

**Critical
Making**

Project Zine

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Berlin, June 2023

Workshop and layout by Sidney Drmay

Edited by Dr. Regina Sipos

Dear Reader,

Welcome to the Critical Making Project Zine!

As an academic consortium, we documented the past 2,5 years of collaboration through traditional academic ways: peer reviewed journals, conference presentations, reports and other deliverables. These are never published before they are deemed perfectly polished.

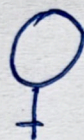
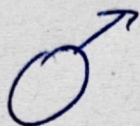
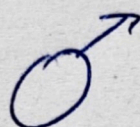
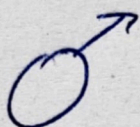
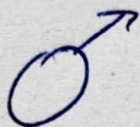
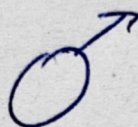
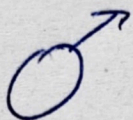
Fortunately, in the last few years, researchers have also started experimenting with non-traditional research outputs, which let us be creative and show you the other side of our work. Inspired by punks and other countercultures, zines provide us with a method to show you what's going on behind the academic scenes. The zines edited by Garnet Hertz helped us frame this project, and Sidney Drmay held our hands throughout the creative process of filling the pages.


As the Critical Making Project is coming to an end, we are publishing this zine not only to summarize our experiences and reflect upon them, but also to thank everyone who helped us make the project happen: our Advisory Board, the many non-academic project partners, and of course all of our global co-researchers, **the critical makers of the world.**

We hope you'll have fun browsing through our experiences.




Yours sincerely,
The Critical Making Consortium Members

How INCLUSIVE is your
MAKER COMMUNITY ?

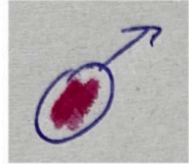
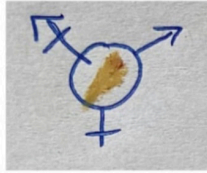
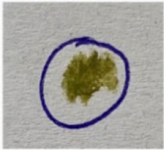
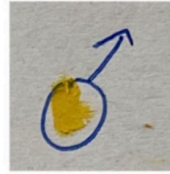
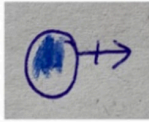




GENDER RELATIONS & INCLUSIVENESS ARE CONTEXT SENSITIVE



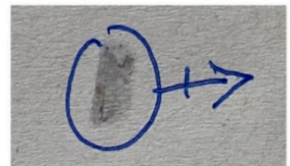
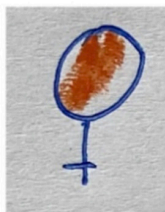
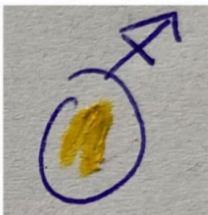
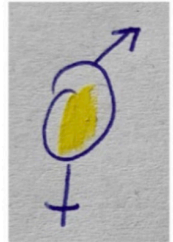
- WHICH INEQUALITIES MATTER IN YOUR CONTEXT?
- WHICH GROUPS OF YOUR SOCIETY ARE NOT/HARDLY REPRESENTED REPRESENTED IN YOUR SPACE - WHY?
- HOW COULD YOU MAKE YOUR SPACE WELCOMING, INCLUSIVE, ATTRACTIVE AND SAFE FOR THESE MARGINALISED POPULATIONS?
- HOW COULD YOU ADAPT YOUR OFFERS SO THAT HARDLY REPRESENTED COMMUNITIES FEEL WELCOME AND SUPPORTED IN YOUR SPACE?
- ARE THERE ORGANISATIONS YOU COULD COOPERATE TO ADDRESS INEQUALITIES?
- ARE THERE ROLE MODELS THAT YOU COULD SUPPORT?

