

## Design Research Through Practice Methodology for the Fashion Design Field

### *A metodologia da Pesquisa em Design através da Prática para o campo do design de moda*

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#### Abstract

This article's aim is to present a few notes that were recognized during a one year internship at the Wearable Senses Lab (Eindhoven University of technology) while working with digital fabrication tools (such as 3D printers, laser cutters, 3D scans) and electronics to be applied on fashion design products and services. To get to know the mechanisms of these digital tools was crucial to have a bigger picture about how the new ways to produce and consume could affect development countries, like Brazil, as well as what should be educationally improved in order to have a more equal outcome in a transition based on the knowledge economy. Firstly, we recognized that the practice based methodologies used by design schools on an academic level stays, somehow, between the "maker culture" and the requirements of the so called 4.0 industry, adding a research quality to the development of fashion products and services through digital processes. Secondly, through testing the "Design Research Through Practice" methodology we identified the value of organizing the main areas mostly demanded by the new roles of a designer and how it can be helpful in developing a design research. Finally, we understand that in order to establish more social equality in an economical transition led by the digital production it is decisive to, at least, maintain opened the access of knowledge and to digital tools.

Keywords: Fashion, Digital Fabrication, Practice, Equality.

#### Resumo

*O objetivo deste artigo é apresentar algumas notas que foram reconhecidas durante um ano no Laboratório Wearable Senses (Universidade de Tecnologia de Eindhoven), enquanto trabalhava com ferramentas de fabricação digital (como impressoras 3D, cortadores a laser, digitalizações em 3D) e eletrônicos. aplicado em produtos e serviços de design de moda. Conhecer os mecanismos dessas ferramentas digitais foi fundamental para ter uma visão mais ampla sobre como as novas formas de produzir e consumir poderiam afetar os países em desenvolvimento, como o Brasil, bem como o que deveria ser melhorado educacionalmente para ter um resultado mais igualitário. numa transição baseada na economia do conhecimento. Em primeiro lugar, reconhecemos que as metodologias baseadas em práticas utilizadas pelas escolas de design em nível acadêmico permanecem, de alguma forma, entre a "cultura maker" e as exigências da chamada indústria 4.0, agregando uma qualidade de pesquisa ao desenvolvimento de produtos e serviços de moda. processos digitais. Em segundo lugar, através do teste da metodologia "Design Research Through Practice" identificamos o valor de organizar as principais áreas exigidas principalmente pelos novos papéis de um designer e como ele pode ser útil no desenvolvimento de uma pesquisa de design. Por fim, entendemos que,*

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<sup>1</sup> Autor, breve currículo de até 5 linhas. Notas de rodapé, com entrelinhamento simples, Times New Roman, corpo 10, justificado.

*para estabelecer mais igualdade social em uma transição econômica liderada pela produção digital, é decisivo, pelo menos, manter aberto o acesso ao conhecimento e às ferramentas digitais.*

**Palavras-chave:** Moda, Fabricação Digital, Prática, Igualdade.

## Introdução

In this article, experimentation projects are described as part of a one year internship at the Wearable Senses Lab (Eindhoven University of technology). A few prototypes were developed as a way to understand how digital fabrication machines like 3D printers, laser cutters, 3D scans, also electronic parts could be applied to fashion design products and services. On top of that, these experiences should serve as a way to recognize how it could be taught in fashion design schools in Brazil in order to prepare students to have more equality on the production of products and services compared to the countries where the knowledge economy is more emphasized (the developed countries).

