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STRUGGLES AS TRIGGERS

IN A DESIGN-THINKING JOURNEY

Accepted (peer-reviewed) Version – CIM - Coco, Calcagno, Lusiani

Abstract

Scholarly and practitioner literature have both described the potential benefits of Design Thinking (DT) to develop innovations. Innovation processes are widely characterized by continuous competing demands, which generate tensions. The paper analyzes a DT innovation journey, focusing on the struggles and triggers of participants as they work through conflicting demands. Following a qualitative inductive research design, the study reports on the experience of a group of management students exposed intentionally for the first time to the introduction of DT practices in a class setting. The originality of the paper lies in the fact that it analyzes participants' particular points of view, including feelings and cognitions, during the overall process. This angle allows us to identify and describe three main struggles and triggers (destabilizing, non-deciding, abstracting) for new adopters in each step of the DT process, which represent a cultural clash with their background. The study contributes to a better understanding of DT by acknowledging its challenges and costs, to be able to apply it as an organizational resource when facing competing demands. Moreover, it aims to provide some initial steps on how to move organizations to a culture based on collaboration and experimentation, able to better cope with innovation tensions.

Keywords: Design Thinking, innovation, tensions, marketing education, competing demands, ethnography

Introduction

In the recent years, a growing stream of organization and management researchers has turned its attention to Design Thinking (DT) as an integrative approach for organizations to cope with the tensions posed by the innovation challenges of our contemporary business environment. While several scholars view DT as a strategic resource to develop the right skills for competitive success and innovation (Brown, 2009; Carlgren et al., 2016) (Dumas & Mintzberg, 1989; Hargadon & Sutton, 1997; Verganti, 2003); Liedtka & Kaplan, 2019), others started to criticize it for being loose, too practitioner-oriented, and confused in its conceptualization (Johansson-Sköldberg et al., 2013), or ill-implemented and often abandoned without realizing its potential benefits (Jahnke, 2009; Yoo et al., 2006) if not culturally supported in the organization (Elsbach & Stigliani, 2018).

This paper addresses this “cultural clash” (Elsbach & Stigliani, 2018), i.e. the challenges of introducing DT methodologies in a context where these new mindsets and techniques could collide with the cultural frameworks deeply ingrained in the organization and/or in traditional management education. In particular, our purpose is to develop a processual understanding of the lights and shadows of DT from the lived experience of participants.

For this purpose, we followed closely through the process of introduction of DT in a context of traditional management education in a master's program in Innovation and Marketing in a leading University in Italy and explored (a) what happens for the students involved, and (b) what is generated through the process. We found that students faced three main struggles (destabilizing, non-deciding, abstracting) in each phase of the DT process, but also noted that these very struggles gradually worked as triggers of quite innovative ideas, too. Hence, we conclude that DT is a process of both struggling and triggering innovation, and, in turn, that triggering innovation implies struggling through the process. Therefore, our contribution is twofold: first, we prove that DT can be used as an organizational resource (Kimbell, 2011) to facilitate the sharpening of skills which will enable people to face competing demands in innovation processes (Brown, 2009); second, by unpacking the

struggles, we highlight the motivations that possibly lead to cultural clash in DT implementation (Elsbach & Stigliani, 2018), but we show that they are functional to the process, in that these same struggles are the very triggers of innovative ideas. Accepting struggles (as triggers) sets the groundwork for a wider reflection on how to train people to cope with and work through conflicting demands. These insights may inspire organizations based on traditional values, as productivity and analytical thinking, to move to a more flexible culture based on collaboration and experimentation.

The paper is structured as follows. The first section reviews perspectives on-innovation in organizations and on DT in the management literature. Then, we present our methodology and illustrate our findings on (a) the struggles encountered by individuals during a DT journey in a management education setting, and (b) the innovative outcomes that were triggered by the process. In conclusion, we will discuss these findings in light of the relevant literature.

Theoretical Background: lights and shadows on DT for innovation

The innovative potential of tensions

Innovation journeys are typically characterized by tensions (Lewis et al., 2002), paradoxes (Miron-spektor et al., 2011), contradictions (King et al., 1991), and dilemmas (W. K. Smith, 2014). Tensions are described at all levels of analysis and concerning antecedents, processes, and consequences of innovations, and can, therefore, be considered pervasive within organizations attempting to innovate. Understanding and managing these tensions are becoming necessary for effective innovation to occur (Garud et al., 2011), and the possibility of training individuals and groups to learn how to deal with these tensions could be a competitive advantage for firms.

Previous research highlights various approaches for managing tensions: (1) accepting, (2) accommodating, (3) differentiating/integrating (Smith, 2014), and (4) synthesizing (Gaim & Wåhlin, 2016). However, scholars in this field stress the fact that to be able to manage tensions, it is necessary in the first place to reframe them to bring to the surface the elements that prevent people from solving

the conflict. This implies finding a new perspective that eliminates the disparity and duality between competing demands, and goes beyond compromise and reconciliation, to synthesize them and to fuel creative potential into an innovation process.

Lights on Design Thinking for innovation

Companies increasingly value creativity, flexibility, and adaptability skills, which are necessary to cope with tensions but are poorly provided by the rational models of traditional managerial education (Hatchuel et al., 2010). To enact the innovative potential of tensions and to develop the appropriate capabilities to operate in contemporary companies, new learning approaches are then being explored. Innovation theory has sought new sources of inspiration by studying design activities, tools, and processes, what started to be called Design Thinking (DT) (Hargadon & Sutton, 1997)(Feldman & Boult, 2005; Stevens & Moultrie, 2011; Ward et al., 2009).

Three main perspectives on DT can be pointed out. A first perspective is centered on the observation of DT as a new set of approaches, practices, and capabilities enabling organizations to cope with complex and “wicked” problems (Buchanan, 1992; Brown, 2008; Liedtka, 2015; dell’Era et al., 2018) of today’s organizations (Dorst, 2011). DT is a scalable, iterative, non-linear, and human-centered process (Brown, 2008) that can convert problems into innovation opportunities. Following the three steps of this process – *inspiration*, *ideation*, and *implementation* – DT offers a structured methodology for generating innovation — a clear process that begins with ethnographic research to develop empathy and define user needs, then moves to ideation to explore possible solutions for improving the user experience, and finally refines concepts through an iterative process of prototyping and testing. The implicit promise of control over creativity, in an optimized, predictable, and rigorous way, emerges from the practice of design consultancy, but its relevance extends well over the adoption of a practice learned from designers. DT thus is part of a design-inspired approach to be used and taught in organizations to foster innovation and customer – or better *user* - real satisfaction ((Johansson-Sköldberg et al., 2013).

