

Invisible to Visible: Identifying the Emerging Communication Needs in the 'New Normal' through Design Research

Simge Esin Orhun ^a* | Yasemin Yıldırım ^a

^a Özyeğin University, Faculty of Architecture and Design, Department of Communication Design: İstanbul, Turkey

* Corresponding author: simge.orhun@ozyegin.edu.tr

ABSTRACT

The pandemic, which started at the end of 2019, has affected societies in their own socio-cultural contexts and altered the interactions of human beings through their use of personal spaces and objects. Changes in the design of a wide range of objects varying from small tools to urban furniture are anticipated, as the “new normal” will be fully established in the coming months and years. We believe that each individual is recognized to be affected by a different aspect of pandemic, which yielded the fact that for such cases the paradigm for design may shift to favor user needs more than maintaining usability. This study examined the personal behavioral transformations after the acceptance of “new normal” and the reflections on the design of everyday objects or spaces. We developed a design research method which guided the students, to turn inwards and relate with their needs that arouse in the pandemic period with one selected city narrative found in the novel *Invisible Cities*, by Italo Calvino. In this method . From the analysis of 17 works based on abductive reasoning, two different categories were obtained: (i) 5 generic cases supported by user scenarios, (ii) 3 groups of artifacts interacted by analogue means.

Keywords: communication needs, design research, interaction, Italo Calvino, pandemic.

INTRODUCTION

Covid 19 has been effective for most of the year 2020 and created a significant and dramatic impact on the life of all the people around the world. While people acted cohesively in facing this emergency situation, acting for survival in their daily life brought new compulsory measures. As the lockdown started, after few weeks of online teaching, we found out that the physical isolation and social distancing caused varying impacts on our design students. Although everybody's primal concern was keeping healthy in those days, we recognized that most of us started to experience “invisible barriers” while trying to keep things going. These barriers, which were activated either from the environment or within the person, showed us that creating standardized affordable solutions for a society or even a particular group of people in times of emergency would result in the insufficiency of the product.

As a matter of fact, the “new normal” comprises opportunities and inspirations for designers and teachers for providing an environment to break free from ordinary (Özcan *et al.*, 2009). Our design students of Communication Design of Ozyegin University faced for the first time with such pandemic and emergency situation. As time passed, they all found out that they were not experiencing their usual routine of design process. When they were asked about

what kind of changes they were going through, they couldn't define it clearly. Based on the circumstances of pandemic, we structured a research that aimed to support design students to define the new behavioral and communicational needs that arouse because of isolation and lockdown and assist them to design solutions to satisfy their needs.

In the light of the defined aim, a design process that would relate our design students with their needs was planned. The online teaching platform, which we were using for our courses, also supported the cause and outcomes to sustain such process. We established 2 online meetings a week that lasted for 6 weeks. 17 students and 2 supervisors attended to all 12 meetings. At the end of the process, 17 analogue interaction mechanisms were delivered and 15 prototypes with simple materials were obtained. The process and works were evaluated by abductive reasoning and 3 categories with their respect to communication and interaction approaches together with 6 user content for the emerging needs were shared with the intention to inform design researchers for the possible paradigm change in the area of design. Overall, this study can be considered as an early phase design research that proposes a model to generate the needs that can be designed for pandemic and post pandemic aftermath.

1. THE VISIBLES AND THE INVISIBLES OF THE PANDEMIC PERIOD

Before the pandemic started, we, human beings, were at the stage of living with the notion that everything was limitless and possible. Till today and as of the future plans, within all the consumption deriving from endless shopping, boundless travelling and irresponsible acting for environment, nobody dreamt of a virus to sabotage this scenery. The virus, which wasn't able to get attention at the beginning, started to be noticed by governors and managers with respect to the increase in death numbers. The geometrical increase in the numbers started to convince people about the seriousness of the situation, however we still could not let go of the idea that this is a kind of seasonal flue.

As events called for urgent precautions to avoid the spread of the virus, the cities started to go under lockdown and people isolated themselves indoors due to curfew. When compared to the people who had to live under inconceivable conditions in enclosed spaces for months and years during of wars, today we can be called lucky to be forced to stay at home, a ceiling to sleep under, food to eat and being equipped with technological tools. However, humans who have been used to socialize, travel, work, shop and recreate themselves supported by the environment, started to find themselves struggling with "invisible" problems. Still, with the fear of contracting the virus, none of us refused or showed reluctance but continued to take the ordered precautions

