



The Circular Product Designer

Fostering Circular Competencies in Design

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The Challenge - a Linear Fashion Industry

61%

Landfills/incineration

Circle Economy. (2024). The Circularity Gap Report: Textiles

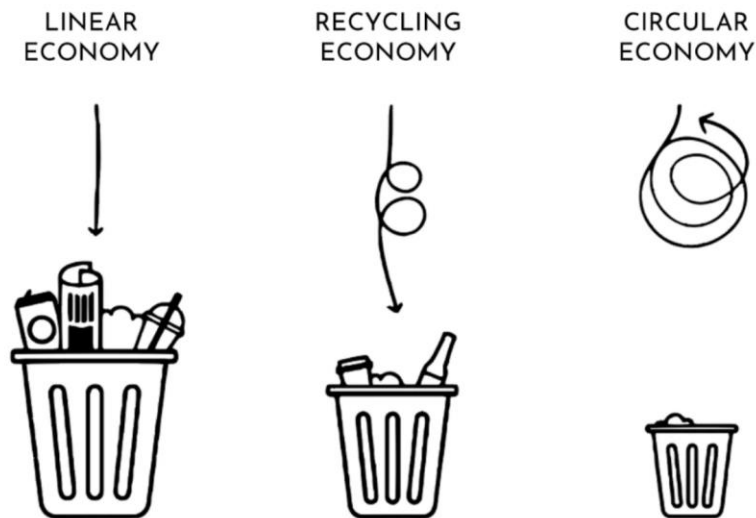
>1%

Textile-to-textile recycling

Textile Exchange. (2024). Materials Market Report 2024

The Challenge

- a Linear Fashion Industry



**We are far from
seeing a global
circular economy.**

Circle Economy. (2024). The Circularity Gap Report 2024

Sustainable Fashion Tech

Sustainable Fashion Tech

- At the crossroads of **design, technology & business**
- Driving **sustainability and digital innovation** in fashion
- Fostering **creativity, technical expertise & business mindset**
- Equipping students for **today's industry and tomorrow's sustainable future**
- Hands-on learning in studio and labs + theory
- 2 years AP + 1,5 years Bachelor
- 160 students

A Sustainable Fashion Tech designer, will typically work in roles such as

- Fashion Designer
- Product Designer
- 3D Fashion Designer
- Technical Designer
- Freelance Designer
- Sustainable Entrepreneur

Why a Circular Design Elective?

Context

Transition from a linear to a circular design approach

Aim

To train students as circular product designers and gain circular design competencies.

Objective

To foster a circular mindset and sense of agency among students.

Perspective

To enable SMEs in the fashion industry to transition towards circularity.



