transitions

D4.6. Final Project Delivery

(Whole Program and Toolkit)

Co-funded by the European Union

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Transitions Project	
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Table of Contents

1. Executive Summary

This document presents the final delivery of the Transitions Training Program and Toolkit. It defines the modular curriculum, its respective learning pathways (VET, HEI, and Professional training) and outlines the supporting resources developed for educators. The document details the knowledge areas, modules, and learning units that compose the curriculum and provides additional materials, including a glossary of teaching methodologies, ready-to-use training materials (presentations), curriculum guidelines, and the Loopholes Toolkit to support curriculum development. Furthermore, it includes the Transitions Labs (TLABs) guidelines and results from the pilot activities' curriculum assessment. The document aims to equip teachers, trainers, and education providers in the textile and fashion sector with comprehensive and adaptable tools to implement new educational programs fostering sustainability, digitalization, business innovation, and stakeholder engagement. Supplementary to this document is Deliverable D4.5, which provides detailed quality guidelines to ensure the effective delivery and continuous improvement of the training offer.

2. About Transitions

TRANSITIONS (Erasmus + Project) is a strategic alliance for innovation formed by research and technological centers, Vocational Education and Training (VET), Higher Education Institutions (HEI), public policy actors, SMEs, and other sectoral organizations from Spain, Italy, The Netherlands, and Sweden. The aim is to nurture the textile and fashion transition to a 4.0 system and a circular economy by developing new learning methods, tools, and practices to help students, young designers, and professionals to face real challenges. The objective is to create collaborative and real work-based training where the different actors in the value chain work on how to take advantage of technology to generate new value proposals and new business models within a circular economy. Transitions proposes a multidisciplinary pedagogical systemic design approach based on emerging disciplines and practices that tackle the topics of sustainability,

digitalization, stakeholder engagement and business and finance in the textile and fashion industry. The modular design allows for the curriculum to be expanded or updated as new industry trends and technologies emerge, ensuring that the learning content remains relevant and up to date.

3. Deliverable Objective

Deliverable D4.6 serves to compile and finalize all training content developed throughout the TRANSITIONS project. This includes:

- The consolidation and update of materials resulting from previous iterations and pilot phases.
- Ensuring materials are formatted and structured for dissemination to the target users (HEI, VET and Professional education and training).
- Providing a final training package that reflects feedback and learning outcomes from implementation and testing stages.

This deliverable marks the completion of the design and development phase and prepares materials for broader exploitation and sustainability purposes across the EU textile and textile & fashion education sector.

4. Methodology

The Transitions final project delivery comprises all the materials developed within the project and contains the result of a co-design process that involved all partners through several collaborative sessions, both online and on-site.

The final project delivery results from a structured, iterative, and collaborative methodology conducted throughout the project lifecycle. The methodology combined co-design processes, pilot testing activities, feedback analysis, content consolidation, and quality assurance measures, ensuring the comprehensive finalization of all outputs.

The methodology involved the following co-design processes:

- **Co-Design and Prototyping:** Using collaborative tools such as MIRO, the consortium partners co-designed the modular curriculum, learning pathways, and supporting resources through physical and online sessions. These sessions integrated multidisciplinary expertise from academia, research, and industry sectors.

- **Pilot Implementation and Evaluation (TLABs):** The draft curriculum and associated materials were tested through Transitions Labs (TLABs) across different countries and educational levels (VET, HEI, Professionals). The pilots gathered qualitative and quantitative feedback on usability, relevance, and impact.

- **Feedback Integration and Refinement:** Following the T-Labs, feedback from educators, learners, and stakeholders was systematically collected, analyzed, and incorporated into the curriculum, toolkit, and training materials. This iterative refinement process ensured alignment with the project's objectives and sectoral needs.

- **Consolidation of Training Content and Resources:** All deliverables, including the Loopholes Toolkit, teaching materials, Curriculum Guidelines, Teaching Methodologies Glossary, and TLABs Guidelines, were updated, harmonized, and formatted for final publication and dissemination.

- **Quality Assurance and Validation:** The results were checked by internal experts in the group to make sure they met the teaching, technical, and sustainability standards outlined in the project goals and Deliverable D4.5 (Quality Training Guidelines).

This methodology allowed us to develop a coherent, comprehensive and modular program, adaptable to diverse educational contexts in the European textile and fashion sector. The deliverable reflects the collective work and validation efforts of

all project partners, ensuring its relevance for future exploitation and long-term impact.

5. Transitions Training Program

This section provides an overview of the Transitions training program and positions it within the broader context of textile and fashion education. We present the curriculum framework, outline its general objectives, and describe how the curriculum is structured around four knowledge areas. We define the competencies that learners should develop, describe the modules and learning units, and specify the learning outcomes that learners will achieve. Finally, we define the three learning pathways at the three educational levels that the Transitions project addresses: VET, HE and Professionals.

Overview

The current state of textile and fashion design education underscores the crucial role of fashion designers in enhancing the sustainability of fashion. This approach is rooted in the belief that designers can significantly influence fashion's environmental, social, and cultural impacts. Education in this field is moving towards creating an equilibrium between craftsmanship, artistic, and business skills, focusing on sustainability (Murzyn-Kupisz M., Hołuj D., (2021). Such equilibrium includes addressing design, production, and consumption challenges to align with sustainable development goals. Textile and fashion education is evolving to reflect the complex nature of sustainability problems, requiring adjustments that span the ecological to the socio-economic and cultural dimensions of textile and fashion (Murzyn-Kupisz M., Hołuj D., (2021), D'Itria, E., Vacca, F. (2021).

Based on the findings described in D3.1 Technology, Sustainability & Industry Toolkit Map and Content Definition of the Transitions project, there is an absence of specific methodologies used in the teaching practice within textile and fashion education. According to previous research conducted by the Transitions project on teaching methodologies and educational models, there is a lack of theoretical and methodological foundations in textile and fashion education.

Existing references in this field mainly draw from the field of Human-Computer Interaction (HCI), indicating a need for the development of methods and frameworks tailored to the Textile and Fashion Design perspective. In a similar line of thinking, fashion designer and researcher Kate Sala states that "there is a lack of substantial information to be found on transformative learning techniques or teaching practices geared toward creating an environment that enables student designers to reflect critically on the current fashion system, in order to identify and create a position for themselves in the future" (Sala, K. 2019, p. 48).

There is also a need for published documentation on design processes, tools and methods used explicitly in European Textile and Fashion Design educational programs. More specifically, the need for nurturing critical, systemic and reflective thinking. These skills are crucial for students to address societal challenges such as climate change, biodiversity loss, and poverty.

According to the OECD Learning Framework 2030, students of the future need to develop their sense of agency to actively participate and positively impact the world. Educators play a role in creating a personalized learning environment that supports students in designing their own learning experiences in collaboration with others. Digital literacy and data literacy, including the ability to navigate, analyze, and manage data using digital technologies, are also essential.

Traditional design approaches often overlook the challenges faced by society, as they tend to focus on linear processes and profitability. However, the complexity of societal problems requires a systemic thinking approach.

The Transitions curriculum addresses the gaps and needs outlined above and proposes a systemic approach (Forlizzi, J., 2013) to textile and fashion education by incorporating sustainability, digitalization, business & finance, and stakeholder engagement as cross-cutting competencies into the curriculum, addressing the industry's complex needs to drive sustainability.

5.1 The Loopholes Toolkit for developing the Transitions Curriculum

The Loopholes toolkit is a participatory strategic tool developed within the TRANSITION project to support fashion and textile companies in assessing their current sustainability practices and ideating innovative pathways for transformation. Designed with a multi-stakeholder logic, it combines EU policy guidance, data-informed planning, and scenario-building exercises to foster responsible, circular, and inclusive practices across the textile value chain.

Composed of several canvases (Project Description, Data, Material, Stakeholder, and Business), a thematic strategy card set, and an interactive game board divided into four lifecycle quadrants—Design, Production, Use, and Loop Management—the toolkit facilitates structured reflection, idea generation, and consensus-building among participants. By aligning industry challenges with policy-driven actions, LOOPHOLES equips stakeholders to collaboratively envision resilient, future-oriented operations.

Relevance for Curriculum Development

LOOPHOLES played a pivotal role in the development of the Transitions curriculum by providing a structured methodology for exploring the competencies, knowledge areas, and systemic insights needed for a sustainable textiles and fashion future.

During the curriculum design phase, the toolkit supported:

- **Mapping industry needs** through the Project Description and Stakeholder Canvases, helping identify skill gaps, stakeholder roles, and future objectives.
- **Linking educational content with EU policy:** The embedded EU policy references (e.g. ESPR, DPP, EPR, CSRD) ensured that curriculum content is policy-relevant and anticipates regulatory changes.

- **Translating strategic insights into learning outcomes:** The Strategy Cards provided a source of modular learning themes across digitalization, sustainability, stakeholder engagement, business and finance.
- **Stimulating co-creation:** By engaging educators, industry representatives, and learners in simulated Loopholes workshops, real challenges were turned into pedagogical scenarios and learning case studies.

These processes ensured that the curriculum was not only comprehensive and future-proof but also responsive to real-world conditions in the textile ecosystem, as revealed through hands-on use of the toolkit.

Future Use in Curriculum Design

Looking ahead, Loopholes will remain a foundational roadmap tool for ongoing refinement and deployment of the Transitions curriculum. Its role will include:

- **Continuous feedback integration:** Via the canvases and strategy card activities, educators and learners can revisit assumptions and introduce updates in response to industry developments or policy changes.
- **Curriculum localization and adaptation:** Institutions in different EU regions can use the toolkit to adapt the core curriculum to their specific socio-economic and industrial contexts.
- **Stakeholder engagement and partnership tracking:** The Stakeholder Canvas helps monitor evolving roles, commitments, and collaborations with external actors, vital for applied learning and internship opportunities.
- **Scenario-based learning updates:** New strategy cards and use cases from industry can be added to expand the educational scenarios, keeping the curriculum dynamic and aligned with market evolution.

The Loopholes toolkit provides a live interface between pedagogy and practice, ensuring that the curriculum remains agile, inclusive, and embedded in the transition logic of the EU's circular textile and fashion economy.

Website: https://transitionsproject.eu/loopholes-toolkit/

5.2 General Objectives of the Curriculum

The Transitions curriculum aims to be versatile, modular, and adaptable to learners' diverse needs across higher education (HE), vocational education training (VET), and professional training environments. The general objectives of the Transitions Curriculum are:

- Integrate sustainable principles and digital skills across all modules
- Promote business and financial knowledge for sustainable models
- Encourage stakeholder engagement for collaborative approaches
- Support systemic thinking for addressing complex interconnections in textile and fashion value chains.

5.3 Modular Curriculum Framework

In this section we introduce the structure of the Transitions modular curriculum framework: its knowledge areas, modules and learning units.

5.3.1 Knowledge Areas and Competences

Four knowledge areas, each covering a broad subject area, divide the curriculum into a set of interconnected modules. These modules consist of multiple learning units that address specific topics within the broader subject. The modular structure facilitates a step-by-step learning process, ensuring that learners can build on their knowledge and skills progressively.

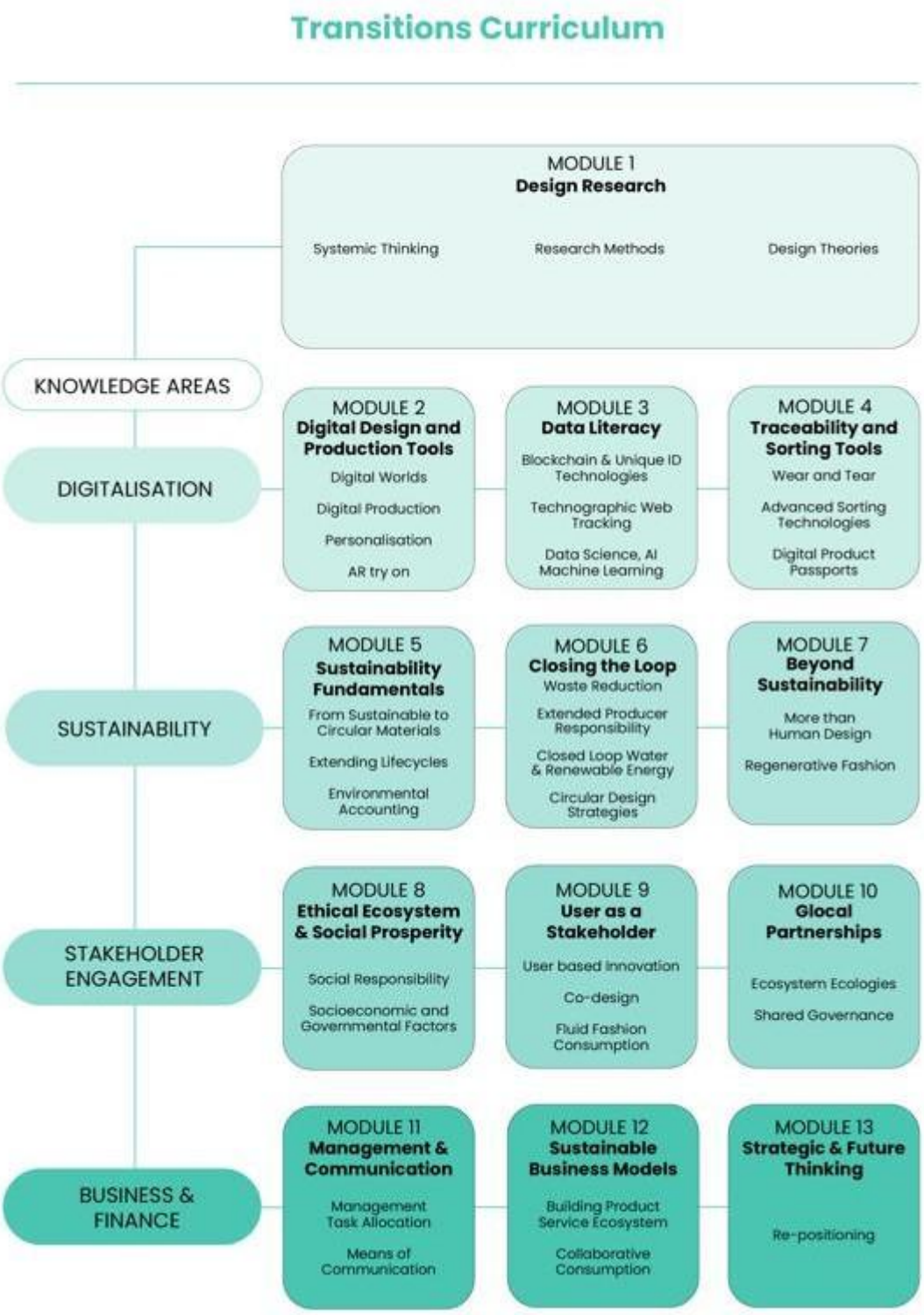

Figure 1: The Transitions modular curriculum framework

The main features of the modular curriculum framework are:

- **Versatility:** Modules can be adapted to different educational contexts, including higher education institutions, vocational training centers, and professional development programs.
- **Interdisciplinary Approach:** Modules integrate various disciplines, such as sustainability, digitalization, business, and stakeholder engagement, to provide a holistic learning experience.
- **Customization:** Learners/Teachers can choose modules that align with their personal and professional interests, creating a tailored learning pathway that meets their individual needs.
- **Scalability:** The modular design allows for the curriculum to be expanded or updated as new industry trends and technologies emerge, ensuring that the learning content remains relevant and up to date.

The fashion and textile industry are currently undergoing significant transformation, needed by technological advancements, environmental sustainability demands, and changes in societal expectations. To effectively address these challenges, the Transitions partners (WP2 and WP3 mappings and surveys) have identified four essential Knowledge Areas: **1) Digitalization, 2) Sustainability, 3) Stakeholder Engagement and 4) Business & Finance**. These areas focus on integrating new technologies, implementing sustainable practices, fostering inclusive collaborations, and enhancing strategic business management. Collectively, they provide a strategic framework that promotes operational efficiency, environmental responsibility, and social responsiveness, positioning the fashion industry for future resilience and success.

1. **DIGITALISATION** knowledge area focuses on the integration of digital literacy across various domains, such as design, manufacturing, retail, and marketing. Modules in this knowledge area address e-commerce, virtual reality, and data analytics to enhance operational efficiency, improve customer engagement, and drive creative innovation throughout the textile and fashion value chain.

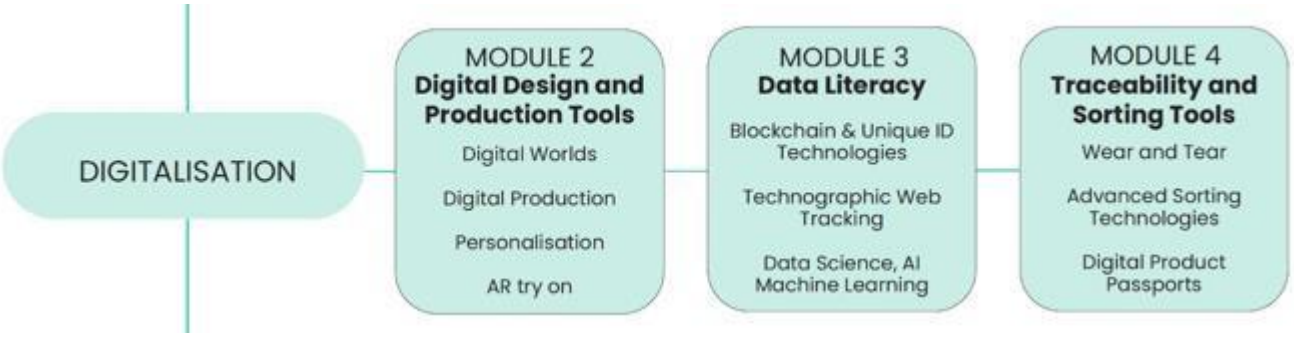

Figure 3: Digitalization knowledge area – *MODULE 2, 3 and 4*

2. **SUSTAINABILITY** knowledge area aims to implement practices that reduce environmental and social impacts. Modules in this knowledge area focus on sustainable materials, cutting waste and emissions, ensuring ethical labour practices, adopting circular economy concepts and complying with current policies and European directives. The overarching aim is to provide learners with knowledge that fosters a textile and fashion industry that is ecologically responsible and socially beneficial.

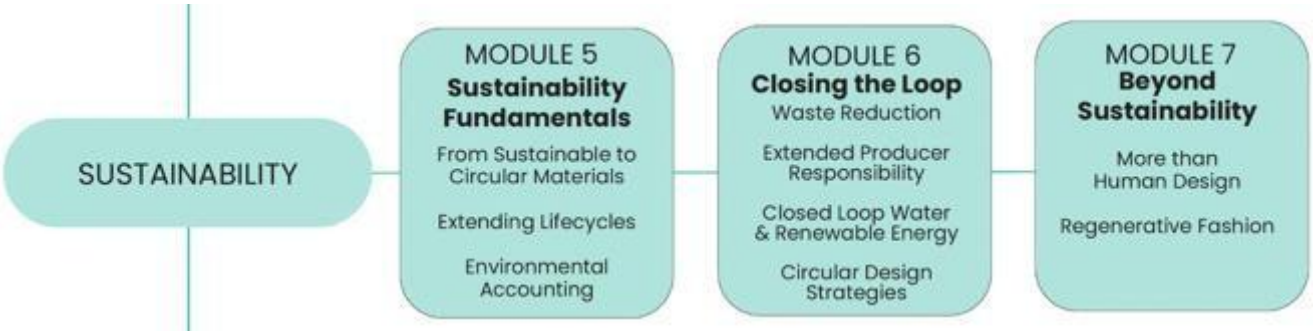

Figure 4: Sustainability knowledge area – *MODULE 5, 6 and 7*

3. **STAKEHOLDER ENGAGEMENT** knowledge area refers to the systematic inclusion and collaboration with diverse groups, including consumers, employees, suppliers, local communities, and non-governmental organizations (NGOs). This process involves establishing transparent and constructive dialogues, accommodating various perspectives, and addressing social and environmental challenges. Through methods for effective stakeholder engagement, learners will be able to build trust, foster societal progress, and align their strategies with the expectations

of the broader community.

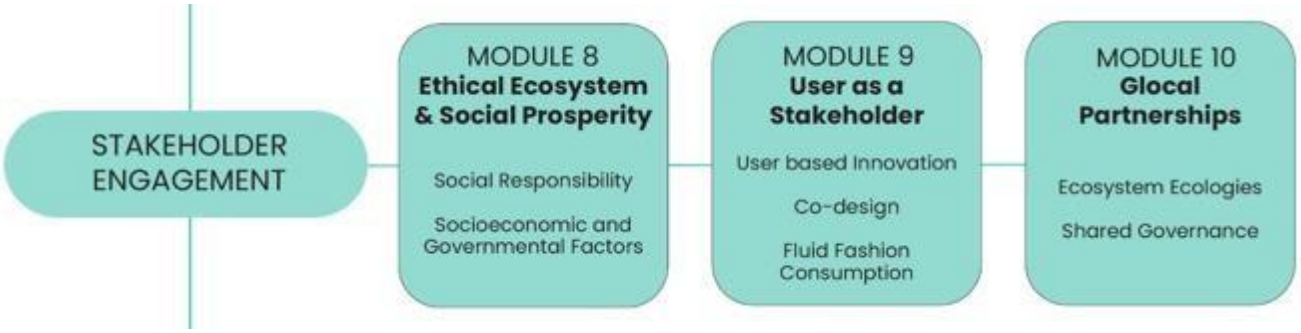

Figure 5: Stakeholder Engagement knowledge area – *Modules 8, 9 and 10*

4. **BUSINESS & FINANCE** knowledge area represents the strategic, business and financial aspects of innovation and sustainability through stakeholder engagement. It is essential for understanding market dynamics, consumer behaviour, supply chain logistics, branding, and profitability. For learners, gaining proficiency in these areas is imperative to successfully navigate the competitive landscape, innovatively respond to shifting consumer demands, and optimise operations for sustainable growth and success in the marketplace.