So, the isolated people all around the world partly went on what they were doing previously and started looking inwards to perceive the situation from a broader point of view. At this point, the question we asked to ourselves was, how to make "visible" the "invisible" challenges and needs of personal and public communication that appeared due to curfew and social distancing. The article named "We Can't Go Back to Normal: How Will Coronavirus Change The World" by Baker (2020) includes both optimistic and pessimistic foresights for future. He referenced Salamon's hypothesis that indicated the importance of sharing the emotional turmoil in the days of pandemic which slows down the pandemic. On the other hand, in the article named "The Stakes Have Never Been Higher as America Reopens. What can a post-coronavirus world look like?" By Cava (2020), CEO of Toffler Associates Maria

Bothwell was referenced who indicated that it will not help to convince ourselves to accept things as ordinary; however, getting over this shock will more or less depend on our ability to adapt. She also denoted that it will not be possible to foresee how much the changes will be permanent or temporary and to what extent we will return back to the original conditions. Bothwell implied that we will face “the new normal” after the crisis and although it may not be huge, human beings have to be ready for the differences.

This study, which was planned as an early stage design research to determine the needs triggered by “the new normal” that is going to be validated within the coming months, takes inspiration from the novel “Invisible Cities” by Italo Calvino (1974). Briefly, the majority of the book consists of narratives of 55 imagined cities that are told by Marco Polo to Kublai Khan. Those stories have been structured by the dialogues between two which were placed in-between the stories. On general terms, the book describes the general nature of human experience based on the physical and emotional means that the narratives are structure upon.

The short stories were found inspirational in connection with our research, due to the following reasons:

1. In the novel, none of the cities are implied as good or bad and happy or unhappy... etc.; but rather distinguished by those that keep on giving shape to desires and others in which desires are shaped or erased by the city in time (Paolo, 2012).
2. Each story tries to picture the cohesiveness of the relationships based on the realities we live through (Butor, as cited in Calvino, 1974).
3. Calvino (1974) himself indicates that these stories satisfy 2 different ways of knowing, whose actuality can never be achieved: First one, being the rationale that is free from body and moving in the spatiality of mind (actuality can never be achieved as artificial language indicates less meaning than natural languages, thus causing noise in understanding the truth). Second one, being the space full of objects and trying to define that space based on them (actuality can never be achieved due to the unmatched density and continuity of the world around us, as there are gaps between pieces and partially, thus saying less in comparison with what could have lived).

The psychological aspects of curfew and fear of contracting virus were recognized to be affecting the students stronger than the physical limitations. Hence, physical limitations also gave rise to emotional turmoil. The students found themselves being limited by invisible barriers that they were aware of consciously but had difficulty to define in words, because nothing seemed to good or bad exactly. Still, they couldn't picture the complicated relationships that they were bound to, like school responsibilities, living with parents, fear and so. For example, the problem definition of one of the students such as “I cannot organize my time in the day when I am all day and everyday at home” couldn't match the depthless of one's case whereas, how he tried to deal with it through apps on phone or alarms did not fulfil his exact need.

At this point, we thought the cities in Calvino's novel can provide varying opportunities to bring definitions to the interwoven tension of the geometric rational of the city and the human life (Calvino, p.82). If the design students can find a narrative or information through tales that can match their invisible requirements, they can get inspired by the objects and

make use of them or their working mechanism metaphorically in their design solutions. With this idea in mind, we engaged senior students of Communication Design in a series of experiments to see if they can make their needs of this specific period visible and find innovative solutions, based on their connection with this novel.

Throughout this study, students were not expected to create artistic small models of cities. We rather anticipated them to grab the essence of their choice of narration and create their own designs by making use of that information for the design of a mechanism, which would be interacted by analogue means.

2. METHOD

In her book “A paradise Built in Hell”, Solnit (2010) used the case studies of many disasters, including 1985 Mexico City earthquake, 2001 terrorist attacks or Katrina Hurricane, to point out that those moments of emergencies are not composed of the times that people become more terrified, suspicious and egocentric. Rather, she denotes that, all the losses and pain can trigger improvisation, solidarity and the potential for stability. She does not canonize disasters but rather is attracted to the probability of them to shake humans to put themselves together. In this research, we grounded our approach from the standpoint of the growing supportive feeling each human feel for each other and based our investigation on design research method.

Design research seeks to make connection between the problem area and the solutions of design through the empirical explanations (Zimmerman et al., 2007). Design, in the context of research, by itself does not only provide solutions, it also provide a theoretical knowledge (Friedman, 2001; Vermaas, 2014). It includes formulating and evaluating design theories and models, and disseminating results, as well as developing design practices. In this respect, it works like other scientific fields, it is aimed at a specific field, it contains specific goals and research methods (Fallman, 2003; Haynes & Carroll, 2007).

Considering design in a scientific context, and the concept of design methods were introduced in the 1960s (Gregory, 1966; Grant, 1979, Hubka & Eder, 1987), the first half of the twentieth century led to the development of scientifically based design approaches. The relationship between design and science has been supported in the way of making science visible through the basis of modern design approaches based on scientific knowledge (Cross, 2007).

