these reasons the design challenge was:

“How will the dessert of the future be in term of form, packaging, communications and consumption?”

La Donatella is following its traditional handmade vocation and today it produces fresh and frozen patisserie bringing the quality and excellence of the Made in Italy global, thanks to the use of high quality and select ingredients.

Envisaging an evolution of the lifestyle of consumers, how can we innovate the communication of the frozen product in order to enhance its freshness and handmade genuineness, protecting the excellence of Made in Italy?

Moreover, how can we best meet the global market by creating new needs and renovating their segment, with a particular focus on the French and the American market?”.

The second firm of this edition was Agricola Lusìa, a young company specialised in the importation of citrus fruits from overseas. In 2016, the brand Goia was created with this objective: “To commercialise through the large distribution, fruit and vegetable products with a high nutritional and energetic value”⁶¹. In the specific case of Active Learning Lab, the company had a very challenging project, that is changing the eating habits of Italian people. The long-term objective was to create a valuable brand which is underpinned by principles like healthy food and a healthy lifestyle. For all these reasons the design challenge created was:

“How to convince Italian consumers to serve orange squeeze on the 15th August?”

Agricola Luisa, a young Venetian company specialized in the importation of citrus fruits from abroad, became one of the most important leaders in the fruit trade in recent years; they were awarded several certifications attesting the quality of products and services they offer.

Oranges are healthy and this is a fact! As it is also known that the major use of citrus fruits in Italy is focused/concentrated during winter. Starting from these considerations, how can we lead consumers to the freshly squeezed oranges of Gioia brand during the summer, by communicating the seasonality of their production area and the security of the imported product guaranteed by Agricola Luisa through their supply chain?

⁶¹ Source: the official website of the company, www.coloralavitadigioia.it

The brand Gioia is an ambitious project of Agricola Luisa, which is based on worthy values closely linked to the human need to have healthy foods. How can we, in this project, make consumers perceive Gioia's products as a contagious and healthy nutrition habit?

The last innovator was Coldiretti (National Confederation of Farmers) the leading organisation of farmers in Italy:

“Can the purchase of quality food of the territory become a multisensorial experience and a meeting-place, a point of reference, for the local communities?

Coldiretti, with one and a half million members, is the main organisation for agricultural entrepreneurs at national and European level. Our country is characterised by a large variety of agri-food products and our tradition brings us to think that there could be a dedicated space able to give value to each single product and transform the bill of sale into a sensorial well-rounded experience.

How can we create a new purchasing experience, through an innovative retail format, in order to give value to seasonal and km 0 products and also to the passion belonging to the farmers, in an urban regeneration context?

Food is a universal language. How can we made this project attractive also for foreign farmers with their own culture and products, to improve social integrations starting from food?”.

2.3.3 Design excellence and Made in Italy

In the winter period, all the companies that joined the programme had the same warhorse that was a high level of expertise in product design. As was the case with previous laboratories the participating companies came from the most disparate sectors, ranging from fashion to furniture.

Vista eyewear is a brand developed by the parent company Vista Eyewear. This firm is active in the sunglasses sector and have been producing frames for 30 years. The company found some challenges in convincing opticians to sell its brand, in fact the innovator asked:

“How we can break the traditional selling pattern of eyeglasses in the Italian market? The Vista Eyewear company produces high quality eyeglasses, in the Belluno eyewear area esteemed context, developing new technological solutions and innovative aesthetics every day.

Seven years ago, with enthusiasm and determination, Vista Eyewear presented on the market the brand “Mad in Italy”.

The “Mad in Italy” eyeglasses are a symbol of the creativity and the exclusive artisan quality of the company that wants to affirm itself in the panorama of the Italian market as a high-quality brand.

The “Mad in Italy” eyeglass is a coffer containing all the company values which must be depicted in the best way from a both technological and aesthetic point of view, in order to convince the optician to sell the product.

The traditional selling channels are no more able to optimally describe the value inside this coffer”.

The second innovator was Moroso, a producer of high end furniture products. Its business is based on the collaboration with famous international designers in order to increase the value of its products. The students of the laboratory were asked to find a communication strategy to deliver the message that the company is based on high design values and high-quality artisanship:

“Evolution is a constant of everything. Evolution is sometimes a leap into the void that makes you find out you have wings. Approaching the future with this spirit, gives you the power to see through the today's complex economic system and discover new trends and innovative sale scenarios.

Moroso represents the evolution of an Italian company built on the artisan-entrepreneur figure.

A company permeable to comparison, which from the idea of “do and do well” typical of the Italian mindset of the second afterwar, has known, with courage and determination, how to combine artisan know-how with industrial production processes, identifying a strong element of uniqueness in the meeting between design, contemporary art and fashion.

The uniqueness of the relationship between artisan, designer and a clear entrepreneurial vision is an added value to the product, which sometimes is not completely valued.

Our challenge will be to communicate this extraordinary triangulation in the very best way.

The communication world is becoming increasingly supported by technology and from decontextualization of its original purpose.

Vision, creativity, contamination and the message to be conveyed will be our key points to be able to sell the excellence of Moroso brand”.

The third innovator was Unifarco. This company is made of three different sub brands which are:

- 1) Farmacisti Preparatori: which produces food supplements, skin-care and personal hygiene products.
- 2) Unifarco Biomedical: specialised in the manufacture of skin care products for skin problems and diseases.
- 3) Dolomia: is the new brand developed in 2016 by the parent company with the objective of creating brand awareness around its products and to extend the products line to different fields, like haircare and perfume. Dolomia has benefited from the existing well-developed distribution network that includes more than 4.300 pharmacies. In particular, Dolomia products are sold in mainly in Italy, Germany and Austria, but the entire distribution network of Unifarco includes also Spain, France and Switzerland.

In recent years, the efforts of the company are clearly addressed to the development of this new brand, as a result challenge that the students faced was:

“How can a product tell the story behind a territory and outline its lifestyle? And how can this territory be depicted by a product?”

Unifarco is a union of pharmacists who have been sharing the same philosophy and values, the same professional deontology and attention to people's welfare and respect for more than thirty years. The Dolomites, inserted by Unesco in the heritage of humanity, act as a frame for the company. Dolomia brand captures the beauty and the huge beneficial effects of the Dolomites and brings it to the consumers through its cosmetics products.

To achieve new consumers, Dolomia cosmetics line must be tried; the beneficial effects of the Dolomitic experience, given by the raw materials characterized by high quality active ingredients grown in a journey of environmental and social sustainability, has to be experienced first hand.

The challenge we have to face is to induce new consumers to try Dolomia products and retain old customers, through new and technologic ways to communicate, paying attention to the digital world, and making the Dolomia brand emerging in the pharmacy market.

This challenge must be faced by respecting the image of the product whilst conveying the values of the Dolomia cosmetics line”.

Fourth innovator participated in this round, Kallistè. A company active in the footwear industry and specialised in the design and production of luxury ladies' shoes. The company was born in Piacenza 50 years ago, but after a short time moved to the shoe district of Brenta. In 2014 the company was acquired by IHM (Italian Holding Moda) which provides competencies and managerial practices to the different business units of Kallistè. According to the digitalisation trend that is affecting the relationship between brand and consumers Kallistè asked to Active Learning Lab:

“The rarity of an object determines its value and the value translates into luxury.

In a highly industrialized society, the luxury product is involved in mass-production, even if it is characterized by superior artisan quality.

Kallistè is a company and a shoe brand which was born in those artisan laboratories scattered between the aristocratic villas along the Brenta Riviera and the venetian streets, where the leading high fashion brands come to design and produce their creations.

The exclusivity that comes from a luxury product is lost when the product itself is not unique. Therefore, the way to approach the customer must be new and unique to sell them the product of the future.

Shaping new ways of interaction with our creations and the innovative relationship with the brand, will be the starting point to design new and alternative sale channels and touchpoints with the customer of the future”.

2.3.4 Urban innovation

The summer edition of the laboratory was unique. Firstly, because of the subject at hand which was a social one and for this reason the innovators involved in programme were cooperatives and social enterprises, with different objectives compared to the previous innovators. Secondly, 8 political refugees participated, one for each group.

Moreover, the facility where Active Learning Lab – Urban Innovation took place was the Ca' Foscari Campus of Treviso, and this gave the opportunity to students to use classrooms during the entire period of the laboratory. It was very useful because Design Thinking is characterised by a graphic and visual approach, so the teams could hang the materials produced during the various phases of the project directly on the walls. Also In this period of the lab the innovators were four.

Arianna led is a company specialised in the design and manufacture of LED lighting systems. It is a young firm founded in 2009 and it is now majority owned by Carel, an Italian multinational company specialised in electronics for air conditioning and refrigeration systems. The main sector is public lighting and fittings produced to illuminate roads, cycle paths, parks and tunnels, but also manufacturing facilities, supermarkets, warehouses and sports fields. The company was interested in finding a way to make people interact with the public lighting and with the city council:

“The light of the sun scans our time and influences our health. We have so much need of light that we look for new solutions to have it always with us.

Arianna Led deals with energetic retraining projects with several municipalities, starting from the renovation of public-lighting installations. Arianna Led, with the use of led-technology products, is committed to make cities smarter thanks to a patented technology which saves on energy consumption, reduces pollution and improves the quality of life of citizens.

Illuminating public spaces has always been a need. It has been 200 years since the first experimentation of public illumination in Paris. From 1811 the technological evolution has brought us new ways to illuminate. Today the public illumination, besides the functional aspect, has not only social implications, but also health and environmental ones.

Illumination can influence the quality of a space and stimulate an active participation of citizens, also by choosing urban furnishings.

How can we connect citizens with public illumination, starting from the street lamp, so that the private citizen can feel an active part of his/her territory and the public administration can collect information and improve the services offered?”

Another innovator was Gruppo Terraglio, a social enterprise founded in 1982 which gives people with disabilities the opportunity to play sports supported by qualified personnel. The group is made up of three different entities:

- 1) Polisportiva Terraglio asd: was created with the objective of linking sport-agonistic practice, medical-functional recovery and psycho-physical disability.
- 2) Stile Libero srl: successively founded in 2004 in Preganziol (TV). It is a sports centre dedicated to people with disabilities and their families.
- 3) FisioSport Terraglio srl: was founded in 2004 in Mestre (VE), and it is a facility completely dedicated to medical-functional recovery.

The social enterprise in this case asked students to reason about concepts like generative welfare and integration:

“Life from water, the good from sport. In the 30 years since its birth, Gruppo Terraglio has never failed to these two inspiring principles. The historical headquarters of Polisportiva Terraglio A.S.D. in Mestre was inaugurated in 1985, and has become, over the years, an important centre for citizens, with sport acting as a strong bridge between two worlds which appear to be very distant from each other, the sport-agonistic practice on one side, and the medical-functional recovery and psycho-physical disability on the other side.

How can we structure an awareness-raising campaign to promote the health and well-being in order to develop better living conditions? The message to convey must be driven by the concept of a generative welfare in order to certify new practices which may have, if recognized, a positive influence on the national healthcare system. We start from the ground up. The receivers of the message are the families that can take advantage of the care and professionalism of facilities like Terraglio group, to better face the incidence of neurological development disorder of their children”.

The second challenge which concerns social issues was given by two cooperatives, Solidarietà and Topinambur, which are described in the design challenge below:

“The cooperative Solidarietà was born in 1982 with the union of families whose project was to create a responsible and social community where difference is not a limitation but an advantage. Let’s make the social value of disability arise! Solidarietà also manages some daily laboratories for disabled guests in which different activities are carried out: ceramics, hosiery, sewn, painting, typography, phototype-setting. Moreover, it is committed to the divulgation of its values, which are cooperation, volunteering, family and social net.

The agricultural social cooperative Topinambur was born in 2010 in Treviso for a specific reason: the need to start in an urban reality a clean and respectful productive activity, for both workers and environment, finalised to the production of vegetables without the use of harmful substances, which means organic agriculture. How can we organize and prepare in a functional way the space we have (around 90 msq) to develop the sale of biological agri-food products of Topinambur integrating the offline sale activity with the e-commerce?

The planning must include also the creation of a social enterprise model that can bring economic sustainability through the implementation of events able to make the location become a place of social aggregation, which gives value to the people working in it.

Finally, the planning should be combined with the creation of a brand able to communicate the social value of disability and, meantime, the quality of the biological agriculture with tools of sale and communication realized from Solidarietà's laboratories".

The last innovator was Urban Center Treviso, which is an entity created by the city council of Treviso. As stated in the design challenge the main objective is to promote the participation of citizens in urban policies:

"Generally, Urban Centres are places of cultural promotion where it is possible to identify past, present and future urban transformations of the territory. The Urban Centre in Treviso is a place of information and a meeting point, a tool for an active communication and promotion of the territory.

