Materials in Context

Mapping opportunities of “waste” in Poblenou

Sessions: 3rd & 10th February from 10-13th
Tutor: Laura Freixas

Name of members of the group (2/3 persons): Anna Mestres, Dídac Torrent and Kai Nieves

1 What are your material research and experimentation interests?

Second life objects, mostly furniture and toys, also biomaterials.

2 Select 5 images of projects related to your material experimentation interest.

Reference #1:
HA Schult Trash Men

Reference #2:
L'hospital de les joquines

Reference #3:
Transfolab

Reference #4:
Concurso Drap-Art Upcycling

Reference #5:
Alargascencia

3 Choose an area of interest in the Poblenou neighbourhood from which to begin your research into material opportunities.
Personal Tip: Look at the type of waste or surplus materials you are looking for and the type of businesses in the area.

Map of Poblenou.

4 Enter and talk to those businesses where you think there may be material opportunities of interest to you.
Personal Tip: Introduce yourself briefly and comment on the motivation of your project and what you would like to experiment with their waste. The aim is to establish a bond of trust and collaboration and to keep them informed in case the results are promising.

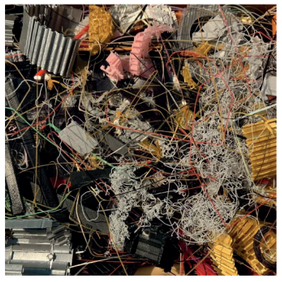
Local Businnes #1:
Biciclot

“Waste” #1:
Metal parts

Local Businnes #2:
Building sector

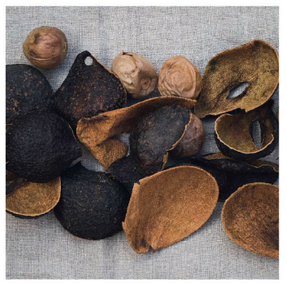
“Waste” #2:
Wood, concrete, cardboard, ceramics

Local Businnes #3:
FabLab



“Waste” #3:
PLA

Local Businnes #4:
Espai Joliu



“Waste” #4:
Coffe, avocado peels, tea herbs

Local Businnes #5:

“Waste” #5:

Local Businnes #6:

“Waste” #6:

5 Submit 3 to 6 material opportunities (waste and surplus) and fill in the following form with your project information by 3/2/2022 at 10am. We will need the information of the project and the material opportunities to be able to carry out the session in class.

If you wish, you can find more information on the subject in the following links:
https://laurafreixas.gitlab.io/laura.freixas/-/organicmatters.html
https://fablabbcn.org/projects/siscode-remix-el-barrio

Material SWOT Analysis

Assessing the potential of material explorations

Strengths

- Easy to shape
- Durability
- Impact resistance
- Chemical resistance
- Manufacturing flexibility

Weaknesses

- Microplastics
- Difficult to sort
- Considered bio but not organic
- Toxic gases when melting