A big promotion on the transition to a new (digital, robotized) 4.0 industry has been done due to the many benefits it can offer like a more sustainable, distributed, customized production. But although there are many arguments saying that everyone is going to gain in this process, since it should provide a more “distributed” production and consumption, it should create new jobs, it doesn’t mean that the social inequalities and economical differences are going to disappear. Ralph Ramman (professor at Cape Town University) showed on the World Economic Forum webpage his concern about the job loss (in South Africa, but it extends to all the other countries) and the maintenance of industrial monopolies:

But the new technologies also involve important risks, which have special significance in developing countries. They may build upon and exacerbate existing inequalities – both within developing countries as well as between developing and more developed regions. Three of these inter-related risks are worsening unemployment, increasing concentration of economic power and wealth, and the spread of biases in influential algorithms. They will manifest in different ways and require different responses in diverse contexts. A cross-cutting problem is that too few developing country governments are giving these risks serious attention.<sup>2</sup>

In Brazil, the traditional fashion industry represents 16,7% of formal jobs in the country, 1,5 million direct employee and 8 million undirect employee<sup>3</sup>. While Brazil presents the statistics of 11,5

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<sup>2</sup> Disponible at: [https://www.weforum.org/agenda/2018/01/developing-countries-need-to-act-on-the-risks-posed-by-new-technologies/?utm\\_content=buffer6178b&utm\\_medium=social&utm\\_source=facebook.com&utm\\_campaign=buffer](https://www.weforum.org/agenda/2018/01/developing-countries-need-to-act-on-the-risks-posed-by-new-technologies/?utm_content=buffer6178b&utm_medium=social&utm_source=facebook.com&utm_campaign=buffer)

<sup>3</sup> Disponible at: <http://www.abit.org.br/cont/perfil-do-setor>

million illiterate people<sup>4</sup> and 4,5 million are on the map of digital exclusion<sup>5</sup>. These data presents obstacles to the ideal of promoting more equality with a 4.0 industry.

One possible solution to avoid an even higher social difference with a transition to a more digital production would be to diffuse this particular knowledge. In a more informal venue (not only academic) the “maker culture” can play an important role in spreading this knowledge through video tutorials teaching how to built itens, internet foruns with solution of problems, webpages that provides digital models. Also, the maker culture discourses and promotion about gender, race, social equality on the digital field, the defense on the openness of information can be a valuable resource to broadcast this knowledge.

In the academic arena for design courses the link between the “maker culture” and the 4.0 industry seems to be fulfilled by the practice based methodologies which enables a more scientific approach to a product or service development in comparison with what is done with a “maker culture” approach. It is true that the “maker culture” resources serves as a starting point for students to develop their first drafts to develop prototypes for a 4.0 industry. The only problem between the link on these two opposites (maker culture and 4.0 industry) is that while using the maker culture (a more practical) approach and open resources the discourses of equality, transparency, fair work and consumption tend to fade away in a 4.0 ambition.

A parallel of this idea can be shortly done with what is presented by Peggy Deamer on “Parametric Schrofrenia” text. She makes a distinction between architectural structures done by groups of people which she identifies as “parametric ethos” (worried with openness, seamless shapes, distributed and fair work) and “B.I.M. ethos” (monumental buildings, worried with less expenses and the most profit the structure can offer), she says that whats happens between the two extremes is a schizophrenic confusion that is present in what the job marked waits from a design or architecture student. Most importantly, she points out that in order to efectively realize the good qualities the digital system have to offer; like more transparency in the production and consumption, more equality in the way of working, etc; these qualities should be reinforced instead of only praise for the aesthetical qualities, fetishes and profit of a product or service. We understand that it should be specially pinpointed in educational stage, therefore when a deeper research is accompanied by a product or service development these issues (other than only profit) can, or at least should, be better addressed. Some parameters such as caring about sustainability, transparency, social equality can be posed, more persistence and time dedication for trials and errors, readjustments, can be encouraged. A serious attention to all the possible particularities of the posed question while promoting new agencies is what could be characterized as a professional designer. In this sense the research work is fundamental and inherent on the routine of a professional designer.

During this one year internship at the Wearable Senses Lab a few fashion related items were developed following the constructive design methodology, specifically within the context of “Lab”, “Field” and “Showroom” described at the “Design Research Through Practice” book, to get to know the method, but also to analyze how it could contribute to the educational area.