UCT's goal is to inform about urban transformations, promote and communicate its politics and organise forms of participation and involvement. UCT wants to be an observatory of the municipal territory dynamics, for a better management of urban politics, thanks to the exchange of information between citizenship and public administration.

How can we structure UCT's activities in a triennial development perspective?

In relation to the chosen place as possible headquarters of UCT, it is very important to define a strategy for the activities management, which, in an advanced stage of the project, will be fundamental for the UCT's economical sustainability; can the start-up or spin-off model be sustainable to reach the goal?".

The municipality of Treviso together with Treviso Smart Community, with which Ca' Foscari University collaborates, wishes to involve its citizens through paths of participation and listening. Asking what is the evolution of the tools which make the participation of citizen active and effective is compulsory in this planning context."

All the challenges identified above are the definitive request presented to students during the Monday of the second week, after the "blue wave". In fact, the challenges which the participants solved during the hackathon were only a small part of the definitive design challenge resolved during the remaining five weeks. It is shown how different business and social topics are treated. The students had the chance to work on very different subjects which touched diverse business areas, from marketing and communication e.g. "La Donatella project" in the agri-food edition to R&D in "Favini project". Moreover, social challenges were also addressed regarding very different stakeholders like cooperatives, institutions, municipalities and associations.

2.4 Participants and interdisciplinary groups

As previously illustrated, throughout the laboratories different subjects were tackled and this, in combination with the flexibility of Design Thinking applied to the most disparate sectors allowed the Active Learning Lab to be adaptable to every kind of degree programmes. Furthermore, an intrinsic characteristic of Design Thinking is to make use of what are called interdisciplinary teams. For these reasons the lab is open to students of every master's degree at Ca' Foscari University.

In the various editions the participants came from very different academic paths, ranging from humanities to scientific disciplines. In the last two editions more than half of the participants attended master degree courses in management or economics, precisely 54% and most of them studied Marketing (22%). The rest of the students came from very different courses: Cultural Anthropology, Computer Science, Governance of Public Organizations, Editorial Interpreting and Translation, Language and Management to China, Work, Social Citizenship and Interculturality, Languages, Economics and Institutions of Asia and North Africa, Environmental Sciences, Language Sciences, History of Arts and Conservation of Artistic Heritage and Intercultural Development of Tourism Systems.

The participation of students with such a diverse academic background allows to create heterogeneous teams. The facilitators⁶² during the first week observe students and create groups. Several criteria with different weight are used to make groups as heterogeneous as possible. Obviously, the first parameter used is the academic background, followed by gender and age. Moreover, other important parameters are used like the fact that two or more people already know each other and the role played by a person inside a group, e.g. leader, moderator, coordinator and follower. Teams must be equally balanced in order avoid tensions which can damage the designing process. The groups are made of 5 or 6 components, it depends on the total number of participants and the number of innovators.

It has proved that heterogeneity and interdisciplinarity have positive effects on working groups, especially in the long term. In fact, the different academic backgrounds and divergence of points of view played a negative role in building cohesion inside the group.

⁶² Are students who already participated to one edition of Active Learning Lab. They have the role of supervisor and help the students in the different phases of the lab. Every facilitator manages two groups, which have the same design challenge.

2.5 How the lab is structured

The results of the interviews show that the participants of the laboratory in most cases have never employed the Design Thinking approach before. Only a few students attended courses in which this method was used, more precisely only students coming from “International Management” and “Innovation and Marketing”. Other participants declared that they used a similar method but it was not precisely Design Thinking, for example a student coming from the Fashion Design master’s degree of IUAV: “Yes, I used Design Thinking but without knowing its name, I have always designed with the phases of research, ideation, moodboard and so on, the path that I follow is the same”. Hence, an initial phase of the lab where all the students can learn the tools of design and the process they will pass through the weeks is needed.

In the first week the product designer D. Boschiggia teaches the method and explains the different steps. The following five weeks are dedicated to the five steps of Design Thinking, according to the model created by IDEO, as it is shown in figure 11.

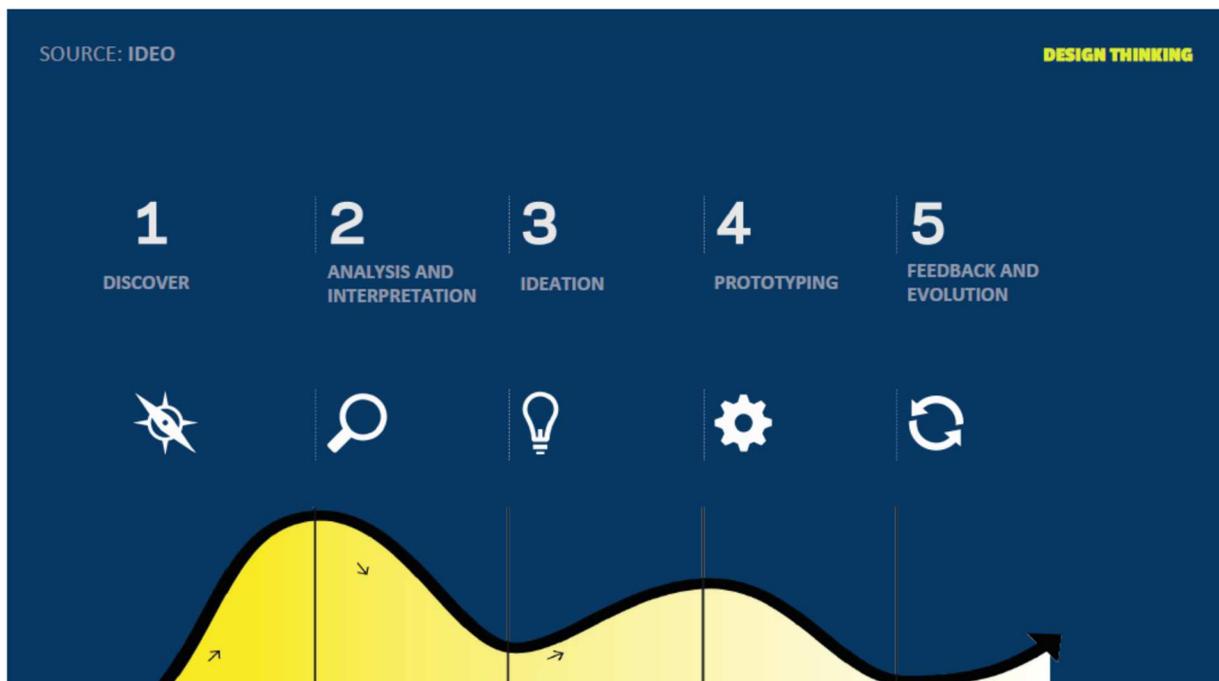


Figure 10: Design Thinking process of the Active Learning Lab

Source: Active Learning Lab materials

A detailed description of the programme is shown in appendix 1.

During the first week the students learn the central concepts of Design Thinking and the tools which they will use in the following weeks. Furthermore, an entire day is dedicated to the Business Model Canvas tool, which is very useful to channel ideas and give a structure to them.

In the first weekend, participants experience the full process of Design Thinking in a hackathon of 27 hours called “Blue Wave” created by Azzurro Digitale specifically to Active Learning Lab. During this design marathon the Design Thinking phases alternate to small challenges where the best team can win an award, given by the innovators. An example is given by the robot race, where the different groups must program a small robot. The object of the game is to knock down the pins as soon as possible and in a limited area. There are different strategies to program the robot, for example it can change direction when it touches something, so in this case when it touches the pins, or it can respond to the variation of light.

Throughout the weekend students work on a design challenge which is only a small part in comparison to the definitive challenge, in fact the last one is presented to students on Monday of the second week, when they really start the five-weeks planning. At the end of the “Blue Wave”, teams present their outputs to their innovator, who at the end of presentations gives some tips for the consecutive planning session.

The “Blue Wave” is very useful to let participants get to know each other and it serves also to create cohesion inside the team, which is very important in the designing process, as demonstrated by the interviews: “[...] during Blue Wave we (team) developed a good understanding and a good feeling”.

All the successive five weeks are made of two meetings per week, in the first on Monday, the students are presented with the tools which they must use during that week and in the second on Friday, where the teams present the weekly output to the designer responsible for the project, and have to possibility to meet their innovator. In the last hour of Friday an expert is invited to discuss topics which are relevant to the subject at hand.

Starting from the research phase, groups have to explore the field in which they are designing and examine the information relative to their company. To do this, three kinds of tools are used:

- 1) Research cards: frames in which the students put the different information found. About the company, the designing subject, and the technology which can be used.
- 2) Timeline: contains information and events about the firm in chronological order. It shows the information visually and it must be easily accessible.
- 3) Interviews objectives: the research phase triggers some questions, about the firm, the sector in which it is active, the consumers, the trends and the stakeholders involved. For

this reason, students prepare some points which will be investigated during the following week.

The second phase of Design Thinking is analysis and interpretation, where students after having clarified the objectives of the investigation write the questionnaires for the interviews. When the data has been collected the teams create the interview cards, which are graphical representations of each interview. In these frames the biographical data of interviewees is displayed and all information collected is sorted into three clusters, which are: needs, criticalities and ideas. As is illustrated in the following figure.

Interview card



Figure 11: example of an interview card used in the laboratory.

Source: Active Learning Lab materials.

This type of visual representation is useful because it helps the students to have a clear idea of the people they are designing for. In other words, interview cards are necessary to identify the personas, which is a different concept than target. Personas are archetypes of users created to represent the different needs and different usage of products and services, whereas the notion of target refers to a broader set of people, in which people with different needs are included. According to D. Boschiglia: "Through personas we can give a human face to a range of data, which otherwise would remain abstract, this stimulates empathy which allows to find adequate planning solutions". The number of personas created varies according to the number of user typologies identified.

The elements which formed personas are: photo, name, slogan (which derives from the statements of people during interviews), backstory (who is, his/her background, his/her interests), education, objectives and weaknesses. An example of personas is depicted in appendix 2.

Moreover, personas are very useful to enter in the ideation phase. They represent a planning tool which is used to put questions to which students answer during the ideation.

Another tool used in this stage is storyboard, which is a sequential representation of the activities which the personas make when he/she is using the product or the service. This tool is useful to explore and define the ways in which the idea under consideration must work to guarantee the user a good experience.

The central tool used in the ideation phase is brainstorming, with which students can release their creativity. Participants must find some words which are central to their design challenge and then for each word they must write every idea which comes into their mind. There are different ways to do brainstorming, in Active Learning Lab students do not follow a precise method, they have only a list of guidelines to do it in the best way. Some of these suggestions are:

- 1) Avoid corrections.
- 2) Keep always a post-it and a pen to not interrupt the flow of ideas.
- 3) Organise the session setting a time limit.
- 4) Who manage the brainstorming must stimulate the process.

An example of a brainstorming session is depicted in appendix 3.

When the brainstorming session is concluded, all the post-its previously made are put into clusters and these clusters will create the mind map with the “planning ways” which must be chosen to their possible implementation.

Another important tool used in this phase is the mood-board, which is a collection of images which put together in a collage, inspire the design process and gives the idea of the guidelines of the project. Mood-boards are usually employed during the brainstorming process to inspire the ideas flow.

The fourth phase is prototyping. Students, after having decided which idea to implement, start to think how they can prototype it. In the last few years thanks to the 3D printers rapid

prototyping is affordable to anyone. The Active Learning Lab in collaboration with the DEL Fablab⁶³ allows students to give a structure to their idea and present it to the innovators. At the end of the presentation students have feedback from the companies and they think about what could work and what could not. In most cases there was a good feedback from the innovators, in fact in some cases they decided to hire the students in their company, but this will be seen in the next chapter.

⁶³ The DEL FabLab is the makerspace of University Ca' Foscari of Venice, it is a space in which are concretely experimented new design processes and digital fabrication. Moreover, it is made research on technologies and production models that characterise the evolution of contemporary products and services. It is a place where future scenarios of "advanced manufacturing" are examined, moreover it is a centre where it is studied the technologic innovation and its impact on both production n and managerial practices.

3. When Design Thinking works and when it does not

As highlighted several times, Design Thinking garnered interest within the academic environment over the last years. In addition to the proliferation of academic literature on the subject, numerous Design Thinking courses have been initiated in many of the world's most prestigious Universities. In this section, key points highlighting the effects of Design Thinking within an educational program will be analysed, along with its positive effects when it is employed with other tools. Moreover, certain peculiarities of the Active Learning Lab and how it can unify the needs of the job market and the needs of the students will be examined.

3.1 Data collection and analysis

As affirmed previously, the implementation of Design Thinking in a structured laboratory was one of the first experiments for Ca' Foscari University. Hence, the most effective method to study the didactic process was a participant observation of the activities and interactions between the students. The information was collected over the last two editions of the lab, from February to March and from June to July. Additional interviews were made during the months of August and September. A diary was employed in order to take notes of every event, interaction and reaction which concerned the students.