A second perspective recognizes DT as a set of cognitive tools whose application, in combination with other established analytical techniques (Martin, 2009) reduces the classical biases affecting the micro-processes of innovation (Liedtka, 2015). In this perspective Dunne and Martin (2006) and Martin (2009) argue that DT offers something of value to managers, stressing the relevance of wicked problem-solving for business and management. The combination of abductive, inductive, and deductive reasoning (Martin, 2009) identifies a set of features, distinguishing DT from other innovation approaches (Dell’Era et al., 2019) and supporting managers who are ill-served by contemporary management education.

A third perspective opens the debate to the actual possibility to change the organization coherently with the change implied by the adoption of a DT approach. Design is identified as a strategic resource for competitive success (Dumas & Mintzberg, 1989; Hargadon & Sutton, 1997; Verganti, 2003), useful for both incremental improvements and radical changes (Liedtka & Kaplan, 2019), and offering non-designers "a number of mindsets, practices, and techniques" (Carlgren et al., 2014) to help organizations deal with innovation tensions such as exploration and exploitation (Martin, 2007). Thus, companies and universities start investing in programs, courses, and workshops to embed DT throughout their curriculum as a way of introducing non-designers to the benefits of design practices (Beckman & Barry, 2007; Dunne & Martin, 2006; Meinel & Leifer, 2011), sustaining innovation in the long-term (Calgren, Elmquist & Rauth, 2014).

Shadows on Design Thinking for innovation

Following the third perspective, the encounter of Design Thinking practices with the organization can produce tensions and challenges, being a driver of strategic success, as well as of complexity and cultural clash (Elsbach & Stigliani, 2018).

On the one side, DT has been criticized for being loose, too practitioner-oriented, and confused in its conceptualization (Johansson-Sköldberg et al., 2013; Carlgren et al., 2014), or ill-implemented and often leading to its abandoning without realizing its potential benefits (Jahnke,

2009; Yoo et al., 2006). On the other side, scholars increasingly started to note that the business world does not seem very well equipped to embrace a design, system-oriented way of thinking (Porter & Heppelmann, 2015), and the impact produced by those techniques in the inner core of the organization is underestimated. DT can be better implemented if we consider its relationship with the organizational culture defined "as comprising the underlying norms, values, and assumptions that defined the "tight way to behave in an organization (Schein, 2010)"(Elsbach & Stigliani, 2018, pag. 2279). In other words, DT seems to support and being supported by a specific kind of organizational culture, more open to failure and experimentation.

All in all, while organizational members can draw on and be informed by the approaches and the mindset of DT when dealing with innovation tensions, there is a call for further research on the challenges and costs of introducing DT methodologies in a context where these new mindset and techniques could sometimes collide with cultural frameworks deeply ingrained in the organization and/or in traditional management education.

This is the point of departure for this paper, which explores the introduction of DT in a context of traditional management education, analyzing the process and the outcomes of the student's innovation journey, to develop a processual understanding of the lights and shadows of DT from the lived experience of participants.

Research Method

Positioned in the research streams on tensions and DT, this paper focuses on the challenges of enacting a DT approach from the point of view of participants, and asks: *How do participants live a DT process? What is generated through the process?* In particular, it explores the process of introduction of a DT approach in a class of marketing students attending a school of management, by reconstructing the process from the eyes of the participants. This particular angle provides in-depth insights into the challenges in terms of change of mindset that introducing a DT approach entails.

Consistent with its explorative nature, the study follows a qualitative inductive research design, the most useful approach when there is a need to develop a rich understanding of specific phenomena (Langley, 1999).

The setting is an Innovation Management (IM) module within the master's degree program in Innovation and marketing at a leading Management University. The module combined theoretical lectures with hands-on group work to experiment with the DT approach in practice, as explained below. The study encompasses both students' and instructors' points of view and relies partly on participant observation (Barley, 1990) and auto-ethnographic material (Boler & Zembylas, 2003; Van Maanen et al., 2007)

The first author has a professional background in design. Her role in the field was that of teaching assistant, with tasks related to the practical training and tutoring of participants in the development of DT skills. The second author is Professor of Innovation Management and was the instructor of the IM module. These two researchers took field notes and kept a research diary to note their observations and reflections during the course. The third author was involved as a management researcher in subsequent rounds of data collection (formal and informal interviews with students) and analysis. This design of roles allowed the potential bias of the participant researchers' views to be counterbalanced while retaining the richness and depth of the insights derived from the techniques of participant observation and auto-ethnography.

The setting

The IM module was an intensive 30-hour course of five weeks, aimed at lecturing students on the theoretical principles of innovation from a marketing perspective, with a focus on DT approach and tools. The class was composed of 43 first-year graduate marketing students, all around 25 years old, with a background of undergraduate studies in business administration, where values as productivity, perfectionism, and competitiveness are strongly encouraged. The focus on DT was infused with the specific intention to challenge the students with a different set of activities, to

enhance a more collaborative and experimental attitude. The module was structured as follows: each week two lectures of theoretical background were followed by one-day laboratory activities. Both the lectures and the lab activities revolved around the three formal stages of the classical process of DT innovation: *inspiration*, *ideation*, and *action* (Brown, 2008; Martin, 2009).

At the beginning of the module, a challenge was launched: students were asked to develop an idea for how citizens and visitors could live, coexist, and thrive in the highly touristic city, where the University is based. As a starting point, the instructors offered four stereotyped points of view: those of students, commuters, tourists, and inhabitants. Each one represented a typical and competing vision of the city in terms of required services, desires, and critiques. The main challenge was to overcome the stereotypes and to learn how to cope with competing demands, such as, for example, a city that bases its business model only on the touristic inflows and a city that demands to stay vibrant to provide people with residency, employment, and opportunities to study.

Students formed nine teams of four to five people and were invited to work on the assigned design challenge for that target stereotype. The DT approach was intended as a means to abandon stereotypes and start acknowledging the problem “for real.” In other words, the instructors induced students to understand a complex system with organizational tensions, like a city, and to apply a DT approach to design responses that would address competing demands with a sustainable and long-term perspective based on user focus, collaboration, and experimentation.

The instructors observed and mentored the groups during the processes of *inspiration*, *ideation*, and *action* (Brown, 2008; Martin, 2009). In each one of these phases, students produced three corresponding partial-stage deliveries, and they concluded their group project with a final presentation based on a prototype to receive feedback on their ideas.