Today, design research has deepened it's approaches not only about the role of the form and visuality of products, but also about the experiences people have with the products, how they interact with them, and how products mediate their relationships with other people and their social environment (Buchanan, 2001). Therefore, besides being an artefact, design turns into a instrument for the research on a particular theory, while the creative process transforms into a communication tool that enables to think about how knowledge can be used and conveys knowledge (Haynes & Carroll, 2007).

The scope of the discipline of Communication Design involves designing interactive products that maintain communication (between user and object, user and user via object and user and environment via object) by making use of visual and audial elements of design. Like other disciplines of design, Communication Design also thrives on functional design education. Within the scope of this discipline, the students are briefed for a design problem

and expected to solve it by develop interactive services and products and interfaces that communicate. Most design problems target digital environment and make use of multitouch surfaces and screens or gestural interactions for solutions. Still, upon decision, developing analogue interactions applied on physical interfaces and mechanisms is a research and working area (Orhun, 2020).

In the frame of this study, we aimed the students, who were designated to the course, to analyse their regular habits that became invisible due to physical isolation from the city, in order for them to define their personal need and create to-the-point innovative interaction and communication solutions.

Haynes and Carroll (2007) divided design research methods into 3 groups according to their application and purpose: Traditional methods (e.g., market research, focus groups, surveys, questionnaires, interviews), adapted methods (e.g., observations, video documentation, ethnography, experiential sampling, cultural inventory artifact analysis, heuristic evaluation) and inventory methods (e.g., participatory design workshops, card sorting, cognitive mapping, visual diaries). The data obtained as a result of all these approaches are analysed by design researchers, quantitatively or qualitatively and interpreted in different formats. These formats can consist of reports, sketches, diagrams and maps, models or visual records. Similarly, prototypes become an important data document of the research, as they contain information on key problem areas and success points. The themes from all these analyses are discussed as models or sets of knowledge as results. Under the pandemic circumstances, we tried to devise a health wise secure research process in which students will make use of simple materials and tools and guided them for the design of physical mechanisms that would be interacted by analogue means.

The process followed the method of research through design because the design activities and products become the principal elements in this process of generating and communicating knowledge (Stappers & Giaccardi, 2017). This process was applied as a 6-week workshop, which took place in the synchronic online teaching environment and planned as follows:

- **Background Information:** The students were informed about analogue interactions and introduced to different mechanism designs with regard to those mechanisms' purposes and user scenarios. They were told that no specific design brief would be given to them, rather they were advised to discover and frame this through class discussions and readings.
- **Assessing the Narratives in The Novel:** The students were asked to observe their daily routine under lockdown conditions. In parallel with the investigation, they were asked to read "Invisible Cities" novel.
- **Identifying the Problem:** The narratives that were partially or fully matching with students' specific needs or requirements during pandemic period would be discussed upon the cultural/emotional connections. Due to students' analysis of the narratives, the scope of each problem would be defined.
- **General Tendency for Design:** The objects in the selected cities' narratives would be investigated and the chosen ones of would be examined for their ability to reflect the idea metaphorically and potential to support the idea of the mechanism and

interaction. The designed product (tool, surface or space) would be preferred to be emotionally relieving and must be physically functional.

- **Preliminary Sketching:** The students were conducted to discover different modes of interactions by analogue means. They were advised to look every mechanism and material around themselves. At this stage, the developed solutions might not be feasible to handle the design problem. So, students would be guided to return back to the stage of identifying the problem and evaluate again.
- **Developing User Scenario:** At this phase, the user scenarios were developed in parallel with alternative forms of activities, actions and operations (Kaptelinin & Nardi, 2006).
- **Prototyping:** Within this stage, dimensions of mechanisms, mapping and feedback of analogue controls and material choices were discussed. Due to material constraints, user scenario might be revised.
- **Evaluation:** An online jury, with the contribution of experts from the area of industrial design and interaction design, was made. In parallel with their experiences, the advantages and disadvantages of each design were discussed in parallel with the circumstances of pandemic.

3. RESULTS

In parallel with the objectives and method proposed above, personal problems for communication under curfew were stated and original design solutions were obtained. The results given below was investigated for the process and for the artifacts separately. The owner of comments and works are coded from S1 (Student 1) to S 17.

3.1. Results concerning the process

During the online classes, ideas and projects were discussed with the help of the white board, and also the revisions continued after the class hours via e-mail when necessary. During the process, the students commented on each other's project ideas and made brainstorming together. After the ideas become more visible, students created storyboards and design iterations continued. At the stage of prototyping, we tried to avoid the students to purchase of prototype materials and they were motivated to use simple materials like straws, milk boxes, fabrics, etc. that they could easily find at home. This prototyping process was also iterative. When the students tested their user scenarios through their prototypes, most of them encountered affordance problems and at that stage they returned to their storyboards and made revisions. They also faced some physical problems with their prototypes owing to the incompatibility of the material and most of them had overcome by trying different techniques. Some projects remained conceptual because it was difficult to manufacture and needed more r&d.