Firstly, the field-notes were written by observing the four teams, in the role of facilitator. This allowed the facilitator, in a sense, to become a member of the groups. Secondly, supplementary notes were taken, however in this case "participant observation" was not as great as the other groups of the laboratory. In the first example, the level of involvement in group observation while assuming the role of facilitator, was very high. Taking into account the simile made in the first chapter which depicted the designer as an anthropologist, it could be said that the type of "participant observation" was "active participation", i.e. when the researcher becomes a member of the group to fully understand its activities and practices⁶⁴⁶⁵. However, in the second case the participation was "passive", which occurs when: "The researcher observes the scene under study, maintaining a certain distance from it and never intervening. Indeed, the role of the researcher is often the role of a passive witness or a bystander"⁶⁶.

⁶⁴ Malinowski, B. (2002). *Argonauts of the Western Pacific: An account of native enterprise and adventure in the archipelagoes of Melanesian New Guinea*. Routledge.

⁶⁵ Bernard, H. R., & Ryan, G. W. (1998). Text analysis: Qualitative and quantitative methods. In H. R. Bernard, *Handbook of methods in cultural anthropology* (pp. 595-646). Walnut Creek.

⁶⁶ Sekaran, U., & Bougie, R. (2016). *Research methods for business: A skill building approach*. John Wiley & Sons.

All this, allowed not only to have a clear global picture of the Active Learning Lab and the ability to focus the attention on criticalities along the path, but also to discover the positive aspects of entire process. The diary was kept for both laboratories and was particularly useful to draw up the semi-structured interviews made in the summer edition of the lab. Another important tool used were the weekly outputs delivered by every team, which represented the summary of the student's daily work which was a useful indicator of the criticalities that arose during the various stages.

In qualitative data analysis there is a risk of interpreting the results in a personal way. For this reason, the examination followed a rigorous approach which allowed the data to be analysed objectively. The method permitted research without any influence of constructs, which are: "abstract theoretical formulations about phenomena of interest"⁶⁷.

This approach, formulated by D. Gioia, is based on these principles: "We do not presume to impose prior constructs or theories on the informants as some sort of preferred a priori explanation for understanding or explaining their experience. This means that we make extraordinary efforts to give voice to the informants in the early stages of data gathering and analysis and also to represent their voices prominently in the reporting of the research, which creates rich opportunities for discovery of new concepts rather than affirmation of existing concepts"⁶⁸.

The analysis takes into consideration both the information acquired by the interviewees and the information grounded in theory, which enables the ability to understand the informant's answers. In this case the firsts are called "evidences" and the latter "codes". The information obtained was clustered, where all the answers of the interviews were analysed simultaneously. Information from different answers was gathered together if they shared the same meanings. Furthermore, different clusters that form evidence were linked to different codes, as illustrated in the following page.

⁶⁷ Gioia, D. A., Corley, K. G., & Hamilton, A. L. (2013). Seeking qualitative rigor in inductive research: Notes on the Gioia methodology. *Organizational Research Methods*, 16(1), 15-31.

⁶⁸ Gioia, D. A., Corley, K. G., & Hamilton, A. L. (2013). Seeking qualitative rigor in inductive research: Notes on the Gioia methodology. *Organizational Research Methods*, 16(1), 15-31.

Evidence	Code
<ul style="list-style-type: none"> • Confusion about what to analyse in SBMC during the entire Design Thinking process. • Inconsistency between the path of Design Thinking and the path of SBMC. • Lack of support from an expert of SBMC. • Lack of theoretical basis to use SBMC. 	<p>Juxtaposition of SBMC and Design Thinking (Downsides)</p>
<ul style="list-style-type: none"> • Useful tool to channel and organise ideas. • Narrows the field of action. • Helps to understand the actual situation of the company. • Useful to understand costs and feasibility of the project. • Filters the creative process. 	<p>Juxtaposition of SBMC and Design Thinking (Upsides)</p>
<ul style="list-style-type: none"> • Initial difficulties in terms of communication caused by different points of views and different academic backgrounds. • Constant learning from different people. • Different backgrounds inside a team fill the knowledge gap, “If you stay with different people, you will have more innovative ideas”. 	<p>Multidisciplinary teams and interdisciplinary thinking</p>
<ul style="list-style-type: none"> • Acquisition of transversal/horizontal skills. • Learned capability of thinking at possible future problems that are not directly predictable. 	<p>Skills developed</p>
<ul style="list-style-type: none"> • The students have the feeling to have developed different competencies that go beyond their field of studies, and that will help them in the future in the labour market. • Planning in an unknown field or discipline. • Advantages of a practical educational tool. “When I apply in a practical manner what I have previously learned I memorise it more easily”. • Close contact with the business world. “There is the possibility to see the firm we are designing for”. 	<p>Learning by doing</p>

3.2 Design Thinking and Social Business Model Canvas

The fourth edition of the lab was dedicated to social innovation. For this reason, it was deemed necessary to perform an experiment introducing a new tool to use in conjunction to Design Thinking. This tool was the Social Business Model Canvas (SBMC). There are several versions of this tool, however one of the most accurate to identify and understand the social impact of an enterprise is the one developed by N. Cabria of Human Foundation⁶⁹. This model is an adaptation of the classic Business Model Canvas (BMC) developed by Osterwalder A. and Pigneur Y. to social enterprises⁷⁰.

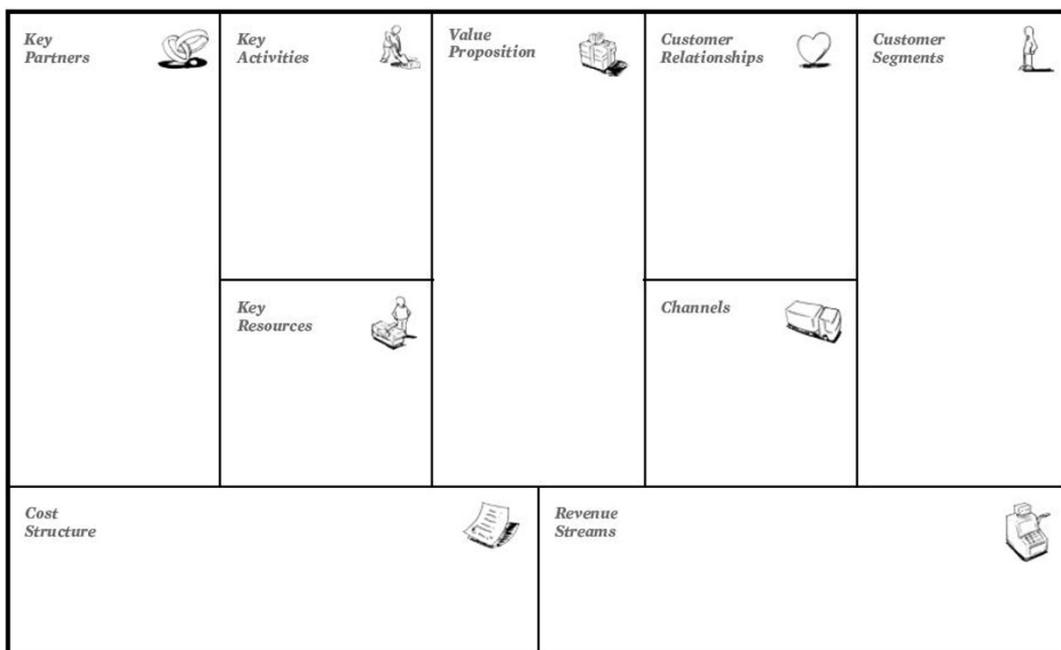


Figure 12: The Business Model Canvas

Source: Osterwalder, A., & Pigneur, Y. (2010). *Business model generation: a handbook for visionaries, game changers, and challengers*. John Wiley & Sons.

The main goal of the Social Business Model Canvas is to clarify the tensions and opportunities between the two main sets of a social enterprise’s objectives, these being positive social impact and viable business. In order to accomplish this, the SBMC includes a re-examined and simplified version of the Theory of Change (ToC) model that includes the social value proposition where the final outcomes and the indicators are found. The outcomes are short,

⁶⁹ It is a non-profit organization that promotes collaboration between business, government, social enterprises, foundations, institutional investors, economic operators and finance world to generate and implement innovative solutions for social problems.

⁷⁰ Osterwalder, A., & Pigneur, Y. (2010). *Business model generation: a handbook for visionaries, game changers, and challengers*. John Wiley & Sons.

medium and long-term changes achieved through the implementation of an organised set of activities, and they should not be confused with outputs, which on the other hand are direct, tangible and measurable products reached through specific activities. The indicators are useful data employed to monitor the entire progress on the social value proposition. As we can see in figure 11, in the right columns of the “SBMC” every outcome has an indicator.

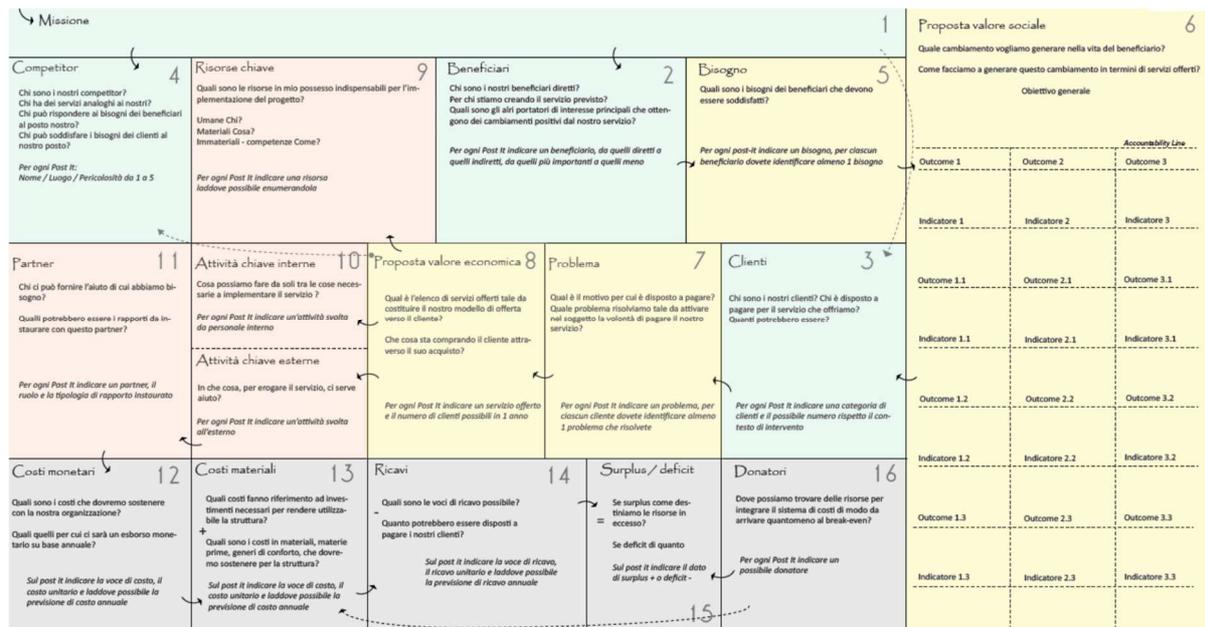


Figure 13: Social Business Model Canvas

Source: Active Learning Lab materials

Clearly, the ToC original models are more complex than this, they allow the description of a sequence of events to generate the desired change, to map the connections between changes, activities, results and resources and to manage the process in a conscious and critical manner. However, the ToC included in the SBMC permits clarification of the target needs that must be satisfied.

3.2.1 An example of implementation of Design Thinking and BMC: bio-briquette industry as a spin-off of ramie fibre industry

Examining the literature, there is no substantial research on the Design Thinking approach implemented with BMC and SBMC. Moreover, there are no reliable documented cases in which the Design Thinking process was empowered with the employment of the Business Model Canvas. In a peculiar case study, the BMC was not used to integrate Design Thinking, but it can be considered the final output of the entire process since it appears at the prototyping stage as depicted in figure 12.



Figure 14: The BMC along the process of Design Thinking.

Source: Ramie (*Boehmeria nivea*) decortication waste bio-briquette business model canvas with design thinking approach, 2017.

The starting point of this case is that: “any material that contains lignin and cellulose can be used as bio-briquette raw material because they can produce carbon. This phenomenon can potentially offer a chance to establish a bio-briquette industry as a spin-off of ramie fibre industry”⁷¹. This process is implemented with an empathy map which allowed the identification of three different customer segments, which are based on low, medium and high class. All this, is then processed into the customer journey map, which is divided into four phases: “ordering bio-briquette”, “bio-briquette arrive”, “using bio-briquette”, “after using bio-briquette”, according to different levels of customer satisfaction. After that, this research ideates a value proposition of the business model based on the customer journey.