To measure the innovativeness of the student’s projects, we referred to the ongoing discussion in innovation literature (Crossan & Apaydin, 2010; Kristensson & Magnusson, 2010) and DT (Brown, 2008; Carlgren et al 2016), which suggests three dimensions: desirability, viability, and feasibility. A high level of these dimensions signals an innovative idea (Kristensson et al., 2004) and

constitutes a completely new value proposition or the development of an entirely new business idea. In our setting, the higher the distance from the given stereotype, the higher the desirability of the students' project; the stronger the underlying business model, the higher the "feasibility and viability" of the project; and, overall, the higher the distance from models and already existing cases, the higher their innovativeness (Table 1)

TABLE 1

Data collection

Capturing the introduction of a DT approach in action requires close observation of everyday activities and a deep engagement in the field, observing and interacting with the students. It also requires finding means to access participants' cognitions and emotions as the process unfolds. This led us to rely on several data sources, collected intensively over the four months of the module, from September to December 2015, with follow-ups until May 2016:

- *Instructors' field notes and diaries from direct participant observation*: the first two authors observed the course activities and wrote their notes throughout the five weeks. This allowed them to keep track of their own views of students' actions, reactions, and interactions as they progressively engaged with the practice and produced deliveries while the project unfolded.
- *Students' individual process books*: to obtain granularity regarding the learning process, we encouraged students to keep a personal diary, called process book, throughout the course. Forty-one process books were collected at the end of the module, allowing us to track not only the unfolding of ideas and project developments but also the particular point of view of each student (including feelings and cognitions) in the process.

- *Groups' partial and final deliveries*: these artifacts can be seen as temporary reification of the groups' collective and emerging ideas, which, in combination with the individual process books, allowed us to make sense of the students' progressive experience. All in all, we collected 27 group deliveries, one for each of the three main stages of the process.
- *Focus group* at the end of the module, in the form of a feedback session (November 2015): to have comparable feedback and to structure the discussion, researchers provided students with a reflection template in the form of a timeline, in which each participant could sketch his/her own experience, reflecting on the ups and downs of the learning journey. Therefore, we also collected 25 templates (provided by instructors) with participants' feedback.
- *Semi-structured interviews* with the students during, right after (November 2015), and well after the course (May 2016). November interviews were real-time, conversational mini-interviews conducted during or right after the course, to access students' views about the process that they were going through, and they were purposely unstructured. May interviews were retrospective and semi-structured interviews, lasting about 15–30 minutes, that covered the following points: retrospective feedback on students' experiences, how they perceived the course, and what they had learned. These interviews were useful to better anchor and substantiate our emerging interpretations about the change and the challenges that the course entailed.

All in all, we believe that engaging in the collection of these rich data allowed us to get close to the students' experience, both individually and collectively.

Data analysis

Iterating among in-depth analysis of field notes, transcriptions of interviews, and documentary materials – in particular process books and group deliveries – we reconstructed the experience of each

group and each student during the three DT steps. The analytical process was highly iterative, involving several rounds of coding and connection to the innovation and DT literature.

Stage I: Developing the descriptions of the learning journey

A first round of exploratory open coding, by cross-referencing the instructors' observations, the informal student interviews in class, and the group deliveries, revealed several ongoing struggles of the participants. Students attempted to fit a DT approach (which is typically inductive, creative, collective, and addresses ill-defined problems) with their traditional management problem-solving attitude (which is deductive, analytical, individualistic, and addresses well-defined problems in search of the best solution – i.e., an either/or approach). This led us to take each individual process book into deeper consideration, in order to better understand how students perceived this new learning experience and to focus on struggles.

Stage II: Identifying individuals' and groups' struggles

Students' process books were coded in two rounds. First, some characteristics emerged around the format (use of colors, photos, size); time (sequentially presenting information, data, and quotes from lectures); steps in the process (contextual observations, notes on interviews, quotes from interviews); and personal attitude (anticipating answers, personal reflections, research of information, analytical graphing, drawing and sketching). Comparing and organizing these characteristics, we proceeded with a second round of coding, developing categories regarding students' cognitive approaches (deductive versus inductive and analytical versus creative), and regarding the struggles that emerged in every stage of the process (namely struggling with *destabilization*, *abstraction*, and *non-deciding*).

Stage III: Identifying long-term skills

To reinforce the analyses, two other informal processes of observation and evaluation took place. We analyzed and compared longitudinally the attitude of the same class of students during their attendance of the subsequent Business Plan course, and we conducted a set of semi-structured interviews at the end of the semester (the May interviews) to compare previous first impressions with more deliberate reflections six months after the end of the course. The analysis of these interviews helped to better picture the correlation and persistence of innovation skills developed to deal with competing demands during this journey in another context over time.

We will now organize our findings presenting, first, the three main struggles that emerged from our analysis, report our findings in a processual manner and using the three main stages of the DT process as a bracketing device (Langley, 1999); second, we will show what the whole process generated in terms of innovative outcomes.

Struggles in an innovation journey

DT was challenging the students to work in ways that run counter to routine patterns of thinking, established with previous training, and to learn instead to collaborate, deal with ambiguity and experiment with various solutions. In each one of the three DT phases, we observed struggles with the *destabilization* that DT purposely introduces, versus a demand for stability and control over the process; struggles with the *abstraction* activity to favor the potentially prolific ideas that DT requires, versus a demand for answering to specific events and facts; struggles with *non-deciding*, namely the DT requirement to cope with an ambiguity of clues, versus a demand for rapidly solving a given problem and to let the process to continue openly.

TABLE 2

Phase 1: Inspiration ... or searching for solutions?

The inspiration stage in DT consists of understanding the problem, doing field research, and organizing information synthetically. This includes one of the core principles of DT: engaging with real people – particularly the users of the innovation project.

Concerning the challenge that instructors presented to IM students, once the groups chose their main “target”, the instructors invited the groups to engage with the *inspiration* practice. This implied that students understood the people for whom they were designing. To design for each group, the instructors asked students to build empathy and approach the issue “without assumptions” (Instructor 02 Diary, 29 September 2015). Students were invited to make contact with the *real users* (no longer referred to as “target” – the first change in language), observe them in their daily life, interview them, and synthesize group findings to discover meaningful *needs* and *insights*.

Struggling with destabilization

Even at this early stage, students felt destabilized. For example, when students were invited to try a first observation experience, they reacted by expecting higher constraints, and there was a demand to re-establish a clear and stable environment: “*What do we have to observe exactly? How should we report it?*” (Instructor 02 Diary, 25 September 2015). Similar requests about frames and guidelines were raised as the groups started their fieldwork for inspiration. In one of the retrospective interviews, one student reported on the struggles on framing this new activity with their previously acquired knowledge: “*This design, from our point of view, had little to do with marketing. We were there to study marketing!*” (Int. retrospective, Jack, 27 May 2016).