The Constructive Design method ((Koskinen, Zimmerman, Binder, Redström & Wesveen; 2011) comes from a school of thought related to the “Research Through Design” (RtD) (Frayling;

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<sup>4</sup> Disponible at: <https://veja.abril.com.br/tveja/giro-veja/brasil-tem-115-milhoes-de-analfabetos-diz-ibge/>

<sup>5</sup> Disponible at: <https://oglobo.globo.com/economia/brasil-tem-45-milhoes-de-excluidos-digitais-22286508>

1994), in which, the practical experience is a central focus for a research in design. Frayling established a relation between the way artists and scientists do their researches to gather a final workpiece or a scientific result.

While traditional design methods are based on concepts found in theories and worked out later in practice, the constructive design starts with the practice itself, the relationship with the stakeholders of a product or service and, during the design process, it finds its theories and literatures as basements for a proper research.

Experiencing this method sound quite intuitive. It felt like offering a more direct perspective of the facts in question. It felt quite liberating but not more easy to work this way, since the practice moments requires a constant self-reflection effort, involving critical observation, restless trials and errors and quite a dose of uncertainty about your results, which means a pressure when you are supposed to be always assertive or innovative. The more self-reflection you can exercise during the process, the best will be your result. Maybe, that is one of the weak aspects of the practice based methods, since the self-reflection work can't be measured, many works can end up at the first drafts and not sufficiently re-managed. At least, the training through the method can inscribe a self-reflection habit. One good exercise can be to combine practice while writing diaries about the experience. During our development processes of the prototypes five diaries were written.

The book "Design Research Through Practice" differs itself or adds to the previous theories in presenting how the constructive design can be successfully applied in the nowadays main actuation areas to make design for a society of complex information systems. The "Design Research Through Practice" book organizes some examples into three main groups named "Lab", "Field" and "Showroom".

"Lab" characterizes itself for generating reflections through prototyping and a meticulous study that includes trials and errors, user experiences, material experimentation and adjustments during a prototype development. "Lab" denotes a work done in a closed space, in which the relation between the designer, the user and the prototype are in constant re-elaboration. With digital fabrication tools, this relation is enhanced by tools such as 3D scanners, sensors, microcontrollers that can capture virtual data, used as source of information that can accelerate dynamics, formalities of the processes. Like enabling data of measurements, for example, that are more complex and assertive.

"Field" is associated with "Participatory Design" (Manzini, 2105), by engaging stakeholders in a co-creation process that also includes field research, ethnography, and the elaboration of projects that are based on the creation of values to the participants.

"Showroom" indicates projects that have as a common base the "Speculative Design" (term inaugurated by Anthony Dunne and Fiona Raby, 2013), in which, designers creating questions while speculating about utopic and dystopic futures. Many of them touches the topic about the future of society with technologies proposing imaginaries that can be questioned if that is what society really want for an ethical future and which steps should be taken in order to prevent what is not desired to happen. From these work pieces many good (also not so good) (BARDZELL; 2013) ideas can have an influence in finding solutions or in the creation of new design items for the current market.

The following topics presents a description of our experience in developing prototypes in the contexts of "Lab", "Field" and "Showroom" proposed by the "Design Research Through Practice" book. As a prevision we can say that to pass through this experience was important to learn the mechanisms of the digital tools, also how those mechanisms creates social changes, but it was also fundamental to note what was important to emphasize in fashion design education within the

disparities of a Brazilian context. This last comment will be better addressed on the topic about the “Field” process, when we were able to trace directions to be implemented as a platform to broadcast open knowledge on how to use the digital tools, ethical issues, a space for reflection on which ways the fashion industry should get to promote a more equal economy and society.

### 1 – An Experience with a “Lab” Project

As a project that refers to “Lab” we developed the “Inside-out Blouse”. A prototype that unfolds other solutions for attaching the seams of a piece of cloth without a sewing machine, as related to Martijn van Strien “Post-Couture Collective” project (2015). The idea was to provide patterns, which could be downloaded anywhere (an example of a distributed production), adjusted by the users on a program for vector edition, the pattern should be laser cutted on textile and, finally, attached by hand, with no need of using a sewing machine for it. (Figure 1)