According to the three main phases of the Design Thinking process, the results are the following:

- 1) Definition: problems found in the existing bio-briquette products are defined here.
 - a) Packaging that easily degrades the bio-briquette quality, and is also vulnerable to damage, less informative packaging.
 - b) Slow respond ordering, lack of after-sales services.
 - c) Consumers are still worried about the bio-briquette safety, it is still difficult to use bio-briquette.
 - d) The late distribution to end user.
 - e) Bio-briquette quality still does not match with customer preference, the absence of a specification bio-briquette that makes the consumers doubt the quality, the size of bio-briquette makes it difficult for the consumer to use it.

⁷¹ Irianto, R., Purnomo, D., Prima, S., & Wulandari, A. The design of financial recording system in industrial bio-briquette of Ramie (*Boehmeria nivea*) decortication waste with design thinking approach.

- 2) Ideation: this phase is based on the results of the gap analysis above. It shows that the obtained positive points are the outcome of the negative points or on the gap of the customer journey. The final results of the ideation are:
- a) The durable, impressive, and informative packaging that has ability to preserve the bio-briquette quality.
 - b) The existence of after-sales service that is easy and responsive.
 - c) The fast distribution to end users.
- 3) Prototype: as seen in figure 13, the final output is a business model created through the tool of BMC, following the basic principles outlined by A. Osterwalder and Y. Pigneur⁷². In fact, its development is owed to the multidisciplinary composition of the team which designed the BMC.

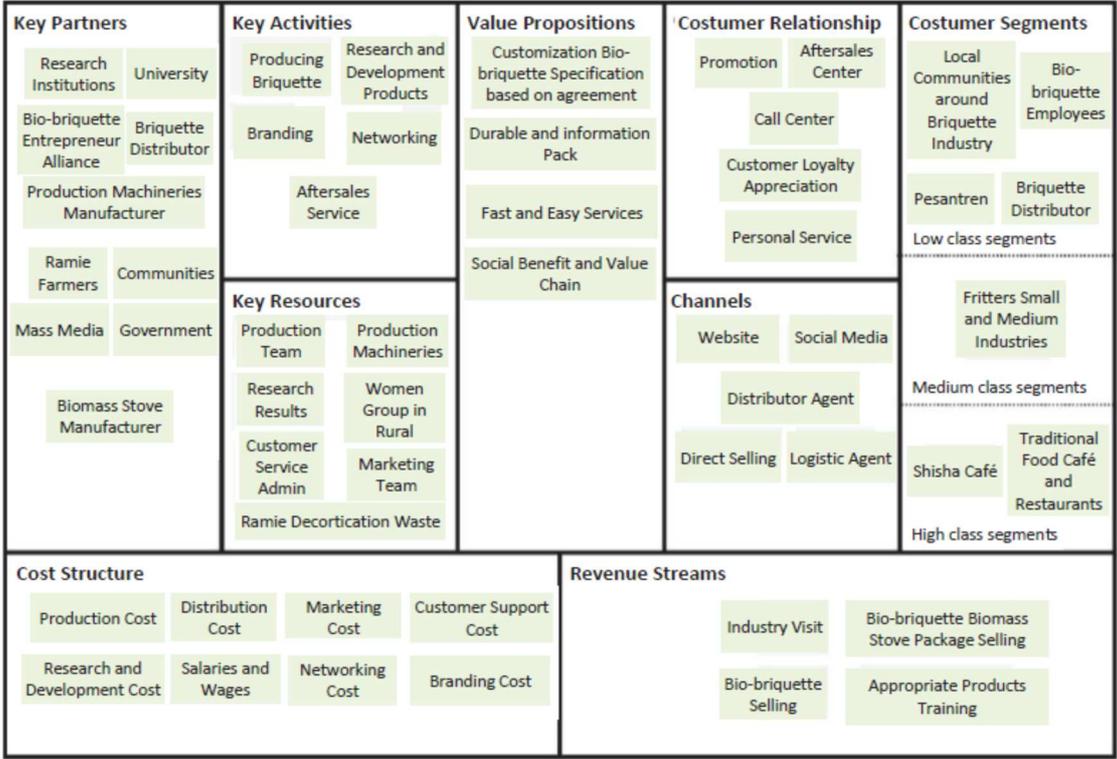


Figure 15: Business Model Canvas with the Design Thinking approach.

Source: Irianto, R., Purnomo, D., Prima, S., & Wulandari, A. The design of financial recording system in industrial bio-briquette of Ramie (*Boehmeria nivea*) decortication waste with design thinking approach.

However, this is a case study in which the BMC is the final output of the process and therefore is different from the case of Active Learning Lab, in that is used the SBMC as support along

⁷² Osterwalder, A., & Pigneur, Y. (2010). Business model generation: a handbook for visionaries, game changers, and challengers. John Wiley & Sons.

every stage of the process. How this integrative tool has been implemented and whether it worked symbiotically with Design Thinking, will be considered below.

3.2.2 The results of the juxtaposition of DT and SBMC

After the participant observation of the students and the following analysis of the interviews the results regarding the juxtaposition of the Design Thinking and SBMC are divided into three main areas.

Firstly, the interviews show at first analysis that the students which were working in projects that were strictly related to social innovation were able to follow a coherent path alternating in a fructuous way the employment of SBMC to Design Thinking. The four groups in which the theory of change has played a significant role in giving a structure to ideas were the “Evolving age project” and the “Social-organic shop project”. In these instances, students had to design services and products for social enterprises, in particular for cooperatives. Hence the stakeholders involved were various and with different needs. This first point suggests the reason why the BMC should be adapted to social enterprises. Secondly, the frame of the theory of change model called “social value proposition” allowed participants to contextualise needs and to measure prospective results. As a matter of fact, a student of one of the groups that belonged to the “Evolving age project” stated: “The outcome and indicator framework gave us the opportunity to understand the relationships between cause and effect, because initially it was not easy to understand what to do, and above all to understand the macro dynamics in a systemic way” (student of the “Evolving age project”). The figure 14 represents a section of the “social value proposition” as described before.

The three outcomes and indicators are divided into short, medium and long term. They should represent the social change that the activities or the whole SBMC generate in the life of the beneficiary.

Outcome 1: “Greater social integration through the sport activity. Through the sport activity we want to help the disabled person to integrate into society”.

Indicator 1: “Growth of the registration number at Gruppo Terraglio. The enrolment number at Gruppo Terraglio will be used to understand how many disabled persons integrate into sport activities together with non-disabled people”.

Outcome 2: “Improvement of the relationships between the disabled and their family. Integration into society improves relationships with family members”.

Indicator 2: "Assessment through family condition indicators. We will use indicators provided by psychologist's evaluations.

Outcome 3: "Greater integration of the disables in society. Wider integration will be reached"

Indicator 3: "Number of people who are sensitive to problems assessed with questionnaires.

In order to verify this, we will use the assessment questionnaire".

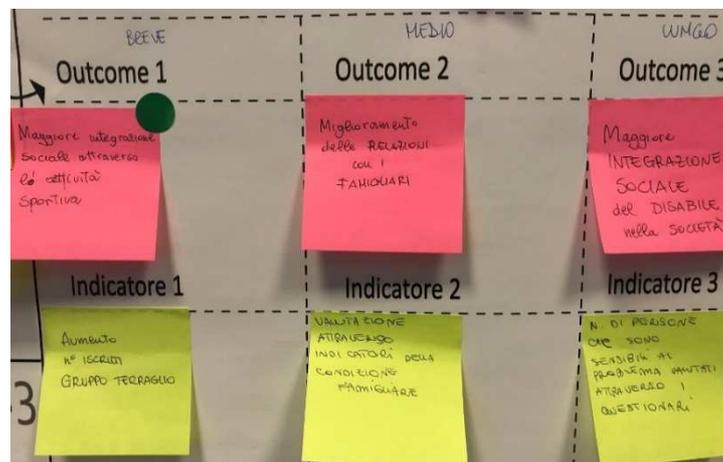


Figure 16: Implementation of the "social value proposition" in the SBMC.

Source: Active Learning Lab materials

According to the interviews and the final output of the projects, it can be stated that the social value proposition is useful in building a global vision of the project and to understand what are the connections between different stakeholders. All this, in conjunction with new frames added to the traditional BMC, which are beneficiaries, competitors, partners, and donors (frames 1.2, 1.4, 3.3, 4.6), allows students to understand better what are the dynamics that regard the social enterprise for which they are designing. Reached this point, we should expand on the criticism identified in management and business schools by D. Dunne debated in the first chapter. According to R. Martin business schools prepare students to look at only few stakeholders⁷³, in this way he supports the idea of Ghoshal, Pfeffer and Fong that: "Management education does not foster in its graduates an appropriate set of ethical values"⁷⁴. Again, from S. Ghoshal: "By propagating ideologically inspired amoral theories, business schools have actively freed their students from any sense of moral responsibility"⁷⁵.

⁷³ Dunne, D., & Martin, R. (2006). Design thinking and how it will change management education: An interview and discussion. *Academy of Management Learning & Education*, 5(4), 512-523.

⁷⁴ Dunne, D., & Martin, R. (2006). Design thinking and how it will change management education: An interview and discussion. *Academy of Management Learning & Education*, 5(4), 512-523.

⁷⁵ Ghoshal, S. (2005). Bad management theories are destroying good management practices. *Academy of Management learning & education*, 4(1), 75-91.

After having analysed the interviews' results it can be stated that Design Thinking employed in combination with SBMC allows management and business students to evaluate each situation where they are designing with a broader perspective taking into account very different stakeholders, as for example beneficiaries and donors. In this way, laboratory participants acquired the skills to analyse the environment in a systemic way. Above all, this last laboratory edition concerning social innovation contributed to enhance the sense of moral responsibility. This last point is seen as a solution to the "value critique" raised by S. Ghosal. Furthermore, continuing to the subject of moral responsibility leveraged by Design Thinking and its human-centred approach, the students during lab session were invited to observe and understand deeply the people to which they were designing. It was organised an event in collaboration with the Municipality of Treviso and the G.A.A.C.⁷⁶ where the students had the possibility to experience all the difficulties of the disabled to who they were been designing. Here, the students wore blind folds and partially sighted glasses, moreover they tried to move around the city with wheelchairs. One student declared: "It was very useful. Putting myself as end user helped me to understand his/her difficulties and his discomforts, it is about looking the situation from different point of point of view which is different from the our starting one" (evolving age project). Other examples of how this very human-centred approach helped the students in the ideation phase is given by a member of the social-organic shop project: "When I tried the wheelchair I realised how much attention that must be put to planning the roads and the sidewalks, even in a town in which there are a lot of narrow streets. The way in which we tried to go through the stairs really helped us in planning the access to the shop". Moreover, this experience was useful also to the social light project: "We decided to implement a totem adjustable in height and grade of the screen and to put the loudspeaker". This is a clear result of how the human-centred approach can change the perspective of people. Walking in the shoes of the end user has completely changed the vision that the students have of the project. Until this experience, the participants involved in projects which were not directly linked to people with disabilities, in other words "social lighting" and "urban centre Treviso", did not take into account some dynamics that may occur. In fact, a student of

⁷⁶ (Gruppo Associazioni per un Abile Città), it is a committee made up of different associations which work in the world of disability, it has started a collaboration with the municipal Authority of Treviso, that as a first important action has adopted the "U.N. Convention on the Rights of the Persons with Disabilities" with the session of Town Council of 30th April 2014. Furthermore, the G.A.A.C. dig up the P.E.B.A. (Piano di Abbattimento delle Barriere Architettoniche) which helps to identify every obstacle that is present in the Municipality.

one of the social lighting groups stated: We took for granted a lot of things and we are wrong to do that". In this way, thanks to these kinds of human-centred methodologies students recognised and overcame the fact that they were not able to "put themselves in the shoes of others".

With regard to the positive influence of SBMC, we found that students were particularly assisted by this tool in two main phases: firstly, in the initial steps when they were struggling to understand how the company/cooperative operates, which were its' values, and more in general its dynamics with the different stakeholders. Secondly, after the ideation phase the students had a lot of ideas but they found it difficult to channel and select the various opinions. In relation to this, a student of the social-organic shop affirmed: "The Social Business Model Canvas helped us to give a structure to ideas and to channel certain collected data [...] it is a useful tool because during brainstorming ideas comes randomly, whereas here (with SBMC) ideas are categorised". As explained above, students were particularly helped by this tool during the first research phase when they had to combine the information about the company: "If I could choose I will put the Social Business Model Canvas only on the first week because it would allow us to understand where the company was in that moment".

This, will bring directly to the consideration of downsides and challenges that this tool found in its implementation along the Design Thinking process. In fact, the SBMC presented also some difficulties that can be divided mainly into two kinds of complications:

- 1) Confusion about what to analyse in SBMC during the entire Design Thinking process.
- 2) Inconsistency between the path of Design Thinking and the path of SBMC.