In the inspiration phase, students’ process books are punctuated with comments about discomfort or confusion on what to do and how to perform the required task. They felt the loss of reference points on multiple levels, as a student reported, “*we learn how to interview a person without judging! It is so difficult.*” This same student, after running an observation in the touristic city, noted

the following in her process book: *“Long way home, I couldn’t find the way back! Too many tourists. We missed time and ... the bus!!!”* (PB, F.S., 07 October 2015). Another student expressed this destabilization well in his process book: *“Big cultural shock as previous academic experiences seldom encourage you to take action. Maybe a small step for others but a big leap for me”* (PB, M.F., November).

Struggling with abstraction

Students demonstrated a rather passive attitude in terms of the ability to go beyond the immediate surface of things. None of the nine groups really challenged the target stereotypes the instructors gave them, even though they were expected to get rid of stereotypes and explore “real people” in the field.

The challenge was broad on purpose and it required students to explore and understand the real context to identify the problem. However, the students’ observations, reported in the process books, tend to remain anchored on supporting the assumptions they got on their stereotypes (*“We kind of expected to explore how tourists with a specific budget go around this city”* – first assignment – Group 7; *“Our assumption about [workers] being not motivated [to visit the city] was correct. So, not being motivated, workers don’t find the time to walk around the city”* – first assignment – Group 1) rather than capturing direct observations. Moreover, they direct their attention on very specific and precise micro issues reported by specific interviewees (*“This city is far more crowded now than a few years ago”* – interviews from second delivery – Group 7; *“How to find a small waterbus station?”* – observation from first assignments – Group 6) without the effort of abstracting and exploring a possible domain of the problem. Students claimed great difficulty in observing reality with a magnifying lens and then abstracting meaning from this observation, and they instead remained attached to manifestations of previous beliefs or preferences:

“We don’t know the problem enough and we are not really interested in it (directly). [...] The group is not really interested in this topic and prefers to focus on problems it knows better.” (PB, P.F., October)

Struggling with “non-deciding”

As a general tendency, in the inspiration phase, virtually all students proceeded by structuring their hypothesis and processed them in search of confirming the best one; a strong decision attitude toward problem-solving emerged, instead of a more explorative one. This practice is very evident in the following passage, where a student reported in her process book, *“(before going in the field) I divided all my questions into 5 macro areas”*, then she added the following note to herself: *“[I need to] choose the right one!”* (PB, Z.L., October). Similarly, some students even at this early stage, felt the need to fix on their process book, their final solution, as *“for each category [of tourist] insert a 24-hour guide about what to do in the city (path to follow where to eat breakfast and so on ...)”* (PB, P.F., 22 September 2015; page one, first entry in the process book) and directly jump to a preconceived solution that resonate with their assumptions.

Moreover, we also found the implicit assumption of observer’s superiority as reported in capital letters from one of the students process book: *“HOW TO CHANGE THEIR (workers) MIND”* (PB, P.J., 6 October 2015), again reflecting the tendency to immediately jump to a solution for the target and dismiss data that could contradict their previous beliefs. Just very few students critically recognized their strong decision attitude, as a student noted to herself at the beginning of the process (the sixth day): *“STOP SEARCHING FOR A SOLUTION RIGHT NOW!”* (PB, S.S., October), written in red capital letters. *“We were really focused on the objectives,”* explained a student in one of the retrospective interviews, *“[but] then we noticed that we were going the wrong way”* (Int. retrospective, P.J., 27 May 2016).

Phase 2: Ideation ... or the stereotype of the genius invention?

Once the team has developed a clear understanding of users' needs, the process moves to ideation—brainstorming possible solutions to meet those needs. In this phase, the instructors asked each group to identify unique and meaningful insights from the observations and the interviews performed and to run three brainstorming sessions to generate concepts, using the guiding question “*how might we?*”.

Struggling with destabilization

Students were asked to reflect on the insights gathered, but as reported in a retrospective interview, they felt this task as something “new”, completely different from the way they do things and the way “they are”:

“it was a very new process. We needed more structure, more explanations, a clear direction. This is the way I am, but I need to know precisely where I am, what I need to do, and what is the objective, and then I can work with a challenge.” (Int. retrospective, P.A., 27 May 2016)

Groups and individuals felt destabilized, even on a personal level and unable to recollect the information from the previous steps in the ideation phase. Instructors then provided students with a template to construct the “*how might we?*” questions: “who/need/what.” Suddenly, groups accelerated the following brainstorming sessions in a painful rush and without a proper certainty of the path to follow. One of the students reported, “*This process is continuously destabilizing me*” (Int., P.A., October 2015).

Struggling with abstraction

Students engaged with this task with a great deal of effort and many process books report this phase in great detail. However, students seemed to lack the abstract conceptualization and reflective observation skills that are preferred requirements (Berg, 2016), because in many of the cases these insights are just a repetition of what was stated in the interviews, as in the following two examples:

Example from Group 1: “Interview quotes: *When I’m inside the train I think about what I need to do the day after or I surf the Web*; Insight: “improve workers’ stay in the trains” (PB, S.S., 13 October 2015)

Example from Group 7: “Interview quote: *The city can be a very expensive city but it has a very old tradition about food and can offer a great gastronomic opportunity, avoiding touristic places*” Insight: “warn tourists and incoming foreign workers about the city’s prices” (PB, A.B, 18 October 2015)

In other cases, the link between the interview/data and the derived insight was not clear at all. For example, one student, working on the “target” inhabitants, reported an observation about the “crowdedness of the streets of the city” and added his own assumption “because of tourist flows” (PB, S. R.). Then, in the ideation process, he lends more credence on his preexisting hypothesis and follows a possible misinterpretation of the problem by asking as a brainstorming question: “*how might we create private streets for inhabitants?*” Additionally, we also observed that none of the groups went back to interviews and observations to check for their assumptions, while instead, they tended to run on interpreting the data soon after their collection without corroborating with multiple observations.

Struggling with “non-deciding”

The decision attitude noted above was even stronger during the ideation stage, whose purpose instead would be to move away from the original perception of the problem toward a new focus gained from the data collected in the inspiration phase. Even if the students engaged in this stage with a great amount of effort, as clearly reported in one of the process books: “*we discuss the interviews and we try to analyze them. We translated every interview and tried to highlight the insights and the*

useful quotes” and *“We met again and we wrote down on many many sticky-notes our main ideas and understanding from the interviews.”* (PB, T.B., October), once again, most of the groups were suffering from the fixation bias (S. M. Smith et al., 1993), and they were stuck on an idea heard during the interviews or on their initial ideas, without generating fresh concepts. Indeed, some individuals fell in love with their idea so much that they used the inspiration phase to tweaking and justify their initial thoughts, even against evidence suggesting a different set of possible solutions. As reported in one of the process books: *“Just because it (my idea) is complex, doesn’t mean it’s impossible! IT’S NOT IMPOSSIBLE!”* (PB, V.A., October; written in capital letters, stressed, in the center of the page).