Opportunities

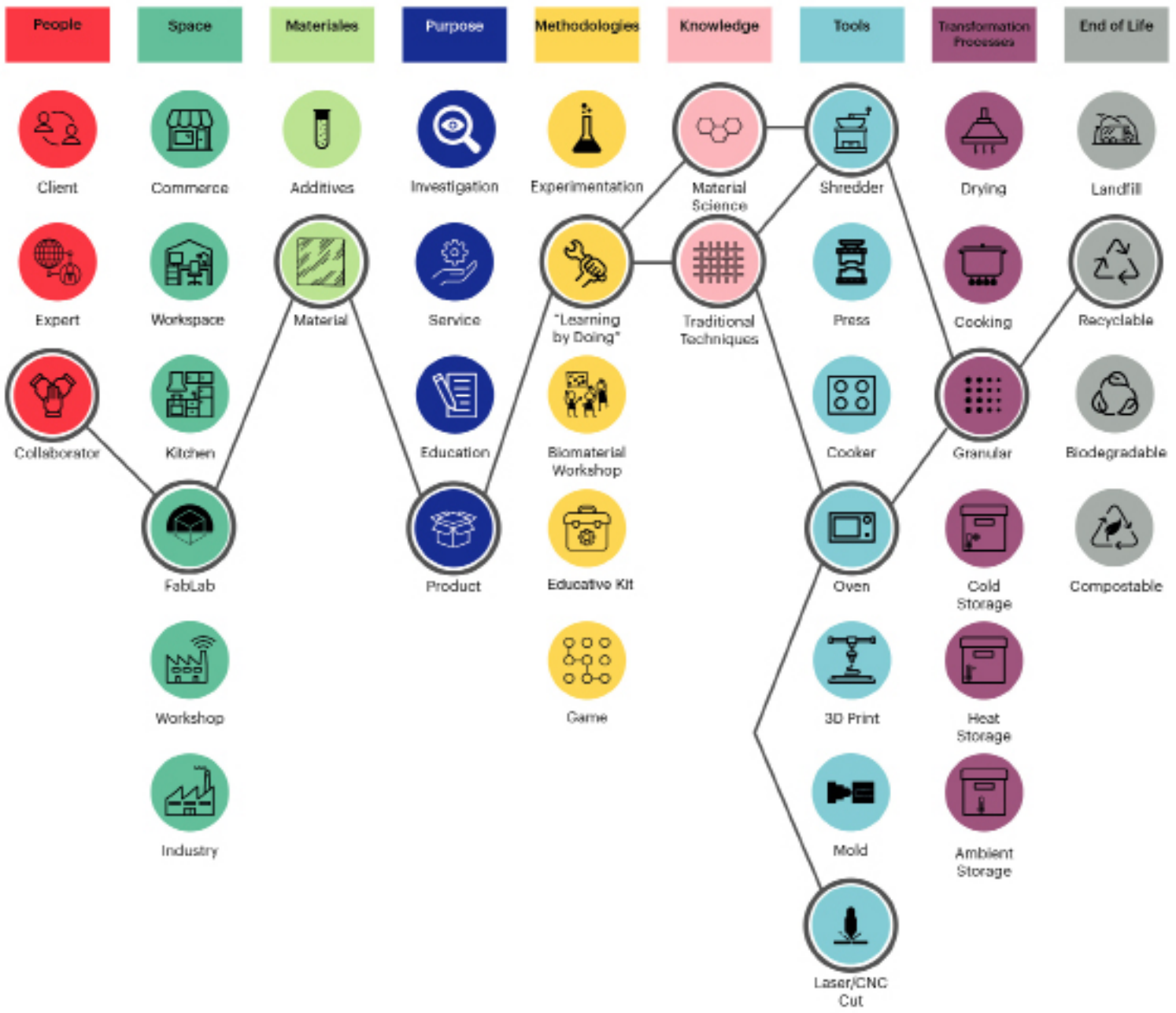
- Circularity: reusing broken or obsolete plastic parts
- Can be turned into many different things
- Can be combined with other materials and technologies

Threats

- Pollution
- Bioplastics are more ethical
- Renewable energy

Title of the project: P-LAb

Members of the group (3 persons): Anna, Dídac & Jeremy


People
Space
Materiales
Purpose
Methodologies
Knowledge
Tools
Transformation Processes
End of Life
Client
Commerce
Additives
Investigation
Experimentation
Material Science
Shredder
Drying
Landfill
Expert
Workspace
Material
Service
"Learning by Doing"
Traditional Techniques
Press
Cooking
Recyclable
Collaborator
Kitchen
Education
Biomaterial Workshop
Cooker
Granular
Biodegradable
FabLab
Product
Educative Kit
Oven
Cold Storage
Compostable
Workshop
Game
3D Print
Heat Storage
Industry
Mold
Ambient Storage
Laser/CNC Cut

Remixing Materials

Documenting the process of material explorations

Sessions: 3rd & 10th February from 10-13h
Tutor: Laura Freixas

Title of the project: P-LAb
Members of the group (3 persons): Dídac, Jeremy & Anna

1 Project referents.

Reference #1:
Metamórfica Lab

Reference #2:
The New Raw

Reference #3:
Crafting plastics

Reference #4:
Ateneu
Fàbrica del sol

Reference #5:
Smile Plastics

2 Objective of the experimentation.

Give a second life to the waste generated by 3D printing machines from the FabLab by turning them into some useful object or tool.

Learn how to process obsolete PLA: shredding, melting, laser cutting and machining.

Explore the different possibilities the sheets of PLA can offer. Check resitance, flexibility, appearance, etc.

3 List of materials.

3D printed PLA parts.

4 Step by step process.

1. Take broken or obsolete 3D printed parts and make sure they are PLA (no ABS nor PETG).

2. Use a shredder machine to shred the parts and obtain the small plastic grain.

3. Use an oven to create the plastic sheets by baking the PLA at 200ºC for 15 minutes. Don't use an oven where food is cooked, gases from PLA are toxic. The sheets should be around 3-5mm thick after baking.