Before explaining these critical points, it should be observed how the SBMC is divided along the four weeks of Design Thinking:

- 1) First week: the phase is "Research" and the frames to complete are mission (1.1), beneficiaries (1.2), customers (1.3) and competitors (1.4).
- 2) Second week: the phase is Analysis and the frames to complete are need (2.1), social value proposition (2.2), problem (2.3), economic value proposition (2.4).
- 3) Third week: the phase is Ideation and the frames to complete are key resources (3.1), internal key resources and external key resources (3.2), partners (3.3).
- 4) Fourth week: the phase is Prototyping and the frames to complete are monetary costs (4.1), material costs (4.2), revenues (4.3), surplus/deficit (4.4), donors (4.5).

Turning back to the first critical point, we observed that the students until the ideation phase tended to complete the SBMC aware of how the company/cooperative was at that time. Clearly, they did not have in mind the ideas of the project in early phases, so they could not complete the early-weeks frames. Only after the ideation phase did the other frameworks start to take the shape of the project that the student had to develop. As a result, in the third week the students asked their facilitators: “We cannot understand what we have to do. Do we have to complete the SBMC with the present situation of the company or with reference to our own project?” (member of social lighting project). With reference to this analysis of this critical issue it was examined better the situation, asking how can be solved this problem. The answers were mostly similar to this: “In my opinion, the idea must be found. Only then can the SBMC be used. It is right to find an idea that has to do with the economic aspect, but this business part must be faced in the end” (member of social lighting project). Another student stated: “I would add it (SBMC) at the end when the ideas are more developed. I would add it on the prototyping step, to arrange the things” (member of the urban centre Treviso). Almost all the interviewees answered that the SBMC should be implemented at the end of the final idea. Considering the whole process, SBMC is useful at the beginning for the reasons clarified above and another SBMC should be employed immediately after the ideation phase when the final idea of the project is clear and well defined. All of this, should be seen in the iterative context of Design Thinking. Therefore, the SBMC implemented with an idea right after the ideation step would not be the same after having passed through the prototyping phase.

Taking into consideration the second critical point, in other words the inconsistency between the path of Design Thinking and the path of SBMC, it was noticed that students found some difficulties to integrate the SBMC tool to the right Design Thinking phase. Students were constantly confused asking to themselves and then to coordinators what do they have to do in the various frames because during the different phases of Design Thinking they were thinking about completely different frames. In fact, in some cases the frames were completed last after the main Design Thinking tools used during the week. As stated by a student: “The SBMC is super disconnected, we have always done it during the final day[...] during the analysis and ideation phases we didn’t go through these points (need, social value proposition, problem, economic value proposition, key resources, internal key resources/external key resources, partners). We had to put the economic value proposition in the second week when we did not have the idea about it” (social lighting student). This second critical point, is mainly

a problem of timing in the implementation of the SBMC. In fact, both criticalities can be solved mainly in two ways:

- 1) The first solution, which is the easiest and the most predictable consists of inserting either SBMC or BMC into the didactic programme. However, it depends on the nature of the project. As explained previously, the first SBMC/BMC should be introduced at the beginning, so that the students understand the characteristics of the cooperative/company for which they are working. The second, should be introduced only when the new idea or the solution of the design challenge arises. The second SBMC introduced at the end could help students to examine on different problems that they probably would have not considered. To give an example, one student stated: “The Social Business Model Canvas allowed us to consider also the part of costs and revenues, that until that point we never took into account [...] I saw the SBMC as an educational tool because you answer a question and this triggers a reflection, and this is good”.
- 2) A second answer to the problem of the lack of coordination in terms of timing between the Design Thinking and SBMC is based on the consistent partition of the different frames of the SBMC. For example, it is optimal to allocate the different frames in the right phase of Design Thinking. As explained before, it is counter-productive to analyse the economic value proposition (frame 2.4) on the second week when the students are experiencing the phase of analysis in which they understand the needs of the different stakeholders and make interviews. In this week they don't have any idea about what they will create. For this reason, the economic value proposition should be analysed at the end of the ideation process.

3.2.3 Conclusions

It has been demonstrated that SBMC and Design Thinking could work very well together. First of all because in most cases SBMC triggers a self-perpetuating mechanism in which the generation of questions dictated by the analysis of the different frames heralds the emergence of new ideas. This in turn enables students to generate new questions. This process formulates a solution that is very precise, primarily because it is a path made of trials and errors. Consequently, every time the students take an idea into account they formulate questions that can either prove or disprove its validity. This process can be viewed in a circular way, but attention should be paid to ensure that this circular procedure regards in a first moment the single frame into consideration and successively it may expand to the other interrelated frames and even Design Thinking phases.

The circular process naturally emerges when students analyse the various frames which could be seen as a sort of iterative process inside the wider Design Thinking path. The SBMC triggers the students' capability to analyse the single aspects of the projects in more detail. In fact, students of the third edition of the Active Learning Lab (Design excellence and made in Italy) did not thoroughly examine every single aspect of their project, because they did not use any BMC or similar tools. Accordingly, in some cases groups arrived at the final stage of the laboratory without any analysis of feasibility costs, or in part only superficially. Clearly, the aim of the laboratory was not the quantitative assessment of the feasibility of a new strategy, but its ideation. In any case, the final output must take into account the feasibility of the new project, otherwise all is futile.

One of the strengths of Design thinking is the continuous feedback from the end user, and this allows the designer or those who are adopting the Design Thinking approach to increase the probability of success of the new product or service designed. In this case, the role of SBMC is to further enhance this feedback mechanism. In fact, as described above, SBMC allows students to evaluate the effectiveness of what they are thinking and ideating at different times. It is an intra-group feedback that permits the ability to test the ideas with the end user in a more precise way. The analytic mechanism that SBMC triggers, helped the students to ideate a solution that embraced a deep understanding of the environment they were designing, thereby enhancing the probability of acceptance by the end users.

Another peculiar point that emerged from the use of SBMC is that it assumed the role of "creative process filter". In fact, after the brainstorming, when students experienced difficulty

in deciding the best idea to pursue and which planning path to choose, as soon as they looked at the SBMC they easily found the best-case scenario. An example of this was given by a student of the “urban centre Treviso” project: “[...] If we had not had the canvas, we would not have thought about it on our own, or we would not have had any idea where to start”. In this instance, the SBMC was useful to understand how to integrate companies inside the urban centre of Treviso. Owing to the SBMC, they understood that the companies of the territory could be a valid source of revenues. As stated by one of the student of the “urban centre Treviso” project: “Initially, the main source of revenue is the advertising that companies put into the totem which are scattered around the city (5000 – 6000 €)”. The revenue written on the post-its are calculated on an annual basis. Furthermore, in the long term, educational activities in primary and high schools (200 € x course) and with private members of specific Bars (1600 € x course) are expected.

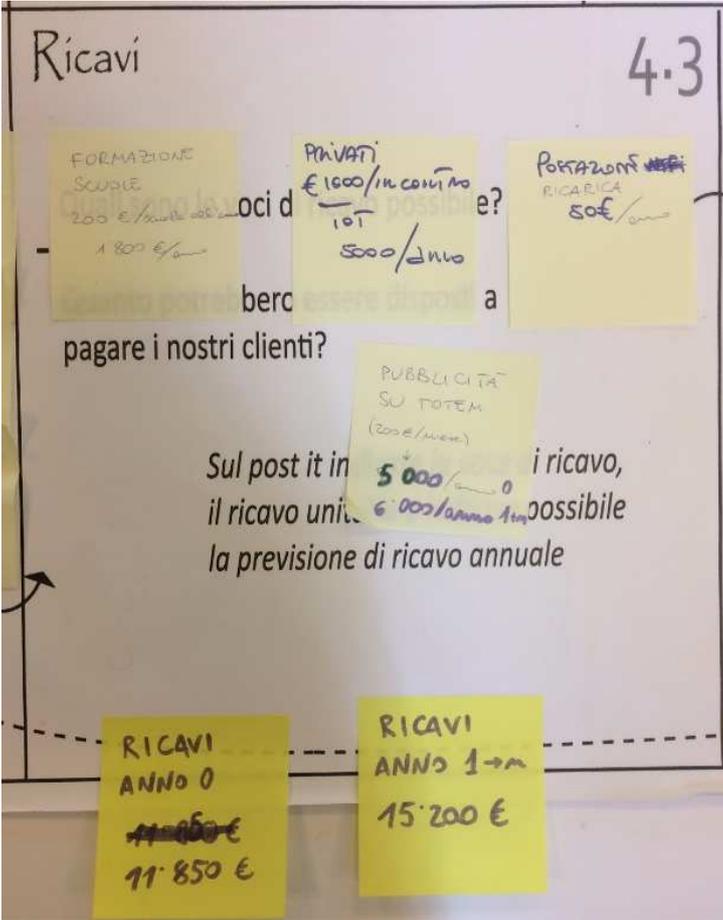


Figure 17: revenues stream of one of the two projects of "urban centre Treviso".

Source: Active Learning Lab materials, Urban Innovation

The following is a student description about the implementation of SBMC:

- 1) “From week to week we updated the SBMC in relation to the Design Thinking phases. It was employed as a support to outline exhaustively all the passages (sometimes quite difficult) that led us to the design of the urban centre”.
- 2) “The use of SBMC allowed us to reorganise the ideas every week and it underlined some points that we would not have taken into consideration. Consequently, we have obtained more complete overall view”.
- 3) “It was a very useful tool to make our final proposal more “solid” from many points of view”.

It has been demonstrated that SBMC used in conjunction with Design thinking does not always represent a good connection. There are cases in which the two tools present conflicting characteristics. In other words, they do not reach an appropriate level of coordination. In this respect, the two points examined are: the confusion about what to analyse in SBMC during the entire Design Thinking process and the inconsistency between the path of Design Thinking and the path of SBMC.

Moreover, the evidence proves that there are other important critical points which are strictly related to the fact that SBMC is a tool that comes from the management world. Consequently, it is a very specific tool that makes use of specific terms and which refers to certain practices. The result is that people new to the world of management find it difficult to use. On the contrary Design Thinking can easily be used potentially by everybody. In this sense, T. Brown claims: “You don’t have to be a designer to benefit from using Design Thinking”⁷⁷. As a consequence, SBMC requires a deeper theoretical basis because the competencies required to use this model are more specific than those required by Design Thinking. Accordingly, in his lectures the designer D. Boschiggia stated several times that: “The Design Thinking approach is a piece of our DNA”⁷⁸. In other words, one does not have to be an expert in this field to employ Design Thinking.

However, the SBMC exhibits some obstacles for this very reason. In fact, as observed during the laboratories and based on the interviews, the students who came from an area of study outside economics or management experienced difficulties analysing the project through this

⁷⁷ Brown, T. (2009). Change by design.

⁷⁸ Source: Active Learning Lab materials

model. An example of this is given by a student⁷⁹ of the “social-organic shop” project: “More theory for the SBMC would be needed, due to the fact that I did not study management and so it was very difficult to use this mechanism. I saw it as something that should be developed deeply”.

In conclusion SBMC used in conjunction with Design Thinking can be a very useful tool, particularly in projects which are close to the sphere of social innovation. On the other hand, it presents some criticalities, but they can be solved with an adequate training and with the right juxtaposition of the Design Thinking process in terms of timing.

⁷⁹ This student has a humanistic academic background. A Bachelor Degree in Cultural Anthropology and a Master’s Degree in Immigration, Migratory Phenomena and Social Transformations.

3.3 Multidisciplinary teams and interdisciplinary thinking

Before examining the characteristics of the heterogeneous teams that are typical of the Design Thinking approach the difference between the two concepts should be clarified: multidisciplinary and interdisciplinary. Often these terms are used interchangeably but they have different meanings. According to J. Klein multidisciplinary has an additive meaning, contrary to interdisciplinarity, which has an integrative connotation: “Knowledge of different disciplines is contrasted and changed by integration”⁸⁰.

The integration and synthesis of knowledge are seen as the main feature of interdisciplinarity. As stated in the first chapter, synthesis is a fundamental part of Design Thinking. According to this, N. Cross gave importance to the design discipline calling it the “third culture” and in describing its methods he included the synthesis as one of the main approaches used in this “culture”, together with modelling and pattern-formation⁸¹. Furthermore, synthesis skills are at the centre of R. Martin critics raised toward MBA education. In fact, he stated that there is a lack of abductive and synthesis competencies developed by MBA programmes⁸². As a consequence, Design Thinking with its quintessential interdisciplinary nature could be a hypothetical solution to the critics moved by R. Martin to business and management education. In this respect, that Design Thinking is characterised by a double nature, should be underlined. It is multidisciplinary because of its implementation in the most disparate fields, and it is also interdisciplinary because of the knowledge created by the multidisciplinary teams which take part in this process.