During this phase, another interesting attitude toward ideation emerged: *“DON’T INVENT. If something doesn’t exist yet, it means it is not working”* (PB, T.B., October). Here, the reality seemed to acquire a negative value, it was seen as an anchor against the possibility of creating something different. In other words, students seemed to swing between the heroic view of the genius inventor (*“it’s not impossible”*) and the conservative view of the administrator (*“don’t invent”*) – both far from the view of ideation that underlies DT innovation.

Phase 3: Action ... or inaction?

In DT the implementation (action) phase is the path toward a final solution. However, it requires an explorative attitude to test, first, for a variety of possible solutions. DT in this phase requires “to build to think”. This involves prototyping, low-fidelity, fast, inexpensive, and simple, manifestations of concepts that enable the rapid generation of user feedback. A prototype is a potential tangible “solution so far”, to engage with users, to continue the understanding of a taken direction, therefore it is not supposed to be “the final solution”.

During the action phase, we asked groups to rapidly develop and build their concepts, and to test their prototypes with potential users and then pitch the concept and feedback received to the class. We proposed a scenario-based prototyping tool to visualize and communicate the intended solutions.

To promote this idea of “making it real,” we engaged students in a warm-up exercise, “the egg drop challenge”, a classic team-building activity, in which teams of 3–5, given some materials, are challenged to design and build devices for protecting an egg from 2 meters drop. In a very limited time – 15 minutes – this activity allows teams to develop creative thinking and understand what prototyping is meant to be, and at the same time, we were expecting them to build confidence in their own ability to manage the work (Warner, 2005).

Struggling with destabilization

The egg activity was embraced with great fun and hilarity. Students made videos and laughed about the activity, but it seemed that they did not truly understand the meaning of the game. They apparently felt it as separate from the design process; this was hinted at by the fact that not one of the process books mentions a word about this specific moment. However, when it came to their concepts for the city, three groups, additionally to the scenario, tried to build a physical prototype of their ideas (a map – Group 2, cardboard app screens – Group 5, a set of cubes – Group 7) to better clarify and communicate the solution but just for the final presentation in class, not to test it with users. In other words, they tended to fall back on the normal formats of presentation and used the prototyping tool to seek validation, rather than embrace criticisms.

Struggling with abstraction

All groups delivered just one final solution, instead of keeping multiple ideas alive. Scenarios were rough; the majority did not craft a proper setting for their solution or an activity sequence to indicate how they imagined people using it. They seemed to have trouble using their imagination for something that did not yet exist. Furthermore, during the presentation, no iterative process was mentioned. The final presentation was enacted to showcase their ideas instead of receiving feedbacks and reactions from potential users. Although instructors had encouraged groups to take notes of the feedback received, not one student reported any in the process book.

Struggling with “non-deciding”

During their presentation, the groups presented each idea as a final concept, they perfected the solution and rejected critics. Some of them did not test the prototype with users. Instead, to explain the value of the idea, groups preferred to apply an analytical framework, analyzing the problem in theory and not supporting their ideas through empirical observations. Indeed, teams did not report any of the quotes from the inspiration phase to support the value of the project for potential users. Their analytical propensity (Boland & Collopy, 2004) seemed to somehow restrain their possibility of trying something out physically.

Outcomes of the innovation journey: What was created despite/through the struggles

Despite the struggles illustrated above, at the end of the five weeks, students presented a surprising variety of deliveries and a certain degree of innovativeness. Three groups worked on concepts for students; two for commuters; two for tourists and two for inhabitants. The projects for students pursued the intention to facilitate their daily life activities such as studying (StudIn) and socializing (Whe nice) but also experiencing in advance the possibility to live in rented and share flats for the first time (Trust week). The concepts developed for commuters aimed to encourage "life" besides daily jobs in an astonishing city. So, they thought to work on routines already in place, like having lunch or coffee breaks to sightseeing the city (lunch boat) or fraternize with other workers (#Easy).

The concepts for inhabitants move in two different directions, one exacerbate the need to have premium service just for inhabitants to distance them from mass tourism (boat sharing), the other instead, works on the compromise of attracting foreigners to establish their home in the city to make it “lively” again. Finally, the concepts promoted for tourists consolidated the idea of exploiting the beauty of the city to have "a dream experience" during traveling (UnWrap) or make it playful (Cluerist) (detail description in Table 2). Three of these projects can be considered to show a high degree of innovativeness because they built from real people insights and attempt to envision a new

business model, four were expressing a medium level of innovativeness by building on concepts already existing but with higher distance from the stereotypes and the rest with low, but none was completely copying something already out in the market.

TABLE 3

Another outcome was that, although students were initially inclined to undervalue the collective intelligence in favor of a more individualistic approach, during the process they increased the time spent collaborating face to face in an intense and continuous interaction, using a set of practical tools to facilitate not only a one-way communication but a two-way conversation (Hooper-Greenhill, 1999) :

“It was fantastic to work in groups. We were mixed and randomized. This was a stimulus for the student’s integration. I worked with new people, which allows us to create new dynamics as colleagues and as friends too.” (Int. Retrospective, P.J., 27 May 2016)

Our evidence also suggests that the process led students to embrace a more open mindset in their approach to problems. Indeed, while students reported a low level of confidence overall and a high level of uncomfortable attitude in each phase of the innovation process, one reported:

“What Design Thinking gives you is another way of thinking and reasoning. It gives you the possibility of not taking for granted the things around what you think you know.”

“DT opens your mind, it makes you reason ... it also breaks your mind but then it helps you to rebuild it. Now whenever I am facing a problem, I start to think about what I know and what it is really about what I think to know.” (Int. retrospective, P.A., 27 May 2016)

Moreover, during the following course of Business Plan, the majority of students spontaneously used the design methods learned in the Innovation Management course with new autonomous confidence. As reported during one of the retrospective interviews,

“We went to conduct an interview during the Business Plan module, and we knew how to deal with it. We let them speak and add information about the issue we were investigating. At the same time, we also observed who was in the same space, who entered ...” (Int. retrospective, P.A., 27 May 2016).

The instructor of the following course reported a surprising dimension of creativity and playfulness that the students exhibited during their presentations and case analyses. She also noticed an improvement in the depth of the observations requested and the ability to dive into reality to analyze it. As she said, *“the outcomes were positively unexpected, [and] groups were able to distance their thoughts from ready-made cases provided by the literature and were able to substantiate their own analysis by meaningful observations and interesting interviews to support them”* (Int., Business Plan instructor).

Figure 1 summarizes our findings, visually displaying the three typical struggles which were repetitively encountered by the students in each DT phase, but which also triggered an increasingly innovative orientation among the students.