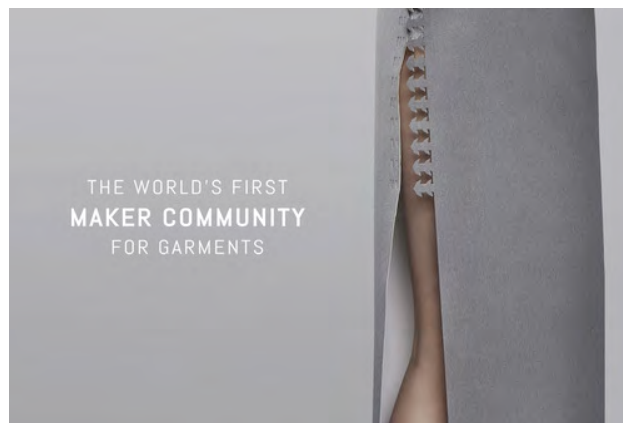


Figure 1: Laser cutted dress by “Post-Couture Collective”

Amazed with van Strien’s project, we bought the digital file of a “Post-Couture” dress in order to try how safe the seams were. The attachment is only by the geometric drawings of the textile. When a too soft, thin or elastic textile is used the seams don’t support movement and it can easily open, while walking, for example. The joints shape are not ideal for plane textiles, since the material structure can simply unravel. Only thicker materials like real leather could enable a better result. Even though, the dress pattern should always be wide in order to avoid tension on the seams and disassemble the cloth.

After a few tests we realized it should exist a safer solution to wear a piece of cloth that could fit closer to the body, sports could be done and the joints would not open so easily. We adopted it as a challenge and started by designing 3D printed joints, pins and chains that could simulate a sewing machine lace. We were still getting to know the machines, their limits, the variety of materials and their availability.

At the second round, we decided to try it out with the laser cutter. We designed another model in a more organic shape, so it could be harder to break it. I also decided to use one stiff material and another flexible one to increase the fixture, so I first laser cutted one part in MDF (3mm), also in PVC (3mm) and the other part in leather. (Figure 2) The concept behind it was that the more

technological we get, closer to the way clothes were primarily done we get, by hand, as a naturalized behaviour. But one that carries all the past experiences brought by machine manipulating and mechanisms apprehended through time. The movements and gestures made by the hands with the pins imitates a sewing machine.



Figure 2: Pins and chains

The results were more satisfying. The MDF was similar to a common button, it was more breakable than the PVC ones. Yet, in both materials, they were not very comfortable since they are stiff materials. So, we decided to use the quality of the “stiffness” as part of the aesthetic and designed other shapes to be laser cutted in PVC.

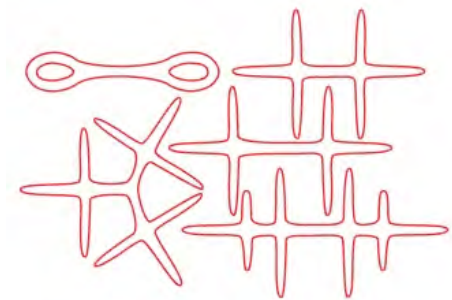


Figure 3: More pin models to be laser cutted

That was our first experiments using digital machines, we still wanted to test other technics like electronics and 3D scanners. Therefore, we paused the tests and regained it when back to Brazil. In São Paulo we found a few latex sheets (2mm-5mm) commonly found in shoe making material stores. We laser cutted them and the result was perfect since the material is flexible, very comfortable to wear and because it is a bit “sticky” it can make the joints even safer than the other materials.

The pins and chains can follow all directions of the textile, allowing the textile to receive curves on the seams. But depending on the material it can be interesting to engrave a thin line along the seam in order to facilitate the folding, as can be found on the research experiments with moulage and laser cutter done by Kairi Lentsius (from Boras University)<sup>6</sup>.

The first patter was laser cutted in a modular patter with the specific holes for the pins to be attached as we see on figure 3 and 4.