We achieved 3 clear results regarding the process of this research:

1. At the beginning of the process, students had difficulty in understanding the problems they were facing, because they had just encountered the concept of "the new normal". Since each student's environment was different from the other, they had difficulty to connect with the slowly appearing problems. Guided by the method

of research by design, we were able achieve in-depth content by intense observations, discussions and analysis to establish the problems and needs.

"[...]I saw that I needed something more mental than physical, and my problem was definitely focus and inability to be creative. An environment without new stimuli slowed my mind. I needed an inspirational object that made me think, helping me make new connections. I thought, how can I turn this intellectual need into a concrete object? [...]" (Comments of S6).

2. After they started to read the stories in the book and discover the metaphors, they started to relate to their own situation. At this stage, it was much easier for them to expose their problems. In this way, the contextual dimension of the new problems that actually emerged had begun to become more visible. For such an emergency case, user cases do not focus on solid design works but rather a personal answer or a reaction to the ongoing changes in life. So rather than giving a well framed design problem, supporting the brief with another medium (in this case Calvino's book, *Invisible Cities*) yielded fruitful results.

"Since this project coincided with the time of Covid 19 virus, we did the project completely by experiencing it. When we started this project, we were asked to choose a story we felt closest to from Italo Calvino's book *Invisible Cities*. I chose *Cities and Eyes*. Yet it was built from all over the earth, above the clouds, and as far away from each other as possible. People were watching the city through a telescope. For this reason, I associate it with the feeling of curiosity in my own life and what I think about contact. I wanted to go out during the Corona virus period. Every time I went out, I was afraid to touch somewhere. This fear has become an obsession of mine and I feel as if I have viruses everywhere I touch and I need to wash my hand immediately. First, I have listed the products that can prevent contact. binoculars, telescopes, etc. Then I decided that I wanted to get out of the house and not freeze without touching it. The *Inspector Gadget* was exactly what I wanted. To touch everything without using your hands" (Comments of S5).

3. Another favoured aspect of the process was the indirect psychological support that was given to the students. At the beginning of the process nobody wanted to define or talk about any need or desire due to the scarce of pandemic, as if their minds were also isolated. However, within weeks they also gained a stronger attitude as they were able to detect problems. Confidence was felt within the students for being vocal about their struggles. At the end of the process, they even matured more as they attacked and battled their anxiety with solid outcomes.

"[...] At first, I was thinking that working time creates stress on people working at home. But when time pass, I experienced that when I complete tasks, stress goes away. So, I have changed my mind to create a product managing tasks rather than managing working time" (Comments of S10).

3.2. Results concerning stated problems and artefacts

At the end of the process, 17 artefacts were obtained. The designated problems for this emergency case were recognized as follows:

- Difficulty in focusing and studying due to being unable to set a personal space at home or monotony (S3 / 1 out of 17)
- Discomfort due to being inactive and stagnant (S7/ 1 out of 17)
- Decrease in the motivation and strained communication because of physical isolation from social surroundings (S6, S12 / 2 out of 17)

- Struggles that arise from the new normal like being unable to plan daily routines and management of time (S1, S4, S10, S11, S13 / 5 out of 17)
- Stress for contracting the virus (S2, S5, S9, S14, S17 / 5 out of 17)
- Inconveniency to meet for fun and social purposes S8, S15, S16 / 3 out of 17)

In parallel with the interactions provided, we classified 17 different projects under 3 different topics. For each group, one direct and one indirect solution were given below to show different points of view. The examples, which were chosen for this article, were selected for the originality and viability of the design solution. At this stage the contribution of the solution to the design area was not discussed.

1. **User interacting with tool (S3, S7, S6, S8, S2, S13):** The projects grouped under this topic are related with the personal needs of the users and how they reflect these needs on their design solutions. These projects involved personal reactions to the catastrophe that pandemic had brought to their lives. The approach of the students was re-reading the objects in parallel with desires, re-arranging and redesigning for a better solution.

ViChange

View Change

(A person observes and wants to watch the changes throughout her life.)

We Change

(Human is an entity that has to adapt to changing life conditions.)

The Case

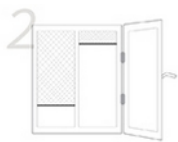
I am stuck home and my room during pandemic. Everything is the same and this bothers me. It is even more difficult to focus and be productive in this period. I have made some changes in my living space to adapt to this new situation, but this may turn into an endless vicious circle. So, I need an object that will increase my mental efficiency and move me mentally away from my environment.