FIGURE 1

Discussion

This paper addressed the “cultural clash” (Elsbach & Stigliani, 2018) that the introduction of DT methodologies potentially creates in traditional organizational or educational settings, by exploring the process of DT implementation in a business school class and the outcomes that were progressively generated through the process.

We found that each one of the three DT phases (inspiration, ideation, action) was characterized by three typical struggles (destabilization, abstraction, and non-deciding). In each phase, the struggles

presented different nuances due to the specificity of the step of the process, but it is their repetitiveness and their progressive softening that captured our attention.

During the inspiration phase, destabilization, abstraction and non-deciding struggles emerged in response to the strong dominance of students' analytical and deductive approaches related to traditional business school learning. Students were looking for stability, processing a given set of alternatives and finding the solution since the beginning, instead of leaning on a more inductive approach, open and explorative. Then, during the ideation phase, we noticed a less strong destabilization struggle and a visible effort to engage in a more open and collective ideation. Students perhaps coped better with the lack of predefined frameworks, however, the tendency to look for solutions close to the preconceived problem (abstraction struggle) and the tendency to stick strongly to a deduced decision (non-deciding struggle) were still present. Finally, during the action phase, students did not understand the meaning of multiple prototyping, and they tended to fall back on the traditional format presentation, with one final solution and showcase their ideas. However, in this phase, the struggles seemed weakened and surpassed by a more active attitude in their presentations. Students acted as groups, all supported collective ideas, and half of them even engaged in physical probes to support their solutions, which were not expected since they were skeptical during the warm-up (the egg-challenge). Overall, this process generated somewhat innovative outcomes (the students' partial and final deliveries), but, most importantly, it produced a progressive softening of the students' struggling over time.

As suggested by Kolb (1984) the results of this journey can be interpreted as consequences of students taking greater cognitive ownership of their learning through active experimentation (against destabilization), abstract conceptualization (against non-abstracting), reflective observation (against non-deciding). DT activates an alternative framework that leads the participants to potentially more informed and innovative decisions, but it also has some costs. Introducing DT activities slowed down the process and made individuals less comfortable with what they were delivering during the learning process. However, students slowly learned to be proactive problem solvers, who could work on

complex problems with a more flexible and exploratory approach (Kelley & Kelley, 2013). To do this, they started to learn how to interact with and embrace uncertainty and failure, which was the major counterweight to their analytic-dominant approach during the learning process.

Apparently, then, students were able to proceed on their ongoing journey *because* of their struggles. Indeed, students, as emphasized in their process books, found DT valuable *because* it was challenging. This entails that the struggles are the main mechanisms through which the experiential learning (Kolb, 1984) is taking place and, therefore, the main value of DT approach is triggered.

Although not central to our analysis, some incidental considerations can be drawn on the potential role of the materiality of space and facilities in DT processes. In our setting, we acknowledged that the room appointed for the course was not adequate. The environment – fixed desks, chairs, and walls – devoted to normal teaching activities, is designed to promote competitive and individual dynamics instead of collaborative ones. Students however slowly reacted to the environment, for example using objects, like Post-It Notes, a canvas, and a digital report file to transform their acquired knowledge to visualize, communicate, and synthesize their thoughts, overcoming the absence of a physical space for keeping track of such things. The physical dimensions of spaces and materials may influence how individuals and groups deal with the tensions by facilitating (or constraining), with tangible visibility, the reframing of the challenge, the integration of perspective between the groups, and the acceptance and embracing of a divergent point of views to explore different responses. Future field research could direct its attention to this very aspect.

Another avenue for future research could deal with the temporal dimension of change in DT. We investigated the DT process on different temporal dimensions: during its unfolding (real-time observations and interviews), and after its conclusion (retrospective interviews and observations during a subsequent and unrelated course with the same students). While during the training, DT was introduced as a step by step process, with a toolbox to improve a specific set of processes, we could appreciate what took time to sediment and eventually linger in the immediate aftermaths of the process. Future research could extend this longitudinal dimension and investigate the longer-term

effects of a DT journey, exploring whether and how it acts as a powerful means of more established changes.

Conclusion

This work illustrates how hard it is to make DT effective when the subjects are new to the method and have already been trained with an emphasis on analytical tools despite attention to developing synthetic skills. The clash between the managerial imprinting of students and the reframing of sense-making introduced through the adoption of DT tools emerges continuously during the process of learning and produces tensions that are both implicitly emerging and explicitly declared.

The paper thus contributes to an emerging theme in DT that aims to shed light on design tools and their ability to develop the organizational culture (e.g., Elsbach and Stigliani 2018, Fixson and Rao 2014). DT literature was initially seen as a set of practices and tools to be used in the process of innovation (i.e. Brown, 2008), however, it also aims for a larger cultural change in the organization. Recognized as a means to empower people, sustaining the competitive strategy of the organization, DT has both a deep impact on the organization but is also affected by organizational culture. Our study empirically highlights the clashes of the DT process when introduced in an established cultural context. It confirmed that DT could be of powerful use as an organizational resource (Kimbell, 2011) to facilitate the meta-skill of being able to face competing models (Brown, 2009), but it also highlights that DT is not just a set of structured steps that can be applied in isolation (Johansson-Sköldberg et al., 2013; Liedtka, 2015; Elsbach & Stigliani, 2018) and it has costs to take in considerations. The approach is both widely variable and cognitively challenging.

The paper also contributes to the debate on the value of DT by highlighting the motivations that possibly lead to cultural clashes in DT implementation (Elsbach & Stigliani, 2018), i.e. the struggles that emerge in each one of the DT phases. However, the paper goes further, showing how

these struggles are functional to the process, in that these same struggles are the very triggers of quite innovative behaviors. The struggles interfere with the demands of effective innovation outcomes and this can be of high costs for organizations. However, if organizations can embrace and shield the conflicts within the learning process, individuals, following the iterative approach and the repetitions in each step of the same struggles, learn how to overcome those and deploy countermeasures, which will increase the probability that the process will generate a certain degree of innovative results.

Accepting struggles (as triggers) sets the groundwork for a wider reflection on how to train people to cope with and work through conflicting demands. These insights may inspire organizations based on traditional values, as productivity and analytical thinking, to move to a more flexible culture based on collaboration and experimentation.