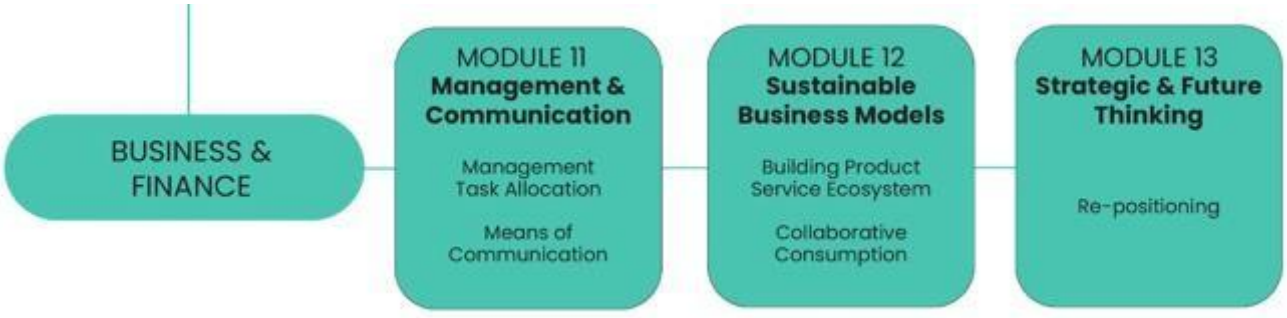

Figure 6 : Business & Finance knowledge area – *Modules 11, 12 and 13*

Competences for Knowledge Areas

The Transitions' modular curriculum equips learners with competencies to make complex judgements about their work and others and trains them to face the

challenges of the textile and fashion industry. The program 's educational units have been designed to help learners achieve these competencies in terms of sustainability tools, strategies, and digital skills to respond to the needs of the textile and fashion industry. Below, the competencies of the Transitions Training Program are defined:

Digitalization

2. Digital Design and Production Tools

- Proficiency in digital design software (e.g., CAD, 3D modelling).
- Virtual sampling and augmented reality applications for fashion.
- Personalization techniques in digital product design.
- Understanding and implementing digital production technologies.

3. Data Literacy

- Data analysis and interpretation in fashion contexts.
- Familiarity with blockchain and unique ID technologies for transparency.
- Ethical data management and digital waste reduction practices.
- Application of AI, machine learning, and technographic web tracking.

4. Traceability and Sorting Tools

- Implementing digital product passports for transparency.
- Use of advanced sorting technologies for recycling.
- Skills in data collection for product wear and tear analysis.
- Developing and managing traceability systems.

Sustainability

5. Sustainability Fundamentals

- Knowledge of sustainable and circular materials.
- Applying lifecycle assessment (LCA) for environmental impact.
- Strategies for extending product lifecycles through design (repairability, modular design).
- Understanding and applying eco-design principles.

6. Closing the Loop

- Circular design strategies focusing on repair, upcycling, and recyclability.
- Knowledge of waste hierarchy and extended producer responsibility (EPR).

- Implementation of closed-loop water and energy systems.
- Reducing environmental impact through resource-efficient design.

7. Beyond Sustainability

- Integrating regenerative practices, such as agroecology.
- Design approaches that consider interspecies relationships and natural ecosystems.
- Exploration of non-conventional fabrics and materials.
- Developing a restorative approach to fashion.

Stakeholder Engagement

8. Ethical Ecosystems & Social Prosperity

- Understanding social responsibility and fair labour practices.
- Skills in assessing socioeconomic and governmental factors affecting industry.
- Promoting ethical production and sustainable equity in business models.
- Analyzing and implementing practices that support social prosperity.

9. User as a Stakeholder

- Engaging users in the design and production process (co-design).
- Developing customer-centered innovation strategies.
- Embracing fluid consumption models and open-source collaboration.
- Creating feedback loops for improved transparency and inclusivity.

10. Glocal Partnerships

- Building and sustaining strategic partnerships for global and local impact.
- Engaging with communities in design, production, and recycling processes.
- Developing shared governance models and ecosystem-based strategies.
- Managing networks to support long-term community and business objectives.

Business & Finance

11. Management & Communication

- Task allocation and strategic management for effective workflows.
- Communication skills for diverse stakeholder engagement.
- Establishing cultures of continuous learning and knowledge sharing.
- Developing brand storytelling and messaging strategies.

12. Sustainable Business Models

- Creating product-service ecosystems that integrate sustainable practices.
- Implementing collaborative consumption and community engagement models.
- Revenue model innovation and cost-analysis methods (e.g., lifecycle costing).
- Integrating digital platforms and personalized services in business models.

13. Strategic & Future Thinking

- Scenario planning and future-oriented market analysis.
- Skills in strategic repositioning for resilience.
- Knowledge of past, current, and future technological innovations.

Module 1: Design Research is an introductory transversal module across all knowledge areas that emphasizes holistic approaches to sustainable transitions, integrating stakeholders across the textile value chain with tools and frameworks that promote systemic thinking. It develops skills for conducting rigorous ethical research, enabling learners to analyze challenges and inform sustainable practices. Additionally, it explores key design frameworks, encouraging critical reflection on the role of design in fostering innovation and sustainability. This module forms a cohesive, transversally applicable knowledge base for addressing the sector's sustainability challenges.

Figure 2: Design Research – MODULE 1

5.3.2 Modules and Learning Units

Modules

Each of the 13 modules is designed to cover a broad subject area and includes some Learning Units that address specific topics within that area.

Introductory Transversal Module

1. Design Research

Digitalization

2. Digital Design and Production Tools
3. Data Literacy
4. Traceability and Sorting Tools

Sustainability

5. Sustainability Fundamentals
6. Closing the Loop
7. Beyond Sustainability

Stakeholder Engagement

8. Ethical Ecosystems & Social Prosperity
9. User as a Stakeholder
10. Glocal Partnerships

Business & Finance

11. Management & Communication
12. Sustainable Business Models
13. Strategic & Future Thinking

Learning Units

There are 34 learning units. The format of these learning units is as follows

- **Title**
- **Introduction**
- **Assessment**
- **Teaching Methodologies**
- **Suggested Activities (product, service, system)**
- **Resource**

MODULE 1 Design Research

Description

The Design Research module provides an essential foundation for navigating the complex transformations occurring in the textile and fashion ecosystem. It introduces learners to systemic thinking, rigorous research methodologies, and key design theories that are critical for fostering sustainable transitions. Emphasizing an interdisciplinary approach, the module empowers learners to understand, analyze, and creatively engage with the interconnected systems that define textile production and consumption today. By exploring practical frameworks, emerging practices, and theoretical underpinnings, this module prepares participants to contribute meaningfully to the industry's shift towards sustainability, inclusivity, and innovation.

Learning Outcomes

- Understand and apply systemic design principles and mapping tools to analyze textile and fashion value chains in the context of sustainability transitions.
- Formulate and conduct research using qualitative, quantitative, and mixed methods, with a strong emphasis on ethical practices and scientific rigor.
- Critically engage with emerging communities, research, and practices in systemic and design research fields, particularly those driving sustainable innovation in textiles and fashion.
- Find, distinguish, and use important design methods—like speculative, participatory, systemic, and embodied approaches—to tackle complicated real-life problems and help create inclusive, sustainable futures.

Systemic Thinking

Introduction

The unit presents systemic thinking and design approaches within the framework of sustainable transitions. Systemic Thinking emphasizes a holistic approach to products, services, and systems, fostering active collaboration among various stakeholders. Embracing a system mindset requires moving beyond isolated efforts and individual product development, considering the dependencies across entire value chains and associated cultural factors. In practice, this approach promotes the exploration of interrelationships, boundaries, and engagement with diverse perspectives.

The unit aims to equip learners with the necessary skills to participate in systemic changes in the textile and fashion ecosystem. It introduces the basic concepts and presents the existing methodological frameworks, including the Systemic Design Framework based on the Double Diamond process, used by Transitions partners. This module presents the Loophole Toolkit as a key pedagogical tool to experience system thinking in the context of T&C transitions. Case studies are presented ranging from global research collaborations to more situated interventions at the regional or company level, collected through various networks, such as TCBL, Fabricademy, Systemic Design community.

Assessment

- System Map or Gigamapping: Ask students to prepare a system map on a topic related to the textile value chains. It can be done with big sheets of paper and pens or in Miroboard or Kumu software.
- Loopholes Round 1: Share the results of the first round of the Loopholes Toolkit, sharing the system map and associated gaps/Loopholes identified for a project or company.

Teaching Methodologies

- Expert-led lectures on systemic design practices.
- Practical workshops on mapping systems and associated loopholes.
- Bioregional Research Explorations
- Systemic Cycles: https://www.systemic-cycles.org/

Resources

- Systemic Design Association Resources: https://systemic-design.org/
- Systemic Design for circular and local textiles: designing a hemp ecosystem PhD candidate: Eliana Ferruli
- Entanglement of Systemic Design and Sustainability Transitions PhD candidate: Svein Gunnar Kjøde
- Real, M., Earley, R., & Goldsworthy, K. (2018). Practices, Places, Projects: Enrolling Stakeholders for Circular Fashion. www. gfc-conference. Eu.
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- https://www.taylorfrancis.com/chapters/edit/10.4324/9781003260356-4/hands-hands-rosie-hornbuckle
- Blonduos Centrinno Cartography:
- https://www.centrinno-cartography.org/blonduos

Research Methods

Introduction

The unit aims to equip learners with the necessary skills and techniques for conducting comprehensive research in textile and fashion design. Research methods are integral to addressing research questions, testing hypotheses, and solving problems.

The learning unit encompasses qualitative, quantitative, and mixed research methods, focusing on data collection and analysis. By exploring diverse research methods, learners will develop the skills needed to formulate research questions, collect and analyze data, and create research proposals. The module emphasizes the importance of maintaining scientific rigour, considering ethical implications, and using research findings to improve textile and fashion design practices and policies.

Assessment

- **Research Article Analysis:** A critical report analyzing a published research paper in textile and fashion design. The report should address the research question, methodology (qualitative, quantitative, or mixed), and data collection and analysis techniques, as well as assess scientific rigour and ethical considerations.
- **Research proposal** related to textile and fashion design, including research questions, literature review, methodology, data collection and analysis and ethical considerations.

Teaching Methodologies

- Expert-led lectures on research practices in textile and fashion.
- Practical workshops on academic and scientific writing

Resources

- Archer, B. (1979) 'Design as a discipline', Design Studies, 1(1), pp. 17–20.
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- Fallon, K. (ed.) (2012) Scandinavian Design: Alternative Histories. London: Berg.
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- Redström, J. (2017) Making Design Theory. Cambridge, MA: MIT Press

Design Theories

Introduction

This unit introduces key design methodologies relevant to applied design research, particularly within the context of transitions in the fashion and textile industries. It explores how designers generate knowledge through making, speculation, collaboration, and systemic inquiry. Each method is approached through a definition, practical application, and integration into real-world transitions. The module frames design as a critical tool for addressing complexity and uncertainty, going beyond human centeredness to incorporate material, ecological, and posthuman perspectives.

The future of design as a discipline demands an approach that is interwoven—connecting materials, data, business models, and human needs. Rather than separating methods from systems, Textile Thinking recognizes that these strands must be designed together, in relation. It is not enough to optimize parts. We must design the fabric of practice itself.

This shift aligns with the Quintuple Helix: academic, industrial, societal, environmental, and governmental actors all play a role in shaping sustainable futures. Textile Thinking makes these layers visible and actionable—giving form to new relations across disciplines, policies, and infrastructures. Designers are increasingly asked to work in these entangled contexts. Textile Thinking provides a way to do so—by weaving together diverse threads of knowledge, responsibility, and care into cohesive, real-world transitions.

Assessment

- Analytical essay comparing two design methodologies in relation to a sustainability or innovation challenge.
- Visual mapping exercise showing how multiple methods interrelate within a real-world design case.
- Group presentation developing a transition-oriented design brief using three selected methodologies.

Teaching Methodologies

- Studio workshops apply techniques in practice-based settings.
- Seminars introducing theoretical frameworks and historical developments.
- Case study analyses fashion and textile design applications.
- Peer critiques and reflective discussion sessions.

Resources

- Crafts Council UK. (n.d.). *Learning resources on contemporary craft and design*. https://www.craftscouncil.org.uk/learning
- Design Council. (n.d.). *Framework for innovation: The Double Diamond*. https://www.designcouncil.org.uk/our-work/skills-learning/tools-frameworks/framework-for-innovation-design-process-double-diamond
- Dunne & Raby. (n.d.). *Speculative Everything*. https://dunneandraby.co.uk/content/projects/621/0
- Ellen MacArthur Foundation. (2017). *Circular Design Guide*. https://www.circulardesignguide.com/
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- Kniterate. (n.d.). *Digital knitting machine for fashion and textiles*. https://www.kniterate.com/
- Kristina Höök. (n.d.). *Soma Design at KTH*. https://www.kth.se/profile/kia/page/soma-design
- Will Odom. (n.d.). *Research Products and Slow Design*. https://willodom.ca/
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DIGITALIZATION

Digitalization in the fashion industry involves the integration of digital technologies across various domains, such as design, manufacturing, retail, and marketing. This transformation leverages e-commerce, virtual reality, and data analytics to enhance operational efficiency, improve customer engagement, and drive creative innovation throughout the fashion value chain.

MODULE 2 Digital Design and Production Tools

The fashion industry is rapidly evolving through the integration of advanced technologies like Augmented Reality (AR) Try-On, pivotal data strategies in Personalization, Digital Production, and Virtual Fashion within Digital Worlds. These innovations are redefining how consumers interact with fashion, enhancing the shopping experience, and driving sustainability. AR Try-On technology allows customers to virtually try on clothing and accessories, bridging the gap between online and offline shopping, reducing return rates, and fostering personalized shopping experiences. Personalization leverages user data to tailor fashion products and services to individual preferences, promoting sustainability by reducing waste and extending product lifecycles. Digital Production and Digital Twinning technologies streamline manufacturing processes and optimize product development, enabling on-demand production and fostering a more sustainable, responsive fashion industry. Finally, Digital Worlds creates immersive environments for virtual fashion, revolutionizing e-commerce, fashion shows, and community engagement. Together, these technologies are transforming the fashion landscape, positioning brands at the forefront of digital innovation.

Learning Outcomes

Develop a comprehensive understanding of how AR Try-On, Personalization, Digital Production, and Virtual Fashion technologies work and their role in enhancing customer experiences, sustainability, and innovation in the fashion industry.

- Acquire practical skills in applying these technologies to create personalized, immersive, and interactive fashion experiences, while driving sustainable practices and reducing waste.
- Analyze case studies and design systems that leverage these digital

innovations to optimize supply chains, enhance customer engagement, and support circular economy models within the fashion industry.

- Gain insights into the impact of these technologies on retail strategies, e-commerce, and social media, understanding how they shape user behavior, industry practices, and the future of fashion.

Digital Worlds

Introduction

The fashion industry has reinvented itself by integrating virtual fashion into digital worlds, driven by the principle of 'digital for digital' fashion design and production. These immersive digital environments enable fashion experiences, interactions and transactions to occur in spaces that merge the physical and virtual dimensions of fashion. Using cutting-edge technology, Digital Worlds redefines the way fashion is used, from communication and trend discovery to user engagement and community building, to build an ecosystem that works for the benefit of us all. Virtual Fashion, a key component of these digital worlds, uses advanced computer graphics and 3D modelling to create and simulate garments and accessories exclusively within the digital space. This innovation enables designers, brands and manufacturers to virtually visualize and assess products and offers a more efficient, eco-friendly solution that reduces waste and speeds up design processes. Together, these technologies are revolutionizing e-commerce, making virtual fashion shows and AR/VR shopping experiences more commonplace and shaping the future of fashion in a rapidly evolving digital landscape.

Assessments

- Active Participation: Engage in discussions and workshops focused on the sustainability potential of Digital Worlds and Virtual Fashion.
- Trend Presentation: Analyze and present how Digital Worlds influence user behavior, industry practices, and the digital fashion landscape.
- Project Development: Create virtual garments or accessories using 3D modeling software, and present an analysis of roles within the virtual supply chain.
- Platform Analysis: Conduct a detailed analysis of a digital fashion platform, assessing its features, user experience, and impact on the industry.

Teaching Methodologies

- Case Study Analysis: Examine real-world scenarios of fashion brands using AR/VR and virtual fashion technologies, with a focus on sustainability and innovation.
- Interactive Workshops: Participate in workshops to brainstorm and develop strategies for companies looking to integrate AR/VR or virtual sampling technologies.
- Group Discussions: Collaborate on discussions about the role of Digital Worlds in the shopping experience and the potential first steps for companies entering this space.
- Self-Directed Learning: Conduct independent research on virtual fashion shows and companies utilizing digital technologies in their platforms.

Suggested Activities

- Product: Design a customizable fashion product using digital production and virtual fashion tools, focusing on sustainability and consumer engagement.
- Service: Develop a service that leverages AR/VR or virtual sampling to offer personalized shopping experiences or on-demand fashion production.
- System: Analyze the impact of Digital Worlds and Virtual Fashion on supply chain efficiency and sustainability and propose a system for integrating these technologies into a fashion brand's operations.

Resources

- Specialist, A. M. B. (2023). *Metaverse and fashion: A relationship for Success.* Evergine.
- Akhtar, W. H., et al. (2022). *A New Perspective on the Textile and Apparel Industry in the Digital Transformation Era.* Textiles.
- McDowell, M. (2019). *Tommy Hilfiger switches to 100% digital design.* Vogue Business.
- Bain, M. (2022). *How virtual sampling went mainstream.* The Business of Fashion.
- Silvestri, B. (2020). *The future of fashion: How digitization and AI reshape the industry post-COVID-19.* ZoneModa Journal.

- Jiang, E. (2021). *Virtual reality: Growth engine for fashion?* The Business of Fashion.

Digital Production

Introduction

Advanced digital production technologies streamline the fashion process and enable innovative and sustainable creation and modification of textiles.

The fashion industry is undergoing a major development and transformation through the integration of Digital Manufacturing and Digital Twinning technologies, driven by the principle of 'Digital to Physical' design and production. Digital Production leverages advanced technologies like 3D printing and computer-controlled machines to streamline manufacturing, enhancing efficiency, customization, and sustainability. This approach enables on-demand production, reduces waste, and marks a departure from traditional mass production methods, allowing fashion brands to respond swiftly to market trends while emphasizing personalization and quality.

Complementing this, Digital Twinning involves creating virtual models that replicate and optimize physical products, systems, or processes throughout their lifecycle. Continuously updated with real-time data, Digital Twinning enables the creation of virtual prototypes, reducing the need for physical samples and improving supply chain management through real-time monitoring and simulation. It also enhances customer experiences by offering personalized avatars for better sizing and styling recommendations and by promoting sustainability through material analysis and environmental impact assessments. Together, Digital manufacturing and Digital Twinning are revolutionizing the fashion industry by driving innovation, sustainability, and operational efficiency. By adopting these technologies, fashion brands can reduce their environmental footprint, better meet consumer demands, and explore new business models that were previously unattainable with traditional methods.

Assessment:

- Digital manufacturing and Twinning Analysis: Conduct a comprehensive analysis of how digital production and digital twin technologies are applied in

a fashion brand, focusing on their impact on design, manufacturing, and supply chain efficiency.

- Design Project: Create a digital twin of a fashion item and develop a workflow for its production using digital manufacturing technologies. Evaluate the performance, aesthetics, and sustainability of the design through virtual simulations.
- Sustainability and Customer Engagement Strategy: Develop strategic guidelines on how the integration of digital production and digital twins can enhance sustainability practices and customer engagement in the fashion industry.

Teaching Methodologies:

- Case Study Analysis: Review real-world scenarios where digital production and digital twin technologies are applied in fashion, enabling learners to apply theoretical knowledge to practical situations.
- Interactive Workshops and Hands-On Labs: Participate in practical sessions involving digital production techniques and digital twin software to simulate real-life fashion design and supply chain management scenarios.
- Guest Lectures and Masterclasses: Gain insights from industry professionals through lectures that cover the latest trends and applications of digital production and digital twins in fashion.

Suggested Activities:

- **Product:**
  - Design a Customizable Fashion Product: Create a fashion product using digital production and digital twin technologies, focusing on customization, efficiency, and sustainability.
  - Design a Virtual Prototype: Develop a virtual model of a fashion product using digital twin technology, emphasizing design optimization and the reduction of physical samples.
- **Service:**
  - Develop a Digital Production Service: Conceptualize a service that offers on-demand production of personalized fashion items using digital production techniques, improving consumer satisfaction

and supply chain agility.

- Create a Personalized Shopping Experience: Develop a service that uses digital twins to offer personalized avatars for sizing and styling recommendations, enhancing the online shopping experience.

- **System:**
  - Analyze the Impact on Sustainability: Conduct a study on how digital production and digital twins contribute to sustainability in the fashion industry by optimizing production processes, reducing waste, and supporting a circular economy.
  - Explore Supply Chain Efficiency: Analyze how digital twins improve the efficiency of fashion supply chains, from production to logistics, by enabling real-time monitoring and simulation.

Resources:

Digital Production:

- Baker, K. (2023). "How to build a product ecosystem buyers will want to be in." HubSpot Blog.
- Armstrong, C.M., & Lang, C. (2013). "Sustainable product service systems: the new frontier in apparel retailing?" Research Journal of Textile and Apparel.
- Yang, S., Song, Y., & Tong, S. (2017). "Sustainable retailing in the fashion industry: A systematic literature review." Sustainability.

Digital Twinning:

- Botín-Sanabria, D.M., et al. (2022). "Digital twin technology challenges and applications: A comprehensive review." Remote Sensing.
- Wagner, R., & Kabalska, A. (2022). "Sustainable value in the fashion industry: A case study of value construction/destruction using digital twins." Sustainable Development.
- Alam, M.D., Kabir, G., & Mirmohammadsadeghi, M. (2023). "A digital twin framework development for apparel manufacturing industry." Decision Analytics Journal.

Personalization

Introduction

In the contemporary fashion landscape, personalization emerges as a pivotal strategy, revolutionizing how products, experiences, and services are tailored to individual customers' unique preferences and needs. This concept leverages user-provided data to craft offerings that resonate on a personal level, marking a significant departure from the one-size-fits-all approach. Personalization entails an immersive involvement of customers in the design process, enabling them to influence aspects such as color, style, or fit, ultimately leading to the creation of fashion items that align with their individual tastes. This shift plays a critical role in addressing the industry's challenges of overproduction and waste, as products are made to order based on precise customer demands. Moreover, personalization extends the lifecycle of fashion products by fostering a sense of ownership and emotional connection among consumers, translating into prolonged use and care. This paradigm shift not only enhances customer engagement and satisfaction but also generates valuable data-driven insights, aiding brands in aligning production with real-time consumer demand. Furthermore, personalization is a cornerstone in promoting circular business models within the fashion industry. It encourages innovative practices like custom repairs or repurposing pre-owned garments, extending product life and supporting sustainability. As we delve into this module, we will explore how personalization is reshaping the fashion industry, contributing to a more sustainable, customer-centric, and data-informed business model. This comprehensive understanding will equip learners with the necessary insights to navigate and contribute to the evolving dynamics of personalized fashion.