According to W. Newell, interdisciplinarity has been gaining interest in education during the last years, mainly because: “Interdisciplinarity can help to address today's complex issues since it is believed that a cross-disciplinary approach facilitates a comprehensive understanding”⁸³. In relation to this, several students of the lab affirmed during the interview that they were learning different notions from people with different academic background. With regard to the “evolving age project”, one student⁸⁴ stated: “One of the pros of multidisciplinary (interdisciplinarity) is the fact that we were learning continuously through

⁸⁰ Klein, J. T. (1990). *Interdisciplinarity: History, theory, and practice*. Wayne state university press.

⁸¹ Cross, N. (1982). *Designerly ways of knowing*. *Design studies*, 3(4), 221-227.

⁸² Martin R. (2011, June 11). *The logic of what might be*. Retrieved from www.futureready365.sla.org/06/12/the-logic-of-what-might-be/

⁸³ Newell, W. H. (2007). *13 Decision Making in Interdisciplinary Studies*.

⁸⁴ Academic background: master's degree in “Languages, Economics and Institutions of Asia and North Africa”

others, because we didn't take anything for granted". This dynamic of learning from different fields and disciplines is called interdisciplinary understanding or interdisciplinary thinking, in other words: "The capacity to integrate knowledge and modes of thinking in two or more disciplines or established areas of expertise to produce a cognitive advancement—such as explaining a phenomenon, solving a problem, or creating a product—in ways that would have been impossible or unlikely through single disciplinary means"⁸⁵. This explanation of the interdisciplinary thinking concept can be interpreted as the development of different capabilities that include the ability to change points of view and make links between different knowledge areas, in other words: "[...] the ability to change disciplinary perspectives and create meaningful connections across disciplines"⁸⁶.

As underlined by the interviews, the Active Learning Lab students found some difficulties in changing disciplinary perspectives in the short term: "At first, I found it hard to understand their point of view, but then they (the other members of the group) helped me in doing this". Accordingly, in analysing the timing to achieve the capability of changing disciplinary perspectives is highly dependent on the single case and particularly on the personal characteristics, such as openness, curiosity and especially empathy. If the entire population being investigated is analysed, a pattern emerges. In fact, the majority of the students tended to change their mental view and create connections between different disciplines at the end of the second week. This represents the analysis phase, particularly during the third week, in which students have to ideate. An important role in this process is played by the brainstorming session, in which students are permitted to be frank and open. Therefore, the level of acceptance of different ideas increases immediately. The brainstorming session became a democratic tool. One student claimed: "The brainstorming was great, everyone was free to say anything, there was a good mood".

As intended by the authors of "Teaching and Learning in Interdisciplinary Higher Education: A Systematic Review", interdisciplinary thinking is a skill that takes time to be acquired, it can be built in months and not in days or weeks as in the case of the Active Learning Lab. In fact: "Interdisciplinary thinking does not occur spontaneously, it can take a considerable amount

⁸⁵ Spelt, E. J., Biemans, H. J., Tobi, H., Luning, P. A., & Mulder, M. (2009). Teaching and learning in interdisciplinary higher education: A systematic review. *Educational Psychology Review*, 21(4), 365.

⁸⁶ Van Merriënboer, J. J. (1997). Training complex cognitive skills: A four-component instructional design model for technical training. *Educational Technology*.

of time for students to achieve an adequate level of expertise in its practice”⁸⁷. On the other hand, as explained above, after the second and the third week the majority of the students started to change their perspective and method of making associations among different fields. As illustrated by a student of the “social-organic shop” project: “In a way, the fact that we speak different languages (figurative) was difficult, but then these languages will intertwine and become an added value, in the end. I learned the economic language and a little bit of economic dynamics”.

An interesting model used to describe the process exists allowing students to achieve the interdisciplinary thinking skills. It was created by J. Biggs⁸⁸ to explain the general teaching and learning process and then adapted to the interdisciplinary thinking theory⁸⁹.

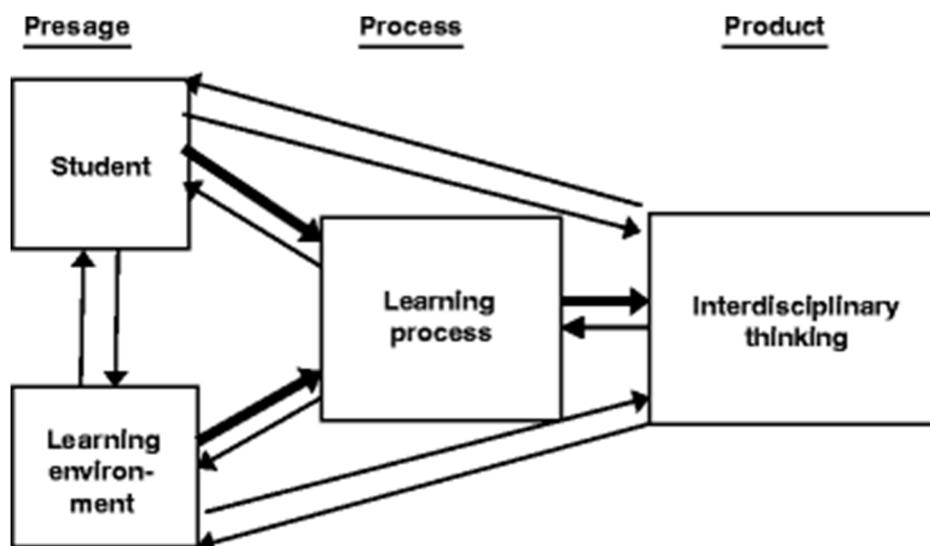


Figure 18: teaching and learning model by J. Biggs, adapted to the interdisciplinary thinking.

Source: Spelt, E. J., Biemans, H. J., Tobi, H., Luning, P. A., & Mulder, M. (2009). Teaching and learning in interdisciplinary higher education: A systematic review. *Educational Psychology Review*, 21(4), 365.

Figure 15 shows the relationships between the four components of interdisciplinary thinking. The various interactions are represented by thin arrows in order to show that the teaching and learning process has an interactive nature. It is conceived as a two-way flow communication. The general direction of interaction is depicted by bold arrows. The first two

⁸⁷ Spelt, E. J., Biemans, H. J., Tobi, H., Luning, P. A., & Mulder, M. (2009). Teaching and learning in interdisciplinary higher education: A systematic review. *Educational Psychology Review*, 21(4), 365.

⁸⁸ Biggs, J. (2003). Teaching for quality learning at university: What the student does. Buckingham: SRHE and Open University Press.

⁸⁹ Spelt, E. J., Biemans, H. J., Tobi, H., Luning, P. A., & Mulder, M. (2009). Teaching and learning in interdisciplinary higher education: A systematic review. *Educational Psychology Review*, 21(4), 365.

elements are the students and the learning environment (presage level). They represent the starting points of the learning process and “[...] jointly produce the activities students undertake for a given learning task”⁹⁰ (learning process level). In turn, this process creates the outcome interdisciplinary thinking (product level). This model permits an understanding of how students create meaningful connections between different disciplines and accordingly, create new knowledge.

3.3.1 Creativity always matters

Previously, the hydroelectric plant metaphor was explored. Explains graphically that knowledge is an important ingredient of creativity, in other words, it is the starting point of this process.

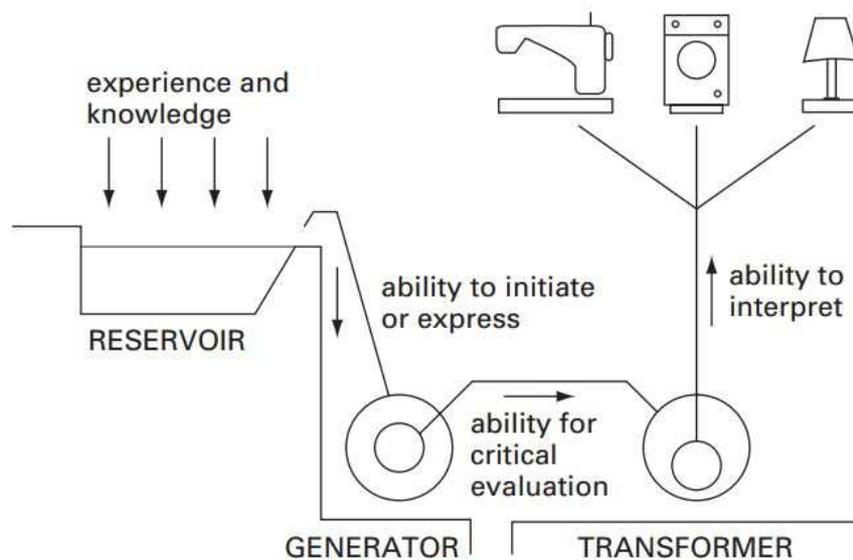


Figure 19: The three-step design learning process represented with the metaphor of the hydroelectric plant.

Source: Laxton, M. (1969). *Design Education in Practice: Attitudes in Design Education*.

In addition, if experience and knowledge come from different fields and disciplines, working groups have the chance to make more connections between different ideas and as a result this increases of the team’s creative capacities. Moreover, creative capacity is enhanced within a group in two ways: horizontally, when the working group is made up of people coming from different disciplines and vertically, in the case of the individual who has skills or knowledge in different fields. This kind of heterogeneity is particularly useful in the Design

⁹⁰ Biggs, J. (2003). *Teaching for quality learning at university: What the student does*. Buckingham: SRHE and Open University Press.

Thinking process during the ideation phase, where every component of the working group contributes in giving every kind of idea that comes to his/her mind. T. Brown and J. Wyatt affirmed: “To achieve divergent thinking, it is important to have a diverse group of people involved in the process. Multidisciplinary people - architects who have studied psychology, artists with MBAs, or engineers with marketing experience - often demonstrate this quality”⁹¹. With regard to multidisciplinary teams, the results of the investigation show that the interdisciplinary thinking allows the students to:

- 1) Open their minds.
- 2) Fill gaps in knowledge.
- 3) Enhance creativity.

One student asserted that: “If you stay with different people you will have more innovative ideas”. Moreover, with reference to interdisciplinary thinking as a method to fill gaps in knowledge, a student of the “urban centre Treviso” project when he/she was talking about her/his multidisciplinary team asserted that: “[...] without the architect the prototypes wouldn’t have been so cool. Without the economists we wouldn’t know how to make the business plan (SBMC) correctly”.



Figure 20: Prototype of the urban centre Treviso.

Source: Active Learning Lab materials, Urban Innovation

One interview answer perfectly describes all three points: “I felt that I was lacking in creativity and my teammates helped me in this regard. From F. (teammate) I have learned to be more

⁹¹ Brown, T., & Wyatt, J. (2010). Design thinking for social innovation IDEO. Development Outreach, 12(1), 29-31.

methodical. I developed more creativity and learned things that I would never have started looking for, alone”⁹².

An important factor of creativity increase due to the multidisciplinary teams is the concept of decontextualization. In this sense decontextualization means the consideration of a technology, a material or an entire product in isolation from its usual context and its possible employment in a different field. Relatively, in some cases the technologies and the innovations already exist, hence it is only a matter of taking them from one context and putting them in another system. Therefore, the more heterogeneous the working team, the better the probability that a large quantity of connection between different disciplines is produced. More creative ideas will be generated as a result.

The Belstaff case study is an example of decontextualization that is often used to explain this concept to the students of the Active Learning Lab. This firm produced the “Excalibur” jacket which was entirely waterproof, but the peculiarity was that the jacket’s fabric was totally innovative to the fashion sector. The material was not the classic nylon or PVC, but metal. The company decontextualized the metal fuel filter of the engine and adapted it to its jacket. Clearly, the raincoat was made with a close woven metal fibre in order to make it waterproof. With regard to the laboratory, there were several cases in which students invented new products using decontextualization. For instance, in the second edition of the Active Learning Lab, a team, which was designing for the new brand “Gioia” of Agricola Lusía, invented a particular product which simplified the process of squeezing oranges and successively drinking the juice. In this case the design challenge was brief: “How can we enhance the consumption of oranges during the summer season? Furthermore, how can we communicate the seasonality of oranges connected to their territory of production?”. During the analysis and ideation phases students employing the human-centred approach understood that the consumer found it difficult to prepare his orange juice on occasions where he was not at home. This included the fact that different tools are required to make orange juice, such as a knife, a cutting board, an orange juicer and a glass. Moreover, added to the various tools needed was the question of cleaning all the materials used. The solution ideated by this working team was a rigid straw with a pointy extremity which allows the user to puncture the orange. With a circular movement the juice is emitted through the straw due to small holes near the tip.

⁹² Academic background: master’s degree in “Economic and Business Development”.

Owing to the partnership between the Active Learning Lab and DEL FabLab⁹³ the students had could prototype the idea rapidly with the 3D printer and then test it in order to present a concrete, working tool. As a result, this product allows consumers to prepare orange juice anywhere, everywhere and at any time, without using a glass or orange juicer.