4. Transform the sheets into other objects using tools or a laser cutter.

5 Photos of the results.

Photo #1:
Grain and sheets

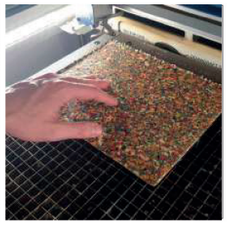


Photo #2:
Sheet on the laser cutter

Photo #3:
Texture from the bottom

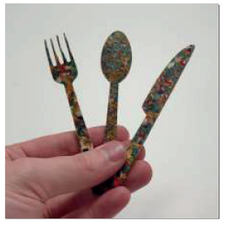


Photo #4:
Cuttlery made from PLA

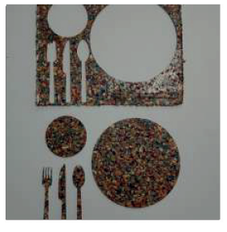


Photo #5:
Laser cut sheet: negative-positive

6 Opportunities identified during the experimentation.

We didn't separate the colours of the PLA and we obtained a coloful mix that was quite impressive. However, depending on what one wants to do with the sheets, it'd be a good a idea to split the colours and then create individual sheets for each colour. Also, it's interesting to create sheets from different thicknesses since they have different properties regarding strength, flexibility, etc.

7 Conclusions of the results according to the stated objective.

Taking into account that our main goal was to explore the process of reusing PLA, we think we reached the goal and thanks to this now we have a whole world of opportunities inside this field of research. We had been interested in initiatives like Precious Plastic for a while and this has been a first intervention in that direction. We didn't create anything new but doing all this experiment was completely new to us.

8 Next steps of the project.

For the next steps, we have started designing some agriculture tools we want to make out of the sheets we still have, combined with some wood parts. In addition, we would like to explore how easy or difficult would it be to reshape the plastic sheets by using a hot gun. There are many possible things to do with these amazingly colorful recycled sheets.

PLA

Material Recipe

· 3D printed PLA parts (one sheet needs 200g more or less)

Tools

· Shredder · Oven (not the one for food) · Silicone mould (A4 size or 20x25cm)	· Laser cut machine· · Electronic balance

Elaboration Process

Step 1: Gather some 3D printed parts and make sure they are made of PLA.

Step 2: Shred the parts to obtain the grain.

Step 3: Weigh 200g of grain for an A4 size silicone mould.

Step 4: Flatten the grain and put it in the oven at 200ºC for 10-15 minutes. Warm set up and down.

Step 5: Take it out of the oven and let it cool down. Ventilate the room.

Step 6: Think of something cool to do with it!