Assessment

- Create a mapping of textile and fashion companies that successfully used personalization to promote sustainability and ethical practices: identify key strategies, assess their effectiveness, and propose improvements.
- Design custom product offerings using consumer data to design tailored experiences.
- Develop a personalization strategy for a textile or fashion company.

Teaching Methodologies

- **A co-design project** where learners collaborate in teams to create personalization strategies.
- **Critical thinking and group discussions** to identify strengths, weaknesses, and potential areas for improvement in each strategy.

Suggested Activities

Product:

- **Develop a Customizable Fashion Line**: Task students with designing a fashion line that incorporates elements of personalization, such as customizable colors, styles, or fits, emphasizing the reduction of waste and enhancement of customer satisfaction.

Service:

- **Launch a Personalized Fashion Consultation Service:** Create a service that offers personalized fashion consultations, using customer data to recommend clothing that fits their unique style and preferences, fostering a deeper emotional connection and longer product life.

System:

- **Analyze the Impact of Personalization on Fashion Sustainability:** Conduct a study on how personalization strategies within the fashion industry can lead to more sustainable practices, including made-to-order production and the extension of product lifecycles, and how these practices contribute to reducing overproduction and waste.

Resources

- Ma, Na, Jieun Kim, and Jee Hyun Lee. "Exploring personalized fashion design process using an emotional data visualization method." Fashion and Textiles 9.1 (2022): 1-15.
- Nobile, Tekila Harley, and Lorenzo Cantoni. "Personalization and customization in fashion: searching for a definition." Journal of Fashion Marketing and Management: An International Journal 27.4 (2023): 665-682.
- Jain, Sheenam, and Malin Sundström. "Toward a conceptualization of

personalized services in apparel e-commerce fulfilment." Research Journal of Textile and Apparel 25.4 (2021): 414-430.

AR Try On

Introduction

This unit explores the world of Augmented Reality (AR) and Try-On technology, redefining the fashion industry by enabling customers to virtually try on clothing, accessories, and other fashion items quickly and precisely. Through this unit, the learner will gain an in-depth understanding of how AR Try-On works, utilizing augmented reality to superimpose digital representations of products onto a live camera feed or uploaded photos, allowing users to see how these items would look on them in real time. The unit covers the topics of virtual fitting experience, enhancing customer engagement, reducing return rates, personalized shopping experiences, bridging online and offline shopping, sustainability and environmental impact reduction, and generating valuable data for trend forecasting. By mastering AR Try-On, the learner will be equipped to help fashion brands create immersive and interactive customer experiences, drive sales, reduce waste, and position them at the forefront of digital innovation in the industry.

Assessment

- Learners will create mini projects demonstrating their understanding of AR Try- On technology. The project involves designing a digital representation of a fashion product and successfully superimposing it onto a live camera feed or uploaded photo.
- In teams, learners will develop a simulated AR Try-On application for a hypothetical or real fashion brand. This includes planning how to use the technology to improve customer experiences, drive sales, and reduce waste.

Teaching Methodologies

- **Instructional sessions** on digital design and AR technology. Facilitate access to relevant software and tools for creating digital fashion items. Guide learners through integrating these designs into AR platforms for live superimposition.
- **Project-based Learning** through brainstorming sessions where teams can ideate and plan their AR Try-On strategies.

Suggested Activities

Product:

- Create a Product for AR Try-On Experiences: Develop a product that offers AR try- on capabilities for fashion items, emphasizing user interaction and realism to decrease return rates and boost customer satisfaction.

Service:

- **Launch a Service for Personalized AR Shopping:** Design a service that leverages AR Try-On technology to provide personalized shopping experiences, enhancing customer engagement and seamlessly connecting online and offline shopping environments.

System:

- **Evaluate a System for AR-Enhanced Fashion Sustainability:** Undertake a study to assess how a system integrating AR Try-On technology can promote sustainability within the fashion industry by minimizing returns and encouraging eco-friendly consumer practices.

Resources:

- Boardman, Rosy, Claudia E. Henninger, and Ailing Zhu. "Augmented reality and virtual reality: new drivers for fashion retail?" Technology-Driven Sustainability: Innovation in the Fashion Supply Chain (2020): 155-172.
- Baytar, Fatma, Telin Chung, and Eonyou Shin. "Evaluating garments in augmented reality when shopping online." Journal of Fashion Marketing and Management: An International Journal 24.4 (2020): 667-683.
- Jayamini, Chamodi, et al. "The use of augmented reality to deliver enhanced user experiences in fashion industry." Lecture Notes in Computer Science 12936 (2021).
- Zak, Marlene. Augmented reality try-on adoption in the Online Clothing Industry: understanding key challenges and critical success Factors. MS thesis. University of Twente, 2020.
- Plotkina, Daria, and Hélène Saurel. "Me or just like me? The role of virtual try-on and physical appearance in apparel M-retailing." Journal of Retailing and Consumer Services 51 (2019): 362-377.

MODULE 3 Data Literacy

Description

This module delves into how Blockchain and Unique ID technologies, Technographic web-tracking and Data Science, AI and Machine Learning, are revolutionizing the fashion industry by enhancing transparency, security, personalization, and efficiency. Blockchain ensures transparency in the supply chain, while AI and ML improve demand forecasting, inventory management, and personalized customer experiences through advanced data analytics and recommendation engines. Web3 and decentralized platforms foster inclusivity and diversity, providing opportunities for small-scale designers and tracking social issues like wages. Technographic Web Tracking offers insights into technological preferences, aiding in targeted marketing and optimizing digital platforms. Together, these technologies create a cohesive, innovative approach to modernizing the fashion industry, from design to distribution.

Learning Outcomes

1. Understand and critically evaluate how Blockchain and Unique ID technologies enhance transparency, traceability, and accountability in the fashion supply chain while anticipating future industry opportunities and challenges.
2. Gain proficiency in technographic web tracking to gather and analyze data on technological preferences and practices, enabling informed decisions for optimizing digital platforms, understanding customer journeys, and tailoring personalized marketing strategies.
3. Develop and apply strategic plans for achieving full supply chain transparency, leveraging knowledge of clear labelling and a brand's strategy's legal and technical aspects.

Blockchain and Unique ID Technologies

Introduction

In this unit, learners will learn about how Blockchain and Web3 technologies represent digital systems that operate in a decentralized manner, and how they can utilize cryptographic techniques, smart contracts, and distributed ledgers to ensure transparency, security, and user-centric development of applications and services. This unit will increase understanding of how Blockchain technology is utilized to record and verify aspects of the fashion supply chain, from raw material origin to manufacturing processes and final product distribution. Learners will also learn about the role of smart contracts in automating various aspects of fashion transactions, including payment settlements, royalties, and licensing agreements, reducing the need for intermediaries and minimizing the risk of fraud. This unit also explores how blockchain-based platforms enable peer-to-peer interactions and decentralized marketplaces in the fashion industry, providing opportunities for small-scale designers and promoting inclusivity and diversity. Further, the unit looks at how web3 technologies can deliver transparent and traceable ecosystems for actors in emerging economies by tracking and tracing social issues like wages and working hours.

Assessment

- Awareness of how Web3 technologies can deliver transparent and traceable ecosystems for actors in emerging economies, particularly in tracking and tracing social issues like wages and working hours.
- Apply theoretical knowledge of Blockchain and Web3 technologies to real-world scenarios in the fashion industry, critically analyzing challenges and proposing innovative solutions to enhance efficiency, transparency, and sustainability.

Teaching Methodologies

- **Group Discussions and Brainstorming Sessions:** Discussion on the current status and future prospects of these technologies in fashion, encouraging critical thinking and analysis.

- **Interactive Workshops:** Conduct a workshop on innovative ideas on how to use blockchain technology in the fashion industry.
- **Lectureswith Industry Experts:** Supply chains in the textile- and fashion industry
- **Guest Lectures and Industry Insights:** invite companies that have successfully used Blockchain technology to create greater transparency in their supply chain

Suggested Activities

- **Product:** Mini project of mapping of a fashion supply chain
- **Service:** Choose a company to study. What could be the next step for the chosen company to reach even greater transparency towards stockholders and users? How could blockchain technology be applied to reach the desired results?
- **System:** Case study analysis on an existing company that uses Blockchain and Web3 technology. How did they implement it? What steps did they take? Did they have to change their suppliers and/or processes? What could be the next step for the chosen company to reach even greater transparency?

Resources

- Baker, K. (2023, March 16). How to build a product ecosystem buyers will want to be in. HubSpot Blog. https://blog.hubspot.com/marketing/product-ecosystem
- Armstrong, Cosette M., and Chunmin Lang. "Sustainable product service systems: the new frontier in apparel retailing?" Research Journal of Textile and Apparel (2013).
- Yang, Shuai, Yiping Song, and Siliang Tong. "Sustainable retailing in the fashion industry: A systematic literature review." Sustainability 9.7 (2017): 1266.
- Gockeln, Lisa. Fashion industry analysis from the perspective of business model dynamics. BS thesis. University of Twente, 2014.
- Lundgreen, Mathilde, and Nanna Flensberg. "Use-oriented product service systems in the fashion industry: Understanding consumers' perception-an exploratory study." (2020).

Technographic Web Tracking

Introduction

This unit investigates Technographic web tracking, a tool that collects data on technology-driven signals to understand individuals' or organizations 'technological attributes and habits. This tool offers valuable insights into technological preferences and practices, aiding in strategic decision-making and personalized targeting. In the fashion industry, this tool enables companies and retailers to gather crucial information about their audience, such as preferred devices, operating systems, and browsers. This knowledge helps tailor marketing strategies, personalize shopping experiences, and optimize websites and applications for various platforms. Additionally, technographic web tracking sheds light on users' engagement with fashion trends, influencers, and social media, aiding brands in identifying key platforms for marketing and analyzing the effectiveness of online campaigns. This data is also instrumental in tracking customer journeys, identifying segmentation and targeting opportunities.

Assessment

- **Technographic Design Project:** Learners will use technographic web tracking tools to analyze a textile or fashion company's web presence. They will gather data on the audience's technological preferences and habits and propose recommendations to improve the company's marketing strategy.
- **Social Media Engagement Mapping:** Learners will map a textile or fashion company's social media engagement using technographic data, analyzing how different audience segments interact with fashion trends and influencers on various platforms.

Teaching Methodologies

- **Workshops:** on Data Analysis Tools. Practical workshops where learners use data analysis tools to interpret technographic data.

- **Individual Projects and Presentations** by learners to apply technographic web tracking to an existing textile and fashion company.

Suggested Activities

- **Product:**

Enhance E-commerce Platform with Technographic Data: Design an e-commerce platform upgrade for a fashion retailer that leverages technographic web tracking data to optimize user experience across different devices and operating systems, ensuring personalized and efficient shopping experiences.

- **Service:**

Create a Technographic-Based Marketing Service: Develop a marketing service that utilizes technographic data to help fashion brands craft personalized marketing strategies, targeting customers based on their technological preferences and habits for more effective engagement.

- **System:**

Analyze the Role of Technographics in Customer Journey Mapping: Conduct an analysis on how technographic web tracking can improve understanding of the customer journey in the fashion industry, from discovery through purchase, by providing insights into preferred technologies and platforms, thereby enabling better segmentation and targeting strategies.

Resources

- Gilbert, J. (2020, March 19). Council post: How B2B and B2C businesses can boost sales with smart intent marketing. Forbes.
- https://www.forbes.com/sites/forbescommunicationscouncil/2020/03/19/how-b2b-and-b2c-businesses-can-boost-sales-with-smart-intent-marketing/
- Van Heerde, Harald J., Isaac M. Dinner, and Scott A. Neslin. "Engaging the unengaged customer: The value of a retailer mobile app." International Journal of Research in Marketing 36.3 (2019): 420-438.
- Berg, Martin. "Digital Technography: A Methodology for Interrogating Emerging Digital Technologies and Their Futures." Qualitative Inquiry 28.7 (2022): 827-836.

Data Science, AI, Machine Learning

Introduction

Data science, artificial intelligence (AI), and machine learning (ML) increasingly play crucial roles in the fashion industry, revolutionizing various aspects of the business, from design and production to marketing and customer experience. Traditionally, every sound business utilizes historical sales data, market trends, and other relevant information to predict future demand and optimize inventory levels. Nowadays, machine learning algorithms allow for more accurate demand forecasting, further potentially reducing overstock and stockouts. Blockchain technologies also help by enhancing transparency and traceability in the supply chain, allowing for richer information, and using data analytics helps optimize production schedules, logistics, and supply chain efficiency. These technologies will largely aid the post-use sorting process. That information is also used in marketing, using data to understand customer preferences and behavior, enabling targeted marketing campaigns. Still, from a demand perspective, implementing AI-driven recommendation engines can help suggest personalized products based on individual customer preferences and browsing history. Natural language processing (NLP) and sentiment analysis connect that data to public opinion and trends on social media platforms, making these methods even more effective. Once a product of choice is determined, implementing AR and computer vision technologies for virtual try-on experiences allows customers to visualize how garments will look on them before making a purchase. Employing AI algorithms also aids in generating design ideas, helping designers explore a broader range of possibilities. By integrating computer vision to analyze trends and provide insights during the creative process, original designs can be made that have a higher chance to appeal to a larger public.

Assessment

- Active participation in class discussions and workshops.
- In-class presentation and an individual research assignment.
- Final exam assessing comprehension of all covered material.

Teaching Methodologies

- **Interactive Workshops:** Practical sessions that involve active participation in tasks or problem-solving activities.
- **Guest Lecturesand Industry Insights:** Lectures by industry professionals sharing real-world experiences and knowledge.
- **Group Discussions and Brainstorming Sessions:** Interactive sessions for generating ideas and discussing topics collaboratively.

Suggested Activities

Product: Develop a Product Using AI for Design Innovation: Task learners with creating a product that incorporates AI algorithms and computer vision to anticipate fashion trends and facilitate the design process, aiming to meet broad consumer appeal.

Service: Build a Personalized Fashion Recommendation Service: Learners will develop a service that utilizes AI, including data analytics, NLP, and sentiment analysis, to offer personalized fashion recommendations based on user preferences and social media trends.

System: Analyze a Sustainable Supply Chain System with Blockchain: Assign a project to study how a system utilizing blockchain technology can enhance the sustainability and efficiency of fashion supply chains, focusing on reducing waste and improving transparency.

Resources

- Chamodi, J., et al. (2021). The use of augmented reality to deliver enhanced user experiences in fashion industry. *Lecture Notes in Computer Science, 12936*.
- Harreis, H. et al. (2023) Generative AI: Unlocking the future of fashion. https://www.mckinsey.com/industries/retail/our-insights/generative-ai-unlocking-the-future-of-fashion.
- Hsu, C.-H., et al. (2021). Deploying resilience enablers to mitigate risks in sustainable fashion supply chains. *Sustainability, 13(5)*, 2943.
- Marlene, Z. (2020). Augmented reality try-on adoption in the Online Clothing Industry: Understanding key challenges and critical success factors. (Master's thesis). University of Twente.

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MODULE 4 Traceability and Sorting Tools

Description

The Traceability and Sorting Tools Module provides a comprehensive understanding of the necessary tools to improve sustainability in the textile and fashion industry. These tools include advanced sorting technologies, digital product passport systems, and wear and tear data collection. Advanced sorting technologies focus on digital recycling and upcycling and explore cutting-edge techniques such as machine vision, artificial intelligence, and data analytics. The digital product passports enable the recording of vital data from a fashion product's origin to its end-of-life, establishing its digital identity. This contributes to enhancing transparency and traceability, identifying potential risks and promoting ethical and sustainable practices. It also emphasizes social responsibility, fair labor practices, and worker welfare, promoting ethical production in the fashion industry. Finally, wear and tear refers to the gradual deterioration of products due to regular use, influenced by friction, stress, and environmental conditions. Analyzing wear and tear data is crucial for understanding product durability, user behavior, and sustainability.

Learning Outcomes

- Acquire a comprehensive understanding of advanced sorting technologies and their practical applications in the fashion industry while developing analytical skills to evaluate their impact and potential in diverse fashion recycling contexts.
- Understand the digital product passport system, focusing on its capture of a fashion product's lifecycle and its emphasis on social responsibility, including fair labor and worker welfare.
- Develop skills to assess and manage environmental impacts in fashion, like carbon footprints and waste, by learning how to evaluate products' sustainability and their industry-wide ecological contributions.
- Understand the impact of wear and tear on fashion product durability and satisfaction and learn to analyze this data to improve sustainability and circular practices.

- Develop skills in using digital technologies like Internet of Thing (IoT) for optimizing product design, maintenance, and longevity.

Wear and Tear

Introduction

This unit investigates the Wear and Tear concept within the fashion industry. Wear and Tear refers to the gradual deterioration of products due to regular use, influenced by friction, stress, and environmental conditions. Analyzing wear and tear data is crucial for understanding product durability, user behavior, and sustainability. This data helps manufacturers enhance design, choose better materials, and improve construction techniques, contributing to product longevity and customer satisfaction. It also sheds light on user habits, enabling the tailoring of products to specific lifestyles. Crucially, wear and tear analysis advances sustainability by identifying areas for durability improvement, reducing waste, and promoting circular economy practices. Moreover, it informs maintenance and aftercare strategies, and when integrated with digital technologies like IoT, it enables real-time monitoring and optimization of product use. This comprehensive approach aids the fashion industry in making informed decisions, promoting responsible consumption, and transitioning to sustainable and digital practices, benefiting both the environment and consumers.

Learning Outcomes

- To gain an understanding of the causes and effects of wear and tear on fashion products and how it influences product durability and user satisfaction.
- To be able to analyze wear and tear data to gain insights into user behavior and preferences and understand how this data can be utilized to advance sustainability and circular economy in the fashion industry.
- To acquire skills in integrating digital technologies, such as IoT, in monitoring wear and tear and how this can aid in optimizing product design, maintenance, and aftercare strategies.

Assessment

- Designing for Longevity Project: Learners will analyze a fashion product to identify wear and tear patterns, assess the product's durability and propose improvements in materials and design for increased longevity.
- User Behavior Mapping: Learners will create a mapping to understand how

different user behaviors affect the wear and tear of fashion products and how this information can be used to tailor products to specific lifestyles and usage scenarios.

Teaching Methodologies

- **Group Discussions** on real-life case studies of textile and fashion products on the impact of wear and tear to foster critical thinking and collaborative learning.
- **Workshop** on design materials focusing on material properties, design principles, and textile technologies influencing wear and tear. Learners will experiment with different materials and construction methods in this practical session.

Suggested Activities

Product

- **Create a Wear and Tear Monitoring Device:** Students are tasked with designing and prototyping a device that utilizes sensors or IoT technology to track the wear and tear on fashion items over time. This project should focus on how data collected by the device can inform better design, material choice, and sustainability practices in the fashion industry.

Service

- **Design a Wear and Tear Assessment Service:** Students will develop a business plan for a service that evaluates the wear and tear of clothing and accessories for fashion brands. This service should offer actionable insights to brands on how to increase the durability of their products, improve customer satisfaction, and support sustainable fashion practices.

System

- **Develop a Wear and Tear Data Analysis System:** Students are assigned to create a system proposal that collects, analyses, and reports data on the wear and tear of fashion products. This system should aim to assist fashion companies in making informed decisions about product design, material selection, and aftercare services to enhance sustainability and extend the

lifecycle of fashion items.

Resources

- Feijs, Loe, Troy Nachtigall, and Oscar Tomico. “Sole maker: towards ultra-personalized shoe design using Voronoi diagrams and 3D printing.” Proceedings of SMI’2016 Fabrication and Sculpting Event (FASE) (2016): 31-40.
- Klepp, Ingun Grimstad, Kirsi Laitala, and Stephen Wiedemann. “Clothing lifespans: what should be measured and how.” Sustainability 12.15 (2020): 6219.
- Aakko, Maarit, and Kirsi Niinimäki. “Quality matters: reviewing the connections between perceived quality and clothing use time.” Journal of Fashion Marketing and Management: An International Journal 26.1 (2022): 107-125.

Advanced Sorting Technologies

Introduction

The unit examines advanced sorting technologies and their impact on the fashion industry. It focuses on digital recycling and upcycling and explores cutting-edge techniques such as machine vision, artificial intelligence, and data analytics. Learners will explore how these technologies have transformed the sorting and categorizing of fashion products and have paved the way for innovative approaches in the industry.

The unit focuses on the following two topics:

1. **Machine Vision in Fashion Sorting:** it gives an overview of how to use cameras, sensors, and image recognition algorithms to capture detailed information about fashion products.
2. **Artificial Intelligence and Data Analytics:** it provides knowledge on how AI and data analytics enhance sorting accuracy and decision-making in recycling and upcycling workflows.

Learning Outcomes

- Acquire a comprehensive understanding of advanced sorting technologies and their practical applications in the fashion industry.
- Gain insight into the importance of machine vision, artificial intelligence, and data analytics in optimizing recycling and upcycling processes.
- Recognize the pivotal role of these technologies in promoting sustainability and the circular economy in fashion.
- Develop analytical skills to evaluate the impact and potential of advanced sorting systems in diverse fashion recycling contexts.

Assessment

- Active participation in class discussions and workshops.
- Presentation of a real-world scenario where AI and data analytics are used in fashion recycling, such as sorting materials or identifying recyclable clothing items.

Teaching Methodologies

- **Case Studies** to analyze the future potential of advanced sorting technologies in the fashion sector through real-world examples and industry insights.
- **Group Discussions** on the role of advanced sorting technologies in promoting a circular economy in the fashion industry, focusing on resource efficiency, waste reduction, and material reuse.
- **Workshops** on how to implement AI models or data analytics processes relevant to sorting in fashion recycling to demonstrate how data can be utilized to make informed decisions and improve sorting accuracy.

Suggested Activities

Product:

- Design a Smart Sorting Machine Prototype: Task students with creating a prototype for a machine that incorporates machine vision and AI, aimed at enhancing the sorting process in fashion recycling.

Service:

- Develop an AI-Enhanced Fashion Recycling Service: Students will conceptualize a service that uses AI and machine vision to improve the accuracy and efficiency of fashion product sorting for recycling and upcycling.

System:

- Research the Impact of Advanced Sorting Technologies: Assign a project to assess how technologies like machine vision and AI have transformed the fashion recycling industry, with an emphasis on future trends and sustainability implications.

Resources

- Charnley, Fiona, et al. “Can Digital Technologies Increase Consumer Acceptance of Circular Business Models? The Case of Second-Hand Fashion.” Sustainability 14.8 (2022): 4589.