Metaphores & Inspiration Elements

1 Invisible Cities - Italo Calvino

Trading Cities 3 - Eutopia

Eutopia is a capital consisting of many small cities. The city has a miracle that when the people here get bored with their lives, they migrate to another small city collectively. So their lives are renewed from move to move.



Window as a metaphor
Sliding flapper move for interaction way



Malevich's Black Square



Pendulum for action image and mental therapy (Radiesthesis)

Product

AN ABSTRACT WINDOW

Sliding colorful curtains that change according to person's choice and energy

Representation: Landscape, Image

Moving pendulum

Representation: Movement, Energy



Interaction Ways of The Product



The magnet assembly holds the pendulum fixed above



To lower the pendulum, pull the string that has magnetic head up



Lay down the string while overlapping the same poles of the magnet this will push the pendulum



Slide the curtain you want



I can use the curtain I want according to the feeling and energy I feel. I can create hundreds of landscapes and hundreds of dreams in my room a any moment. A window that prompts me to think and dream: ViChange.

FILİZ SÜZEN
Tangible Media Design
Supervisor Simge Esin Orhun

Figure 1. ViChange, designed by Filiz Süzen (S6) as an indirect solution for communication.



Figure 2. Selfiso, designed by Ceren Ertürk (S3) as a direct solution for communication.

4. **User communicating with user via tool (S14, S15, S16, S17):** The aim of this group of projects classified was mainly to socialize with friends, communicate with people directly or indirectly and remembering intimacy and good memories. The solutions focused on how to revert the disadvantage of social distancing into game or fun for self-support. The approaches for solution included establishing relational communication or disconnection.

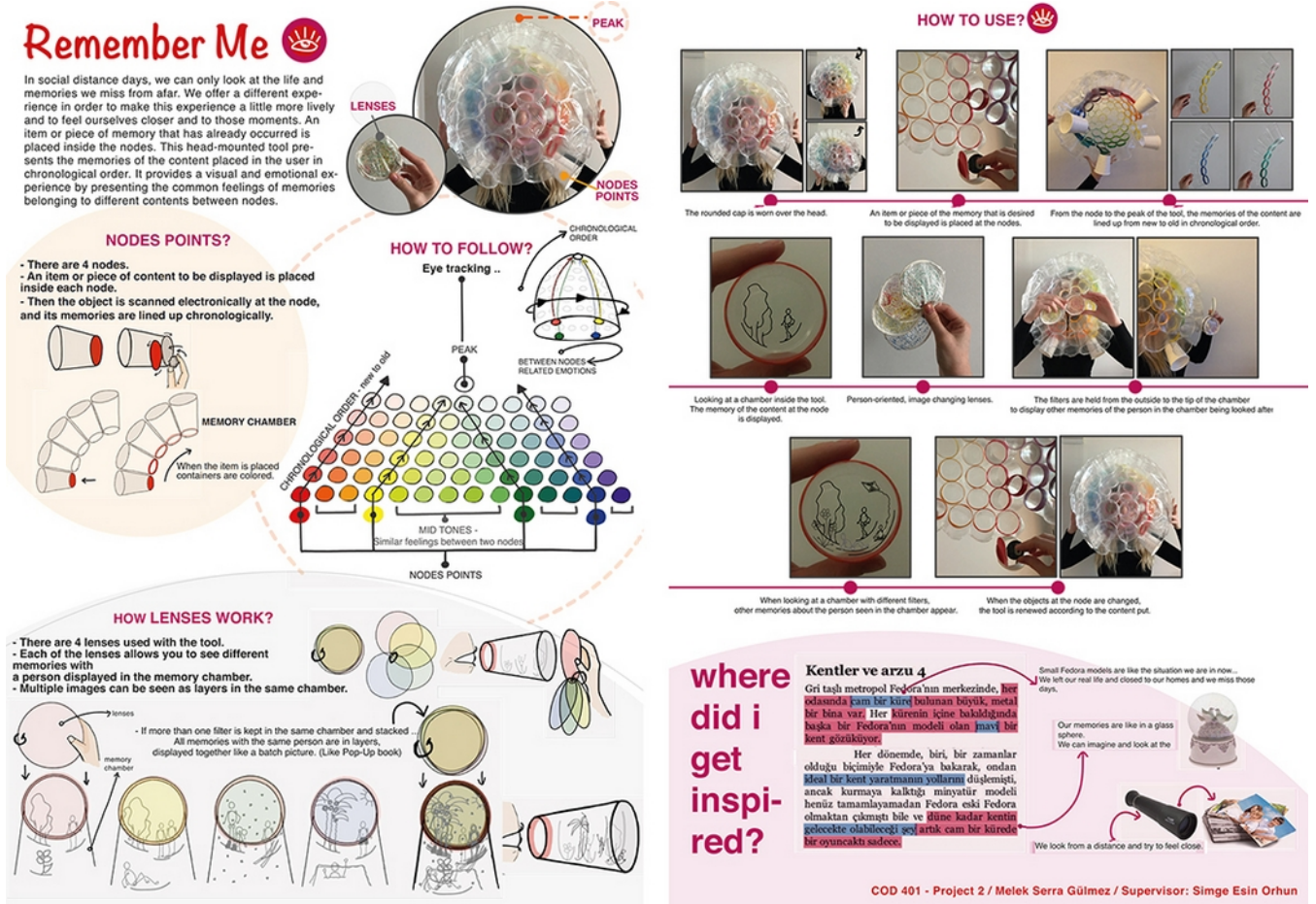
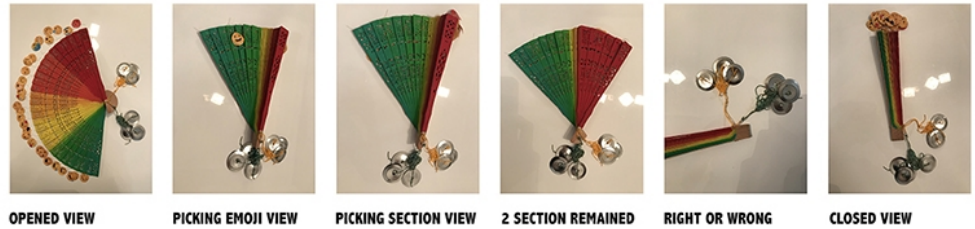