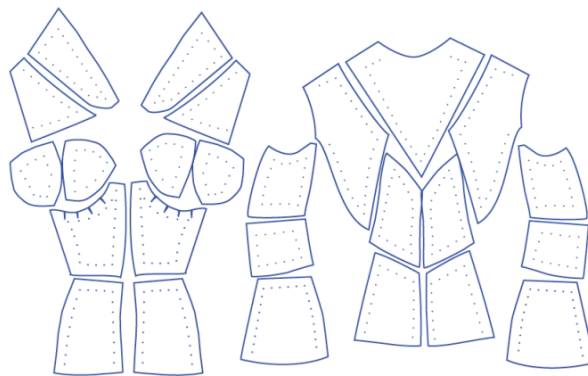


Figure 3: "Inside-out blouse" pattern

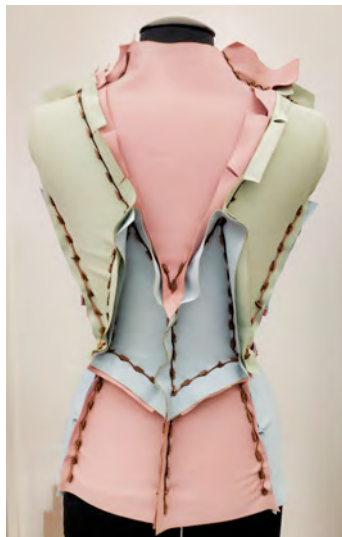


Figure 4: First draft of the "Inside-out Blouse"

<sup>6</sup> Disponible at: [https://issuu.com/kairilentsius/docs/degree\\_work\\_written\\_kairi\\_lentsius](https://issuu.com/kairilentsius/docs/degree_work_written_kairi_lentsius)



Figure 5: Strenght test shown at a Vogue-Brazil Video interview<sup>7</sup>

It can be understood as a project that fits into the DRTP “Lab” conception because the whole process was permeated by trials and erros, many adjustments and continuous labor done in a dialectic move between the objects and the designer, adjusting specificities to have a good final result for a sewing machine-less garment. The term “Lab” makes an analogy with empirical laboratorial researches done by minucious discrimination of facts, the use of measurements and repetition of tests. All those activities were included during this project.

## 2- Na experience with a “Showroom” Project

During our second experience, we decided to work with electronics, silicone and laser cutted moulds. We wanted to experiment with different densities of silicone.

The “Showroom” concept presented at the DRTP book is associated to “Speculative Design” a theory and practice developed by Anthony Dunne and Fiona Rabby, as explained on the previous pages.

While working with the “Inside-out Blouse” project we had a feeling of a real engagement with the technologies. It was a tactile engagement present in our own practice. A direct contact with the machines, in a fast pace of results presentations with the digital fabrication tools. But the same sense of touch was also present on the discourses of the maker culture bringing ideas of sharing and finding ideas through a global network, working in collaboration, among other indications that brings a sense of belonging. A discourse pretty much adopted by the big companies too, which enables people to feel part of the culture when consuming products that signalizes the moment’s “Zeitgeist”.

One of the consequences of living in a society of image is that our hands are often hungry for what only our eyes are able to take in. However we are not left entirely wanting. For the society of image is coupled with a consumer culture. Given that many of the images surrounding us are advertisements, it is not surprising that a primary means of satisfy the sense of touch is through the purchase of products. Buying the “right” clothes, camera, car, not only gives us something to touch, it also

<sup>7</sup> More about Vogue Brazil video interview will be indicated on the following pages.



assuages our sense of alienation by letting us feel “in touch”, connected to the contemporary culture. (CLASSEN; 2005; p. 403)

From one perspective the sense of belonging is very comfortable and productive, from another point of view, it is more difficult to criticize or clearly understand the dynamics of interests from what brings us a good feeling of belonging. For the “Showroom” project we needed to pose a scenario of a technological future in order to generate critical reflections. We felt a necessity to work alone. At the same time, we were reading a book called “The eyes of the skin” from Juhani Palasmaa (2005), that reveals how our visual sense is so much more required nowadays than the tactile sense. In our personal sphere, were also missing Brazil a lot. We were missing the caos, all the ugly reality and problems that, because they are unpleasant they give us an impression of being more “real”, “closer”, “tactical”. An association we didn’t understand rationally why or how we could sense it. From our point of view, all the establishments were perfect in a high-tech city. A perfect flat landscape, the perfect trimmed plants, perfect food colors and shape, while serious political discussions about the war in Syria, the blockage of the migrants, Brexit, the outrages and the panic of people that were not used anymore to big instabilities that comes along with problems of social inequality, were happening. The feeling was suffocating.