- Colombi, Chiara, and Erminia D'Itria. "Fashion Digital Transformation: Innovating Business Models toward Circular Economy and Sustainability." Sustainability 15.6 (2023): 4942.
- Alpert, Cirrus, Michaela Turkowski, and Tahiya Tasneem. "Scalability solutions for automated textile sorting: a case study on how dynamic capabilities can overcome scalability challenges." (2021).
- Bonifazi, Giuseppe, et al. "End-of-Life Textile Recognition in a Circular Economy Perspective: A Methodological Approach Based on Near Infrared Spectroscopy." Sustainability 14.16 (2022): 10249.
- Humpston, G., et al. "Technologies for sorting end-of-life textiles." A technical and economic evaluation of the options applicable to clothing and household textiles, WRAP, UK (2014).
- Nørup, Nynne, et al. "Development and testing of a sorting and quality assessment method for textile waste." Waste Management 79 (2018): 8-21.

Digital Product Passports

Introduction

The unit investigates the digital product passport (DPP) system, planned to be adopted by the textile and fashion industry in the coming years. The DPP system will be crucial in recording essential data from a fashion product's origin to its end-of- life, thereby establishing its digital identity. The DPP system has many benefits, including enhancing transparency and traceability, identifying potential risks, and promoting ethical and sustainable practices. It also focuses on social responsibility, fair labor practices, and worker welfare, promoting ethical production in the fashion industry.

Within the DPP system, Clear Labelling allows companies to make the methods of production used transparent. The labelling can happen on traditional paper labels but also via NTC, RFID, or QR technologies (CFR product ID). This label can include information about eco-friendly materials, ethical sourcing, and fair labor practices. Clear labelling builds trust by providing information about a product's journey from raw materials to the finished garment. This transparency helps establish credibility and fosters a positive relationship between the brand and the consumer. Clear labelling allows fashion businesses to meet market expectations by showcasing their commitment to sustainable and ethical practices.

The unit also covers the system's role in assessing environmental impact, including measuring and managing factors such as carbon footprint and waste generation.

Learning Outcomes

- To develop an in-depth understanding of the focus of DPP on social responsibility, including fair labor practices and worker welfare.
- Knowledge about the legal and technical implications of clear labelling
- To acquire skills in applying measures and managing various environmental factors within the fashion industry, such as carbon footprint and waste generation.

- Being able to develop a strategic plan that leads to full transparency in the supply chain enabled by all stakeholders

Assessment

- Active participation in class discussions and workshops.
- In-class presentation and an individual research assignment.

Teaching Methodologies

- Group Discussions and Brainstorming Sessions: Interactive sessions for generating ideas and discussing topics collaboratively.
- Case Study Analysis: Learners analyze real-world scenarios to understand complex issues and apply theoretical knowledge.
- Interactive Workshops: conduct workshops where learners discuss the future requirements and implications of clear labelling using existing data on laws, regulations and theory.

Suggested Activities

Product: Create a Fashion Product with an In-depth DPP: Task learners with designing a fashion product that includes an in-depth digital product passport, emphasizing transparency from sourcing to end-of-life and showcasing its environmental and social impact.

Service: Conduct a creative workshop where learners develop a service that complements the fashion industry's products, focusing on extending their life. Ideas can range from repair services to sharing platforms, aiming to reduce waste and encourage sustainability.

System: Evaluate the Systemic Benefits of Digital Product Passports in Fashion: Conduct an analysis to explore how the digital product passport and clearly labeling system impacts the fashion industry at a systemic level, focusing on its role in improving transparency, sustainability, and ethical practices.

Resources

- Impact of international, open standards on circularity in Europe_. GS1 in Europe. (2022, November 18). https://gs1.eu/news/impact-of-international-open-standards-on-circularity-in-europe/
- Team, B., & Company, M. &. (2022a, March 2). The year ahead: What product passports will do for brands. The Business of Fashion. https://www.businessoffashion.com/articles/technology/the-state-of-fashion-2022-bof-mckinsey-product-passport-technology-resale-luxury-counterfeit/
- Candour.Digital. (n.d.). Digital product passports, what are they, and why should we care? LinkedIn. https://www.linkedin.com/pulse/digital-product-passports-what-why-should-we-care-candourdigital/
- This start-up is making digital passports... for clothes. Here's what that means for the fashion industry_. World Economic Forum. (n.d.). https://www.weforum.org/agenda/2021/05/tracking-fashion-clothes-sustainable/
- Remington, W. by C. (n.d.). Circular.fashion backs push for digital product passports. Ecotextile News. https://www.ecotextile.com/2022101729950/materials-production-news/circular-fashion-backs-push-for-digital-product-passports.html
- Plociennik, Christiane, et al. “Requirements for a Digital Product Passport to Boost the Circular Economy.” INFORMATIK 2022 (2022).
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- Humpston, G., & others. (2014). Technologies for sorting end-of-life textiles: A technical and economic evaluation of the options applicable to clothing and household textiles. WRAP UK.
- Richards, H. (2021). Rethinking value: 'Radical transparency' in fashion. Continuum, 35(6), 914-929.

- Beyers, F., Leventon, J., & Heinrichs, H. (2023). Collaborative governance or state regulation? Endless efforts but little capacity for sustainability transformation of the German textile sector. Environmental Policy and Governance, 33(1), 56-77.
- Yu, D., & Zhao, P. (2022). Global Value Chain Governance of the Apparel Design Industry under the Background of Global Sustainable Economic Development. Journal of Environmental and Public Health, 2022.

SUSTAINABILITY

Sustainability in the fashion industry is about implementing practices that reduce environmental and social impacts. This involves using sustainable materials, cutting waste and emissions, ensuring ethical labor practices, and adopting circular economy concepts. The overarching aim is to forge a fashion industry that is ecologically responsible and socially beneficial.

MODULE 5 Sustainability Fundamentals

Description

Sustainability Fundamentals module focuses on the shift of the textile and fashion industry towards sustainability and circular systems, looking into strategies for extending the lifecycle of products, such as durability, repairability, and modular and timeless design. Drawing references from the Ellen MacArthur Foundation's circularity roadmap, UNEP, SDG, among others, the module unfolds eco-design principles and examines social, economic, and environmental issues. The module covers the Life Cycle Assessment (LCA), a tool for analysing environmental impacts and implementing sustainable practices throughout the whole supply chain and manufacturing processes.

Learning Outcomes

- Understand eco-design principles and gain knowledge about circular materials.
- Gain knowledge and skills to extend products' lifecycle
- Identify contemporary trends, stakeholders, socio-environmental dependencies and future scenarios for sustainable development.
- Develop a comprehensive understanding of the LCA tool and learn how to use it in eco-design processes
- Explore real-world applications of LCA within businesses and evaluate its role in achieving supply chain transparency, conducting energy/resource and emissions analyses in manufacturing processes, and identifying opportunities for integrating more sustainable practices into operations

From Sustainable to Circular Materials

Introduction

From Sustainable to Circular Materials explores eco-design principles in the fashion industry, focusing on reducing environmental impact through sustainable materials, ethical manufacturing, and waste management. It emphasizes a holistic approach to product lifecycle, challenging the linear 'take-make-waste' model and encouraging innovation in material science. This unit covers sustainable materials that contribute to a circular economy, including those that can be recycled, reused, or biodegraded. Additionally, it introduces biobased materials, derived from renewable biological sources such as plants and algae, which play a crucial role in reducing the environmental footprint of fashion products. Learners will understand how these materials support circularity through their ability to decompose naturally or be recycled, extending the value of materials in the fashion ecosystem. The module also examines technologies and processes that create continuously recyclable materials, fostering a more environmentally conscious fashion industry.

Assessment

- Active participation in discussions and workshops.
- Demonstrate a comprehensive understanding of sustainable and circular materials, including biobased options.
- Define key concepts related to environmental impact, circularity, and responsible material sourcing.
- Present a critical analysis of the carbon footprint of different fashion materials.
- Apply circular design principles to real-world scenarios.
- Explore various sustainable materials, providing insights into their properties, applications, and ethical implications.

Teaching Methodologies

- **Case Study Analysis:** Evaluate brands using circular material systems, such as Zara's Circulose collection and Stella McCartney's use of biobased materials like Mylo.
- **Interactive Workshops/Design Sprints:** Hands-on engagement with sustainable and biobased materials, aiming to develop innovative services

or systems.

- **Field Trips:** Visit facilities producing regenerated and biobased fibers, as well as farms for sustainable fiber production.
- **Guest Lectures:** Host designers and material innovators to share circular design projects.

Suggested Activities

- **Product:** Design a fashion product using circular materials and methodologies, such as bio-based textiles or recycled fibers. Research and compile information on various circular materials, focusing on their sourcing, production, and applications. The final design should fit within either the technical or biological cycle to ensure recyclability.
- **Service:** Develop a service for a fashion brand that educates consumers on circular and biobased materials, using touchpoints like product labels, digital platforms, and in-store displays. Create prototypes that demonstrate how users interact with this service and explore how technology can enhance the delivery of information on sustainable practices.
- **Systems:** Design a system for a brand transitioning to circular materials, emphasizing biobased options. Conduct research, analyze the brand, identify suitable biobased and circular materials, and engage stakeholders through surveys or interviews. Develop a detailed design for sustainable sourcing, production, and traceability.

Resources

- Luengo, B., & Bakker, T. (2020). "Biobased materials and circularity in fashion: Opportunities and challenges." *Circular Economy Journal*, 12(3), 89-103.
- Thompson, S. (2021). "Biorejuvenation in textiles: Innovations in material science for sustainable fashion." *Sustainable Fashion Review*, 18(4), 221-229.

- Garcia, A. (2019). "Exploring the circular potential of biobased materials in fashion." *Journal of Textile Research and Development*, 14(2), 167-175.
- Bast Fiber Technologies. "Innovations in Biobased Bast Fibers for Sustainable Fashion." BFTi, 2022.
- Ananas Anam. "Piñatex: Sustainable and Innovative Biobased Material." Ananas Anam, 2022.
- Modern Meadow. "Biofabricated Materials for Sustainable Fashion: The Case of Zoa." Modern Meadow, 2022.
- Ecoalf. "Sustainable Fashion through Biobased Materials: Ecoalf's Approach." Ecoalf, 2022.

Extending Lifecycles

Introduction

This unit focuses on the importance of Extending Lifecycles in opposition to fast fashion, promoting durability, repairability, and timeless design. Strategies include producing high-quality garments, offering repair services, and promoting responsible consumption habits. The unit covers designing for physical and emotional durability, care instructions, repair methods, and promoting consumer awareness through market trends and social media. Within the unit, learners are introduced to the Life Cycle Assessment (LCA) tool, used to analyze environmental impact of products or activities from extraction to waste management. Through case studies they learn how LCA can be used by businesses for supply chain transparency, energy/resource emissions analysis in manufacturing, and identifying areas for more sustainable practices.

Learning Outcomes

- Gain an understanding of environmental and social impacts of fast fashion production and recognize the need for sustainable/circular alternatives, specifically focusing on extending life cycles.
- Gain knowledge of how to apply design principles for extending product lifecycles, such as physical and emotional durability, timeless design concepts, and repair and maintenance strategies.
- Learn how to conduct a Life Cycle Assessment (LCA) to analyze the environmental impact of products or activities throughout their entire lifecycle.
- Explore real-world applications of LCA within businesses and evaluate its role in achieving supply chain transparency, conducting energy/resource and emissions analyses in manufacturing processes, and identifying opportunities for integrating more sustainable practices into operations.

Assessment

- Successful analysis and presentation of case studies on existing remake and repair systems

- Development of a research-based assignment on a garment lifecycle extension service
- Attendance and active participation in guest lectures and discussions
- Participation in hands-on workshops exploring repair and remake techniques, with tangible outcomes assessed on quality, innovation and creativity.

Teaching Methodologies

- **Case Study Analysis:** Learners analyze real-world scenarios to understand complex issues and apply theoretical knowledge.
- **Design Thinking:** Uses designer mindsets and methods to create user-focused strategies, emphasizing process over product and combining design, technology, and business.
- **Creative Problem Solving:** Focuses on innovative solutions through creative thinking, exploring multiple possibilities and approaches.
- **Guest Lectures and Industry Insights:** Lectures by industry professionals sharing real-world experiences and knowledge.
- **Interactive Workshops:** Practical sessions that involve active participation in tasks or problem-solving activities.

Suggested Activities

- **Product: Host a sustainable fashion repair and Remake hands-on workshop.** Following a demonstration of basic repair techniques such as sewing on buttons, patching holes, fixing seams and showing examples of successful and creative fashion remakes, learners will have the opportunity to repair damaged clothing items and remake unwanted items through redesign processes, using Anna Lidtsröm's 'Redesign Foundations' as a reference for new designs.
- **Service:** Undertake a garment lifecycle extension service design challenge through case study analysis and Masterclass delivery. The masterclass should highlight current challenges and opportunities in the fashion industry related to lifecycle extension and emphasize the importance of understanding consumer preferences and industry practices and engage learners to identify key components of a service that can effectively extend the lifecycle of fashion

products. Learners should produce a service blueprint, including backend processes and digital integrations.

- **System:** Explore integrated sustainable fashion ecosystem design through a research-based assignment.

The research assignment can be conducted over time or in a condensed sprint or workshop format, utilizing the Loopholes toolkit for rapid system design. Learners discuss systems design's potential to prolong fashion product lifecycles and study sustainable fashion practices, initiatives, and systems. They identify stakeholders in sustainable fashion ecosystems, delineate roles and responsibilities, and map potential intervention points to extend product lifecycles, presenting findings to the group.

Resources

- https://ecostandard.org/wp-content/uploads/2021/04/ECOS-REPORT-HOW-ECODESIGN-CAN-MAKE-OUR-TEXTILES-CIRCULAR.pdf
- Oxborrow, L., and Claxton, S. (2016) Extending clothing lifetimes: an exploration of design and supply chain challenges., in Lloyd, P. and Bohemia, E. (eds.), Future Focused Thinking - DRS International Conference 2016, 27 - 30 June, Brighton, United Kingdom. https://doi.org/10.21606/drs.2016.482
- Laitala, K., & Klepp, I.G. (2011). Environmental improvement by prolonging clothing use period.
- Laitala, K., & Klepp, I. G. (2020). What affects garment lifespans? International clothing practices based on a wardrobe survey in China, Germany, Japan, the UK, and the USA. Sustainability, 12(21), 9151. https://doi.org/10.3390/su12219151
- Zhang, L., & Hale, J. (2022). Extending the lifetime of clothing through repair and repurpose: An investigation of barriers and enablers in UK citizens. Sustainability, 14(17), 10821. https://doi.org/10.3390/su141710821
- RE/DONE - https://shopredone.com/
- Maggie Marylin - https://www.maggiemarilyn.com/prosperity/reports

Environmental Accounting

Introduction

This unit focuses on the systematic recording, analysis, and interpretation of environmental indicators associated with the fashion industry. It aims to equip participants with skills in tracking metrics like water usage, energy consumption, carbon emissions, chemical usage, land use, and air pollution. Environmental accounting is essential for understanding the ecological footprint of products and services throughout their life cycle. This unit will emphasize compliance with regulations such as the Corporate Sustainability Reporting Directive (CSRD) and fostering sustainable business practices. Participants will learn how to integrate environmental data into decision-making processes, leading to a more transparent and sustainable industry.

Learning Outcomes

- Understand the principles and scope of environmental accounting in the fashion industry.
- Develop skills to collect and analyze environmental data across the supply chain.
- Apply Life Cycle Analysis (LCA) to evaluate the environmental impact of products and services.
- Identify opportunities for resource optimization, waste reduction, and emission mitigation.
- Integrate environmental accounting practices into business strategies to meet regulatory standards and enhance transparency.

Assessment

- Conduct an LCA of a selected fashion product, analyzing the environmental impact at each life cycle stage.
- Develop a report on the environmental performance of a company's operations, proposing strategies for improvement.

- Participation in workshops focused on interpreting environmental data and applying it to business practices.
- Presentation of a case study highlighting the use of environmental accounting to achieve sustainable outcomes in the fashion industry.

Teaching Methodologies

- **Interactive workshops** – Hands-on sessions for collecting and analyzing environmental data from supply chain activities.
- **Case-based learning** – Analysis of real-world examples of environmental accounting practices in fashion.
- **Problem-based learning** – Students will work on scenarios involving the implementation of environmental accounting in various fashion business models.
- **Guest lectures** – Experts from industry and academia will provide insights on best practices and regulatory developments.

Suggested Activities

Product Level: Conduct a Life Cycle Analysis (LCA) of a fashion product, focusing on the environmental impact of materials, manufacturing processes, and end-of-life scenarios. Analyze the findings to suggest material substitutions or process improvements.

Service Level: Map out the environmental data flow from a service-oriented perspective (e.g., textile recycling services). Evaluate how these services contribute to overall resource efficiency and suggest ways to enhance transparency and data sharing.

Ecosystem Level: Develop a sustainability strategy for a fashion company's operations, including data collection from suppliers, logistics, and production. Present a plan for reducing the company's carbon footprint and improving resource management.

Resources

- Joyner Armstrong, C. M., & LeHew, M. L. A. (2011). "Sustainable Apparel Product Development: In Search of a New Dominant Social Paradigm for the Field Using Sustainable Approaches." *Fashion Practice*, 3(1), 29-62.
- Trucost. (2011). "Puma's Environmental Profit and Loss Account for the Year Ended

31 December 2010." Trucost Report.

- Schaltegger, S., Burritt, R., & Petersen, H. (2003). "An Introduction to Corporate Environmental Management: Striving for Sustainability." *Greenleaf Publishing*.
- Guinee, J. B., et al. (2002). "Handbook on Life Cycle Assessment: Operational Guide to the ISO Standards." *Kluwer Academic Publishers*.
- Chouinard, Y., Ellison, J., & Ridgeway, R. (2011). "The Sustainable Economy." *Harvard Business Review*, 89(10), 52-62.

MODULE 6 Closing the Loop

Description

Closing the Loop introduces participants to circular design strategies and involve a holistic approach to design, materials, resources, and services that is mindful of the waste hierarchy as well as EPR. Learners will learn of conscious strategies and practices that reduce waste, consider the entire lifecycle of textile products and how the overall environmental impact of the garment/product can be minimized, and how products can be made to easily go into material recycling at the end of their lifespan. Part of the module will focus on repair, upcycling and design for disassembly as circular design strategies increasing the longevity of materials, waste reduction and product use.

Learning Outcomes

- Understanding circular design principles and how they reduce waste in the fashion industry.
- Understanding closed-loop recycling processes: the collection, sorting, processing, and manufacturing steps.
- Understanding efficient production processes aimed at minimizing waste.
- Learners will be able to demonstrate an understanding of how considered material selection and secure construction techniques contribute to the repairability and modularity of items.
- Knowledge of EU legislation and how it impacts companies and the fashion industry.
- Learners will gain insight into existing systems and practices to ensure repairability within the fashion industry and how to integrate repairability into their design and production processes, contributing to a more circular fashion industry.
- Learners will explore how user empowerment in self-disassembly, part swapping, and restyling can deepen their connection with fashion items.

Waste Reduction

Introduction

This unit focuses on minimizing waste generation through strategies such as reduction, reuse, recycling, and repurposing, as well as upcycling of materials to transform textile waste into new fibers or higher-value products. These practices promote the circular economy and address challenges in managing clothing disposal. Instead of being discarded, valuable resources can be redirected into recycling or upcycling processes, supporting a circular fashion supply chain. The unit explores the identification, sourcing, and respectful use of post-use materials in design and manufacturing, emphasizing recyclable, biodegradable, or recycled sources.

A key component of this unit is sustainable packaging, which uses materials and practices that reduce environmental impact throughout the packaging lifecycle. This approach emphasizes biobased or recycled materials and reducing overall packaging use. Sustainable packaging is essential for minimizing the ecological footprint of fashion products. By adopting these methods, brands can better align with consumer demand and regulations.

Learners will explore alternatives to the linear production model, focusing on designing products with recycling or upcycling in mind and adopting mono-material principles for easy recycling. They will also gain insight into the systems of sourcing, handling, and organizing reusable textiles, as well as the role of consumer education in encouraging responsible disposal. As the fashion industry evolves, innovative solutions for managing end-of-life materials are vital to a sustainable and circular economy.

Assessment

- Active participation in classroom discussions and workshops.
- Analysis of a case study.
- Demonstrate an understanding of how post-use materials can be used in remaking garments through circular methodologies.
- In-class presentation and an individual research assignment.

Teaching Methodologies

- **Lectures with Industry Experts:** Insights from professionals on sustainable practices.
- **Lectures and Seminars:** Attend conferences and seminars on circular economy principles.
- **Workshops:** Active discussions and hands-on practice focused on waste reduction and sustainable packaging.
- **Case Study Analysis:** Study real-world examples of brands using post-use materials.
- **Group Discussions:** Mapping local stakeholders involved in post-use material systems.

Suggested Activities

Product: Design and create a remade/upcycled piece using post-consumer garments, following a mono-material or disassembly-friendly approach. Consider the entire lifecycle of materials, including end-of-life implications.

Service: Develop a service that facilitates the collection and redistribution of post-use materials, including strategies for consumer education on proper disposal. Explore redesigning care labels with end-of-life instructions, using sustainable packaging materials.

Systems: Facilitate discussions on developing recovery systems for post-use materials in the local context. Create a platform that documents materials usage and waste, identifying opportunities for waste reduction and improved recycling. Include sustainable packaging considerations in logistics and supply chain planning.

Resources

- Bonifazi, G., et al. (2022). "End-of-Life Textile Recognition in a Circular Economy Perspective: A Methodological Approach." *Sustainability*, 14(16), 10249.
- Cernansky, R. (2021). "End-of-life regulation is coming for fashion." *Vogue Business*.

- Humpston, G., et al. (2014). "Technologies for sorting end-of-life textiles." WRAP UK.
- Nørup, N., et al. (2018). "Development of a sorting and quality assessment method for textile waste." *Waste Management*, 79, 8-21.
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- Gupta, S., & Sharma, S. (2020). "Sustainable packaging: A step towards environmental conservation." *Journal of Sustainable Development*, 13(5), 112-119.
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Extended Producer Responsibility

Introduction

This unit refers to the practice of participating in a recycling system. Sustainability in the fashion domain involves more than just creating stylish garments; it entails a fundamental shift towards responsible practices, which is the focus for learners in this unit. Closed-loop recycling represents the commitment to a recycling system where discarded or worn-out garments find new life. Learners will learn how, in a closed-loop system, the materials from used clothing items are collected, processed, and reintegrated into the production of new products. This unit will also cover EU legislation and the EU strategy for sustainable and circular textiles.

Assessment

- Active participation in discussions and workshops.
- Assessment of products and how to redesign them to work in a closed-loop recycling system.
- Participation in on-site visits to textile sorting facilities and recycling plants.