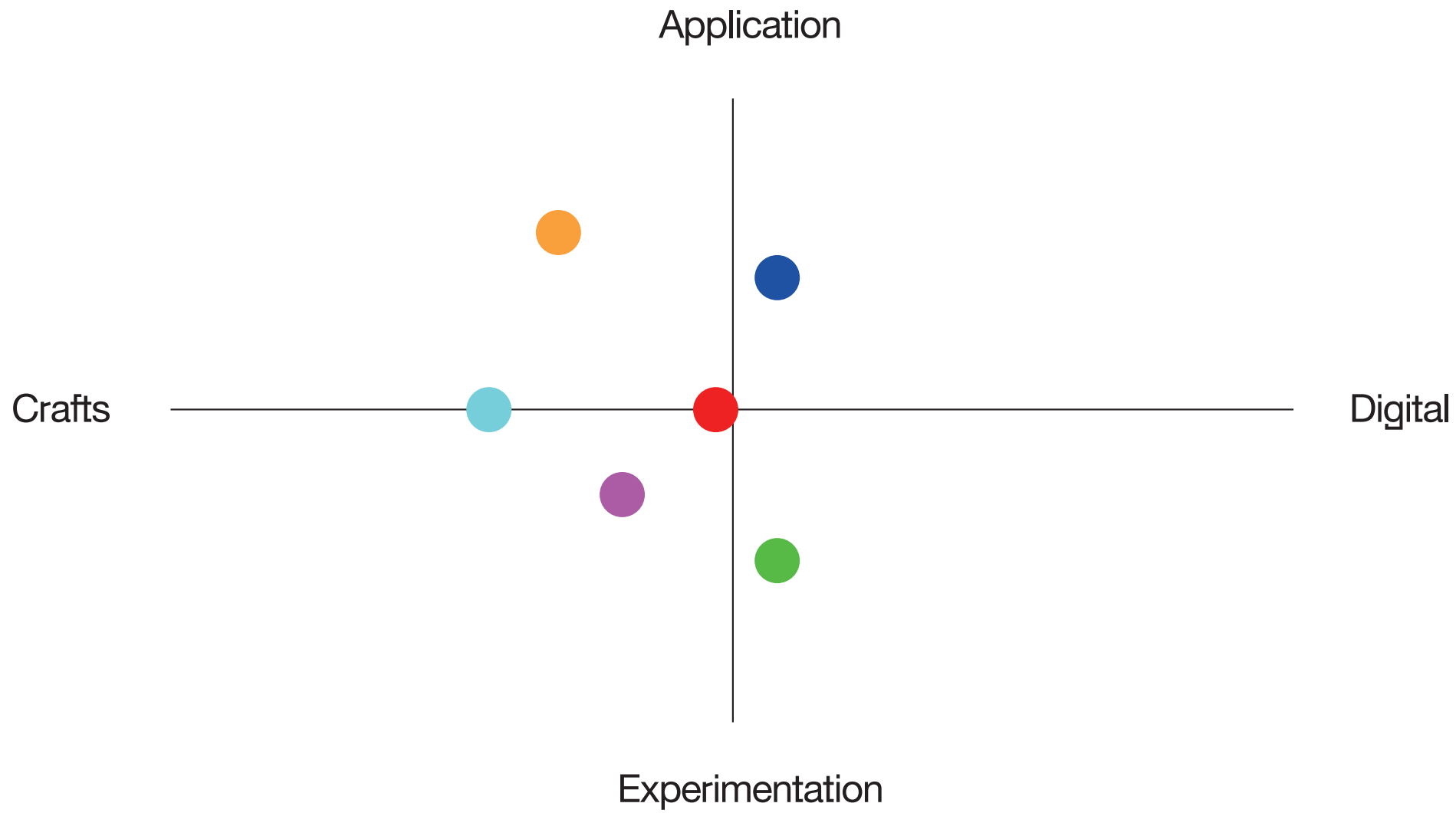
Properties

Hardness	Strong
Elasticity	Low
Flexibility	Low
Impermeability	Yes
Weight	Heavy
Texture	Variable
Brightness	Variable
Odour	Soft smell

Material Pictures

Material Feedback

Assessing the potential of material explorations



Title of the project: P-lab

Members of the group (3 persons): Jeremy, Dídac & Anna

Where we stand.

Material Feedback

Assessing the potential of material explorations

Material Properties	DIY Recipies	Experimental Processes	Possible Applications	General Feedback
- Colorful - Resistant - Low heat resistance - Low flebility - Different texture	We do not recommend following the recipe at home, due to the needs of a special oven. It is also necessary to crush the PLA with a powerful crusher, (it is not recommended to use the one for cooking).	All the tools that FabLab has were used to learn how to use more advanced recycling processes, althou-gh not as accessible.	- Filaments for 3D printing. - Objects manufactured by molds or laser cutter. - The possibility of mixing it with different materials.	Good experimentation of the work. Research on the color separation of the PLA to make more artistic panels. Use the scraped contour as an instrument, to play and research on music elements.