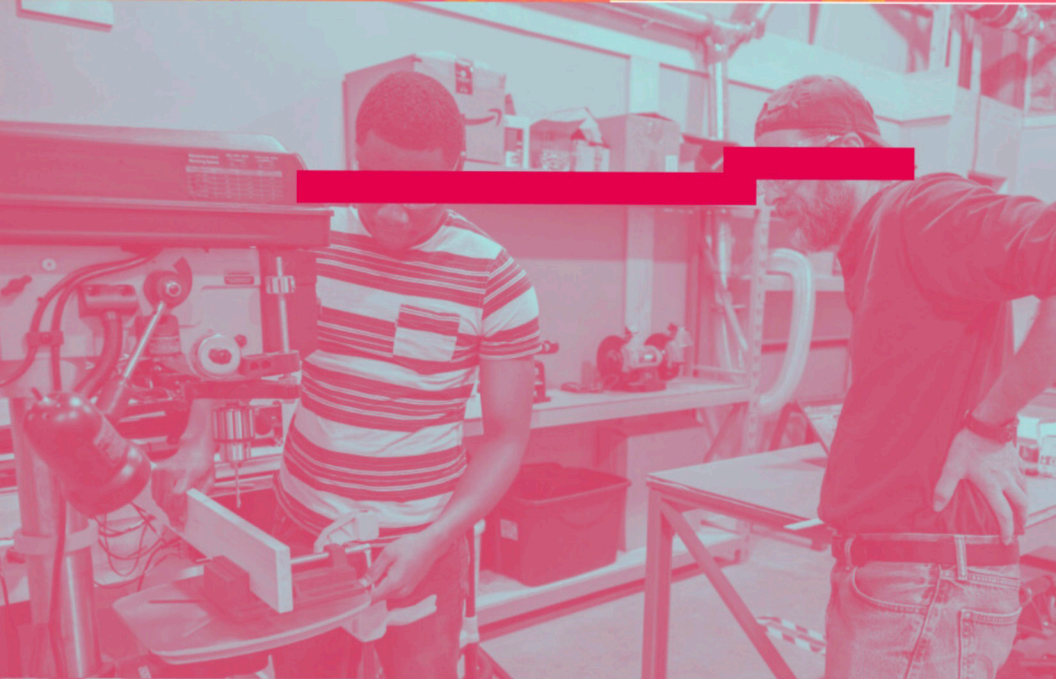


More infos, guidelines, role models, stories, initiatives on gender-inclusive making:



SCAN ME



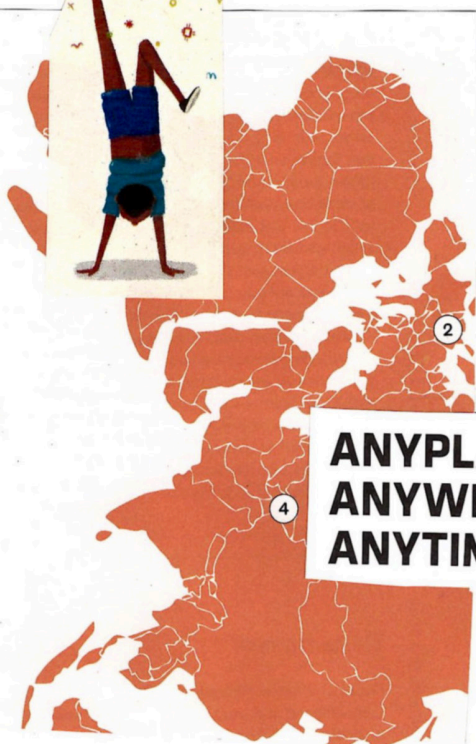
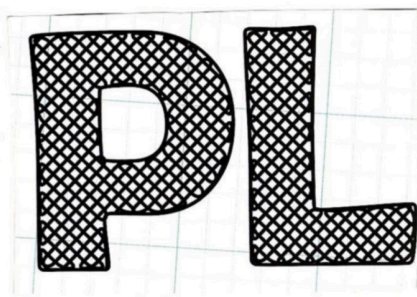


LERN DOCH, WAS DU WILLST!*

* LEARN, WHATEVER YOU WANT



create and Future



**ANYPLACE,
ANYWHERE,
ANYTIME**





Art. 29 EDUCATION

Deine **Bildung** soll Dir helfen, alle **Deine Talente** und Fähigkeiten zu entwickeln. Sie soll Dich außerdem darauf vorbereiten, in Frieden zu leben, die **Umwelt** zu **schützen** und andere **Menschen** und ihre Rechte zu **respektieren**, auch wenn sie anderen Kulturen oder Religionen angehören. Dafür sollst Du auch die Menschen- und Kinderrechte kennenlernen und achten.

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KONVENTION ÜBER DIE RECHTE DES KINDES



AY



Making

IS MORE
THAN

3D PRINTING

The pillars of
in EDUCATION



Critical
Making

PROSUMEERISM



Transparency

SOCIAL
INNOVATION

REFLEXIVITY

a brand-new
economy and financial system
that truly services people, planet,
and prosperity.