Teaching Methodologies

- **Flipped classroom:** learners get to study recent reports on EU legislation.
- **Lectures with Industry Experts** on EU legislation and EU strategy for sustainable and circular textiles.
- **Active learning:** On-site visits to facilities that collect and sort textiles for reselling and/or recycling.
- **Case Study Analysis:** Study and analyze companies working with designing in mono materials, for example, Houdini Sportswear.
- **Guest Lectures and Industry Insights:** invite companies working with recycling textile waste, for example, Lenzing, Södra Once More, or Renew Cell.

Suggested Activities

- **Product:** Mini project. Design a mini collection using only mono materials that we can recycle today.

- **Service:** Class discussion on how to incorporate closed-loop recycling into brand strategy and product development
- **System:** Assessment of products and how to redesign them to work in a closed- loop recycling system.

Resources

- Isaac, Roman. "Restitching the Common Thread: The Potential of Closed Loop Recycling in the Textile and Clothing Industry for Regional and Entrepreneurial Resilience in Northern Portugal." (2018).
- Wang, Shi. "Brief analysis on closed-loop ecosystem of textile and clothing recycling." IOP Conference Series: Earth and Environmental Science. Vol. 186. No. 4. IOP Publishing, 2018.
- Brydges, Taylor. "Closing the loop on take, make, waste: Investigating circular economy practices in the Swedish fashion industry." Journal of Cleaner Production 293 (2021): 126245.
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Closed Loop Water and Renewable Energy

Introduction

This unit explores the implementation of closed-loop water systems and renewable energy in the fashion industry. Closed-loop water systems involve technologies that enable the recycling and reuse of water in production, reducing the need for fresh water and minimizing wastewater discharge. This practice is essential for conserving water resources in an industry known for high water consumption. Renewable energy involves utilizing naturally replenishing energy sources such as solar, wind, and hydroelectric power to reduce the reliance on fossil fuels. By integrating these practices, fashion brands can significantly lower their environmental impact, align with global sustainability goals, and move towards a circular economy. Participants will learn how to adopt and implement these technologies in various stages of fashion production.

Assessment

- Analyze a fashion company's water and energy usage and propose strategies for implementing closed-loop water systems and renewable energy solutions.
- Develop a detailed plan for transitioning a traditional fashion production facility to a sustainable one, incorporating closed-loop water systems and renewable energy sources.
- Participation in workshops focused on the design and operation of water recycling systems and renewable energy infrastructure for fashion production.
- Presentation of a case study where closed-loop water systems and renewable energy have been successfully implemented in a fashion or textile company.

Teaching Methodologies

- **Case study analysis** – Examination of successful implementations of closed-loop water systems and renewable energy in fashion production.

- **Problem-based learning** – Develop solutions for integrating closed-loop systems into existing production processes.
- **Hands-on workshops** – Simulated projects to design water recycling processes and renewable energy strategies for fashion brands.
- **Guest lectures** – Industry experts discuss practical challenges and innovative solutions in sustainable water and energy management.

Suggested Activities

- **Product:** Design a sustainable product line that integrates closed-loop water systems in the dyeing and finishing processes. Calculate the water savings and environmental benefits compared to conventional methods.
- **Service:** Develop a business model for a fashion company that offers water recycling and renewable energy consulting services to other fashion brands, helping them transition to sustainable production practices.
- **Systems:** Create a strategic plan for a fashion hub that relies entirely on renewable energy sources and closed-loop water systems. Consider factors like infrastructure, partnerships, and policy compliance.

Resources

- Köhler, A. R., & Som, C. (2020). "Circular Economy in the Fashion Industry: A Review of Sustainability Strategies." *Journal of Cleaner Production*, 267, 122049.
- Fletcher, K., & Tham, M. (2019). "Earth Logic Fashion Action Research Plan." Centre for Sustainable Fashion, University of the Arts London.
- Hossain, M. M., & Alam, M. J. B. (2018). "Sustainable Water Management in the Textile Industry: A Review." *Journal of Environmental Management*, 223, 831-844.
- Preuss, H., & Schaltegger, S. (2019). "Sustainable Fashion: A Review and Implications for the Circular Economy." *Sustainability*, 11(20), 5691.

Circular design strategies

Introduction

In this learning unit, learners get to explore circular design methods such as design for multiple uses, repairability, disassembly, and more. The use of circular design methods can promote the longevity of a garment or accessory's lifespan, minimize waste and the need for overconsumption, and lower the overall environmental impact of a product. Through material selection, suitable and secure construction techniques, and clever design solutions for adaptive styles and removable hardware, products can be more personalized by the user as well as being more easily disassembled at the end of their lifespan. Users can be empowered to connect more strongly with the product, prolonging its active lifespan. Learners will get a better understanding of how design and material choices can affect expanding business models and support a more holistic approach to the interconnectedness of resources, design, business, and users.

Assessment

- Successful analysis of academic and market case studies on circular design methods and their environmental gains.
- Demonstration of knowledge of repair systems, repair techniques and suitability of materials for repair, in both the fashion industry and those of other sectors.
- Participation in a design sprint.
- Active discussion and group idea generation around different circular design methods and their role in reducing waste and extending lifecycles.

Teaching Methodologies

- **Case Study Analysis:** Analyze brands who are designing their products for disassembly, such as Nike.
- **Interactive Workshops:** Engage learners actively in the design processes and methods required for modular design and designing in mono material.

- **Guest Lectures and Industry Insights:** Invite professionals who are working in the field of disassembly to share their methods.
- **Design Sprint:** A time-constrained process where learners go through phases of design, prototyping, and testing ideas or products.
- **Group Discussions and Brainstorming Sessions:** Interactive sessions for generating ideas and discussing topics collaboratively.

Suggested Activities

- **Product: Design sprint**. Learners could explore different circular design methods in short sprints, including existing market components, available and innovative material choices, and user benefits. Ideally learners explore two or more: modular design, design for longevity, design for disassembly, and design with mono material.
- **Service: circular business models**. Learners could develop a service business model focusing on operations and customer needs. They'll study successful case studies, discussing the service's impact on brand reputation and sustainability. Learners analyze how the service aligns with the brand's ethos, mapping the logistical processes and the customer journey. They identify pain points and design a comprehensive service considering channels, communication, tracking, engagement, and financial aspects.
- **System: Mapping and developing a Digital Platform for Community Engagement.** Develop digital platforms or mobile applications to facilitate garment rentals, track usage, and provide educational resources, where a community of like-minded individuals interested in sustainable fashion and multiple-use garments can share styling tips, exchange garments, and participate in events and discussions.

Resources

- Textile Design for Disassembly: A Creative Textile Design Methodology for Designing Detachable Connections for Material Combinations, Laetitia Forst, https://www.researchgate.net/publication/356430078_Textile_Design_for_Disassembly_A_creative_textile_design_methodology_for_designing_detachable_connections_for_material_combinations
- Application of Design for Disassembly in Men's Jacket: A Study on

Sustainable Apparel Design, Hye-Shin Kim & MyungHee Sohn, https://www.researchgate.net/publication/233627271_Application_of_design_for_disassembly_in_men's_jacket_A_study_on_sustainable_apparel_design

- Design for a Circular Economy, Ruud Balkenende, Nancy Bocken & Conny Bakker, https://www.taylorfrancis.com/chapters/edit/10.4324/9781315625508-42/design-circular-economy-ruud-balkenende-nancy-bocken-conny-bakker
- Repairing Fashion Cultures: From Disposable to Repairable, Kirsi Niinimäki & Marium Durrani, https://www.researchgate.net/publication/352897684_Repairing_Fashion_Cultures_From_Disposable_to_Repairable
- The Jeans Redesign, Ellen MacArthur Foundation, https://ellenmacarthurfoundation.org/the-jeans-redesign
- Circular Fashion, C&A, https://www.c-and-a.com/eu/en/shop/circular-fashion
- Futurecraft.Loop – A Performance Running Shoe Made to Be Remade, Adidas, https://news.adidas.com/running/adidas-unlocks-a-circular-future-for- sports-with-futurecraft.loop–a-performance-running-shoe-made- t/s/c2c22316-0c3e-4e7b-8c32-408ad3178865
- ISPA Link & Link Axis, Nike, https://about.nike.com/en/stories/ispa-link-link- axis
- Resortecs, https://resortecs.com
- Repair Process, Patagonia, https://help.patagonia.com/s/article/RepairProcess
- Textile Recycling Companies, Conscious Fashion Collective, https://consciousfashion.co/guides/textile-recycling-companies
- Repairhaus, Berghaus, https://www.berghaus.com/repairs.list

- RM: Research Methodology, Pushp Gund, https://issuu.com/pushp.gund/docs/rm
- Untitled (VCU Thesis on Modular Design), Kenneth Christiano, https://scholarscompass.vcu.edu/cgi/viewcontent.cgi?article=5810&context=etd
- How Clothes Can Regrow After Being Torn, University of Texas at Austin, https://www.futurity.org/fabric-self-heal-toxins-1211672-2/
- Textile Design for Disassembly – video presentation, Laetitia Forst, https://www.youtube.com/watch?v=ZUtI3YK_PKM
- Futurecraft.Loop: Performance Footwear Circularity – video, Adidas, https://www.youtube.com/watch?v=tfFN1Wtyang
- Patagonia, Rapha, Decathlon – United Repair Centre https://www.unitedrepaircentre.com/
- IKEA Spare parts - https://www.ikea.com/nl/en/customer-service/returns-claims/spareparts/
- Nike X Undercover Modular Design - https://www.eyecmag.com/news/2020/12/2/nike-and-undercover-unveil-a-concise-capsule-for-holiday-2020
- Modular clothing: a proposition, Kenneth Christiano, https://medium.com
- Lang, C., & Wei, B. (2019). Convert one outfit to more looks: Factors influencing young female college consumers' intention to purchase Transformable Apparel. Fashion and Textiles, 6(1). https://doi.org/10.1186/s40691-019-0182-4
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- Laitala, K., Boks, C., & Klepp, I. G. (2015). Making clothing last: A design approach for reducing the environmental impacts. International Journal of Design, 9(2),93-107
- Cuyana - https://cuyana.com/collections/clothing
- Patagonia - https://eu.patagonia.com/nl/en/product/womens-tres-3-in-1-parka/28411.html
- Johanna Parv - https://johannaparv.com/collections/spring-summer-2023
- http://clothingasconversation.com/clothings-as-conversation/approach/
- Nicole McLaughlin - https://nicolemclaughlin.com/work-2

MODULE 7 Beyond Sustainability

Description

Beyond Sustainability, it looks specifically at the interconnectedness of all living beings and nature through a less human-centered approach. It involves adopting a broader perspective to design, evaluating humanity´s impact and integrating holistic practices in harmony with nature. Learners become aware of current problematics such as animal and environmental exploitation and monoculture while they gain insights through approaches that shift the paradigm, such as agroecology and fibreshed. This module also explores alternatives to conventional fabrics and how a shift towards a more restorative approach to the fashion industry can be achieved by embracing regenerative fashion.

Learning Outcomes

- Acquire an overall understanding of More than Human perspectives currently existing in design, with concrete examples as references.
- Knowledge about the main benefits and risks involved in sourcing regenerative fibers.
- Being able to apply solutions that are effective in managing supplier relationships aimed at long-term collaboration.
- Being able to implement a regenerative sourcing strategy in a way beneficial to all stakeholders.
- Gain an overview of alternative perspectives on design through history and case studies.
- Learn how to think and design from a More than human perspective, stepping away from Anthropocentric design perspectives.

More-than-Human Design

Introduction

The *More-than-Human Design* module looks specifically at the interconnectedness of all living beings and aims to engage students in fashion products and systems that are sustainable, ethical, inclusive, and respectful, promoting a harmonious relationship between fashion and nature. This module encourages a holistic approach, recognizing and respecting the intricate relationships between human activities and broader ecological systems. Students will learn that *More-than- human design* moves beyond human-centered perspectives to include the well- being of non-human entities—such as animals, plants, insects, water systems, and other elements of the natural environment. The aim is to create fashion products and practices that minimize environmental harm, conserve resources, and promote ecological balance. This involves adopting alternative materials and production methods that minimize harm to animals and ecosystems, such as using plant- based and recycled materials, adopting organic farming practices, and reducing harmful chemicals in textile production.

Students will also explore the welfare of animals and ensure that fashion products do not involve the use of fur, exotic skins, or other materials obtained through cruel practices. The module emphasizes the importance of understanding how design choices impact both human and non-human stakeholders throughout the entire fashion lifecycle. Therefore, this module functions as a connecting overview to a set of practices developed in further individual modules: Co-Design, Fair Labour Practices, From Sustainable to Circular Materials, Regenerative Design, and Local Community. It explores the relatively new and developing area of *More-than- Human design* by examining projects of independent designers, brands, and theorists who engage with human-lived experiences in a multi-species context entangled through the processes by which we live, design, and create.

Assessment

- Active participation in class discussions and workshops.
- Presentation of a case study demonstrating a deep understanding of *More-than-Human* design in practice, with specific consideration of the ecological impact and engagement with various stakeholders.
- A sound project proposal for a *More-than-Human* design project, with nominated actors and goals within the project (e.g., a handwoven bag made for foraging, using locally grown & processed nettle fiber, which supports local biodiversity and benefits pollinators).

Teaching Methodologies

- **Embodied Learning:** Involving the whole body in processes related to learning about *More-than-Human* design, e.g., students planting a garden or intentionally walking to observe and record non-human ecosystems, fostering an understanding of ecological interdependencies.
- **Interactive Workshops:** Conduct workshops where students design with *More-than-Human* agents, such as plants or bacteria, considering the impact of their design on surrounding ecologies.
- **Guest Lectures and Industry Insights:** Invite professionals from fashion and textile companies exploring *More-than-Human* understanding in their production processes, such as Stella McCartney or Babaà Knitwear, who work with wool from shepherds practicing traditional methods of transhumance, integrating the needs of both ecological systems and local communities.
- **Group Discussions and Brainstorming Sessions:** Facilitate discussions on agency and *More-than-Human* interactions with existing fashion garments— trace/imagine their impact on ecosystems and stakeholders before, during, and after production.

Suggested Activities

Following an embodied experience involving consideration of *More-than-Human* actors in the local environment and a discussion about agency and human impact on non-human actors, students could choose from the following activities:

- **Product:** Design a fashion product that initially serves its purpose for humans and then has a second life as a host to non-human actors, such as insects or bacteria, through designing for multiple uses and considering ecological impacts.
- **Service:** Create a fashion service that incorporates *More-than-Human* design principles through research and analysis of a known sustainable fashion service context, identifying both human and non-human stakeholders, conducting a needs assessment, and developing a concept service—e.g., a community garden for growing local fibers that supports local pollinators.
- **System:** Design a comprehensive system for the fashion industry that incorporates *More-than-Human* design principles, emphasizing sustainability, ethical practices, and positive impacts on humans, animals, and the environment. The process involves mapping human and non-human stakeholders, using system frameworks to integrate technology, sustainable materials, and ethical practices across the entire fashion lifecycle, from design to production, consumption, and disposal. This also includes designing ethical supply chains that ensure fair labour practices, animal welfare, and ecological conservation.

Resources

- https://mitpress.mit.edu/9780262542999/things-we-could-design/
- https://oxman.com/projects/silk-pavilion-ii
- https://more-than-human.com/
- Morton, Timothy. Humankind: Solidarity with Non-Human People (2017) London: Verso https://www.versobooks.com/en-gb/products/350-humankind
- Fletcher, K. St. Pierre, L. & Tham, M. Design and Nature: A Partnership (2019) London: Routledge.
- More-Than-Human reader 2020, Het Nieuwe Instituut, Manifesta Foundation, Office for Political Innovation, Serpentine Galleries
- https://san-serriffe.com/product/more-than-human/
- Babaà Knitwear - https://babaa.es/blog/babaa-sheep-la-trashumancia/

Regenerative Fashion

Introduction

Regenerative fashion proposes a sustainable alternative to traditional garment production methods, suggesting the use of natural fibers in the production process to achieve a fair production process for the soil, avoiding exploitation practices such as monoculture. Increase soil organic carbon (SOC) levels, soil health and biodiversity juxtaposed against 'conventional'. Using innovative, sustainable materials and production processes is crucial in regenerative fashion. This includes exploring alternatives to conventional fabrics, such as organic cotton, recycled materials, and bio-based textiles. A shift toward a more restorative approach to the fashion industry can be achieved by embracing regenerative fashion. It recognizes the interconnectedness of environmental, social, and economic factors and aims to create a positive impact across all these dimensions. As awareness of environmental and social issues grows, regenerative fashion is gaining momentum as a more sustainable and responsible way of producing and consuming clothing. Regenerative fashion emphasizes fair labor practices and ethical treatment of workers throughout the supply chain. This includes fair wages, safe working conditions, and fostering a sense of community and well-being among workers. Brands engaged in regenerative fashion often prioritize transparency in their supply chains. They provide consumers with information about the origins of materials, the production process, and the social and environmental impact of their products.

Assessment

- Active participation in class discussions and workshops.
- In-class presentation and an individual research assignment.
- A final exam assessing comprehension of all covered material.

Teaching Methodologies

- **Interactive Workshops:** Conduct workshops where learners are encouraged to develop and present a proposal for a collaboration with tier 1 suppliers of regenerative fibers.

- **Guest Lectures and Industry Insights:** Invite professionals from fashion and textile companies with experience in managing relationships for a regenerative sourcing context.
- **Group Discussions and Brainstorming Sessions:** Facilitate discussions on how supply chain management and sustainability can be integrated into a regenerative sourcing strategy.

Suggested Activities

- **Product:** Design a regenerative sourcing strategy. The strategy should include a proposal clearly stating the benefits and requirements for the supplier from the brand's perspective.
- **Service:** Participants will write a long-term contingency plan regarding the most effective way to implement a regenerative sourcing strategy for the above-mentioned cases. Learners can take on different roles within the value chain, from fashion company employee to a farmer. Together they make decisions on how to build and evolve their collaboration.
- **System:** Create innovative and systemic change models by redesigning and restructuring management and supplier relationships.

Resources

- Albani, M., & Henderson, K. (2014, July 1). Creating partnerships for sustainability | McKinsey. https://www.mckinsey.com/capabilities/sustainability/our-insights/creating- partnerships-for-sustainability [Accessed March 2023]
- Allbirds to Only Use Wool from Regenerative Sources by 2025. (n.d.). The Business of Fashion. https://www.businessoffashion.com/news/sustainability/allbirds-to- only-use-wool-from- regenerative-sources-by-2025/ [Accessed February 2023]
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- Tonti, L. (2023) "Impact starts at fibre': seven designers who are championing regenerative fashion,' The Guardian, May 17. https://www.theguardian.com/lifeandstyle/2023/may/16/impact-starts-at-fibre-seven-designers-who-are-championing-regenerative-fashion

STAKEHOLDER ENGAGEMENT

Stakeholder engagement refers to the systematic inclusion and collaboration with diverse groups, including consumers, employees, suppliers, local communities, and non-governmental organizations (NGOs). This process involves establishing transparent and constructive dialogues, accommodating various perspectives, and addressing social and environmental challenges. Through effective stakeholder engagement, fashion brands can build trust, foster societal progress, and align their strategies with the expectations of the broader community.

MODULE 8 Ethical Ecosystems & Social Prosperity

Description

In the "Ethical Ecosystems & Social Prosperity" module, learners will explore the transformative potential of ethical practices in the apparel industry. This module examines the importance of fair labour practices, the importance of social responsibility, and the impact on socioeconomic sustainability as the apparel industry deals with globalization, environmental sustainability, and social equity challenges. By providing an understanding of this, this module aims to equip learners with the knowledge and skills to support sustainable equity practices in the fashion and textile industries.

Learning Outcomes

- Understand the principles of fair labour, including safe working conditions, fair wages, and the importance of respecting workers' rights throughout the fashion supply chain.
- Gain insights into the roles and responsibilities of fashion brands in promoting inclusivity, diversity, and fair trade, understanding how ethical practices contribute to social sustainability.
- Explore how socioeconomic factors affect consumer behavior and industry practices, and the importance of affordability, consumer values, and cultural norms in promoting sustainable fashion.
- Develop strategies for integrating ethical practices and social responsibility into business models, recognizing the interplay between ethical, social, and economic factors in shaping a sustainable fashion industry.

Social Responsibility

Introduction

Focusing on social responsibility as a holistic topic, this unit delves into the ethical foundations and practices necessary to develop an equitable and sustainable fashion industry. It emphasizes the importance of professional integration and acknowledges the complex interactions between socio-economic factors affecting consumer behavior and industry standards. By developing an understanding of how ethical practices, inclusiveness, and social and economic awareness contribute to the sustainability of the industry, this unit aims to equip learners with the knowledge and skills they need to successfully recommend and implement responsible clothing practices. Through this lens, participants will explore the various dimensions of social equity through the need for all sectors to engage in fair working practices, environmental stewardship, and building positive social impact.

Assessment

- In-class presentation and an individual research assignment.
- A final exam assessing comprehension of all covered material.
- Participation in discussions and workshops focused on real-world applications of social responsibility principles.
- Analytical assignments evaluating fashion brands' adherence to social responsibility standards, including labour practices and socioeconomic impact assessments.
- A capstone project that proposes innovative solutions for enhancing social responsibility in a fashion brand or supply chain.

Teaching Methodologies

- Case Study Analysis to explore real-world examples of social responsibility in action, providing learners with insights into the practical application of ethical practices within the industry.

- Interactive Discussions, Group Discussions and Brainstorming Sessions to facilitate interdisciplinary learning and stakeholder engagement, encouraging a deep understanding of varied perspectives on social responsibility.
- Interactive Workshops and Role-Playing Activities to offer hands-on experience with decision-making processes related to ethical labour practices and socioeconomic considerations, enhancing the comprehension of social responsibility's impact in fashion.

Suggested Activities

- Product: Design a fashion product that embodies the principles of social responsibility, assessing its impact through ESG or similar standards, and refining based on feedback.
- Service: Launch a social responsibility campaign, focusing on education and awareness to influence consumer behavior and promote sustainable practices.
- System: Develop a service model that enhances social responsibility within the fashion ecosystem, utilizing best practices to improve worker welfare and consumer engagement.

Resources

- Alpert, C., Turkowski, M., & Tasneem, T. (2021). Scalability solutions for automated textile sorting: a case study on how dynamic capabilities can overcome scalability challenges.
- Athreya, B. (2022). Can fashion ever be fair? Journal of Fair Trade 3(2), 16-27.
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- Cavusoglu, L., & Atik, D. (2023). Extending the diversity conversation: Fashion consumption experiences of underrepresented and underserved women. Journal of Consumer Affairs 57(1), 387-417.
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Business Models toward Circular Economy and Sustainability. Sustainability 15(6), 4942.