Figure 3. Remember Me, designed by M. Serra Gülmez (S16) as an indirect solution for communication

MOOD GUESS FAN short game for social distance

There are a variety of emojis for people to communicate more comfortably and fun, and a tiny game starts to predict the mood. One chooses an emoji and starts telling you with a masked face. The emojis are categorized by colors, and to find out which emoji is chosen, first you need to find the right color. Then you show the emoji you choose in the range with the help of ropes, and your friend tells you whether the guess is correct or not with tassels that having the bells. When it turns out wrong, you drag it down so that the emoji doesn't confuse you anymore, and you keep playing. So you try to find emoji by eliminating and the game is over.



DESIGN PROBLEM

In the corona process, the expressions are not understood since people can meet by wearing masks. I observed that people are not willing to speak as much as before, because they're bored. Based on this, I tried to find a solution to the problem by gamification.



DILAN GELIR - COD401 -

Figure 4. Mood Guess Fan, designed by Dilan Gelir, 2020 (S15) as a direct solution for communication.

5. **User interacting with other media via tool (S5, S11, S10,S1,S4):** Most students also were suffering about losing track of time under lockdown conditions. They had difficulty in organizing their day, they couldn't keep on with time when everything continues to be the same for days and weeks, with no change.

Equipoise

The Case

I brought self-discipline to myself as a result of social distance, and in fact, I keep my life in balance with a balanced discipline, a mechanism that helps me keep things under control due to unexpected events around me that I cannot control.

Too much sound around me, there are sounds I do not know and I take these sounds to compose a music I try to put it in a layout like the music partition and turn them into something that I know.

Italo Calvino Invisible Cities

Cities and Memory 4 - Zora

As in the story, this program that I can not stop think of is my armor and a honey-comb in whose cells I can place the things and solve it, Living a systematic life that I know by heart makes me comfortable.

"This city which cannot be expunged from the mind is like an armature, a honey-comb in whose cells each of us can place the things he wants to remember..."

Metaphors

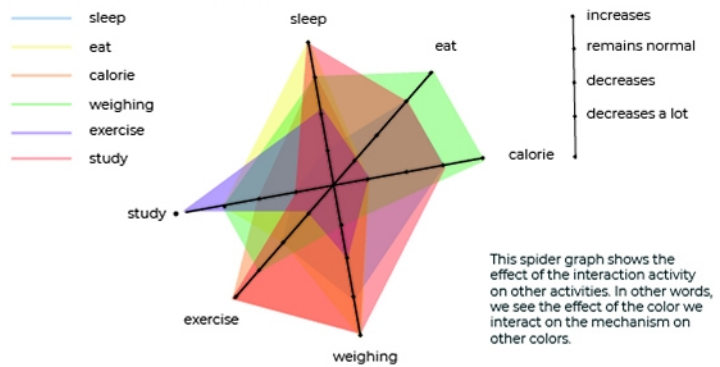


Colors
The primary colors are the primary activities and the activities created by them are the intermediate colors.