References

- Agar, M. H. (1986). *Speaking of ethnography*. Beverly Hills, CA: Sage .
- Barley, S. R. (1990). The Alignment of Technology and Structure through Roles and Networks. *Administrative Science Quarterly*. <https://doi.org/10.2307/2393551>
- Beckman, S. L., & Barry, M. (2007). Innovation as a Learning Process: Embedding Design Thinking. *California Management Review*, 50(1), 25–56. <https://doi.org/10.2307/41166415>
- Berg, J. M. (2016). Balancing on the Creative Highwire: Forecasting the Success of Novel Ideas in Organizations. *Administrative Science Quarterly*. <https://doi.org/10.1177/0001839216642211>
- Boland, R. J., & Collopy, F. (2004). Design matters for management, in *Managing as Designing*. Stanford University Press.
- Boler, M., & Zembylas, M. (2003). Discomforting truths: The emotional terrain of understanding difference. *Pedagogies of difference: Rethinking education for social change*. <https://doi.org/10.4324/9780203465547>
- Brown, T. (2008). *Design Thinking in Harvard Business Review* | *ideo.com*. Harvard Business Review.
- Brown, T. (2009). Change by Design. In *HarperCollins Publisher*. HarperCollins Publishers.

- Carlgren, L., Elmquist, M., & Rauth, I. (2014). Design thinking: Exploring values and effects from an innovation capability perspective. *Design Journal*.
<https://doi.org/10.2752/175630614X13982745783000>
- Carlgren, L., Rauth, I., & Elmquist, M. (2016). Framing Design Thinking: The Concept in Idea and Enactment. *Creativity and Innovation Management*. <https://doi.org/10.1111/caim.12153>
- Crossan, M. M., & Apaydin, M. (2010). A Multi-Dimensional Framework of Organizational Innovation: A Systematic Review of the Literature. *Journal of Management Studies*, 47(6), 1154–1191. <https://doi.org/10.1111/j.1467-6486.2009.00880.x>
- Dorst, K. (2011). The core of «design thinking» and its application. *Design Studies*, 32(6), 521–532. <https://doi.org/10.1016/j.destud.2011.07.006>
- Dumas, A., & Mintzberg, H. (1989). Managing Design-Designing Management. *Design Management Journal*. <https://doi.org/10.1111/j.1948-7169.2007.tb00076.x>
- Dunne, D., & Martin, R. (2006). Design thinking and how it will change management education: An interview and discussion. In *Academy of Management Learning and Education* (Vol. 5, Numero 4, pagg. 512–523). <https://doi.org/10.5465/AMLE.2006.23473212>
- Elsbach, K. D., & Stiglicani, I. (2018). Design Thinking and Organizational Culture: A Review and Framework for Future Research. *Journal of Management*, 44(6), 2274–2306. <https://doi.org/10.1177/0149206317744252>
- Feldman, J., & Boulton, J. (2005). Third-Generation Design Consultancies: Designing Culture for Innovation. *Design Management Review*. <https://doi.org/10.1111/j.1948-7169.2005.tb00006.x>
- Gaim, M., & Wåhlin, N. (2016). In search of a creative space: A conceptual framework of synthesizing paradoxical tensions. *Scandinavian Journal of Management*, 32(1), 33–44. <https://doi.org/10.1016/j.scaman.2015.12.002>
- Garud, R., Gehman, J., & Kumaraswamy, A. (2011). Complexity Arrangements for Sustained Innovation: Lessons from 3M Corporation. *Organization Studies*. <https://doi.org/10.1177/0170840611410810>
- Hargadon, A., & Sutton, R. I. (1997). Technology Brokering and Innovation in a Product Development Firm. *Administrative Science Quarterly*, 42, 716–749. <https://doi.org/10.2307/2393655>
- Hooper-Greenhill, E. (1999). Learning in art museums: Strategies of interpretation. In *The Educational Role of the Museum*.
- Jahnke, M. (2009). Design Thinking As Enabler of Innovation in Engineering Organizations. *8th European Academy Of Design Conference*.

- Johansson-Sköldberg, U., Woodilla, J., & Çetinkaya, M. (2013). Design thinking: Past, present and possible futures. *Creativity and Innovation Management*, 22(2), 121–146.
<https://doi.org/10.1111/caim.12023>
- Kelley, T., & Kelley, D. (2013). Creative confidence: Unleashing the creative potential within us all. *The Business Source*. <https://doi.org/10.1080/08963568.2014.883249>
- Kimbell, L. (2011). Rethinking Design Thinking: Part 1. *Design and Culture*, 3(3), 285–306.
<http://dx.doi.org.lcproxy.shu.ac.uk/10.2752/175470811X13071166525216>
- King, N., Anderson, N., & West, M. A. (1991). Organizational innovation in the UK: A case study of perceptions and processes. *Work & Stress*. <https://doi.org/10.1080/02678379108257031>
- Kolb, D. (1984). *Experiential Learning: Experience As The Source Of Learning And Development* (Vol. 1), Englewood Cliffs, NJ, P Prentice Hall
- Kristensson, P., Gustafsson, A., & Archer, T. (2004). Harnessing the Creative Potential among Users*. *Journal of Product Innovation Management*, 21(1), 4–14.
<https://doi.org/10.1111/j.0737-6782.2004.00050.x>
- Kristensson, P., & Magnusson, P. R. (2010). Tuning Users' Innovativeness During Ideation. *Creativity and Innovation Management*, 19(2), 147–159. <https://doi.org/10.1111/j.1467-8691.2010.00552.x>
- Langley, A. (1999). Strategies for Theorizing from Process Data. *Academy of Management Review*, 24(4), 691–710.
- Lewis, M. W., Ann Welsh, M., Dehler, G. E., & Green, S. G. (2002). Product development tensions: Exploring contrasting styles of project management. In *Academy of Management Journal*. <https://doi.org/10.2307/3069380>
- Martin, R. (2007). *Opposable Mind: How Successful Leaders Win Through Integrative Thinking*. In *Harvard Business School Press Books*.
- Martin, R. (2009). The Design of Business: Why Design Thinking is the Next Competitive Advantage. In *Harvard Business Press*.
- Meinel, C., & Leifer, L. (2011). Design Thinking Research. In *Design Thinking: Understand, Improve, Apply*. <https://doi.org/10.1016/B978-0-12-387667-6.00013-0>
- Miron-spektor, E., Erez, M., & Naveh, E. (2011). THE EFFECT OF CONFORMIST AND ATTENTIVE-TO-DETAIL MEMBERS ON TEAM INNOVATION : RECONCILING THE INNOVATION PARADOX. *Academy of Management Journal*, 54(4), 740–760.
- Porter, M. E., & Heppelmann, J. E. (2015). How smart, connected products are transforming companies. In *Harvard Business Review*. <https://doi.org/10.1017/CBO9781107415324.004>