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- Speed, Alexandra Grace. “Impact of fast fashion and international law on workers and the environment.” (2021).

Socioeconomic and Governmental Factors

Introduction

This unit examines the role of socioeconomic and governmental factors in shaping the fashion industry, with a focus on sustainability and technological adaptation. It explores how laws, regulations, social beliefs, and economic conditions drive systemic change, influencing product design, production processes, and consumption patterns. Participants will learn how these factors impact fashion brands, guiding their operations and strategic decision-making in response to societal shifts and economic realities. The unit emphasizes the importance of adapting to evolving regulatory landscapes, such as the Corporate Sustainability Reporting Directive (CSRD), and aligning business practices with societal expectations for greater transparency and accountability.

Assessment

- Analysis of the impact of a new regulation on a specific fashion brand's sustainability practice.
- Research report on how changing social values influence consumer behavior and brand strategies in the fashion industry.
- Presentation on the role of economic factors, such as inflation or trade agreements, in shaping supply chain decisions and production processes in fashion.
- Group project on developing a strategic plan for a fashion brand to align with new governmental policies and societal expectations.

Teaching Methodologies

- Case study analysis – Participants will explore real-world examples of fashion brands adapting to socioeconomic and regulatory changes.
- Problem-based learning – Groups will work on scenarios involving the integration of governmental regulations into sustainable fashion practices.
- Expert panels – Industry experts and policymakers will share insights on emerging regulations and their impacts on the fashion sector.

- Interactive discussions – Focused on the societal shifts driving consumer demand for sustainable and ethical fashion products.

Suggested Activities

- **Product:** Develop a proposal for a fashion product line that complies with new sustainability regulations, such as the EU's Ecodesign for Sustainable Products Regulation (ESPR). Outline the adjustments needed in material selection, design, and production processes to meet these standards.
- **Service:** Analyze the role of government incentives in promoting sustainable practices within fashion services, such as recycling programs or take-back schemes. Develop a plan for a service-based initiative that leverages these incentives to enhance circularity.
- **Systems:** Map the impact of a significant trade policy on a global fashion supply chain, considering factors like tariffs, labour laws, and environmental standards. Identify strategic adjustments a brand can make to align with these changes while maintaining sustainability goals.

Resources

- Amed, I., Balchandani, A., Beltrami, M., Berg, A., Hedrich, S., Jensen, J. E., ... & Rölkens, F. (2021). *The State of Fashion 2021: In search of promise in perilous times*. McKinsey & Company. Link
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MODULE 9 User as a Stakeholder

Description

The "User as a Stakeholder" module explores the transformative shift in the fashion industry where users are not just consumers but active participants in the design, development, and sustainability processes. This shift recognizes users as central figures who influence trends, demand sustainable practices, and engage in the co- creation of products. Through this module, learners will explore how digital technologies and participatory design models enable a more inclusive, sustainable, and user-centric approach to fashion. By embracing open-source collaboration, fluid consumption models, and feedback mechanisms, fashion brands can foster deeper engagement, transparency, and innovation, leading to products that resonate more closely with user values and expectations.

Learning Outcomes

- Understand the principles of co-design and the methods to actively involve users in the creative process, enhancing product relevance and user satisfaction.
- Gain insights into establishing effective user feedback loops using digital technologies to inform product development and improve customer experiences.
- Explore the benefits of open-source co-production in fostering innovation, transparency, and community engagement in fashion design and manufacturing.
- Examine models of fluid consumption that encourage sustainable practices like renting, sharing, and swapping, aligning with circular economy principles.
- Understand the broader implications of viewing users as stakeholders, including their impact on sustainability, ethical practices, and the global fashion ecosystem.

User-Based Innovation

Introduction

In an age where digital technology has changed the way fashion brands communicate with audiences; the importance of content management and stakeholder engagement has never been greater. This study finds the fashion industry evolving in an environment where this evolution shifts focus towards greater participation and responsive frameworks. By emphasizing the value of presenting users as contributors and stakeholders, the goal of the unit is to equip learners with the tools and skills needed to use these services for innovation, customer satisfaction and sustainable practices. At the core of this study is the understanding that users, through digital channels, can deliver valuable insights that extend beyond simple consumer preferences to provide ethical products with consistent use and transparency requirements. Case studies, networking workshops, and collaborative planning. Featuring a mix of projects, learners will explore ways to collect user feedback, critically explore, use digital tools for enhanced communication, and incorporate user-centered approaches into apparel industry applications. Upon completing this unit, learners will be ready to initiate projects that not only respond effectively to user feedback but also promote a culture of collaboration and sustainability within the fashion ecosystem.

Assessment

- **Case Study Analysis:** Evaluation of instances where fashion brands have successfully integrated user feedback and stakeholder participation into their operations.
- **Practical Project:** Design a user engagement and stakeholder participation plan for a conceptual fashion brand, incorporating digital tools and sustainable practices.
- **Presentation:** Showcase methods and strategies for enhancing user feedback mechanisms and stakeholder involvement in fashion brands.

Teaching Methodologies

- **Interactive Lectures & Workshops:** Covering the synergies between user feedback loops, stakeholder involvement, and digital technologies in the fashion industry.
- **Field Trips and Industry Visits:** Providing real-world insights through engagements with industry professionals and visits to relevant sites.
- **Online Collaboration Platforms:** Utilizing tools like Miro or Figma for collaborative design and feedback activities among learners.

Suggested Activities

- **Product:** Organize multidisciplinary groups to co-design products, incorporating user feedback and stakeholder perspectives from the outset.
- **Service:** Develop campaigns focused on sustainability awareness, leveraging user-generated content and feedback for continuous improvement.
- **System:** Map fashion ecosystems and customer journeys to identify opportunities for enhancing stakeholder participation and implementing sustainable practices.

Resources

- Fletcher, K. (2022). The Fetishization of Transparency. Retrieved from Kate Fletcher's website.
- Liu, Na, et al. (2022). Fashion platform operations in the sharing economy with digital technologies: Recent development and real case studies. *Annals of Operations Research*.
- Sun, Lushan, and Li Zhao. (2018). Technology disruptions: Exploring the changing roles of designers, makers, and users in the fashion industry. *International Journal of Fashion Design, Technology and Education*.

Co-design

Introduction

This unit explores the intersection of collaborative design practices and community-led products in the apparel industry. Emphasizing the importance of inclusiveness, transparency and shared decision-making, the course aims to redefine traditional approaches through all stakeholders, designers, architects, end users, and communities in the participation in the process. Through exploration of participatory models, fab labs and maker spaces, participants will learn to harness the cumulative power of knowledge sharing and open-source platforms. This approach not only democratizes fashion but also supports sustainability and ethical products with a strong focus on user engagement and practices that protect the environment. Through exploring collaborative crafts and other forms of collaborative production, learners will gain the skills necessary to sustain and contribute to fashion's future landscape. A culture of creativity will be fostered, encouraging inclusion and accountability.

Assessment

- Participation in collaborative projects, workshops, and hackathons, incorporating feedback from diverse stakeholders to refine designs.
- Development of partnerships for co-design and co-production projects, with a focus on sustainability and user-centered design.
- Contribution to and utilization of open-source design platforms and material databases, enhancing transparency and collaborative potential.

Teaching Methodologies

- **Online Collaboration Platforms** – create digital spaces for participants to co-design sustainable products based on the needs of the group.
- **Challenge-based learning** – engage various stakeholders through a co-design challenge for sustainable solutions
- **User-centered methodology** – use iterative prototyping to refine co-designs based on feedback, surveys and user data for a target audience.

Suggested Activities

- **Product:** Create a multidisciplinary group involving various stakeholders to co-design a new product or redesign an existing one. Gather feedback from the first prototypes and reiterate the design. (the format can be a challenge, a makeathon, a prototyping workshop, etc.)
- **Service:** Create a sustainability awareness campaign by gathering content from users. Launch a survey or perform interviews to gather insights for designing the campaign.
- **System:** Collaboratively map a fashion ecosystem (e.g., from raw materials to end-users) and visualize the interactions and interdependencies of the stakeholders.

Resources

- Zhang, G., Y. Shi, and C. Gale. "Co-design: a novel approach to create value-added products in the creative fashion industry." J Textile Eng Fashion Technol 7.4 (2021): 134-141.
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- Wang, Luo, Bin Shen, and Xiaogang Liu. "The value of design collaboration in the fashion business: A literature review." The Design Journal 20.6 (2017): 795-820.
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- Pietri, Maria. "Designing together? An exploratory study on the practice of co-design between UK-based independent fashion micro-brands and consumers, with managerial implications for the future." (2021).
- Bujor, Adriana Silvia, Avasilcai, and Lidia Alexa. "Co-creation in the fashion industry: The case of AWAYTOMARS." Ann. Univ. Oradea 3 (2017): 22-25.
- López-Navarro, Miguel A., and Cristina Lozano-Gómez. "Co-creation experiences as the basis for value creation in the sustainable fashion industry." Customer Experience Management: Enhancing Experience and Value through Service Management, Kendall Hunt, Dubuque (2013): 133-152.
- Chatterjee, Sheshadri, Nripendra P. Rana, and Yogesh K. Dwivedi. "Assessing consumers' co-production and future participation on value co-creation and

business benefit: an FPCB model perspective." Information Systems Frontiers (2021): 1-20.

- Pétursdóttir, Gunnhildur, and Liisi Lehtonen. "Value Co-creation in Slow Fashion: Exploring opportunities in new product development." (2022).
- Niessen, BERTRAM MARIA. "Open Source p2p social innovation and clothing." (2010).
- Diez, Ladera T., Ferro C., Niaros V., Parikh M., & Jusic I. (2022 October 19). "The Fab City Full Stack: Multiscalar Framework for Distributed Production Strategies in Cities and Regions." In Proceedings of the Fab 17 Research Papers Stream. Hogeschool Rotterdam. https://doi.org/10.5281/zenodo.7432027.

Fluid Fashion Consumption

Introduction

Fluid fashion consumption allows for exploring diverse styles, mixing and matching pieces, and evolving wardrobes sustainably. It promotes reimagining ownership and embracing innovative models like renting, borrowing, swapping, and sharing items. This unit focuses on rental services as a new income stream for businesses transitioning to circular practices. How can companies build community, extend garment life, facilitate customer interaction, and remain profitable within a sustainable business model?

Assessment

- Presentation of a case study that demonstrates a deep understanding of successful renting, borrowing, swapping or sharing services.
- Compare and contrast a case study of fluid fashion consumption with a traditional fashion consumption one, highlighting the benefits and challenges of adopting fluid fashion practices.
- A final presentation on a sustainable business model canvas on renting, borrowing, swapping or sharing services, with consumer data in mind.

Teaching Methodologies

- **Case Study Analysis:** Analyze real-world examples of brands that have successfully implemented different forms of rental services, such as Houdini Sportswear.
- **Lectures with Industry Experts:** Discuss various practices like renting, borrowing, swapping, and sharing. Highlight current trends and success stories.
- **Interactive Workshops:** Conduct workshops where learners explore strategies for creating a sense of belonging and community among customers. This might include online forums, events, and social media engagement.
- **Group Discussions and Brainstorming Sessions:** Facilitate group discussions and encourage learners to develop action plans for implementing fluid fashion consumption in already existing business models.

Suggested Activities

- **Product:** Case study on an existing company and business model dealing with lending, borrowing, swapping or sharing. What does it take for the product to be handled in this manner by many different people?
- **Service:** Target group analysis. Have learners collect data on consumer behavior regarding using services and what would make them more likely to use services instead of buying new products. Present the data and discuss the similarities found and solutions needed to increase the number of people using a service as their first choice.
- **System:** Business model canvas. Task learners with developing a renting, borrowing, swapping or sharing service through a sustainable business model canvas. Ideally, learners would use the consumer data to develop their business ideas.

Resources

- Arkivet.com is a second-hand store in two locations and online that only accepts items two years old or newer, i.e., still "in fashion"/contemporary. They offer a curated selection of contemporary fashion in low- and mid-price ranges, catering to the fashion-conscious customer. Sellers sell on commission.
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- Cavusoglu, Lena, and Deniz Atik. “Extending the diversity conversation: Fashion consumption experiences of underrepresented and underserved women.” Journal of Consumer Affairs 57.1 (2023): 387-417.
- Liu, Younan, and Ye Hei. “Exploring Generation Z Consumers’ Attitudes towards Sustainable Fashion and Marketing Activities regarding Sustainable Fashion.” (2021).
- Kim, Hyojung, Inho Cho, and Minjung Park. "Analyzing genderless fashion trends of consumers' perceptions on social media: using unstructured big data analysis through Latent Dirichlet Allocation-based topic modelling." Fashion and Textiles 9.1 (2022): 1-21.
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sustainability and circular economy: A gender/generation quantitative approach." Sustainability 12.7 (2020): 2809.

- Hickman, Mary-Kate, Wilson Ozuem, and Jummy Okoya. "Gender fluidity in the age of technologically mediated environments: implications for fashion industry." Gender Economics: Breakthroughs in Research and Practice. IGI Global, 2019. 135-174.

MODULE 10 Glocal Partnerships

Description

The Glocal Partnerships module takes a holistic perspective on how wider networks and systems of engagement between stakeholders are built and sustained. By examining different styles of engagement strategies, such as strategic partnerships between brands, shared governance models, or involving the local community in the design, use, production or recovery of goods, learners will be able to identify which model of engagement or partnership can be beneficial in various situations and the long-term impact it will have on a business at a product, service or system level.

Learning Outcomes

- Ability to identify a company's ecosystem and which organizations and networks are critical to different parts of the industry and professional roles within a company.
- Develop the ability to design and implement a circular business strategy in a way that is beneficial to all stakeholders.
- Develop the ability to identify the economic, cultural, and social impact of collaborative dynamics.
- Develop the ability to identify potential partnership opportunities – whether with local community stakeholders or other aligned organizations – assess compatibility, and implement strategies for collaborative initiatives, considering factors like market trends, customer bases, and integrating innovative technologies or sustainable practices.
- Learn how to identify new roles or adjust existing ones to address emerging needs and opportunities in the fashion industry, particularly when supply chain management and many stakeholders are involved.

Ecosystem Ecologies

Introduction

Ecosystem Ecologies delves into the interconnected relationships within the fashion industry, encompassing environmental, social, and economic aspects. It explores how strategic collaborations among fashion brands, designers, retailers, and technology companies contribute to shared objectives and mutual benefits such as sustainable practices and positive social impact. Learners gain insights into how to select materials and production methods that minimize environmental harm, embrace circular economy principles, and promote biodiversity. Additionally, the unit addresses the importance of fair labour practices, safe working conditions, and ethical treatment of workers throughout the supply chain. Learners explore the significance of transparency in supply chains.

Moreover, the unit discusses the need for refreshing roles within fashion organizations to adapt to changing market dynamics and technological advancements. It covers strategies for redistributing responsibilities, creating new roles, and fostering an agile workforce culture. Learners gain competence in assessing skills gaps, promoting cross-functional collaboration, and integrating digital technologies to enhance operational efficiency. Real-world case studies provide practical insights into successful role-refreshing strategies and collaborative alliances, empowering learners to navigate the complexities of the fashion industry while aligning with organizational goals and future needs.

Assessment

- Develop the ability to identify opportunities for role refreshment, assess compatibility with organizational goals, and strategically implement changes to adapt to industry dynamics.
- Draw insights and assess the contribution of strategic partnerships in real-world case studies.
- Propose a strategic partnership for hypothetical scenarios within the fashion industry and evaluate its possible impact.

- Through mapping, we show understanding of systemic interrelation, considering the impact different local ecosystems have on each other when combined.

Teaching Methodologies

- **Interactive Workshops:** Conduct workshops where learners are encouraged to develop and present a circular business model clearly stating each stakeholder's goals, benefits and risks.
- **Group Discussions and Brainstorming Sessions:** Facilitate discussions on how to create joint commitment and motivation in an ecosystem context. Encourage sharing of innovative ideas and strategies among learners.
- **Challenge-based learning** that engages various stakeholders in forming multidisciplinary teams to solve complex challenges – e.g., how can a non-profit collaborate with a large brand?

Suggested Activities

- **Product:** Design a circular business model based on post-human, industry 5.0 principles. The strategy should include a stakeholder map, stating the benefits and requirements for each stakeholder.
- **Service:** Use the Loopholes game board and strategy cards to simulate the development of the ecosystem. Learners should take on different roles within a fashion company and recognize where there are skills gaps, as well as in its ecosystem (including 'nature') and make decisions on how to build and evolve their collaboration. Present these decisions.
- **System:** Groups will write a long-term contingency plan regarding the most effective way to implement a business model, considering an iterative, contingency approach involving different stakeholders. They will research new and innovative solutions in the realm of circular fashion business ecosystems.

Resources

- Wiedemann, S. G., Biggs, L., Clarke, S. J., & Russell, S. J. (2022). Reducing the environmental impacts of garments through industrially scalable closed-loop recycling: Life cycle assessment of a recycled wool blend sweater. Sustainability, 14(3), 1081.

- Cavusoglu, L., & Atik, D. (2023). Extending the diversity conversation: Fashion consumption experiences of underrepresented and underserved women. Journal of Consumer Affairs, 57(1), 387-417.
- DeLoughrey, E. M. (2013). The myth of isolates: Ecosystem ecologies in the nuclear Pacific. cultural geographies, 20(2), 167-184.
- Gazzola, P., et al. (n.d.). Trends in the fashion industry. The perception of sustainability and circular economy: A gender/generation quantitative approach.
- Jacometti, V. (2019). Circular economy and waste in the fashion industry. Laws, 8(4), 27. Also, Dissanayake, D. G. K., & Sinha, P. (2012). Sustainable waste management strategies in the fashion industry sector. International Journal of Environmental Cultural Economic and Social Sustainability, 8(1), 77-90.
- Kim, H., Cho, I., & Park, M. (2022). Analyzing genderless fashion trends of consumers' perceptions on social media: using unstructured big data analysis through Latent Dirichlet Allocation-based topic modelling. Fashion and Textiles, 9(1), 1-21.
- Liu, Y., & Hei, Y. (2021). Exploring Generation Z Consumers' Attitudes towards Sustainable Fashion and Marketing Activities regarding Sustainable Fashion.
- https://www.pwc.nl/nl/actueel-publicaties/assets/pdfs/pwc-what-does-young-talent-want.
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- Jastram, S., & Schneider, A. M. (2015). Sustainable fashion governance at the example of the partnership for sustainable textiles. UmweltWirtschaftsForum, 23, 205-212.
- Thopte, I., & Poldner, K. (2014). David and Goliath in sustainable fashion: strategic business alliances in the UK fashion industry. International Journal of Strategic Business Alliances, 3(2-3), 179-200.

Shared Governance

Introduction

Shared Governance focuses on fostering collaboration and inclusivity in decision-making and management within the fashion and textile sector, emphasizing engagement with local communities. It explores how both suppliers and users can actively participate in shaping business practices, leading to more sustainable outcomes. By connecting businesses with networks and organizations focused on corporate social responsibility (CSR) including fair labour practices, use of sustainable materials, environmentally conscious production, and development of local communities, often with historical experience or indigenous knowledge, learners gain insights into fostering sustainable and just practices throughout the industry. The unit delves into the collaborative dynamics within a company's ecosystem and how digital tools such as AI, 3D, and social media are utilized to engage users in decision-making processes, potentially reducing environmental impact by aligning production with user preferences. Additionally, learners engage with case studies showcasing the interaction between the fashion industry and local communities. They explore initiatives promoting economic development, cultural preservation, and social inclusivity. Through this unit, learners gain a comprehensive understanding of how collaborative approaches and community engagement can drive sustainability and social impact within the fashion industry.

Assessment

- Case study analysis exploring the social, economic and cultural impact of a brand working with local communities, highlighting how collaborative dynamics change the traditional workflow.
- Mapping exercises demonstrate knowledge about different organizations and their scopes and how the different stakeholders in an ecosystem interact.

Teaching Methodologies

- Case study on one or more companies that have successfully worked with their local communities to develop their product, supply chain or impact.

- Guest Lectures and Industry Insights: Invite professionals from T&F companies that have built successful collaborations with their users. How did they turn their message into a conversation, and how do they implement user input into their business?
- Field Trips and Industry Visits that facilitate productive conversations between trainees and employees to places such as Fab Labs, digital fabrication manufacturing facilities, micro-factories, factories, design offices, or research centers.
- Group Discussions and Brainstorming Sessions: what role do they see AI having in the ecosystems moving forward?

Suggested Activities

- **Product:** Mini project, design a capsule collection in 3D and let potential customers vote on their desired styles. Try to anticipate the outcome. Did the student/participant manage to predict the same garments that the voters voted for? Calculate how much greenhouse gas emissions were saved by using 3D in the process versus using traditional linear methods of sampling.
- **Service:** Organize a series of field trips to local brands and artisans to foster dialogue and knowledge exchange between participants and local communities. Envision new service opportunities (rental, repair, tool mutualization, etc.) with them.
- **System:** Mapping and analyzing. Map out a company's ecosystem, either on the production or customer sides. How many tiers down in the production line can learners find information? What kind of communication does the company have with the customer? Is it one-sided or an actual conversation? How does their local community factor into the ecosystem?

Resources

- Beyers, Felix, Julia Leventon, and Harald Heinrichs. “Collaborative governance or state regulation? Endless efforts but little capacity for sustainability transformation of the German textile sector.” Environmental Policy and Governance 33.1 (2023): 56-77.
- Yu, Dan, and Peipei Zhao. “Global Value Chain Governance of the Apparel Design Industry under the Background of Global Sustainable Economic

Development." Journal of Environmental and Public Health 2022 (2022).

- Transforming Fashion Through Community Innovation. EC R&I Success stories. (2020, April 17). https://ec.europa.eu/research-and-innovation/en/projects/success-stories/all/transforming-fashion-through-community-innovation
- Wu, D., Zhuang, M., Zhang, X., & Zhao, Y. (2022). Towards Circular Fashion: Design for Community-Based Clothing Reuse and Upcycling Services under a Social Innovation Perspective. Sustainability, 15(1), 262.
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BUSINESS & FINANCE

Business and finance represent the strategic and financial facets of the industry, pivotal for comprehending market dynamics, consumer behavior, supply chain logistics, branding, and profitability. For fashion brands, proficiency in these areas is imperative to successfully navigate the competitive landscape, innovatively respond to shifting consumer demands, and optimize operations for sustainable growth and success in the marketplace.