During the experiments with silicone we tried the first one in a very soft density. We laser cutted a half-shaped t-shirt mould on a 4mm layer of acrylic. The second one followed the same shape but with “nerve” patterns. After pouring the silicone, the touch feeling was the same of touching rotten meat.



Figure 6: “Touch me, please” blouse, first part

We were beginning to learn how to work with electronics and we found out that it would be more economical to buy electronic toys and use it's parts than to buy the shields and sensors separately. We bought a bird that records sounds, play it back and also plays bird sounds.

We attached it on the half shaped silicone t-shirt. The connection was done with conductive threads embroidered like scars. The visual and touch aspects were disgusting. When the spectator had the courage to touch the "scars" he could hear his own voice or a bird sound. The concept here was: "What if, in the future, we decided that the ugliness, the failure, is essential in our lives, as much as the beauty and perfection, because that's what make us humans. If we understood that, would companies start to simulate and reproduce ugliness?" The meaning is related to the capacity to touch and be touched, as a mirror, when mostly feel present and alive.<sup>8</sup>

The other project done with the same half-shaped silicone t-shirt, plus magnets, laser cutted acrylic, metal sticks and a sound board, was also related to the touch sense. The sticks could be manipulated by a shiatsu therapist that could at the same time control the energetic fields of the body as making music through touch and the sound impact generated by it.

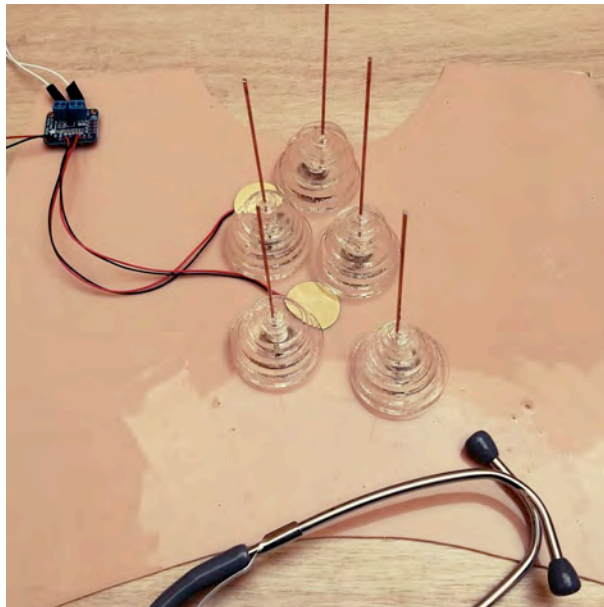


Figure 7: Second experiment

The question posed here was: "How could technology help us better organize or heal our humour and feelings (subjective questions) by the combination of touch or a physical stimulation?"

These experiments were surely influenced by our immersion in the use of digital technologies on the making processes of our projects. Therefore, the idea and the feeling of being merged, or "in touch" with technologies was clear. Technics that naturalizes and are "embodied" while their manipulation become part of our habits, as rituals, they seem to disappear. But, surrounded by a

<sup>8</sup> In a poetical sense, more about this relational sense of the touch sense can be found the Michael Foucault's text "The Utopian Body" (1966).

society mediated by technological systems, our bodies seems to require, through an even louder voice, some kind of treatment that shouldn't be omitted by more and more systems. Even though, human beings are characterized as technical beings.

### 3- Na experience with a "Field" Project

For the "Field" Project, the challenge was to bring all that was learned during our internship and try to adapt this knowledge to people interested in the fashion field in Brazil. As a result, we could recognize a few issues that should be reinforced during teaching about ways to produce and consume fashion products and services developed with digital tools. Therefore, all the previous contact, experimentation with digital tools, and critical reflections about the ways technologies impact our society were fundamental to serve as a base for a field research. Even though, we still needed to have a bigger picture about what was happening in Brazil around this topic and how this knowledge could be received.