LOVE TO LEARN

HACK | MAKE | BUILD | CREATE



HOW FAR?

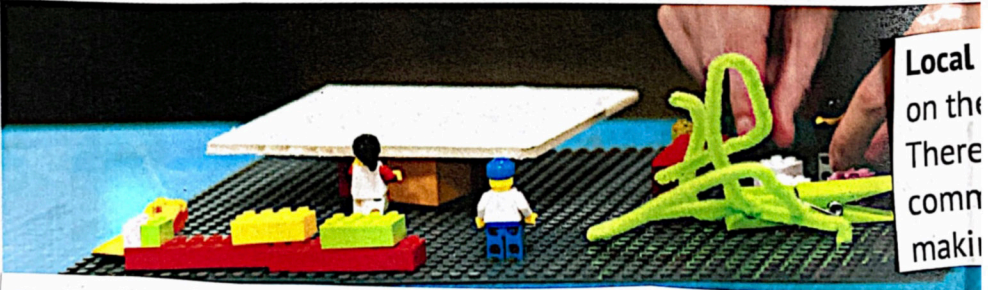




6 core values Critical :

Impactf
seeks to

Social & Diverse: Critical Making reflects on the social dimension of making, the living realities of those persons involved and concerned, as well as the ethical implications of their work. Critical Making thereby addresses societal challenges and needs. That's why it is so important to strive for diversity and inclusiveness.



Local
on the
There
comm
maki

Reflexive: Critical Making re-thinks and re-constructs the dominant mainstream maker culture from a critical stance, reflecting on underlying power structures and their implications.

Open:
sharin
ecosys

Joyful & meaningful: Critical Making is still about the joy of making, but adds meaning to it. What is made critically is made with a specific purpose of individual or social kind.

values of al Making

Impactful: Critical Making aspires to really make a difference. It seeks to improve life and build a sustainable future.

dimensions
and
work. Critical
s. That's
eness.

Local & connected: Critical Making is happening locally, working on the ground and adapted to a particular socio-cultural context. Thereby, critical making implies an engagement with local communities as well as global networks – thinking globally and making locally.

ie dominant
ing on

Open: Critical Making promotes open collaboration, including the sharing of skills and knowledge. It boosts creativity in the ecosystem of makers by making processes and results accessible.

oy of and in
is made



Critical Making

mentoring programme

We taught 18 makers from all around the world with practical tools to make their projects more sustainable and critical – and provided financial support for materials and the open documentation.

Saad Chinoy

Make things that make sense

In the first workshop, the general sense of maker projects will be considered. What are the problems you are trying to tackle with your making? How to consider ethical aspects when making?



Emilio Velis

Share how you make it

In the second workshop of the series, questions of sharing and reproducibility of makes are considered. Sharing is not a simple task, if you wish for others to be able to remake and remix what you have made.



Aravindh Panch

Include ecosystem services

The third workshop of the series focuses on the environment you are working in.



Georgia Nicolau

Integrate local knowledge

In this workshop, you will learn about different solutions that could be found through co-design or other human-centered design practices, where the local knowledge beyond your makerspace can be utilized.



Bahar Kumar

Build for continuity

The last workshop of the series focuses on financial questions. How to make your making financially sustainable? In this workshop, you will get tools to build a self-sustaining, continuous making practice.



meet the teachers

Make time to make stuff + document it



Programme Outline

First Deadline for applications

May, 22nd

Secure your spot early!



Information on acceptance to the programme

May, 31st

First round of projects acceptance

Final Deadline for applications

May, 31st

It's now or never!

Information on acceptance to the programme

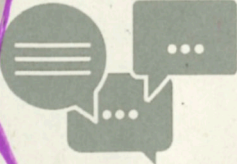
June, 15th

Second round of projects acceptance

Entry Interview

20 - 24, June

this is a place for you to stop and think about your project, the sustainability values you are currently promoting and various ways in which your project could be even better



Workshop series

June to December

Each workshop has a different mentor, so during the series, you will learn from many distinct perspectives and themes. In a group mentoring setting, you will learn not only from the mentors, but also other mentees



Demo Week

December

X March

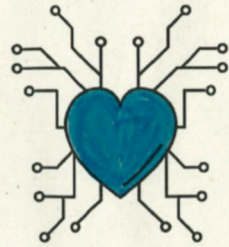
Finish your documentation and present your results to the world. Isn't it great?