MODULE 11 Management & Communication

Description

The Management and Communication module equips participants with essential skills for thriving in the dynamic fashion industry, where trends, consumer demands, and market conditions are ever-changing. Exploring communication, participants will learn how to craft clear, concise, and impactful messages tailored to various stakeholders. The module delves into the nuances of visual and verbal communication, emphasizing storytelling and branding as key tools for resonating with target audiences. Participants will also explore modern communication channels, including digital marketing, social media, and emerging technologies like AI and VR, to create immersive experiences and build strong brand presence.

On the management side, the module addresses the strategic allocation of tasks and resources to optimize team performance and support business objectives. Participants will explore how to align tasks with individual skills, foster a culture of agility, and respond effectively to evolving industry trends. The module also covers essential competencies such as design, trend analysis, sustainability, and supply chain management. Through a blend of theoretical frameworks and practical case studies, learners will develop a data-driven approach to planning and implementing effective management strategies, ensuring both personal and organizational growth.

Learning Outcomes

- Understand how strategic task management aligns business objectives with individuals' skills within an organization and how digital tools can be leveraged for this task allocation.
- Develop the ability to recognize and prioritize essential skills and knowledge areas vital for the fashion industry, including design, sustainability, and digital trends.
- Recognize the benefit and necessity of continuous learning in a fashion environment, whereby industry trends are met with engagement in training programs designed to enhance these new knowledge areas.
- Develop awareness of a wide range of communication strategies, including building brand narratives, utilizing various mediums (video, text, audio) and truthful sustainable communication, including fact-checking.

Management Task Allocation

Introduction

The Management Task Allocation unit addresses critical aspects of successful business engagement in fashion, from both a top-down and bottom-up perspective. Management Task Allocation explores how managing resources efficiently and optimizing team performance can support organizations. It emphasizes the importance of aligning tasks with skills and career development paths and fostering a culture of agility and flexibility to respond effectively to changing trends and consumer demands. Identification and enhancement of key competencies is essential to support this work, alongside learners developing awareness of their own competencies and skills gaps. The unit explores tools for building competencies in design, trend analysis, sustainability, supply chain management, marketing, and digital technologies. Through theoretical frameworks and practical case studies, participants gain the knowledge needed to develop a self-sufficient approach to learning and awareness of how to plan and implement effective management strategies through data-driven approaches.

Assessment

- **Case Study Analysis:** Evaluation based on the analysis of real-world fashion industry case studies, focusing on management and task allocation strategies.
- **Practical Project:** Application of learnt principles in a practical project, demonstrating effective management and task allocation skills.
- **Competency Mapping Project:** Develop a detailed plan for identifying and enhancing key competencies within a given fashion organization or scenario.
- **Reflective Journaling:** Maintain a journal documenting personal learning journeys and insights gained throughout the course.

Teaching Methodologies

- Interactive Lectures: Engaging lectures that involve learners actively through questions, activities, or discussions.

- **Group Discussions and Brainstorming Sessions:** Interactive sessions for generating ideas and discussing topics collaboratively.
- **Role-Playing Activities:** Activities where learners act out roles to learn about a specific situation or practice skills.
- **Guest Lectures and Industry Insights:** Lectures by industry professionals sharing real-world experiences and knowledge.
- **Collaborative Projects:** Group work focused on joint problem-solving and learning.

Suggested Activities

Product (Practical Application and Review):

- First, conduct a Competency Mapping exercise and then recognize how these competencies can be applied through a Task Allocation Case Study to understand practical task management within a fashion company.
- Engage in Peer Review Exercises where learners assess and critique each other's competency mapping and task management strategies.

Service (Planning and Growth):

- Create Development Plans aimed at improving service competencies both personally and within a fashion organization.
- Develop a Management Plan for handling tasks within a hypothetical fashion project, focusing on service efficiency, suitability of tasks and effectiveness.

System (Analysis and Knowledge Integration):

- Carry out an Industry Research Assignment to understand how competencies are managed on a systemic level in leading fashion brands.
- Analyze and present how these systemic competency strategies can be applied in a hypothetical or actual fashion organization.
- Encourage Reflective Journaling to document and contemplate the learning journey in task management, promoting a systemic understanding of personal and professional growth.

Resources

- Wen, Xin, Tsan-Ming Choi, and Sai-Ho Chung. “Fashion retail supply chain management: A review of operational models.” International Journal of Production Economics 207 (2019): 34-55.
- Huang, He, Shanling Li, and Yu Yu. “Evaluation of the allocation performance in a fashion retail chain using data envelopment analysis.” The Journal of The Textile Institute 110.6 (2019): 901-910.
- Schwarz, Jan Oliver. "Strategy orientation in the fashion industry: short-or long-term?" Journal of Futures Studies 24.1 (2019): 77-90.
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- Kamis, Arasinah et al. “Technical skills, knowledge competencies and expected changes in the clothing industry.” (2014).
- Mohanraj.PMohanraj., P and Tjprc. “An Industry View on Process Competencies of Apparel Designers, A Study.” (2018).
- Da Silva, Luiz Henrique, et al. “Leader’s Role in the Development of Collective Competencies of Fashion Work Teams.” Journal of Fashion Marketing and Management: An International Journal, (2023).

Means of Communication

Introduction

Effective communication is paramount in the fashion industry, a realm where trends, styles, and market demands are in constant flux. This module focuses on enhancing communication skills tailored to the unique needs of the fashion sector. It emphasizes the importance of clear, concise, and impactful communication, both within an organization and with external stakeholders such as customers, suppliers, and partners. In the fashion world, the means of communication extend beyond traditional verbal and written formats. Visual communication, through design, imagery, and branding, plays a critical role in conveying the style, ethos, and values of a fashion brand. This module aims to equip participants with the ability to craft compelling narratives that resonate with their target audience, leveraging the power of storytelling and branding. Understanding the nuances of different communication channels is also vital. Whether it's social media, press releases, or in-person presentations, each medium has its unique strengths and best practices. The module covers these aspects, providing insights into how to optimize each channel for maximum impact. Participants will learn about the latest communication tools and technologies shaping the fashion industry. The course covers a broad spectrum of modern communication avenues, from digital marketing strategies to the use of AI and VR in creating immersive customer experiences. This comprehensive approach to communication in fashion aims to enable participants to articulate their vision effectively, engage with their audience meaningfully, and build a strong brand presence in the competitive world of fashion.

Assessment

- **Communication Strategy Project:** Development and presentation of a comprehensive communication strategy for a fashion brand.
- **Brand Narrative Assignment:** Creation of a compelling brand story, demonstrating storytelling skills.
- **Digital Communication Analysis:** Evaluation based on the use of digital tools in a simulated communication campaign for a fashion brand.

Teaching Methodologies

- **Interactive Lectures:** Engaging lectures that involve learners actively through questions, activities, or discussions.
- **Workshops:** Focused meetings for active discussion, problem-solving, and hands-on practice aimed at developing solutions and exchanging ideas.
- **Case Study Analysis:** Learners analyze real-world scenarios to understand complex issues and apply theoretical knowledge.
- **Group Discussions and Brainstorming Sessions:** Interactive sessions for generating ideas and discussing topics collaboratively.
- **Role-Playing Activities:** Activities where learners act out roles to learn about a specific situation or practice skills.

Suggested Activities

Product (Content Creation and Messaging):

- Develop a Communication Plan that details messaging for a fashion brand or event, focusing on the product's features and appeal.
- Craft Press Releases to practice writing formal announcements for new fashion products or events.

Service (Engagement and Interaction):

- Conduct a Social Media Strategy Workshop to create a plan for engaging with customers and promoting the brand's services on various platforms.
- Engage in Role-Play Scenarios to simulate service scenarios such as client meetings and media interviews, honing interpersonal communication skills.

System (Presentation and Communication Skills):

- Execute a Public Speaking Exercise where learners present a new fashion campaign, sharpening skills vital for systemic communication across the fashion industry's networks.

Resources

- Karlsson, Annika. “Communication of sustainable fashion: To communicate sustainable fashion through the label.” (2015).
- Faria, Ana Paula, Joana Cunha, and Bernardo Providência. “Fashion communication in the digital age: findings from interviews with industry professionals and design recommendations.” Procedia CIRP 84 (2019): 930-935.
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MODULE 12 Sustainable Business Models

Description

The module explores the concept of Business Models for establishing sustainable value chains in fashion and textile sectors, from revisiting the value proposition and new forms of collective production to revenue models, introducing new ways for optimizing customer relationships and introducing new cost analysis tools such as life cycle costing. It supports learning on the creation of product-service ecosystems within the fashion industry, offering guidance on how fashion brands can successfully blend physical products, online platforms, and personalized services to enhance community engagement and the customer experience. Participants will gain knowledge on strategically constructing a holistic ecosystem that offers a range of services, including clothing, accessories, styling, consultations, on demand production, repairs and P2P strategies.

Learning Outcomes

- Acquire a comprehensive understanding of Business Model (BM) and Product Service System, starting with an introduction to the Business Model Canvas and its adaptation for sustainability.
- Deep dive in financial and accounting approaches for sustainability through revenue model exploration and life cycle costing in supporting sustainability initiatives and corporate social responsibility goals.
- Grasp knowledge on new business models from On-Demand Production, Collaborative Consumption, P2P platforms and communities.

Building Product Service Ecosystems

Introduction

This learning unit explores the development of product-service systems within the fashion industry, focusing on innovative and sustainable business model approaches. Participants will gain knowledge on strategically constructing a holistic ecosystem that offers a range of services, including clothing, accessories, styling, consultations, and repairs. Exploring new business models in the fashion industry is pivotal for all value-chain stakeholders, such as brands and designers, to ensure sustainability and economic viability. This learning unit delves into the diverse range of business models that can be leveraged within the fashion sector.

Participants will be introduced to on-demand production as a model to align manufacturing with market needs and consumer preferences. This contemporary approach to production differs from traditional mass production by producing garments only when needed. This approach promotes sustainability, flexibility, and quick response to fashion trends. The learning unit also explores integrating digital technologies in business models, such as e-commerce platforms, mobile applications, and online marketplaces. Participants will understand how these digital channels can expand market reach, enhance customer experience, and contribute significantly to revenue growth. In addition, the learning unit will emphasize the importance of aligning revenue strategies with brand values, market positioning, and consumer expectations. In addition to revenue generation, the unit addresses the strategic management of pricing, cost control, and profit maximization. Participants will learn about traditional and innovative revenue models, from direct sales and wholesale distribution to subscription services and licensing agreements, and gain insights into pricing strategies that align with brand positioning and target markets, as well as cost management techniques that optimize profitability. Assessing the financial impact of a product throughout its entire life cycle, from raw material extraction to production, distribution, use, and end-of-life, can assist brands in achieving a more holistic view of the sustainability of their products. In that line, participants will be introduced to Life cycle costing (LCC), in the context of fashion as an accounting and analysis method that

considers the total cost of a product throughout its entire life cycle and as an approach that provides a more comprehensive understanding of the economic impact of a fashion product and helps businesses make informed decisions about production, pricing, and sustainability.

The module provides practical tools and case studies to help participants to design product-service systems and analyze and develop effective business models for the fashion and textile sectors. By the end of the course, participants will have a comprehensive understanding of the various business models applicable in the fashion industry and the skills to implement and adapt these models to drive sustainability.

Assessment

- Active participation in training discussions and workshops.
- Product Service System Design: Use PSS tools such as service blueprints to map and design the user experience of your PSS.
- Business Models: Apply (sustainable) Business Model canvas to diverse fashion and textile brands with comparison.
- Study real-world case studies to learn about successful collaborations and partnerships in reaching more consumers.
- Cost and Revenue Model Analysis: Practice life-cycle costing, evaluate and compare different revenue models used in the fashion industry.
-

Teaching Methodologies

- **Lectures and Presentations:** Comprehensive lectures covering various business models in the fashion industry.
- **Guest Speaker Sessions:** Inviting industry professionals and entrepreneurs to share insights and experiences regarding innovative models in fashion.
- **Interactive Discussions:** Encouraging debates and discussions on the advantages and challenges of different business models, particularly in the context of sustainability and digital transformation.
- **Case Study Analysis:** Examine successful brands such as Levi's, Poshmark, and Lululemon that have integrated product-service ecosystems. Explore how they curate interconnected elements for a cohesive user experience.
- **Interactive Workshops:** Host workshops for learners to design a product-service

ecosystem for a fashion brand, including business modelling, mock-ups of digital platforms, service blueprints, and touchpoint strategies. **Use the Loopholes Toolkit** with specific cards and work with the business value proposal.

- **Group Projects:** Assigning students to work in groups to analyze and compare different PSS and business models and their suitability for various fashion business scenarios.

Suggested Activities Product (Innovation):

- Analyze and propose a sustainable business model for a fashion product.
- Undertake a Sustainability Impact Report to assess the environmental and financial implications of on-demand production methods, including life cycle costing.
- Participants map out and analyze revenue models, such as direct sales and licensing, that directly relate to the fashion product lifecycle.

Service (Enhancement):

- Host a workshop to devise services that prolong the life of fashion items. Consider rental, repair, or swap services. Discuss the service's sustainability and customer appeal after creation.
- Conduct role-playing exercises to practice service-oriented pricing and sales negotiations that align with digital and sustainable transformation efforts.

System (Integration):

- Map the journey of a fashion product or service from start to finish, find sustainability improvements, and discuss the system-wide impact.
- Work on group projects to create business plans that incorporate systemic cost management and profit maximization for emerging fashion business models, such as on-demand production.
- Engage with industry professionals to understand the systemic implications of adopting various business models, especially in the context of sustainability and digitalization.

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Collaborative Consumption

Introduction

The 'Collaborative Consumption' unit examines collaborative and access-based approaches to fashion use. Collaborative consumption involves sharing and exchanging clothing and accessories, allowing individuals to access a wide range of fashion items without needing full ownership. Learners will explore both the practical and theoretical concepts of collaborative consumption, such as centralized rental platforms, swap parties, and peer-to-peer clothing exchange sites such as Depop and Vinted. Learners will also examine case studies of non-commercial, research-based collaborative consumption projects which attempt to bring multiple perspectives together, with garments serving as a source of individual stories, collective experiences, shared goals, history and hopes for the future. The unit aims to guide learners through the process of developing (theoretical) platforms that explore methods of collaborative consumption to explore the systems, knowledge and communication elements required to make a successful collaborative consumption model. A focus on Peer-to-Peer strategies will be offered, as such interactions have been significantly amplified with the rise of social media and digital platforms, making them a critical component of contemporary fashion marketing strategies. This includes the needs of skills related to personalized communication, community engagement, and customer-driven design.

Assessment

- Successful case study analysis of brands that facilitate methods of collaborative consumption, including digital peer-to-peer strategies.
- Demonstrable awareness of the multi-layered methods of collaborative consumption through product, service or system design, and community Engagement plan.
- Attendance of field trips and active participation in discussions about collaborative consumption models, exploring the successes and limitations of these kinds of products and services.

- Development of a theoretical collaborative consumption platform with a comprehensive P2P engagement strategy.

Teaching Methodologies

- **Case Study Analysis:** explore a variety of business angles on collaborative consumption, ranging from centralized rental platforms to peer-to-peer swaps. Check out how P2P engagement was enhanced with the use of social media and other digital tools.
- **Field Trips:** visit the warehouse or storeroom of a centralized rental platform to better understand the systems used for shipping, cleaning, storing and renting clothes.
- **Interactive Lectures:** In-depth sessions exploring the fundamentals of P2P interactions in the fashion industry, including case studies and current trends.
- **Role-Playing Activities:** Simulations where students take on different roles within P2P scenarios to understand various perspectives.

Suggested Activities

Product:

- Design a product that is meant to be shared amongst users. How does it change and evolve over time, showing the use or previous lives of the product?
- Engage in P2P Campaign Development to create a marketing strategy that involves both digital and physical realms, focusing on the interaction of the product with consumers.

Service:

- Develop a comprehensive fashion service that facilitates collaborative consumption, emphasizing user engagement, peer-to-peer strategy, sustainability, and a seamless sharing experience.
- Carry out Customer Journey Mapping to understand the consumer's experience within a P2P retail system, identifying key engagement opportunities.
- Implement Peer Feedback Sessions to create a service environment where feedback is utilized to refine and improve marketing strategies and social media to foster community engagement.

System:

- Design an innovative, collaborative consumption system that addresses the limitations of centralized and peer-to-peer rental platforms, promoting sustainability, user engagement, and a sense of community.

Resources

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MODULE 13 Strategic & Future Thinking

Description

Within the learning module of Strategic and Future Thinking, learners will be focused on key elements such as repositioning strategies and technological and economic resilience. The module is designed to radically challenge the current fashion system and gain new skills towards thinking about the future and being prepared for new trends, increasing resilience capacities. Learners will be able to navigate through the textile and fashion industry by repositioning their own brands, having an overview of past, current and future technologies, situating the current development of innovations, and ideating on new opportunities in the market with associated value-chain configurations. Participants will learn how to envision diverse scenarios and position themselves into a dynamic and tactical scope of the rapidly changing environment.

Learning Outcomes

- Strategic Repositioning, grasping the essentials of re-positioning in the fashion industry and be introduced to Market Analysis, gaining insights into the global economic landscape and its impact on the fashion industry, and recognizing signals of change, from patterns of economic fluctuations to consumer behavior or other emerging trends.
- Technology Landscape and Readiness, grasping the role and impact of technology in the fashion industry, acquiring basic knowledge on Technology Readiness Level (TRL).
- Resilience Strategies Development, learning how to develop and implement strategies that enhance resilience both at a business and technological level, focusing on diversification, innovation, and risk management.

Re-Positioning

Introduction

Re-positioning in the fashion industry is a crucial strategy for brands seeking to adapt to changing market dynamics, consumer preferences, and competitive landscapes. This module explores the multifaceted process of re-positioning, focusing on its significance in maintaining brand relevance, driving growth, and fostering innovation. The concept of re-positioning involves more than just altering a brand's image or product offerings; it is a comprehensive approach encompassing market analysis, understanding consumer behavior, and strategic branding initiatives. In a rapidly evolving fashion landscape, re-positioning becomes essential for brands to stay ahead of trends, meet emerging consumer needs, and differentiate themselves from competitors. Participants in this module will gain insights into the key aspects of successful re-positioning strategies, including brand identity refinement, target market re-evaluation, and communication re-alignment. The course will provide practical tools and frameworks for analyzing market shifts, assessing brand perception, and identifying new opportunities for brand positioning. One of the critical elements of re- positioning is understanding and responding to consumer trends and preferences. This module will delve into methodologies for consumer research, trend forecasting, and aligning brand values with contemporary consumer expectations. Moreover, the course will address the challenges brands face during re-positioning, such as maintaining brand equity, managing consumer perceptions, and effectively communicating changes to stakeholders. By exploring these aspects, participants will be equipped with the knowledge and skills necessary to navigate the complex process of re-positioning in the fashion industry, ensuring their brands remain relevant, vibrant, and competitive in a constantly changing environment.

Assessment

- **Participation** in the activities
- **Case Study Evaluation:** Analyze a real-world example of a fashion business that successfully repositioned, adapting to economic and societal changes,

identifying the gaps and key steps to redefine market trends and production and their impact using an individual research assignment.

- **Strategy Development Project:** Create a comprehensive plan outlining new strategies for resilience, including a market and consumer trend analysis, (technological) innovation strategies, offer diversification with a prediction of financial resources, and risk management measures.

Teaching Methodologies

- **Case Study Analysis:** Examination of successful and unsuccessful brand re-positioning and innovation cases in the fashion industry to identify good practices, key strategies and pitfalls. Integrate real challenges faced by companies and create debates. Map the innovation process following TRLs scales.
- **Interactive Workshops:** 1) Future Scenario workshops using speculative tools such as the Atlas of Weak Signals and/or its version for emergency situations. 2) Use the Loophole Toolkit to get to know your current system and find strategies to explore for transitioning towards circular and digital fashion systems. 3) Activities focused on the practical aspects of re-branding, including visual identity, target market analysis, and brand messaging.
- **Simulation Exercises:** Role-playing and simulations to understand the challenges and decision-making processes involved in innovative strategy development.
- **Expert Panels:** Sessions with innovation and marketing professionals and brand strategists to discuss real-world experiences and best practices in innovation processes and brand re-positioning.
- **Market Research Techniques:** Teaching different market research methods to understand changing consumer trends and preferences and the adoption of technologies.

Suggested Activities

Product

  - Undertake a Brand Audit Project to evaluate a fashion brand's current market position and develop product re-positioning strategies according

to different scenarios. Play with the *Loophole Toolkit* to explore new strategies for the main product(s) of the brand.
- Navigate through TRLs by comparing diverse technologies and by retracing the innovative journey of one specific product overtime. Reflect and comment on innovation processes.
- Discover and Practice the *Reservist Atlas of Weak Signals*[1] to prepare the company to be more resilient and prepared for emergency situations.

Service

- Scenario Planning and Decision-Making. Engage in Role-Play Exercises where students take on the roles of company executives, navigating service-related challenges during different economic conditions.
- Create a Re-Branding Proposal that includes not just the product, but also service elements such as customer engagement strategies and marketing materials. Invite companies into the activities to bring experience and local insights to advise the students or professionals and open the space for new ideas.

System

- Discover and practice the *Atlas of Weak Signals*[2] to rethink how to position in emerging trends.
- Industry Expert Panel Discussion: Discuss with industry experts the systemic impact of technology on fashion and explore future trends.
- Complete Research Assignments that delve into historical economic downturns and the strategic systemic responses by fashion companies. Participate in Guest Speaker Sessions and develop Reflections to understand and analyze real-world industry experiences and system-level thinking.

Resources

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5.3.3 Train the trainers (ToT)

Overview

The objective of the Train the Trainers (ToT) sessions was to create a pool of expert trainers familiar with the Transitions curricula, approach, and values.
It aimed to equip trainers with the necessary tools and topics developed within the Transitions Project to prepare, develop, and deliver the education training program and Transition Labs pilots.

Specific Objectives

The training specifically aimed to:

- Introduce the Transitions approach and values
- Equip trainers with skills to use various teaching methodologies, such as the Learning Arches.
- Provide strategies for designing and delivering high-quality training interventions.
- Offer basic knowledge of the Kaospilot learning design method and toolbox.
- Ensure understanding and adoption of codes of ethics for educators.
- Facilitate peer-learning exchanges on content and approaches.

Target Audience

The target audience included Transitions project partners and their trainers or assistants responsible for delivering the curricula and Transition Labs.
Preference was given to trainers with prior experience and an interest in sustainable and digital transitions in the textile and fashion industries.

Program Structure

The program was structured as follows:

- Pre-assessment: Trainers completed a survey assessing existing knowledge, skills, and interest, leading to a customized training plan.
- Preparatory Work: Participants received materials such as the Loopholes toolkit, a glossary of methodologies, the Kaospilot Learning Arches methodology, and a trainers' code of conduct.