This represents a meaningful case of product decontextualization. In fact, the straw was removed from its function, thereby allowing the user to drink without putting his/her lips on the surface of the receptacle to embrace the new role of orange squeezer. The case of the metal-fibre jacket together with the “Straw Squeezer” are examples of how innovation can sometimes be incremental due to the conjunction of different fields of application of a material or of different functions performed by a product. Obviously, interdisciplinarity and its open-minded and creative nature contribute immensely in all this.

⁹³ The DEL FabLab is the makerspace of University Ca' Foscari of Venice, it is a space in which are concretely experimented new design processes and digital fabrication. Moreover, it is made research on technologies and production models that characterise the evolution of contemporary products and services. It is a place where future scenarios of “advanced manufacturing” are examined, moreover it is a centre where it is studied the technologic innovation and its impact on both production n and managerial practices.

3.4 Learning by doing and skills development

The interviews show that the Active Learning Lab students gained different skills due to its characteristics, firstly because of the practical approach used. Before examining the various competencies developed by students in detail, it is necessary to discuss the definition of experiential learning and learning by doing.

According to L. Lewis and C. Williams: “In its simplest form, experiential learning means learning from experience or learning by doing. Experiential education first immerses adult learners in an experience and then encourages reflection about the experience to develop new skills, new attitudes, or new ways of thinking”⁹⁴. This is one of the founding principles of the lab and, its name reflects this kind of active learning process. Current literature reveals different models which explain the experiential learning theory and one of the simplest is the Lewinian model. The diagram below, demonstrates the model’s four-step process. It is similar to Design thinking, in that the learner forms abstract concepts post-observation. For instance, the second and third phases of Design Thinking equate to the third step of the Lewinian model where those designing observe the target and attempt to ideate and test ideas.

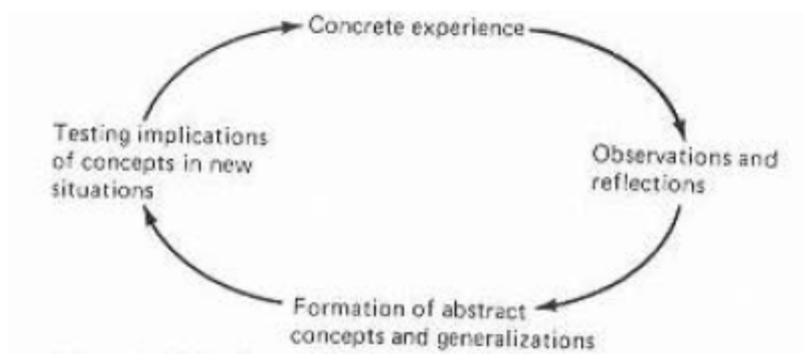


Figure 21: Lewinian model

Source: Lewis, L. H., & Williams, C. J. (1994). Experiential learning: Past and present. *New directions for adult and continuing education*, 1994(62), 5-16.

The starting point is concrete experience, where observations can be made and assimilated into a theory, from which new implications of concepts are tested and then: “[...] these implications and hypotheses serves as guides in acting to create new experiences”⁹⁵. Here the focal point is concrete experience conceived as a tool to validate abstract concepts. It

⁹⁴ Lewis, L. H., & Williams, C. J. (1994). Experiential learning: Past and present. *New directions for adult and continuing education*, 1994(62), 5-16.

⁹⁵ Kolb, D. A. (2014). *Experiential learning: Experience as the source of learning and development*. FT press.

illustrates perfectly what the Active Learning Lab represents. The concrete experience of students during the laboratory validates and tests the concepts that have been acquired during the traditional frontal classes.

3.4.1 The role of Design Thinking and Active Learning Lab in learning by doing

In our rapidly changing world there is a need for flexibility and the ability to employ the most disparate experiences to different fields⁹⁶. Consequently, education must follow this trend to satisfy this demand, most notably capable people with so-called 21th century skills. In this respect, there are some commonly recognised best practices and admonitions in modern education. For example, Hirsch reiterated a list of “more” and “less” admonitions to a correct modern and experiential education⁹⁷. This list of recommendations is approved by different organisations and institutions⁹⁸. What is interesting here is the fact that each of the following points describes at least one of the characteristic of the Active Learning Lab. The various points are:

- 1) “LESS whole-class teacher-directed instruction”: During the laboratory there are some traditional frontal lessons to explain the Design Thinking process and its tools, but most of the time students are occupied with their real-case project.
- 2) “LESS student passivity, sitting, listening, receiving”: Even this point can be explained by the real-case project activity.
- 3) “LESS attempts by teachers to cover large amounts of material”: The only material used by the teacher is the explanation of the approach to be used during the six weeks and the relating tools.
- 4) “LESS rote memorization of facts and details”: As stated previously the laboratory is based on the Design Thinking approach and for this reason the students use a graphic approach to memorise information. In this kind of lab is common to find the walls full of post-its, customer journey maps, personas, storyboards and so on.

⁹⁶ Lewis, L. H., & Williams, C. J. (1994). Experiential learning: Past and present. *New directions for adult and continuing education*, 1994(62), 5-16.

⁹⁷ Hirsch Jr, E. D. (2010). *The schools we need: And why we don't have them*. Anchor.

⁹⁸ They are mainly U.S. institutions: National Council of Teachers of Mathematics, the Center for the Study of Reading, the National Writing Project, the National Council for the Social Studies, the American Association for the Advancement of Science, the National Council of Teachers of English, the National Association for the Education of Young Children and the International Reading Association.

- 5) “LESS stress on competition and grades”: A minimum level of competition is always present during the different editions of the laboratory, especially when two teams are working on the same design challenge. On the other hand, there is no stress on grades, there is no final exam, the performance of the students is assessed through their commitment and involvement along the weeks, and also through how they solve the design challenge. The interviews show that students decided to attend this laboratory mainly to learn a different approach. As a result, they are driven by curiosity which overshadows the pressure of the final grade. This is due also to the optional nature of the laboratory.
- 6) “MORE experiential, hands-on learning”: As affirmed previously, students work on real challenges with real companies and institutions, so they have the chance to learn by doing.
- 7) “MORE active learning with all the attendant noise of students doing, talking, collaborating”: The aim of the Active Learning Lab is also, the collaboration and the exchange of ideas. As V. Finotto states: “The challenge that we face in these laboratories which puts together students, researchers, entrepreneurs, experts and technicians is to go beyond the schools and the university conceived as a closed system in classrooms. The challenge is to create communities which innovate and learn together, everyone sure of his knowledge but everyone ready to learn from other people”⁹⁹.
- 8) “MORE cooperative, collaborative activity”: As described in the preceding point one of the scopes of the laboratory is collaboration and cooperation not only between students but also among different figures.

Previously it was seen the reasons why Design Thinking should be included in the world of education. N. Cross in describing the values on which the “third culture” is based mentioned practicality as seen in table 1. Hence, Design Thinking has a practical nature that can be easily adapted to learning processes. In this respect: “Design develops innate abilities in solving real-world, ill-defined problems” and “Design offers opportunities for the development of a wide

⁹⁹ Finotto V. (2016). La scuola come spazio di apprendimento e di innovazione: esperienze a Nord Est. Nord Est 2016. Marsilio Editori.

range of abilities in nonverbal thought and communication”¹⁰⁰. The following section addresses the different abilities developed by the students.

In addition to the role of design in experiential learning, how practical experience implemented by students could be an effective way to learn has been observed. In this respect, a student of the “evolving age project” affirmed: “When I apply in a practical manner what I have previously learned I memorise it more easily. I realise that doing things in practical terms means that I succeed in retrieving the information at a later stage”. In this instance, the student was referring to the case in which he/she visited the cooperative to which he/she was designing. The fact that the student physically saw the spaces of the firm and talked with owners and employees, seems to have positive effects in acquisition, storage and retrieval of information.

Furthermore, the interviews demonstrated that the practical approach of Design Thinking and the Active Learning Lab present a positive “spillover effect”. Students affirmed that they felt more involved in the laboratory in comparison to traditional and theoretical courses. For example: “[...] another good point (of the Active Learning Lab) is the fact that it is a real thing, it is concrete and it stimulates you to do more and do better: seeing your idea implemented gives you unique satisfaction”.

3.4.2 Active Learning Lab: a bridge that connects the University with the labour market

Owing to the practical nature of Design Thinking, the laboratory helps students to develop skills that will be useful when they enter in the labour world. In the first chapter the importance of 21st century skills was analysed. Therefore, this framework will be used to understand which skills the Active Learning Lab develops and which skills are useful in the reality of the workplace environment¹⁰¹¹⁰².

During the first round of interviews it became apparent that the lab was a very useful tool to connect students with entrepreneurs. It was evident that this point required more attention. It was noted that three students were contacted by the firms which participated in the lab. Two of them actually work for these companies. For privacy reasons the three students will be referred to as A, B and C.

¹⁰⁰ Cross, N. (1982). Designerly ways of knowing. *Design studies*, 3(4), 221-227.

¹⁰¹ Bellanca, J. A. (Ed.). (2010). *21st century skills: Rethinking how students learn*. Solution Tree Press.

¹⁰² Source: the official website of the Organisation for Economic Co-operation and Development, OECD.org.

Students A and B participated in the third edition of the lab where the theme was “Design Excellence and Made in Italy”. Student A¹⁰³ was in one of the working teams dedicated to the firm Moroso, but was hired in another partner firm of the lab called Unifarco. During the lab Student B¹⁰⁴, was working on the design challenge of Kallistè and was hired by this company. Student C¹⁰⁵ was a participant of the first edition on sustainability and worked on the project of the Stevanato Group.

Student A works in the marketing department as an intern of a sub-brand of Unifarco, called Dolomia. The student is working on the market launch of a new cosmetic product line called Dolomia skin care and collaborates with the brand manager and the product manager. Student A stated: “Dolomia still represents a small brand and for this reason the work that I have to do is not so different and this enables me to be an active part of the development of a product, from its ideation to its market launch”.

Student B works in Kallistè as an apprentice in the marketing department. The student is involved in various duties such as: strategic planning, e-commerce management, packaging, shooting, set up of retail shops, ideation of promotions for retail, management of relationships with public relation agencies and social media marketing management. Student B is responsible for different branches of the marketing department.

After the laboratory Student C was contacted by the Stevanato Group, also in this case for a position in the marketing department, but the student didn't start to work in this firm. The student currently works in a company which operates within the energy management sector and is the responsible for strategic marketing. Student C's tasks are: definition of the consolidation strategy in markets in which the company is already present (Europe and North America) and definition of the penetration strategy in new markets (mainly Asia). Moreover, she manages digital communication to hit the right target.

All three students declared that the laboratory was very important for them because it gave them the opportunity to acquire different skills. Student A claimed: “Firstly, it (Active Learning Lab) positively affected my capability to manage the relationships, especially in team working and conflicts management. [...] At Unifarco I work in a team and I am sure that my positive attitude towards team working was affected by Active Learning Lab and other group projects

¹⁰³ Student of the master's degree programme in Marketing and Communication.

¹⁰⁴ Student of the master's degree programme in Economics and Management of Arts and Cultural Activities.

¹⁰⁵ Student of the master's degree programme in Innovation and Marketing

done during my university studies”. Student B also mentioned team working: “Design Thinking should be taught to everyone who is entering the work environment, especially to those who work in team. My previous certainties about just how important it is to work in a team, to respect and implement different ideas have been consolidated”. Interacting in heterogeneous groups is one of the main skills developed by the Design Thinking process, hence by the lab. In this regard, students who found difficulties in team working admitted that the lab played a big role in improving this skill. As stated by the Student C: “Personally, I always found it easier to work alone, but with the lab I finally appreciated and reaped the benefits of a collaboration between people with different academic backgrounds. Above all, I learned to contribute positively and in a constructive manner to solutions that I initially found unpromising, but in the end, they turned out valid and successful”.

Other skills developed included empathy. Empathy is very important because it is at the basis of every fruitful relationship and, in a working environment understand colleagues is very important to reach a common objective. Design thinking is based on empathy. In fact, in the research phase students tried to understand and connect deeply with the people they were designing for, owing to the characteristic human-centred approach.

Furthermore, Student A enunciated other different skills acquired such as management of emotions: “This experience helped me to control my emotions under stressful conditions, for instance during a public speech or when I have to interact with other people I do not know [...] like entrepreneurs, hence people very different to me”.

Another capability is problem solving. Design Thinking is conceived as a method to solve problems, it gives a frame to resolve a challenge. Student A said: “Design Thinking as a methodology is very useful to recognise a structure/underlying pattern in amongst apparently non-organised information. Simply think at personas: A lot of information that will be successively elaborated is obtained from interviews, and this is systemic thinking”. Accordingly, student B found Design Thinking useful to enhance this skill: “Thanks to the lab I acquired a method that allows me to look at a problem calmly and to find several solutions by analysing all of the aspects of which it is composed”.