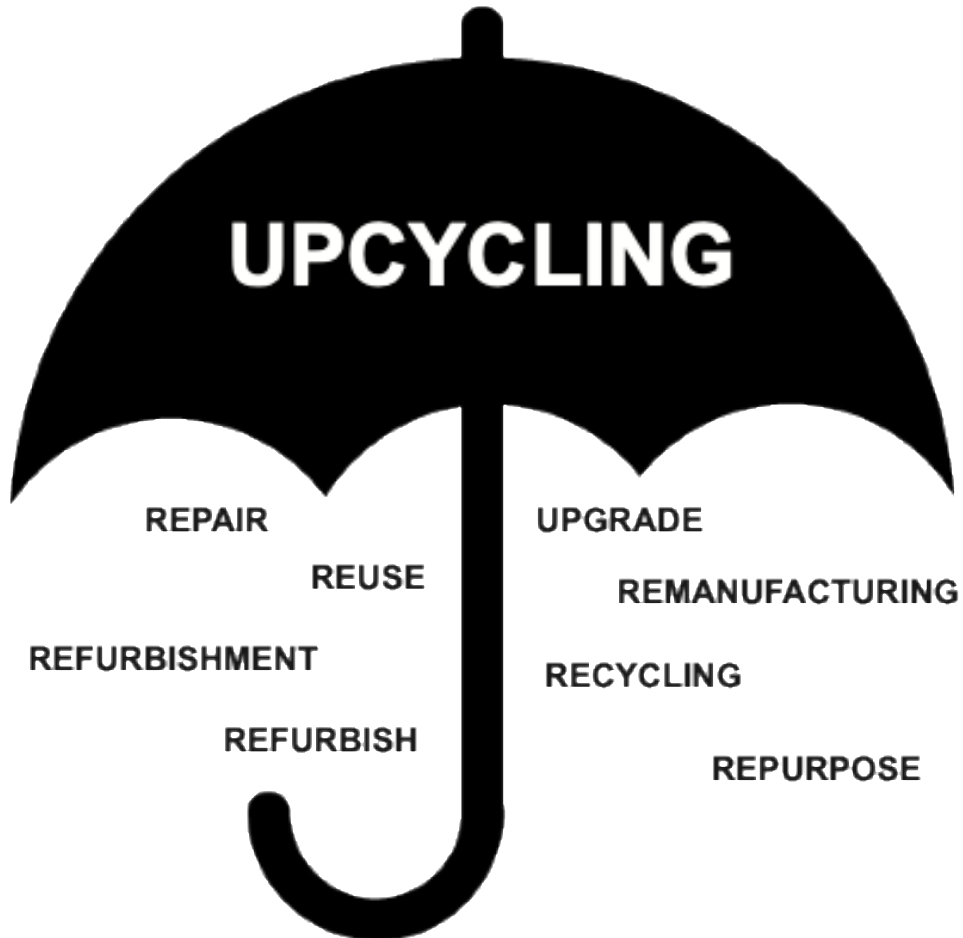
Circular Design Course Overview

- 10-week elective
- 24 Sustainable Fashion Tech students
2 years AP
- Main learning approaches:
Theory + experimenting hands-on workshops
- Goal: gain circular design competencies



Addressing the Challenge

-What is Upcycling?



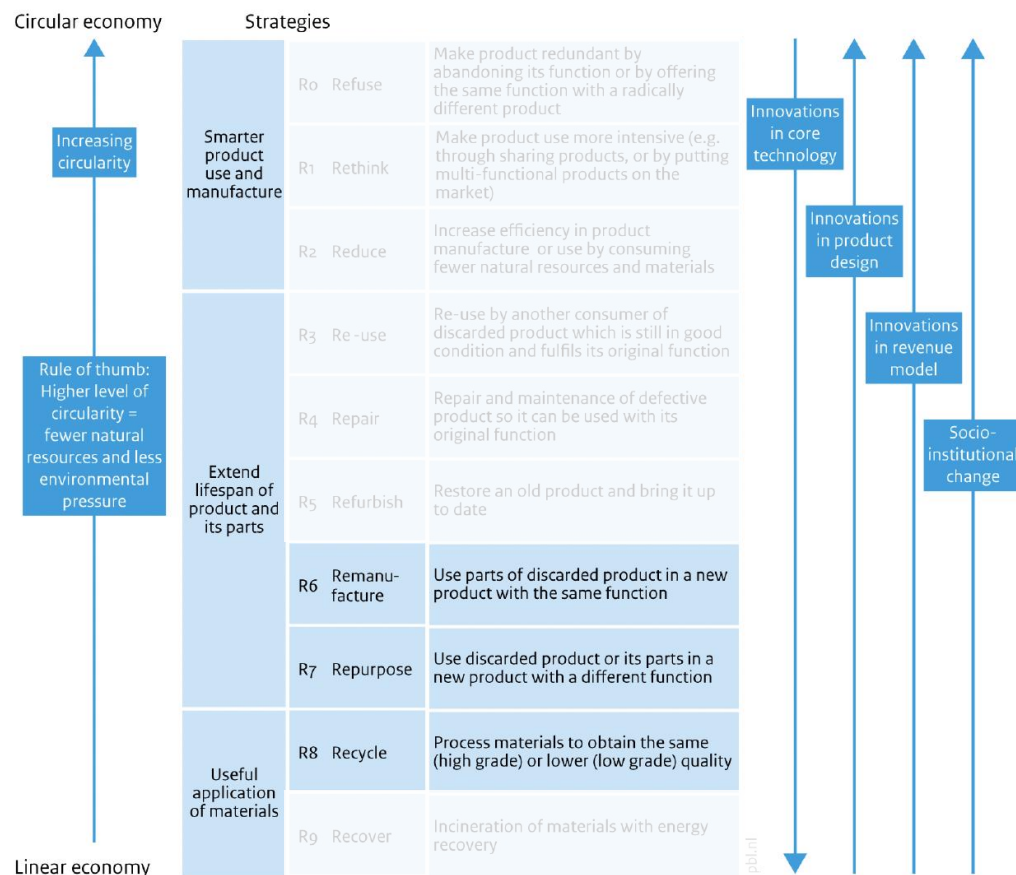
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‘Upcycling is popularly understood as an umbrella concept incorporating ‘creative’ forms of repair, reuse, repurpose, refurbishment, repurpose, upgrade, remanufacture and recycling.’

‘In theory it extends the lifetimes of products and materials, thereby increasing material efficiency and reducing industrial energy consumption. It reduces solid waste.’

Han et al. (2017). Standard vs. Upcycled Fashion Design and Production. *Fashion Practice*, 9(1), pp.69-94.