- Smith, S. M., Ward, T. B., & Schumacher, J. S. (1993). Constraining effects of examples in a creative generation task. *Memory & Cognition*, 21(6), 837–845.
<https://doi.org/10.3758/BF03202751>
- Smith, W. K. (2014). Dynamic Decision Making: A Model of Senior Leaders Managing Strategic Paradoxes. *Academy of Management Journal*, 57, 1592–1623.
<https://doi.org/10.5465/amj.2011.0932>
- Stevens, J., & Moultrie, J. (2011). Aligning strategy and design perspectives: A framework of design's strategic contributions. *Design Journal*.
<https://doi.org/10.2752/175630611X13091688930525>
- Van Maanen, J., Sørensen, J. B., & Mitchell, T. R. (2007). The interplay between theory and method. *Academy of Management Review*, 32(4), 1145–1154.
<https://doi.org/10.5465/AMR.2007.26586080>
- Verganti, R. (2003). Design as brokering of languages: Innovation strategies in Italian firms. *Design Management Journal*. <https://doi.org/10.1111/j.1948-7169.2003.tb00050.x>
- Ward, A., Runcie, E., & Morris, L. (2009). Embedding innovation: Design thinking for small enterprises. *Journal of Business Strategy*. <https://doi.org/10.1108/02756660910942490>
- Warner, A. G. (2005). An Egg-Centric Approach to Teaching Strategic Types: Adapting a Classic Exercise. *Journal of Management Education*, 29(4), 583–592.
<https://doi.org/10.1177/1052562904272435>
- Yoo, Y., Boland, R. J., & Lyytinen, K. (2006). From Organization Design to Organization Designing. *Organization Science*. <https://doi.org/10.1287/orsc.1050.0168>

Table 1: Evaluation details on outcome innovative degree

0	low	medium	high	100
Already existing in the market and stereotyped user	The same concept already existing but with one element of discard	The same concept already existing but with more than one element of discard (I.e. higher distance from the stereotypes)	The re-contextualize idea with a proper re-framing (high distance from stereotypes and attempt on new business model)	Completely new value proposition

Table 2: Struggles with DT

DT Struggle	Description
Destabilizing	The conflict between the demand for control and demand for disruption
Abstracting	The conflict between the demand for dealing with grounded facts and demand for embracing potentials of new ideas
Non-deciding	The conflict between the demand for deductively solving a problem and demand for inductively generating an idea

Fig 1- Design Thinking struggles as triggers: a process model

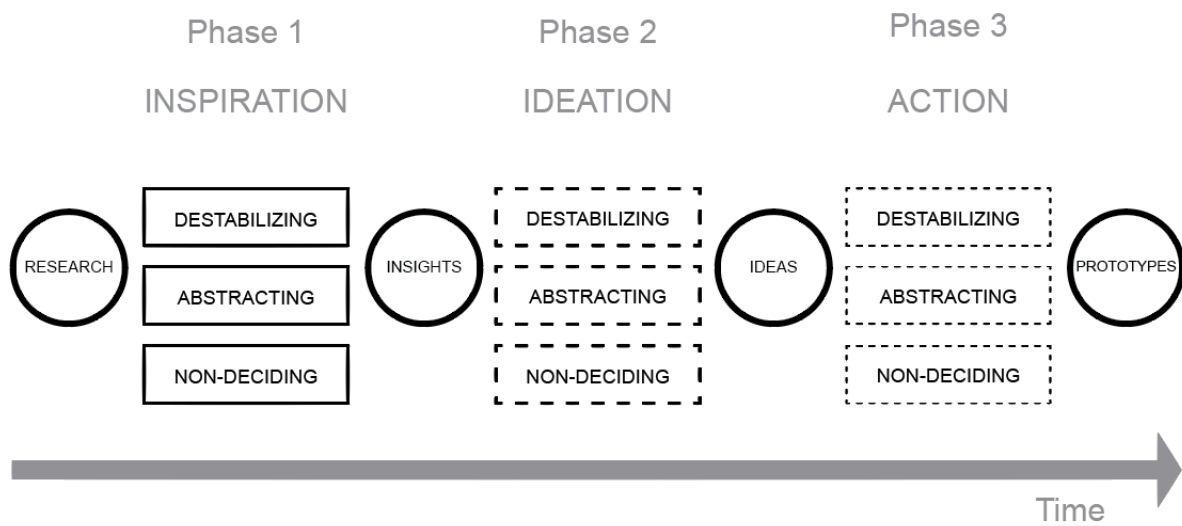


Table 3: Final outcomes and evaluations

Group number	Users	Concept title	Brief Description	Type of prototype	Evaluation of the innovative degree
Group 1	commuters	Lunch boat: A 30-minute-food-experience for workers while enjoying the city on a boat	Public boat dedicated to lunch-workers. During lunchtime, workers can use a new type of "restaurant", on a boat while sightseeing in the city. Every day they will be meeting new colleagues while watching a stunning location.	None	Medium innovative degree
Group 2	students	“Whe nice” - A digital map built by students for students	An app that follows students desires and interests. Made by students, for students, it shows the “cool” places on the actual scene and the best way to find them	map	Medium innovative degree
Group 3	students	Trust week: Try your life in the city before choosing it	A website to have a glance at your life in another city before moving there. The service will provide suggestions on your accommodation and you'll be able to experience it by moving in for a week before renting it for the whole year.	None	Medium innovative degree
Group 4	inhabitants	Become a citizen.com	A website to persuade people that living in the city has many advantages and to get rid of all the typical stereotypes that usually make foreigners not consider it as a possible home	None	High innovative degree
Group 5	students	StudIn: Create an app to facilitate all the aspects related to the students' world in the city	The services focus in particular on the library offers. Libraries are the center of student's life, this service provides students with a lot of opportunities to socialize with others while doing their core activity, studying.	Prototype: cardboard screens	Medium innovative degree
Group 6	tourists	Cluerist: engage in a treasure hunt to be part of the most exclusive events around the city	Tourists can solve puzzles and know more about the city to be part of the exclusive events promoted by the city. Clues and puzzle will enable the tourist to know more about the history of the city and enjoy the events along with their citizens	Cardboard	High innovative degree

Group 7	tourists	Unwrap: Choose your experience	The service allows tourists to design their perfect experience in the new city. By using the app, a tourist can customize the type of events, shops, and experience he would like to pursue in a small amount of time for the best price.	Prototype: website: http://unwrapp.weebly.com	Low innovative degree
Group 8	inhabitants	Boat sharing: Easier and faster way for inhabitants to get around	Citizen has the options to move around with a boat service instead of walking in the crowd. The concept is similar to car-sharing but using boats for citizens	None	Low innovative degree
Group 9	commuters	#Easy: A place with a joyful, smart, and modern atmosphere to take a break or to have a delicious fast meal	The service provides a coffee sharing experience. Each worker can leave an already paid coffee with a message for another worker and make him enjoy his coffee-break!	Prototype: sketched rendering of a café and simulated café table on a classroom desk	High innovative degree