It has been demonstrated that contextual learning skills are particularly relevant in the actual world of work and can be considered in a certain sense root of systemic thinking. Owing to the trial and error process the individual is able to develop a holistic view of the problem. The iterative process and the learning by doing process are typical of Design Thinking and it

provides a perfect example of contextual learning. Furthermore, the interactive nature of the laboratory can also bring value to a contextual learning process. Student C stated: “I learned to proceed often questioning assumptions made in an initial phase of the process and to define an action strategy through a dynamic of trial and error and intense collaboration.

It is interesting to note how students developed different skills from the Active Learning Lab, but it is equally interesting to understand how these different abilities are put into practice by the students in their internships. The analysis of the interviews demonstrates different instances where 21st century skills are used.

With reference to collaboration and communication skills, it is simple to find examples in which they are used inside a firm. One instance is given by Student A who declared: “[...] during the meeting I must present the research that was assigned to me. It was about the no bite nail polish. [...] It was the first time that I had to tell my tutor, the chief buyer and other professionals about my research”.

Communication skills are very useful but also very common. In detail, it is important to find skills that are directly linked to the Design Thinking process. A pertinent example of this is given by Student C: “I use every day competencies like critical thinking, problem solving and contextual learning. In the definition of a marketing plan I started from the corporate history, and then I focus my actions on the research on scientific literature of my sector and on competitors’ managerial practices. I examined the features of every product and I hypothesized the most effective techniques to communicate them to the target”. This is an instance in which part of the Design Thinking process is adapted to the lab. During the first weeks, students learn how to conduct competent research and analysis. In the first week students make cards representing all of the competitors features and compare them to the card of the firm for which they are designing. After this they make a timeline of the history of the firm and the technology it uses or sells. Another similar example is given by Student A: “[...] I collaborated with the product manager to decide the nail polish colours for the 2018 collection range. The first thing that I did was to research our competitors collections, then we analysed the data of different agencies that provide information about consumption. This would have allowed us to predict the next trends”.

Moreover, the same student stated: “[...] to monitor the trends and needs of consumers we also conducted interviews and questionnaires [...]. In this way we have direct feedback from our consumers”.

These statements illustrate that there are a lot of similarities between Design Thinking and the method used to solve problems in these marketing departments. From the research of the first week to the questionnaires of the analysis phase and in addition from the ideation to the final feedback of the fifth week of delivery. To conclude it is apparent that students developed different skills due to Design Thinking. It gives students a framework from which they can analyse and solve problems that exist in very different sectors, such as in this case: make up, fashion and energy management.

Conclusions

It has been seen the reasons why Design Thinking should be employed in higher education, especially in business and management teaching. To verify this, it has been examined a real case of Design Thinking implementation. The results show that this approach presents several positive effects, but also some critical points.

Design Thinking employed in Active Learning Lab was adapted in order to accomplish two main objectives: education and the delivery of a viable solution to the challenges faced by the companies which were members of the project. To deal with this double aim it has been added the strategic managerial tool of BMC and SBMC for social enterprises. These templates helped students to give a structure to their ideas and facilitate a deep understanding of the environment where they were designing, enhancing the probability of acceptance by the end users. In Design Thinking sometimes is difficult to pass from the divergent to the convergent phase, but the BMC or SBMC in this context plays the efficient role of “creativity filter”.

Findings show also that in some situations the SBMC does not fit Design Thinking very well. Firstly, because of the different things analysed by the two approaches. Secondly, because SBMC requires specific knowledge to be implemented, contrary to Design Thinking. For the last reason, not all students were able to understand from the beginning how it should be used. These critical points can be solved with the right juxtaposition of the different sections of SBMC to the Design Thinking process and with an adequate training of the students before they use the SBMC.

One of the intrinsic characteristic of Design Thinking is interdisciplinarity. It was demonstrated that it helps students to open their minds, fill the gaps in knowledge and enhance the level of creativity. On the other hand, interdisciplinarity can generate disagreements inside the working groups. In most cases this happens in the short term, but thanks to the action of facilitators the unconstructive divergences can be easily resolved.

Furthermore, the practical approach upon which is based the laboratory connected to the interdisciplinarity enabled students to develop what are called “21st century skills”. These kinds of competences are necessary to compete and work in our fast-changing economic environment. The answers of the interviews showed that students had the feeling they developed different transversal competencies which by definition, go beyond their field of studies. For this reason, it was decided to analyse deeper the issue and it was discovered that

students of the laboratory not only developed some important skills, but some of them were also hired by the partner companies of the lab. As a result, Active Learning Lab and Design Thinking represent a bridge linking the world of education with the labour market.

It is difficult to predict what the future of education will be. According to this, can Active Learning Lab and Design Thinking embody the first step towards a new educational system?

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Appendix 1

Detailed version of Active Learning Lab programme, (sustainability edition).

WEEK 1 - FULL IMMERSION SULLE METODOLOGIE Ca' Foscari Zattere - Venezia

Lunedì 19/09

14:00 - 17:00 Introduzione Prof. Vladi Finotto – Benvenuto Dott.ssa Veronica Gusso
METODOLOGIA "Design Thinking Part I" Dott. Davide Boschiglia

Mercoledì 21/09

14:00 - 17:00 METODOLOGIA "Design Thinking Part II" Dott. Davide Boschiglia

Venerdì 23/09

9:30 - 13:00 METODOLOGIA "Lean Startup e Business Model Canvas" Dott. Jacopo Pertile
14:00 - 17:00 **Elementi e Strumenti di Sostenibilità** a cura di docenti e collaboratori Ca' Foscari
Prof. Fabio Pranovi e Ca' Foscari Sostenibilità (14.00-14.30), Prof. Marco Fasan (14.30-16.00),
Dott.ssa Petra Scanferla (16.00-17.00)
17:00 - 18:00 **PILLOLA CON L'ESPERTO Prof. Alfonso D'Ambrosio, docente presso IIS Cattaneo Mattei di Monselice, eletto miglior docente innovatore italiano**

BLUE WAVE - WEEK-END 24h NO STOP Ca' Foscari Zattere - Venezia

Da Sabato 24/09 alle 10:00 a Domenica 25/09 alle 12:00

9:30 - 10:00 Registrazione
10:00 - 10:15 Apertura, Prof. Vladi Finotto, Università Ca' Foscari Venezia
10:15 - 10:30 Saluti Prof. Michele Bugliesi, Rettore, Università Ca' Foscari Venezia
10:30 - 10:45 Saluti Dott. Roberto Crosta, Segretario Generale, Camera di Commercio Venezia Rovigo Delta Lagunare
10:45 - 11:15 Introduzione ai lavori, Dott. Carlo PAsqualetto, Founder, AzzurroDigitale
11:15 - 13:00 **Brief delle aziende - Stevanato Group, Favini, Gruppo Argenta**
13:00 - 14:30 Buffet Lunch
14:30 - 15:00 Divisione dei gruppi
15:00 - 17:00 Work session I - Definizione delle Design Challenge
17:00 - 19:00 Robot Race - Laboratorio di programmazione robot
19:00 - 21:30 Work session II
21:30 - 23:00 Cena
23:00 - 1:00 Work session III
1:00 - 1:30 Momento emozionale
1:30 - 4:30 Work session IV
4:30 - 5:00 Quiz Challenge
5:00 - 7:30 Work session V
7:30 - 8:00 Colazione
8:00 - 10:30 Work session VI
10:30 - 12:00 **Presentazione dei progetti e feedback dalle aziende**
12:00 - 12:30 Feedback moment

WEEK 2 - EXPLORING Ca' Foscari Zattere - Venezia

Lunedì 26/09

14:00 - 17:00 TOOL CHOICES: i gruppi di studenti si ritrovano in aula per approfondire la fase di **EXPLORING** e selezionare strumenti e metodi di lavoro da utilizzare durante la seconda settimana. Durante i giorni successivi i team sono lasciati liberi di lavorare in gruppo, sul campo, fuori dall'aula

Venerdì 30/09

14:00 - 16:00 **OUTPUT E FEEDBACK:** i gruppi ritornano in aula per fare il punto sui risultati della settimana ed avere un primo feedback da parte dei coach e dei rappresentanti delle aziende
16:00 - 16:30 **LABORATORIO: Ca' Foscari Competency Lab - to be confirmed**
16:30 - 18:00 **PILLOLA CON L'ESPERTO: "Metodologia SCRUM" Dott. Giovanni Conz, Founder di Uniwhere e Project Manager at Toshiba Europe GmbH**

WEEK 3 - DEFINITION

Ca' Foscari Zattere - Venezia

Lunedì 03/10

14:00 - 17:00 TOOL CHOICES: i gruppi di studenti si ritrovano in aula per approfondire la fase di **DEFINITION** e selezionare strumenti e metodi di lavoro da utilizzare durante la terza settimana. Durante i giorni successivi i team sono lasciati liberi di lavorare in gruppo, sul campo, fuori dall'aula

Venerdì 07/10

14:00 - 17:00 OUTPUT E FEEDBACK: i gruppi ritornano in aula per fare il punto sui risultati della settimana ed avere un feedback da parte dei coach e dei rappresentanti delle aziende

17:00 - 18:00 PILLOLA CON L'ESPERTO: *to be announced*

WEEK 4 - IDEATION

Ca' Foscari Zattere - Venezia

Lunedì 10/10

14:00 - 17:00 TOOL CHOICES: i gruppi di studenti si ritrovano in aula per approfondire la fase di **IDEATION** e selezionare strumenti e metodi di lavoro da utilizzare durante la quarta settimana. Durante i giorni successivi i team sono lasciati liberi di lavorare in gruppo, sul campo, fuori dall'aula

Venerdì 14/10

14:00 - 17:00 OUTPUT E FEEDBACK: i gruppi ritornano in aula per fare il punto sui risultati della settimana ed avere un feedback da parte dei coach e dei rappresentanti delle aziende

17:00 - 18:00 PILLOLA CON L'ESPERTO: "**Public Speaking and Presentation**" **Dott.ssa Manuela Marangoni, Senior Trainer, Talent Partners srl**

WEEK 5 - SOLUTION

Ca' Foscari Zattere - Venezia

Lunedì 17/10

14:00 - 17:00 TOOL CHOICES: i gruppi di studenti si ritrovano in aula per approfondire la fase di **SOLUTION** e selezionare strumenti e metodi di lavoro da utilizzare durante la quinta settimana. Durante i giorni successivi i team sono lasciati liberi di lavorare in gruppo, sul campo, fuori dall'aula

Venerdì 21/10

14:00 - 17:00 OUTPUT E FEEDBACK: i gruppi ritornano in aula per fare il punto sui risultati della settimana ed avere un feedback da parte dei coach e dei rappresentanti delle aziende

17:00 - 18:00 PILLOLA CON L'ESPERTO: "**Ideation**" **Dott. Andrea Maragno, Partner co-founder, JoeVelluto**

WEEK 6 - DELIVERY/DEMO DAY

Ca' Foscari Zattere - Venezia

Lunedì 24/10

14:00 - 17:00 TOOL CHOICES: i gruppi di studenti si ritrovano in aula per approfondire la fase di **DELIVERY** e selezionare strumenti e metodi di lavoro da utilizzare durante la quinta settimana. Durante i giorni successivi i team sono lasciati liberi di lavorare in gruppo, sul campo, fuori dall'aula

Venerdì 28/10

14:00 - 17:00 **DEMO DAY**: i gruppi di studenti presentano le soluzioni alle aziende

Appendix 2

Example of a personas elaborated by the team of “La Donatella project” of the agri-food edition.



Nome: Vanessa

Età: 25

Professione: Dottoranda

Città: Firenze

“Ho bisogno di giornate da 48 ore”

Profilo

Vanessa è una dottoranda presso l'Università degli Studi di Firenze, città in cui vive con le sue due coinquiline. E' sempre molto impegnata durante la giornata con ricerche da fare, professori da contattare, libri a visionare e molte altre cose. Durante il poco tempo libero che ha a disposizione le piace fare sport o uscire con gli amici. Ma c'è una cosa che proprio odia fare: perdere tempo perché non ne ha mai abbastanza.

Interessi



Per quanto riguarda il consumo di dolci, a Vanessa non interessa molto la provenienza di questo, le basta che ci sia quando ne ha bisogno. Può capitare una giornata di riposo piovosa e quindi Vanessa decide di preparare un dolce da sé per portarlo ad una cena con degli amici oppure che una giornata piena di impegni dove urge passare in pasticceria o in supermercato per presentarsi con qualcosa in mano, fresco o congelato che sia. Il tutto però sempre facendo caso al prezzo, perché va bene la qualità, ma non essendo né lei né i suoi amici grandi intenditori, ci si accontenta di quel che c'è.

Appendix 4

Prototype of the “Squeezing Straw” made by the “Corefood” team during the Agri-food edition of Active Learning Lab.