During this one year research in Holland, I heard that 13 public digital fabrication laboratories were opened in São Paulo, our hometown city. São Paulo is the only city in Brazil with so many public and completely free Fab Labs. They are mostly located in the peripheral regions of the city in order to promote digital inclusion and promote innovative productions.

When we came back to Brazil we wanted to share what we learned with other people while we could check how and through which processes other people would learn what we apprehended during the internship. We were also interested to understand how other people would use the machines, for what purpose (within the fashion field), how it could improve creativity or production in the fashion design area in Brazil, and finally, what could be done to improve teaching in these area. So we organized a one week workshop in which we would present a few projects developed with digital fabrication, show the machines and let them free to try it however they wanted, at the end we would make an interview with the participants in order to record their impressions. The workshop had such an impact that in the last day Vogue Magazine showed up at the course to make an interview about the topic<sup>9</sup>.

Through the feedback the participants gave us on the interviews and through our own observations (noted on our field diaries), the digital fabrication could firstly have an important impact for small producers as a tool to help them express their creativity in utilitarian products. In Brazil, the small producer faces a tough path in finding small scale services and materials, while the taxes to entrepreneur are quite high. On top of that, because our production is too much based on heavy industries, to supply big cities, for a big country, there is too little space for experimentation, from where creative and original designs can emerge. The large scale culture installed here puts designers in a condition of simple copies of what is done in Europe, otherwise it won't be sold. As a second moment, we could find out some interests in thinking about the use of these machines as source of innovative research for products, materials and services. But it was clear that the "language", how the digital machines works, to understand their internal mechanisms, should be better exercised since the "heavy industry" mechanisms (that also evolves a way of living and thinking) is too present for us. This presence trap our confidence about the access (for all social classes) we can have to this kind of technologies and that we can make things differently.

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<sup>9</sup> Video Interview disponible at: <http://vogue.globo.com/Video/Moda/Vogue-Tech/noticia/2017/09/fablab-incidentiva-o-uso-de-fabricacao-digital-na-moda.html>

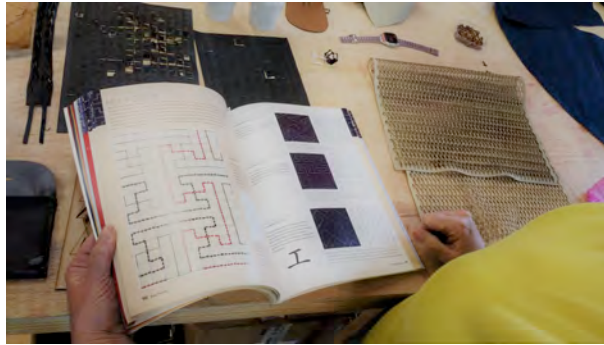


Figure 8: Workshop on São Paulo FabLab Livre – uniting traditional craft and digital procedures

Figure 9

After this workshop we also wanted to understand how this same knowledge could be used to improve creativity and production in other cities that have no public FabLabs like São Paulo. So we went to a city called Brasilia and we offered a one week set of courses and lectures about fashion and digital fabrication at a private FabLab (Brasília Fab Lab) in collaboration with a public University. The lectures were for free and the workshops costed around 10 euros.