Exit Interview

March X

Another chance to reflect on your making practices! In the exit interview, you will get to reflect on how your making has changed during the mentoring program together with other attendees.

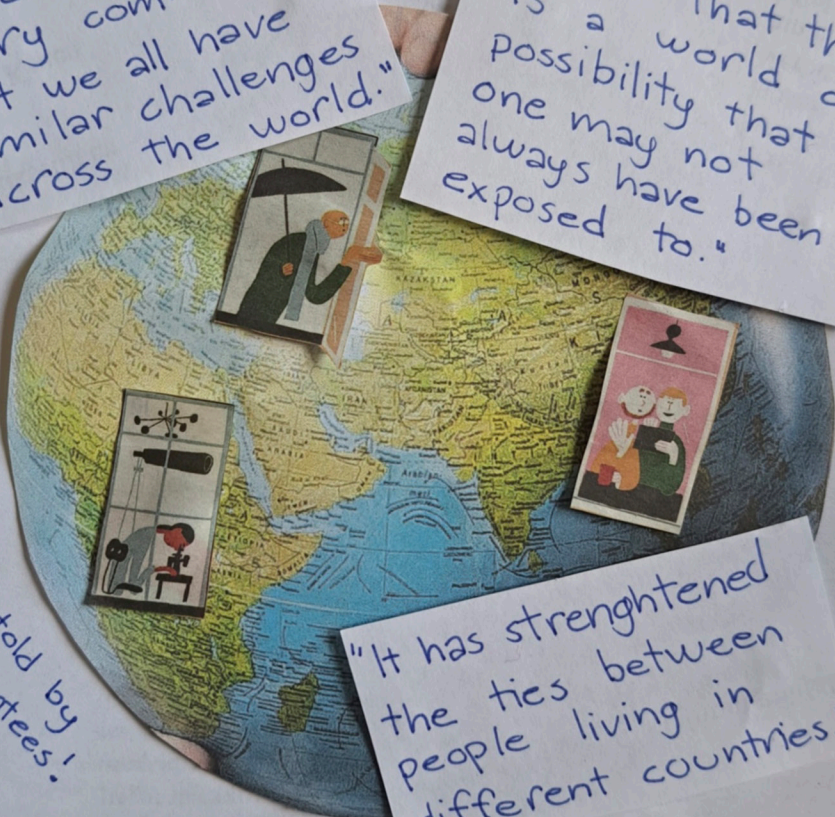


During the process we needed to adjust the timeline - of course.

CRITICAL MAKING MENTORING

"It's different in every community but we all have similar challenges across the world."

"This programme shows that there is a world of possibility that one may not always have been exposed to."



as told by
the mentees!

"It has strenghtened the ties between people living in different countries."

Hosting makers from around the globe online, sharing knowledge and creating ties.

The Power of Responsibility

How to Measure Impact

1 No Poverty



2 Zero Hunger



3 Good Health and Well-Being



4 Quality Education



5 Gender Equality



6 Water and Sanitation



7 Affordable and Clean Energy



The Sustainable Development Goals as Our Guide

8 Decent Work and Economic Growth



9 Industry Innovation and Infrastructure



10 Reduced Inequalities



11 Sustainable Cities and Communities



12 Responsible Consumption and Production



13 Climate Action



14 Life Below Water



15 Life on Land



16 Peace, Justice and Strong Institutions



17 Partnership for the Goals



SDGs the Critical Making project contributes to most

IMPACTS OF CRITICAL MAKING PROJECT

Reflexivity

1. NEW SKILLS FOR IMPACTFUL MAKERS THROUGH THE MENTORING PROGRAMME



Responsiveness

2. NEW TOOLS AND CAPABILITIES FOR EDUCATORS TO BRING CRITICAL MAKING INTO THE CLASSROOMS



Community empowerment

3. EMPOWERMENT OF FEMALE MAKERS THROUGH COLLABORATION AND FINANCES, ALLOWING THEM TO NAVIGATE THE MALE-DOMINATED FIELD OF TECHNOLOGY BUILDING



Ethics

4. GUIDELINES FOR HOSTING INCLUSIVE MAKERSPACES CO-CREATED WITH PRACTITIONERS AND DISTRIBUTED ONLINE

Anticipation

5. CREATING AN ONLINE COMMUNITY WITH OPENLY SHARED MAKER PROJECTS ON WIKIFACTORY, BUILDING A BASE FOR CONTINUITY



Openness

6. AND MORE! CHECK OUT CRITICALMAKING.EV TO READ MORE AND ACCESS THE RESOURCES!



Anticipation refers to systematic thinking which aims to increase resilience of communities and helps to recognize and create opportunities for challenging the existing state of the art with novel social and technical innovations. Anticipation can be fostered with various participatory and deliberative foresight tools including horizon scanning, scenario building and road mapping. The aim is also to make people aware of existing social imaginaries.