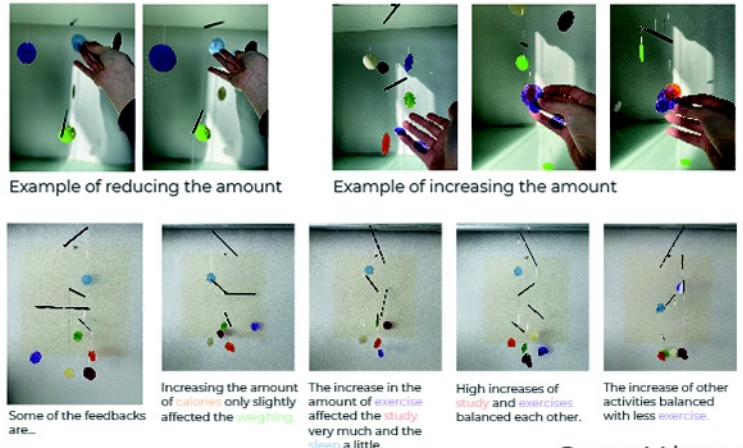


Balance
Balance is the metaphor for trying to keep it under control.

Interaction of activities



Interaction with the product



Serra Yilmaz

Figure 5. Equipoise, designed by Serra Yilmaz, 2020 (S11) as an indirect solution for communication.

Physical Task Manager

When people work at home, they have to carry the stress with themselves. Stress level increases with responsibilities.

So, knowing the tasks waiting us, not accumulating them too much and managing them are keys to handle the stress.

That is why I create this Physical Task Manager.

INVISIBLE CITIES - ITALO CALVINO Thin Cities 2 - Zenobia

A city on top of long sticks, that is able to change and take shape according to people's desires.

Rods and pulleys in the story, gave me the inspiration on hangable and reformable object.



Add New Task



Remove Task



Mertol Okcu

Figure 6. Physical Task Manager designed by Mertol Okcu (S10) as a direct solution for communication.

As the artifacts were evaluated, it was possible to say that designated problems and proposed designs reached beyond the ongoing solutions of masks usage, online conferences or mobile apps for personal control and motivation. While one solution may not be an

answer for the other, the individuality embedded in all artefacts was found to be successful in providing support for pandemic days and the “new normal” approaching.

4. CONCLUSION

In this paper, we presented an approach for uncovering the invisible tensions and reactions regarding communication that came to existence in the pandemic, due to the stress for contracting virus and isolation triggered by social distancing and curfew. With this study, being an early stage design research, our intention was to share the insights of the possible future needs and solutions for the “new normal”.

In parallel with the objectives of this study, the students were told to identify their needs for communication and satisfy those needs by creating a tool, surface or space, which could be manipulated by analogue means based on user centred design. Hence, some students looked up on themselves for defining a problem and others developed ideas based on the needs of their close circles to start the process.

This research was built upon the experiences and the process of 17 students which we met twice in one week. The research lasted for 6 weeks and had been carried on through Teams online platform. The results concerning the process supported our claims for making use of research by design methods and not to give a well-defined brief. Although this is an early stage design research, we were able to get in-depth analysis from students. Moreover, the stories by Italo Calvino supported the students upon 3 aspects: 1. Defining their communication problem through the narratives of the cities, 2. Exploring metaphors to refine and frame their scope, 3. Discovering tools to be inspired by, so as to solve their problem. So, the students main instruments for design have been the metaphors and analogies developed within the design process. Metaphors acted as tools for design and were used to framing the problem in the initial steps of design. Analogies that were developed from their selection of inspiring tools for concept generation. These tools, which are commonly referred as key tools as enhancing design were benefited for a real case problem and they were successful in yielding design projects as self-reflections on their physical and/or mental situations.

The primary benefit of the method being reflected in this educational process for the students, was to face their subjectivity as designers and discover more about their identity by making use of it. They were guided to interpret their subjectivity to make their designs operational and recognizable. The approach also yielded a variety of results, which were born from the same trauma. Using this approach, the results obtained are mainly classified 2 different categories: *(i) outcomes related with subject of the need, (ii) interaction types associated with the tool and user.*

Making use of research for design supported our study as we learnt a lot from the process and artefacts equally. While this emergency situation gave the chance to break free from the ordinary, releasing the invisible needs and defining them were our primary concern rather than maintaining their usability factors, so the contribution of the solutions to the design area were not discussed, as this aspect demanded further exploration.

It is our hope that this pandemic will end soon, however other emergency cases may arouse again in near future. Researchers, supervisors and students need to face unpredicted conditions in most efficient ways. Being inspired by them is a promising option to tackle

problems, however we need to respond to these unconventional cases with different approaches, varying material alternatives and innovative approaches to satisfy all the parties.