Figure 10: Bioplastic workshop

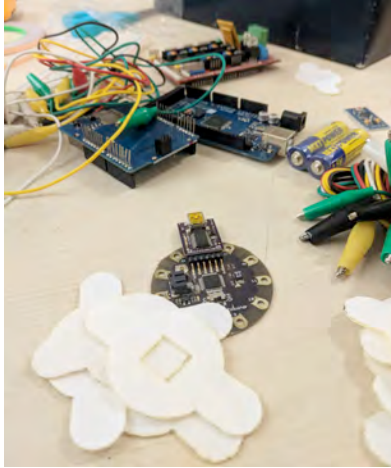


Figure 11: Wearables workshop



Figure 12: 3D scan and laser cutter workshop

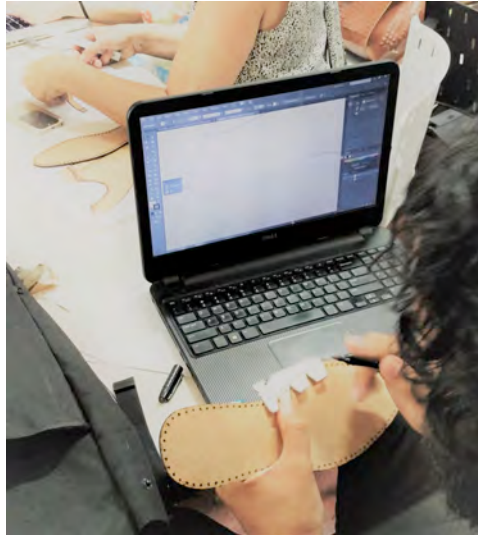


Figure 13: Laser cutter workshop



Figure 13: Parametric modelling for 3d printed textile structures

We had a small audience during the lectures. We believe it happened because people are not familiar to the topic, it still seems to be too distant from the students reality (it happened at the university). During the workshops, most part of our participants were professors or designers at the beginning of their careers. During the workshops they could understand what the machines could do, they got to know a few examples about what it was done but there was no sufficient time for them to experiment. The event helped to promote the ideas in the city and also the private FabLab as an interesting space to develop small scale productions for designers, but it didn't have a big impact in all social classes as happened in São Paulo.

Back to São Paulo we were asked to organize a course (of one semester or one year) about fashion and digital fabrication that could be offered at the public FabLabs of the city. During the two experiences we described previously what mostly missed for us was to make the participants experiment more freely reaching different areas that the design field can actuate nowadays. Then I

understood how important it would be to present to fashion designers, not simply different examples about what could be done, but to organize these examples within the concepts of “Lab”, “Field” and “Showroom”. What happens is that when examples are presented, participants simply try to do something similar to what they got to know. But when you show examples within the three main directions of design agency it opens a broader view about what the participant can do to their community (“field”), to one project that would fit better as an art project (“showroom”) or how he/she could regain a product idea and further develop it within other technologies (“lab”), and let them more free to experiment their own ideas. That was the moment I understood the importance of this theory and how it would be useful to remodel the way of teaching in fashion design courses.

The structure of the course (which is still on a working process) should work to function remotely and the instructor of each laboratory would coordinate the project of each participant. The first step would be to present the three concepts present at the DRTP book, a series of video-tutorials would be freely available at the São Paulo FabLab website page and would also present a space for interviews, testimonials and space for sharing questions, ideas, problem solutions and sharable models. As important as the items already mentioned is to enable information about the roots and history about the maker culture. Explain the differences between open-source and free software movement, for example, while broadcasting ethical behaviours prompted by a social base movement that has good intentions in an effort to not vanish those values when preparing students for the professional market arena.

We consider this whole experience and learning process as part of a collection of data that helped us organize a way to stablish a service (as an educational intent) while at the same time the efficiency of the theory presented at the “Design Research Through Practice” book could be tested.

## Conclusions

This article’s aim was to present a few notes that were recognized during a one year internship at the Wearable Senses Lab (Eindhoven University of technology) while working with digital fabrication tools (such as 3D printers, laser cutters, 3D scans) and electronics to be applied on fashion design products and services. To get to know the mechanisms of these digital tools was crucial to have a bigger picture about how the new ways to produce and consume could affect development countries, like Brazil, as well as what should be educationally improved in order to have a more equal outcome in a transition based on the knowledge economy. Firstly, we recognized that the practice based methodologies used by design schools on an academic level stays, somehow, between the “maker culture” and the requirements of the so called 4.0 industry, adding a research quality to the development of fashion products and services through digital processes. Secondly, through testing the “Design Research Through Practice” methodology we identified the value of organizing the main areas mostly demanded by the new roles of a designer and how it can be helpful in developing a design research. Finally, we understand that in order to establish more social equality in an economical transition led by the digital production it is decisive to, at least, maintain opened the access of knowledge and to digital tools.

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