Responsiveness is the ultimate aim of the three previous RRI principles: to increase the capacity of researchers and science and innovation system to be responsive for social challenges related to their research. In institutionalized research this kind of responsiveness is shown for example in the direction of research efforts towards recognized societal challenges. In addition, research actors can actively influence the rules of the game in society by promoting changes in regulation and standards and contributing to ongoing policy debates and programs.

Reflexivity refers to deliberate rethinking of how one's activities encounter and reflect the social norms and conventions and potentially challenge or strengthen existing social power relations, division of labor and costs and benefits or whether it causes potential risks for other people or ecological environment. Reflexivity is a process of questioning one's own activities and looking at them from the perspective of other people and natural beings.

Inclusiveness refers to the need to include multiple voices and stakeholders in the innovation and making to bring in legitimacy and to provide an opportunity for stakeholders to express their concerns and opinions about the direction of activities. Several engagement methods to achieve inclusion in research have been introduced including for example citizen juries and panels or more light consultation through surveys and polls. In grassroots innovations the context is different as innovations are driven by citizens. In this case also, there is the need to carefully consider that people with multiple background feel welcome and get their voices heard in making activities and to make sure that also often underrepresented citizens (e.g. elderly people, young people, people with lower socioeconomic status etc.) are invited to participate.

• What futures do we want?
• What consequences does my making have?

Am I addressing a social issue?

What resources am I using? Where do they come from?

Whom am I excluding? Why?

ANTICIPATION

RESPONSIVENESS

REFLEXIVITY

INCLUSIVENESS

The Story of How we Got to an Escape Route Game from an Academic Framework

Step 1: We had an idea!

During the development of the proposal, we realized that Designable Research & Innovation (DRI) and Grassroots Innovation Movements (GIM) did not have an intersection. So we decided to change this.

it needs to be translated for non-academic audiences
 it needs to be hands-on
 it needs to be creative
 it needs to be co-created

TIME TO REFLECT:
 How can we make this more hands-on?
 How can we make this more creative?
 How can we make this more co-created?
 How can we make this more translated for non-academic audiences?

Step 2: It's very well received by the advisory board AND we even use it to propose a "new PhD key" focus on community empowerment (see FUSPEI 2022)

Step 2: The Critical Making Responsibility Framework is born!

A multidisciplinary group of researchers came together to combine two existing frameworks:

Component	Background	Key Concepts	Contribution
1. Critical Making	Focuses on the material and social aspects of making, emphasizing the role of the maker and the context of making.	Making, Maker, Making Practice	Emphasizes the social and cultural aspects of making, moving beyond the technical and individual focus of traditional maker education.
2. Responsibility	Focuses on the ethical and social implications of making, emphasizing the role of the maker and the context of making.	Responsibility, Accountability, Ethics	Emphasizes the ethical and social implications of making, moving beyond the technical and individual focus of traditional maker education.

The goal is to help researchers study the intersection of making practices in grassroots practice

Regina Sipos & Maria Averman
 To cite this article: Regina Sipos & Maria Averman (2023), Introducing the Critical Making Responsibility Framework for analyzing responsible innovation practices: Innovation: The European Journal of Social Science Research, DOI: 10.1080/13511610.2023.2195583
 To link to this article: <https://doi.org/10.1080/13511610.2023.2195583>

1. The DRI framework selection. To ensure relevance, literature on Responsible Research & Innovation (RRI) and Designable Research & Innovation (DRI) was reviewed. The framework was selected based on its focus on ethical dimensions and its potential for grassroots innovation. The framework was selected based on its focus on ethical dimensions and its potential for grassroots innovation.

2. The GIM framework was selected based on its focus on grassroots innovation and its potential for responsible innovation. The framework was selected based on its focus on grassroots innovation and its potential for responsible innovation.

the Story of Part 2:

→ Step 3: Approaching Unboxes

We asked unboxes to help us refine the questions in a collaborative workshop online to tackle the phenomena of implementing critical thinking in writing without losing the fun out of it. It was a long and interesting workshop! But

Figure 4: Online white board supporting co-creation in the Critical Making Responsibility Framework workshop with makers.