Addressing the Challenge -With R-Strategies



Source: RLI 2015; edited by PBL

Figure: Potting et al. 2017. Circularity strategies within the production chain, in order of priority.

“

Several circularity strategies exist to reduce the consumption of natural resources and materials, and minimise the production of waste.

Lifetime extension of materials is followed by recycling through recovery.

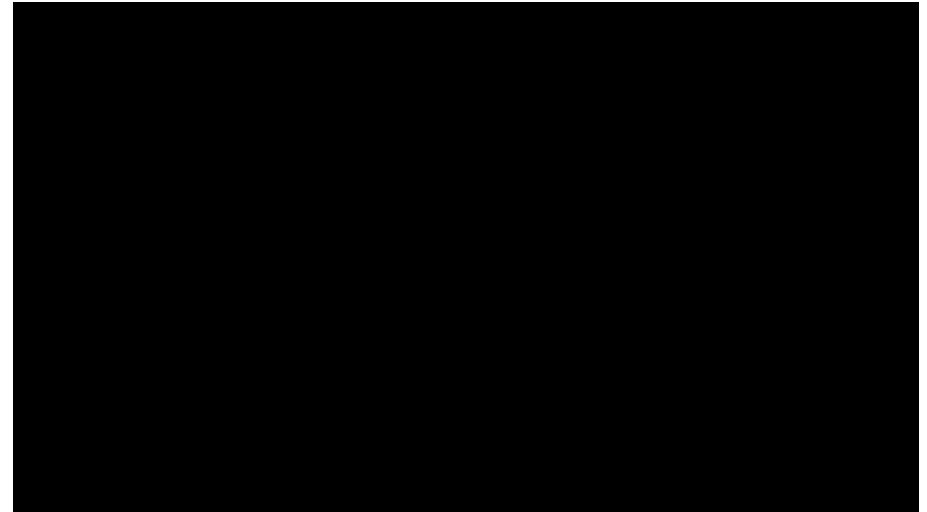
Potting et al.. (2017) *Circular Economy: Measuring Innovation in the Product Chain*. The Hague: PBL Publishers. P.4-5.

Workshop 1 Upcycling R7-Repurpose Strategy

- Upcycling tablecloth (post-consumer textiles)
- Design must include subtraction cutting, material manipulation or/and screen print
- Design Methods: subtraction cutting, material manipulation, screen print



Tablecloth – post consumer textiles / Group exhibition

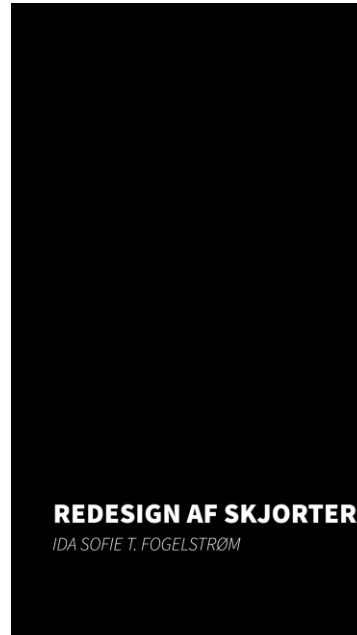


Student's work: video of prototype

Workshop 2 Redesign

R6-Remanufacturing Strategy

- Redesigning men's shirts (post-consumer textiles)
- Design must include repurposed elements from shirts
- Design Methods: deconstruction, reconstruction, patchwork, mending, surface design and CLO 3D



Students' work: photo of experiments and video of prototype

Methodology (Research Design)

Collected Data

- Observations
- Photos documenting students' experiments
- Students' photos and videos of process and products
- Final exam products
- Qualitative focus group interviews
- Survey

Approach

- Deductive coding + inductive pattern finding



Circular Design Course

Key Competencies Developed

Circular Economy Storytelling

- Video and visual storytelling
- Crafting narratives for Instagram
- Exhibitions