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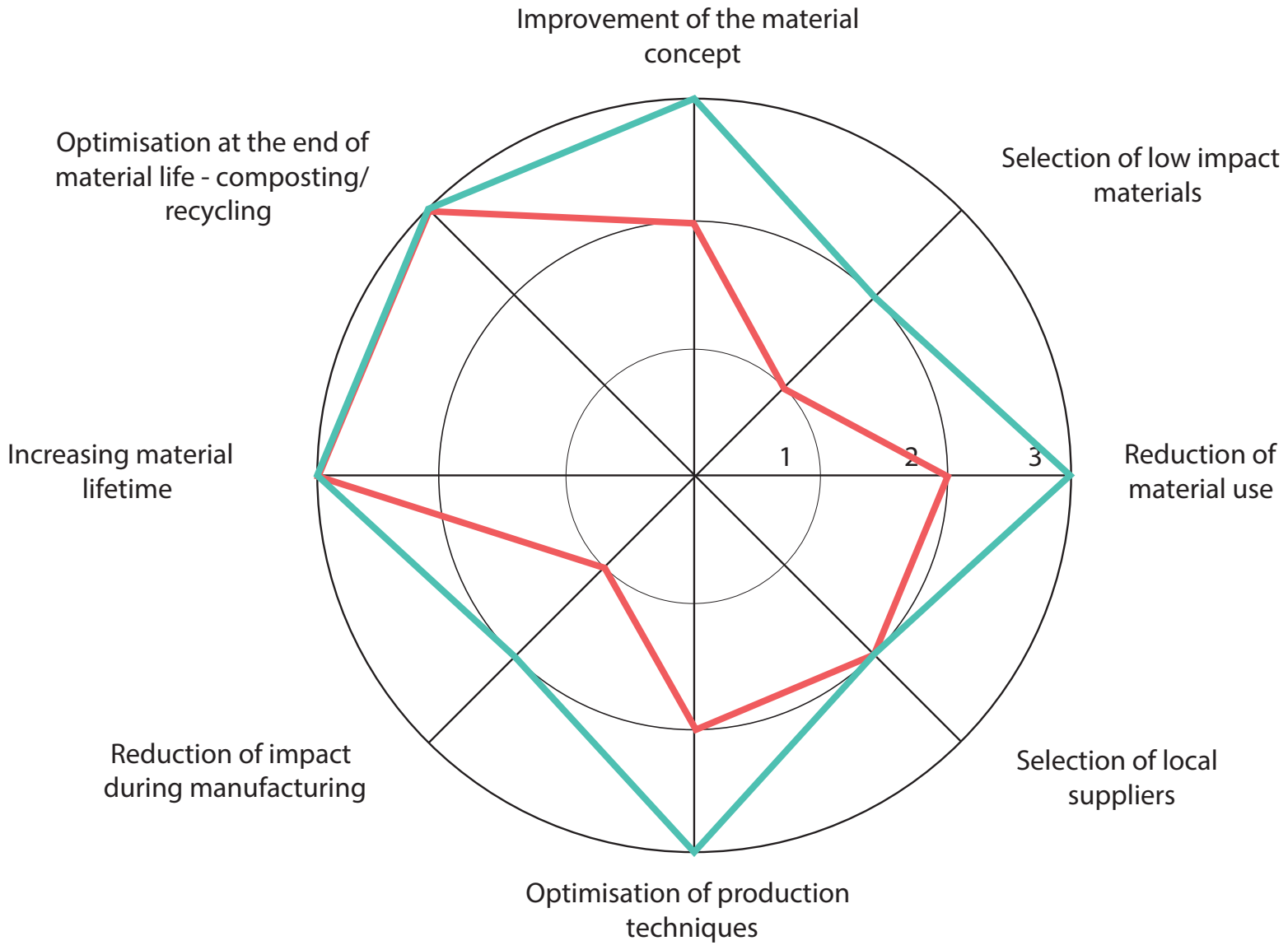
Ecodesign Strategy Wheel

Assessing the impact of material explorations

Legend

- Actual Material
- Ideal Scenario Material

1 More Impact
2 Intermediate
3 Less Impact



Material Reflection

A) WHERE DOES THE MATERIAL COME FROM? WHICH RESIDUES?

It comes from the FabLab, they are residues of 3D printing models, as errors or broken parts or that are no longer used.

B) WHY IS THE MATERIAL INTERESTING FROM AN ENVIRONMENTAL, SOCIAL AND ECONOMIC POINT OF VIEW?

Polylactic acid, commonly referred to as PLA, is a bioplastic and thermoplastic made from natural materials like corn starch. It is one of the main materials most used in 3D printing, due to its modeling flexibility. It is considered a cheap, non-toxic and biodegradable material, and offers a wide range of colors. It melts at low temperatures but resists very well chemically. All these properties make it an accessible and widely used material both DIY and factory.

C) WHY DOES YOUR MATERIAL FIT IN A CIRCULAR ECONOMY?

By being part of thermoplastics their molecular bonds once broken allow them to be reformulated again. In this way, increasing the temperature we can get to gather the links and give new shapes to the material, without losing the initial properties, only depending on the design of the new part.

D) MENTION 5 POSSIBLE PRODUCTS WHERE YOUR MATERIAL COULD BE APPLIED.

- 3D printing models
- Toys
- Garden tools
- Buttons
- food packaging

E) IS THE ELABORATING PROCESS OF YOUR MATERIAL SIMILAR TO EXISTING INDUSTRIAL PROCESSES? WHICH ONES?

The process followed has been guided by common industrial processes, which are now functioning.

F) WHAT ARE THE REQUIRED NEXT STEPS TO INDUSTRIALIZE MATERIAL?

The main problem in the process, which we find, is to be able to distinguish PLA above the different existing plastics.

Final Exploration