CR/MRE	Reflexivity	Anticipation	Inclusiveness	Responsiveness
Context	How do you (re)define your role in your community?	What are the roles of others in your community?	Who are the stakeholders in your community?	How do you (re)define your role in your community?
Frameworks	How does the way you practice affect the community?	How do you (re)define your role in your community?	How do you (re)define your role in your community?	How do you (re)define your role in your community?
Spaces & Strategies	How do you (re)define your role in your community?	How do you (re)define your role in your community?	How do you (re)define your role in your community?	How do you (re)define your role in your community?
Pathways	How do you (re)define your role in your community?	How do you (re)define your role in your community?	How do you (re)define your role in your community?	How do you (re)define your role in your community?

Table 2: Initial reflexive questions that were discussed in the co-working workshop.

we managed to refine these reflexive questions:

Critical Making Responsibility Framework. Extending an Academic Proposal to Support Reflexivity in Maker Communities

Regina Spies, Maria Bannura, Hanna Saut, Barbara Kitzinger

DOI: 10.5281/zenodo.7432145

And our paper presented at the MIT FabTest in 2022 titled the "Best Paper Award"! ↳ checked out the video on YouTube

from Brazil, Germany, Tunisia and Singapore!

CR/MRE	Reflexivity	Anticipation	Inclusiveness	Responsiveness
Context	How do you (re)define your role in your community?	How do you (re)define your role in your community?	How do you (re)define your role in your community?	How do you (re)define your role in your community?
Frameworks	How do you (re)define your role in your community?	How do you (re)define your role in your community?	How do you (re)define your role in your community?	How do you (re)define your role in your community?
Spaces & Strategies	How do you (re)define your role in your community?	How do you (re)define your role in your community?	How do you (re)define your role in your community?	How do you (re)define your role in your community?
Pathways	How do you (re)define your role in your community?	How do you (re)define your role in your community?	How do you (re)define your role in your community?	How do you (re)define your role in your community?

Table 3: Elaborated reflexive questions after the workshop.

we also asked the unboxes: U.S. What format? University, public test? Game? U.S. How is this unbox? unboxes for reflection, learning, and creativity

→ Step 4: UNBOXING - the Critical Unboxing Escape Room Game!

Together with Julia Franco, they created a fun game. So that unboxes can open the "locks" box.



we will test this game live with boxes of boxes early June 2023 and collect their feedback!

Questions were taken from the critical questions in our other workshops. We rephrased the questions to make them more relevant for the game. We rephrased the questions to make them more relevant for the game.

Conclusion

We are curious to see: unboxes are easy practice - or not? What happens if they are given or give themselves the tools, think, and permission to stop, think, anticipate and reflect together? ↳ CRITICAL LEARNING!

EMPOWERED MAKER COMMUNITIES

For makers, community
is the key.

For communities,
making can be
the key to
empowerment.



Empowering maker communities can

- teach useful skills
- offer resources to community members, such as tools & spaces
- create pathways to financial independence
- promote gender equality

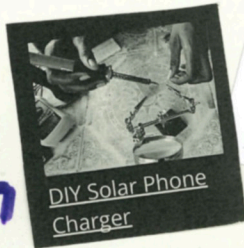


GET INVOLVED IN

CLIMATE ACTION



locally available
upcycled materials
to charge phones in
areas without
electricity. →



DIY Solar Phone
Charger

sustainable solution to reduce
carbon emissions and landfill
waste

locally-sourced
cost-effective wood



Eco Star Extension
Cable

"We need to shift from
ego to eco on every level
of our existence."

BUILD

TRANS- FORMATIONAL ECONOMIES

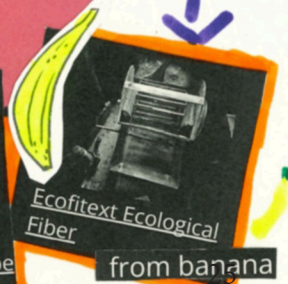


promote a thriving
circular economy in
the textile
industry

providing affordable & safe
healthcare equipment
alternatives. →



Digital Wireless 3D
Printed Stethoscope



Ecofitext Ecological
Fiber

from banana

Project Partners:



and many global
co-researchers:
THANK YOU!



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101006285

<https://criticalmaking.eu>