Circular Systems Thinking

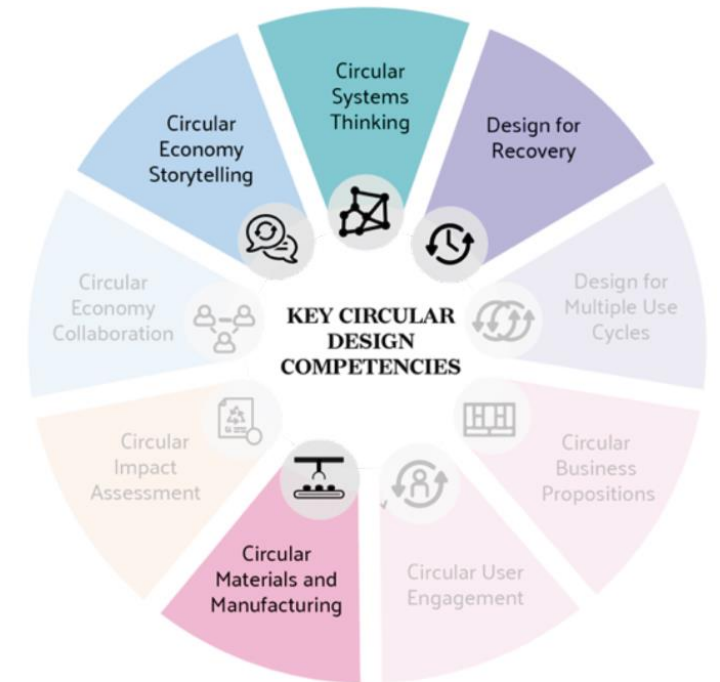
- Lectures and external talks
- Practical and theoretical approach
- Experiential learning
- Critically reflection

Design for Recovery

- Hands-on activities (upcycling and redesign)
- Material constraints
- Experimental design methods
- Lectures and external talks

Circular Materials and Manufacturing

- Hands-on activities (upcycling and redesign)
- Material constraints
- Experimental design methods
- Lectures and external talks



Analysis framework

Circular Design Competency Wheel (Sumter et al. 2021).

Circular Design Course Insights from Research

- Hands-on + theory = strongest learning and analytic approach
- Engagement highest when methods disrupted habits
- Students developed critical thinking within circularity and a circular mindset
- Moved from uncertainty to agency
- Storytelling essential for professional communication of circularity



'It gave me new ways of thinking... It was exciting and a good challenge.'

'I found it [the course] really interesting, and it gave me new ways of thinking ... It gave new life to something that might otherwise have been discarded.'

Students quotes from focus group interview

Circular Design Course

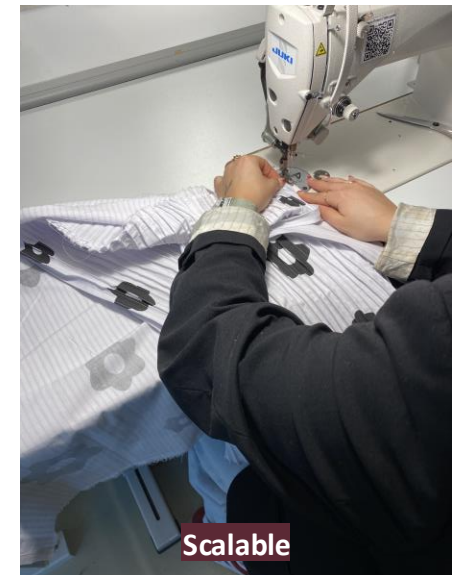
Future Considerations

Improvements

- Remanufacturing needed more time
- Waste streams like offcuts not fully addressed
- More focus on professional approach vs. hobby craftsmanship

Potential

- Investigate how to scale circular design
- Link with circular business models



Our Responsibility as Design Educators

To move design from supporting the unsustainable to foster sustainability:

- Intertwine competencies
- Use sustainability competencies frameworks in planning educational programs
- Blend lectures, expert talks etc with hands-on tasks connected to real-world problems.



Students' work: video of prototype

learn
Intertwina
in design education
design

22-24 sep.'25
university of aveiro - portugal

Design
Research
Society

DRS

Fostering Circular Competencies in Design: From Uncertainty to Agency

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Abstract: This paper examines the concept of Intertwina as a representation of new possibilities and futures in sustainable design, juxtaposing it against the often-misused term of sustainability in the corporate world. Our investigation draws upon Tony Fry's notion of "sustain-ability" to challenge traditional discourses on sustainability, advocating for a new paradigm that recognises the finite nature of resources and the significance of ethical design interventions. We focus on the pivotal role of design educators in equipping students with the necessary capabilities to affect change in a circular economy. By highlighting the importance of incorporating a circular mindset within design education, we present two courses at the Copenhagen School of Design and Technology. One course aimed at developing circular fashion product designers, capable of enhancing material longevity; the other course focused on designers as "change agents" who can guide companies towards sustainable and circular business models. The research reflects on the integration of hands-on design competencies within the curricula of the two courses, in alignment with two different frameworks for sustainability competencies. Our findings illuminate the ways in which specific educational elements foster sustainable competencies, preparing students to become agents of change in the design profession and a circular economy. Through this reflective process, the paper discusses the challenges and possibilities in design education, providing insights and inspiration for future curricular development.

Keywords: Circular Design Competencies, Sustainability Competencies, Design Education, Sustainable Fashion Designer, Circular Change Agent.

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Thank You

Stay in touch

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