REFERENCES

- Buchanan, R. (2001). Design Research and the New Learning. *Design Issues*, 17(4), 3-23. DOI: [10.1162/07479360152681056](https://doi.org/10.1162/07479360152681056)
- Daros P. (1990). *Les parcours d'écriture*. [Writer's Carrier Paths]. Magazine Littéraire, Calvino Special Edition 274.
- Calvino, I. (1974). *Invisible cities*. New York: Harcourt Brace Jovanovich.
- Calvino I. (2007). *Amerika dersleri: Gelecek binyıl için altı öneri* [Six Memos for the Next Millenium](p. 82) (K. Atakay, Trans.). İstanbul: Yapı Kredi Kültür Sanat Yayıncılık.
- Cava, M D. (20, February 2020) The stakes have never been higher as America reopens. What can a post-coronavirus world look like? *USA Today*. Retrieved August, 1, 2020, from <https://www.usatoday.com/story/news/nation/2020/05/28/after-coronavirus-ends-what-life-like-new-america/5193279002/>
- Cross, N. (2007). From a Design Science to a Design Discipline: Understanding Designerly Ways of Knowing and Thinking. *Design Research Now*, (41-54). DOI: [10.1007/978-3-7643-8472-2_3](https://doi.org/10.1007/978-3-7643-8472-2_3)
- Fallman, D. (2003). Design-oriented human-computer interaction. *Proceedings of the Conference on Human Factors in Computing Systems - CHI '03*. DOI: [10.1145/642611.642652](https://doi.org/10.1145/642611.642652)
- Friedman, K. (2001), 'Creating Design Knowledge: From Research into Practice', in E.W.L. Norman and P.H. Roberts (eds), *Design and Technology Educational Research and Development: The Emerging International Research Agenda*, Loughborough: Department of Design and Technology, Loughborough University,(31-69).
- Grant D. (1979) Design Methodology and Design Methods. *Design Methods and Theories: Journal of the DMG* 13(1) ,(46-47).
- Gregory S.A. (1966) Design Science. In: Gregory SA (ed.): *The Design Method*. London: Butterworth.
- Haynes, S. R., & Carroll, J. M. (2007). Theoretical Design Science In Human-Computer Interaction: A Practical Concern? *Artifact*, 1(3), (159-171). DOI: [10.1080/17493460701872016](https://doi.org/10.1080/17493460701872016)
- Hubka V., Eder W.E.(1987) A Scientific Approach to Engineering Design. *Design Studies* 8(3),(123-137).
- Orhun S.E. (2020) From Digital to Analogue: An Interdisciplinary Case Study to Enhance the Communication of Design Products Through Physical Constraints. In: Shin C. (eds) *Advances in Interdisciplinary Practice in Industrial Design*. AHFE 2019. *Advances in Intelligent Systems and Computing*, vol 968. Cham:Springer.
- Özcan O., Yantaç A.E & O'Neil M.L. (2009) Breaking the rules in interactive media design education, *Digital Creativity*, 20:(1-2), (115-124) DOI: [10.1080/14626260902868129](https://doi.org/10.1080/14626260902868129)
- Peter C Baker (March 31st, 2020) "We Can't Go Back To Normal: How Will Coronavirus Change The World", Retrieved August, 1, 2020, from <https://www.theguardian.com/world/2020/mar/31/how-will-the-world-emerge-from-the-coronavirus-crisis>
- Silvestri P. (2012): *After-word. 'Invisible cities': which (good-bad) man? For which (good-bad) polity?* In P. Heritier, P. Silvestri (eds.), *Good government, Governance and Human Complexity*. Luigi Einaudi's Legacy and Contemporary Society (pp. 313-332), Frenze: Leo Olschki.
- Solnit, R. (2010) *A Paradise Built in Hell: The Extraordinary Communities That Arise in Disaster*, USA: Penguin Books.
- Stappers, P. J., & Giaccardi, E. (2017). Research Through Design, *The Encyclopedia of Human-Computer Interaction* (2nd Ed), Aarhus, Denmark. Retrieved July, 26, 2020, from <https://www.interaction-design.org/literature/book/the-encyclopedia-of-human-computer-interaction-2nd-ed/research-through-design>
- Vermaas, P. E. (2014). Design Theories, Models and Their Testing: On the Scientific Status of Design Research. *An Anthology of Theories and Models of Design*, 47-66. DOI: [10.1007/978-1-4471-6338-1_2](https://doi.org/10.1007/978-1-4471-6338-1_2)
- Zimmerman, J., Forlizzi, J., & Evenson, S. (2007). Research through design as a method for interaction design research in HCI. *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems - CHI '07*. DOI: [10.1145/1240624.1240704](https://doi.org/10.1145/1240624.1240704)

Orhun, S. E. & Yıldırım, Y. (2021). Invisible to Visible: Identifying the Emerging Communication Needs in the 'New Normal' through Design Research. *Strategic Design Research Journal*. Volume 14, number 01, January – April 2021. 299-311. DOI: [10.4013/sdrj.2021.141.25](https://doi.org/10.4013/sdrj.2021.141.25)