- Educational Principles and Concepts: Online sessions delivered insights into the Transitions approach and teaching methods.

- Practice and Feedback: Participants engaged in peer-learning, rehearsing activities, and receiving structured feedback, supported by icebreaker activities.

- Action Planning: Trainers formulated a sequence of steps or activities to ensure successful strategy execution.

- Follow-up Support: Ongoing support was provided to ensure that skills and knowledge gained were implemented effectively.

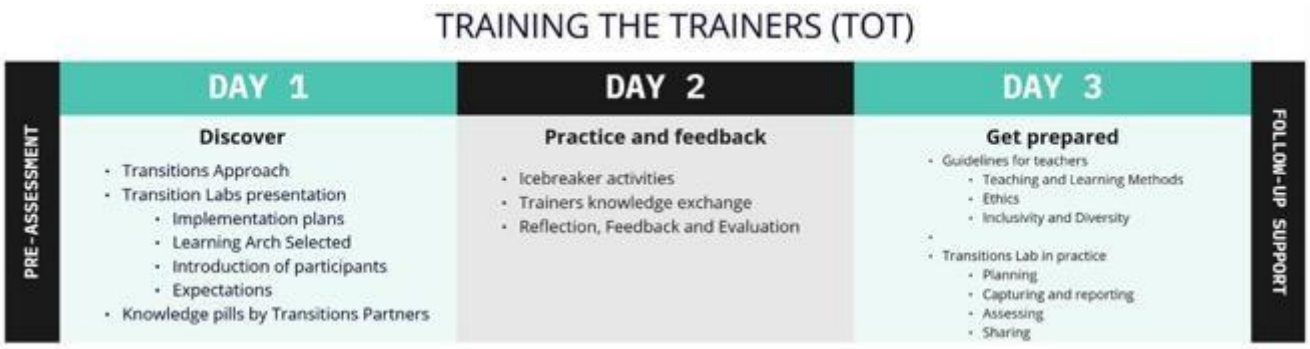


Figure 7: Training the trainers program

Learning Outcomes

Upon completion, participants:

- Understood the expectations of the ToT program.
- Strengthened their capability and confidence in facilitating training sessions.
- Adopted innovative teaching and learning methods.
- Gained the ability to design workshops aligned with the Transitions approach.
- Contributed to content creation for the Loopholes modules.
- Developed new skills through peer exchanges.
- Acquired the ability to plan and implement action steps effectively.

Time Commitment

The ToT program was organized into three online sessions during the Transitions Labs pilot period, each lasting three days, with three hours per day.

Output

After the ToT, trainers were required to produce individual or paired lesson plans translating learning units into specific lab sessions.

These lesson plans included:

- Learning content
- Teaching methods
- Activities (if any)
- Compulsory and optional literature and learning resources
- An assessment form and evaluation norms.

In the tables below, we provide the list of activities for the three ToT online sessions.

Table 1: ToT 1st session agenda – day 1

DAY 1				
Activity	**Speaker**	**Duration**	**from**	**to**
Ice-Breaking Activities	IAAC	20	9.00	9.20
Pre-assessement survey (Zoom Form) (see note 1)	IAAC	10	9.20	9.30
Short introduction on the Transitions Project, Curricula and Transitions Labs	Elisava	20	9.30	9.50
Teaching methodologies (see note 2)	Città	20	9.50	10.10
The Loopholes Toolkit	HVA	15	10.10	10.25
Break			10.25	10.40
1 Learning Unit presentation + Miro session (see note 3)	Elisava + ALL	30	10.40	11.10
1 Learning Unit presentation + Miro session (see note 3)	NTT + ALL	30	11.10	11.40
Open discussion and conclusions	IAAC + ALL	20	11.40	12.00

Table 2: ToT 1st session agenda – day 2

DAY 2				
Activity	**Speaker**	**Duration**	**from**	**to**
Ice-Breaking Activities	Proteko	20	3.00	3.20
Guidelines for teachers: Quality Guidelines	Proteko	30	3.20	3.50
Break			3.50	4.10
1 Learning Unit presentation + Miro session	Proteko + ALL	40	4.10	4.50
1 Learning Unit presentation + Miro session	HVA + ALL	40	4.50	5.30
Learning Arches Exercise	Città or HVA	10		
Open discussion and conclusions	IAAC or Elisava + ALL	30	5.30	6.00

Table 3: ToT 1st session agenda – day 3

DAY3				
Activity	**Speaker**	**Duration**	**from**	**to**
Debrief (day1+Day2) + Ice-Breaking Activities	Città Studi + IAAC	30 mn	9.00	9.30
Learning Arches presentation	Elisava	40 mn	9.30	10.10
Break		10 mn	10.10	10.20
1 Learning Unit presentation + Miro session	NooF + ALL	40 mn	10.20	11.00
1 Learning Unit presentation + Miro session	Città + ALL	40 mn	11.00	11.40
Open discussion and conclusions	Elisava	20 mn	11.40	12.00

Table 5: ToT 2nd session agenda

DAY 1	**April 10th**	09.00-12.00	
09:00-09:20	Transitions Positioning and Approach	Elisava	20'
09:20-09:50	Transitions Lab Guidelines and the TL1 Pilot experience	IaaC	30'
09:50-10:20	The modular curricula, modules, LUs and glossary of Teaching methodologies	Citta	30'
10:20-10:30	Q&A and Feedback		10'
10:30-10:45	Break		15'
10:45-11:45	The loopholes toolkit and its modes of play	HVA	60'
11:45-12:00	Q&A and Feedback		30'
DAY 2	**April 15th**	14.00-17.00	
14:00-14:10	Agenda of the day + Summary of Day 1 key aspects	Citta	10'
14:10-14:30	Systemic Design Generic Module	IAAC	20'
14:30-14:45	Overview Knowledge area: Digitalization	Elisava	15'
14:45:15:15	Learning Modules, Learning Units and Learning Outcomes	Elisava	30'
15:15-15:30	Break		15'
15:30-15:45	Overview Knowledge area: Sustainability	NOOF	15'
15:45-16:15	Learning Modules, Learning Units and Learning Outcomes	NOOF	30'
16:45-17:00	Q&A and Feedback		
DAY 3	**April 19th**	14.00-17.00	
14:00-14:15	Agenda of the day + Summary of Day 2 key aspects	Citta	15'
14:15-14:45	Design Research Methods and Design Theories Generic Modules	Elisava + HVA	30'
14:45-15:00	Overview Knowledge area: Stakeholder Engagement	HVA	15'
15:00-15:30	Learning Modules Learning Units and Learning Outcomes	HVA	30'
15:30-15:45	Break		15'
15:45-16:00	Overview Knowledge area: Business & Finance	HVA	15'
16:00-16:30	Learning Modules, Learning Units and Learning Outcomes	HVA	30'
16:30-17:00	Q&A and Feedback		30'

Table 6: ToT 3rd session agenda

DAY 1	**Wednesday 13/11/2024**	09.30-12.30	
09:00-09:20	Transitions Positioning and Approach	Elisava	20'
09:20-09:50	Transitions Curricula Guidelines (Knowledge Areas, Competencies, Modules, Learning Units)	CITTA	30'
09:50-10:20	Transitions Toolkit for teachers (teaching methodologies)	CITTA	30'
10:20-10:30	Q&A and Feedback		10'
10:30-10:45	Break		15'
10:45-11:15	Reflection of TLabs Informing the Curricula Design	Iaac	30'
11:15-11:45	Quality Guidelines and Evaluation in Transitions	CITTA (General ones: Città) - HVAand/or IAAC (Indicators for trainers)	30'
11:45-12:00	Q&A and Feedback		15'
DAY 2	**Wednesday 27/11/2024**	09.30-12.30	
09:30-09:45	Introduction to the loopholes toolkit		
09:45-11:00	Loopholes Toolkit Training Round 1	HVA	
11:00-11:15	Break		
11:15-12:15	Loopholes Toolkit Training Round 2	HVA	
12:15-12:30	Q&A and Feedback		
DAY 3	**Friday 29/11/2024**	14.00-17.00	
14:00-14:15	Learning Pathways Design Approach	CITTA	30'
14:15-14:30	Learning Pathways VET	NTT/IAAC -Citta	30'
14:30-14:45	Learning Pathway HEI	Elisava - HVA	15'
14:45-15:00	Learning Pathway Professionals	Proteko - Modacc	30'
15:00-15:15	Break		15'
15:15-16:30	Designing Learning pathways codesign activity	breakout rooms	75'
16:30-17:00	Review and feedback		15'

5.4 Learning Pathways: HE, VET and Professionals

In alignment with the Transitions project's aim of developing a modular curriculum for vocational education and training (VET), higher education (HE), and professional training, we offer comprehensive guidelines tailored to support the development of three distinct learning pathways. These pathways are designed in accordance with the European Qualifications Framework (EQF) levels to ensure seamless integration into both existing and new educational and training programs. This structured approach aims to equip learners with the necessary skills and knowledge to drive sustainable transformation in the textile ecosystem.

A Learning Pathway is a structured sequence of educational experiences, including courses and activities, designed to achieve specific competencies in a particular field. The pathway is tailored to guide learners through progressively advanced stages of learning, ensuring they acquire the necessary skills and knowledge.

Higher Education Learning Pathway

The HE level (EQF Level 7) corresponds to advanced knowledge and skills typical of a master's degree or equivalent. Learners at this level are expected to demonstrate expertise in specialized or multidisciplinary fields, integrating advanced knowledge and skills to solve complex problems and contribute to professional practice or academic research.

This pathway emphasizes the integration of digitalization, sustainability, and systemic thinking, addressing global challenges such as compliance with new EU sustainability legislation, advancing circular economy principles, and implementing Industry 5.0 technologies.

- Tailored for university-level students pursuing degrees in textiles, fashion, and related fields.
- Focuses on integrating advanced theoretical knowledge with practical applications.
- Emphasizes research, critical thinking, and interdisciplinary collaboration.
- Designed to align with the European Higher Education Area (EHEA) guidelines and qualifications framework.

Competences

Advanced Knowledge & Theory Application

- Integrate foundational and cutting-edge knowledge in textiles, fashion, sustainability, and digitalization.
- Develop research competencies focused on sustainability, circular systems, and digital transformations.
- Apply critical and analytical thinking to solve complex design and production challenges.

Interdisciplinary Collaboration & Communication

- Foster collaborative skills across fields, aligning with sustainability, ethical practices, and emerging technologies.

- Engage in interdisciplinary projects and communicate effectively within cross-functional teams.
- Research & Innovation
- Conduct and apply research within textile and fashion contexts, contributing to innovation.
- Use research methodologies to identify, evaluate, and implement sustainable and digital solutions.

Global & Ethical Awareness

- Develop competencies in understanding and addressing global fashion and textile industry challenges.
- Embed ethical considerations in design, production, and management practices.

Teaching Methodologies

Teaching methodologies for HE learners emphasize critical thinking, independence, and collaboration in advanced contexts. These include:

- **Problem-Based Learning**
- **Research-Based Teaching**
- **Case Studies and Simulations**
- **Collaborative Projects**
- **Reflective Practices**

Example of a Collaborative Project: Learners collaborate with industry partners to develop a case study of a blockchain-enabled circular supply chain model for fashion products.

Activities

Activities at this level foster specialized problem-solving, digitalization, and sustainability. Examples include:

- Research Projects: Conducting in-depth investigations using digital tools like CLO3D or similar systems to address challenges in sustainability.
- Case Analyses: Critically evaluating circular business models and designing solutions for supply chain transparency.
- Collaborative Learning: Leading interdisciplinary projects with industry partners to integrate circular design principles.
- Presentations: Delivering insights and proposals to academic and professional audiences.

Examples of Case Analysis, Research Projects and Presentations:

1. Designing a lifecycle assessment for textile products, incorporating cradle- to-cradle principles.
2. Developing a digital twin of a garment to simulate its environmental impact throughout the value chain.
3. Conducting a foresight analysis of how Industry 5.0 technologies will shape sustainable fashion production.

Assessment Methods

Assessment at the HEI level evaluates advanced knowledge, critical thinking, and systemic problem-solving. Methods include:

- Research Projects: Exploring innovative solutions for industry challenges.
- Case Studies: Analyzing real-world applications of sustainability frameworks.
- Professional Portfolios: Documenting practice and reflective learning.
- Presentations: Articulating insights and solutions to diverse audiences.
- Scenario Planning: Developing adaptive strategies for future challenges.

Example of a Case Study: A consultancy project addressing a circular business model transition in response to ERP legislation.

Evaluation Criteria

Evaluation criteria at the HEI level emphasize the integration of theory and practice, focusing on:

- Advanced Methodologies: Mastery of specialized tools and design frameworks, such as Transition Design.
- Critical and Systemic Thinking: Synthesizing diverse information sources to develop innovative solutions.
- Sustainability and Digitalization: Addressing global challenges with advanced tools like lifecycle analysis and blockchain.
- Collaboration: Partnering effectively with interdisciplinary teams and industry stakeholders.

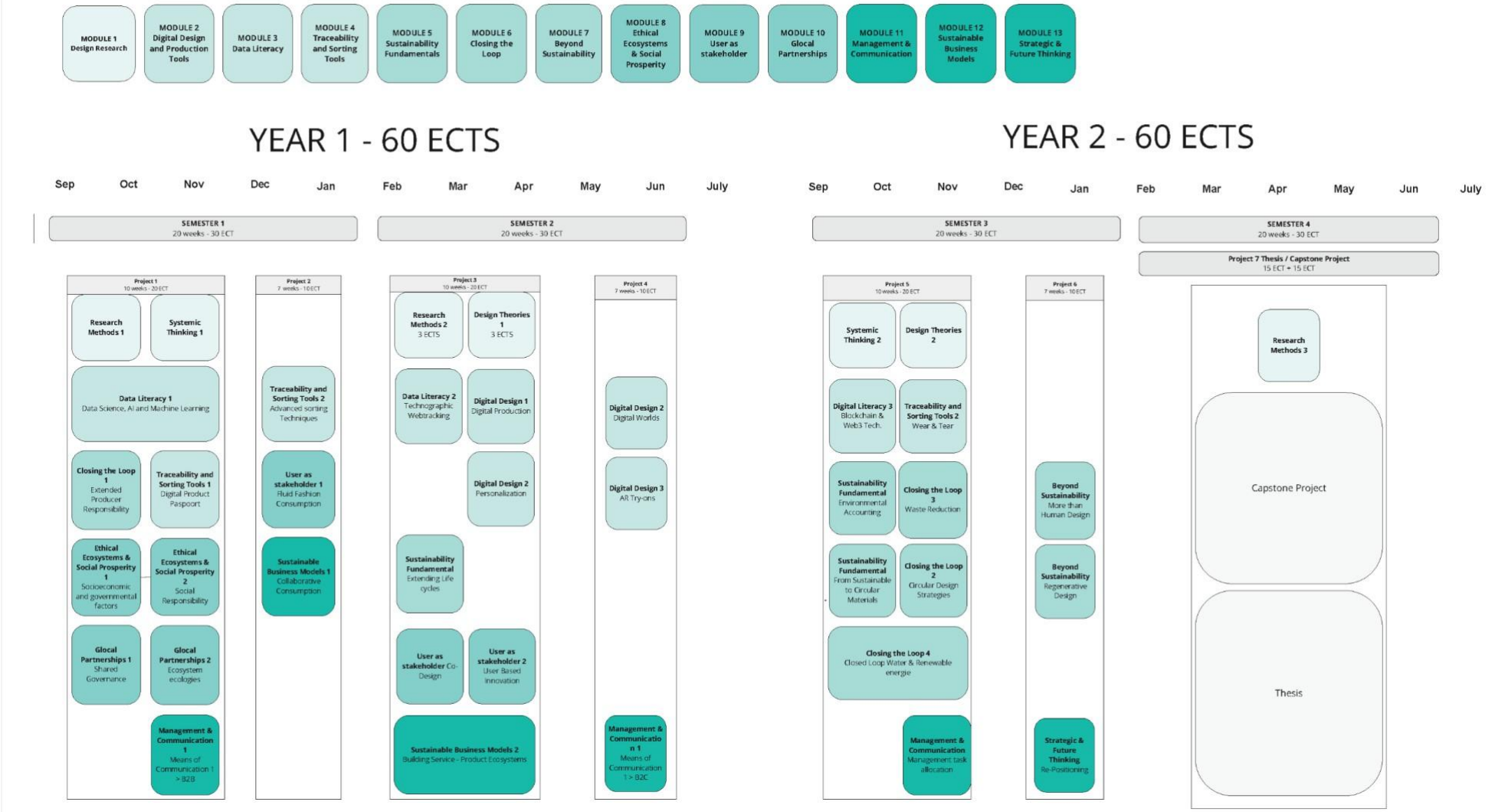
Example: A research report is evaluated based on its originality, methodological rigor, and relevance to sustainability goals in the fashion sector.

Additional Tools and Frameworks

Learners are introduced to advanced tools, such as:

- Lifecycle analysis (LCA) software to evaluate environmental impacts.
- Digital workflows (e.g., CLO3D, PDM systems) to integrate design and production processes.
- Transition Design Framework to develop systemic interventions for circular fashion

Figure 8 : HE Learning Pathway



Vocational Education and Training (VET) Learning Pathway

The VET pathway outlined in this curriculum is designed to provide learners with a comprehensive and interdisciplinary education in sustainable and circular practices for the textile and fashion industries. Each module integrates theoretical knowledge with practical applications, fostering a deep understanding of systemic approaches, innovative technologies, and sustainable strategies. The curriculum emphasizes experiential learning through workshops, real-world challenges, and industry placements, ensuring that learners are equipped with both technical expertise and critical thinking skills. This structured approach not only prepares participants to address current industry challenges but also positions them as leaders capable of driving transformative change across the textile ecosystem.

- Aimed at learners enrolled in vocational training programs focused on practical skills and direct industry applications.
- Includes hands-on learning experiences, technical training, and industry- specific competencies.
- Emphasizes employability skills and immediate application in the workforce.
- Structured to meet the European Qualifications Framework (EQF) standards for vocational education.

Competences

Practical & Technical Skills

- Gain hands-on experience with digital tools, sustainable materials, and production processes.
- Build competences in techniques such as CAD, AR/VR, sustainable manufacturing, and digital traceability.

Employability & Industry-Specific Competencies

- Cultivate skills directly relevant to industry roles, emphasizing adaptability and technical problem-solving.
- Understand and apply industry standards, including those for sustainability and circular design.

Immediate Application & Job-Readiness

- Prepare learners for direct entry into the workforce through competency-based projects.
- Focus on skills such as precision in technical work, attention to sustainable materials, and process efficiency.

Health, Safety, & Environmental Practices

- Develop awareness of environmental health, safety standards, and ethical practices in textile production.
- Implement eco-conscious practices and understand lifecycle management in production settings.

Teaching Methodologies

- Case Study Analysis
- Co-Design Projects
- Critical Thinking Exercises
- Group Discussions
- Guest Lectures and Industry Insights
- Interactive Workshops
- Project-Based Learning
- Scenario Analysis
- Self-Directed Learning

Suggested Activities

Product Development: Focuses on creating customizable fashion products using digital tools. Examples include developing virtual garments or personalized AR try-on products.

Service Design: Involves developing services that integrate advanced technologies, such as on-demand production services or blockchain-based transparency solutions.

System Analysis: Encourages evaluating impacts and proposing integrated systems, like designing a system to reduce supply chain waste using digital tools.

Assessment Overview: The assessments in the VET pathway focus on active participation, practical application, critical analysis, and collaborative problem-solving. They align with the learning outcomes of each module, emphasizing competences in digitalization, sustainability, stakeholder engagement, and business strategies for the textile and fashion industries.

Assessment Methods

Active Participation: Students engage in discussions, workshops, and brainstorming sessions to explore course topics, demonstrate understanding, and contribute ideas.

Project Development: Learners develop and present projects, such as creating digital twins, designing virtual garments, or devising personalization strategies, showcasing their technical skills and innovative thinking.

Critical Analysis and Reflection: Tasks involve analyzing case studies, evaluating systems or strategies (e.g., AR try-on technology or Blockchain in supply chains), and reflecting on their sustainability and efficiency.

Practical Application: Hands-on assessments require learners to use tools and technologies, such as 3D modelling software, data tracking systems, or digital production methods, to solve real-world challenges.

Collaborative Work: Group-based tasks, such as co-designing solutions or strategizing for circular economies, encourage teamwork and communication while addressing complex problems.

Presentations and Reporting: Students present findings, trends, or strategies and write reports on their work, such as mapping a supply chain or creating marketing plans using data insights.

Scenario and Future Thinking: Learners analyze future trends, forecast scenarios, and propose adaptive strategies, particularly for sustainability and innovation in the fashion sector.

Examples of Assessment Aligned with Modules

- **Digital Design and Production Tools:** Projects creating AR try-on apps, virtual samples, or digital twin workflows.
- **Sustainability Fundamentals:** Proposals for eco-design, lifecycle assessments, or closed-loop production systems.
- **Stakeholder Engagement:** Analysis of ethical ecosystems or strategies promoting fair labour practices.
- **Business and Finance:** Development of sustainable business models or strategic repositioning plans.

Each assessment is designed to reflect a learner's ability to integrate interdisciplinary knowledge, demonstrate systemic thinking, and contribute to innovative and sustainable practices in fashion and textile industries.

Evaluation Criteria

The evaluation criteria for VET students are designed to assess their knowledge, practical skills, analytical abilities, collaboration, and creativity in addressing challenges within the fashion and textile industries. The criteria align with the curriculum's emphasis on digitalization, sustainability, stakeholder engagement, and business acumen.

Knowledge and Understanding

Learners are expected to demonstrate a strong grasp of sustainability principles, including the use of sustainable materials, lifecycle assessment (LCA), and eco- design concepts. They should also show proficiency in digital tools like CAD and 3D modelling, as well as an understanding of traceability technologies. Awareness of ethical labour practices, social impacts, and the strategic foundations of sustainable business models is crucial. This can be evaluated through written tests, quizzes, and reflective essays.

Practical Application and Skills

Learners should exhibit the ability to apply theoretical knowledge through hands-on implementation, such as using digital tools for design and production or blockchain for traceability. They should develop practical solutions to industry challenges, including product prototyping and systems design focused on sustainability and innovation. These competences are assessed through portfolio reviews, practical assignments, and project presentations.

Analytical and Critical Thinking

Learners must analyze case studies effectively, identifying opportunities for improvement and innovation. They should engage in scenario planning to address future challenges and apply systemic thinking to connect design, production, use, and information management across the value chain. These skills can be evaluated through group discussions, written reports, and strategy evaluations.

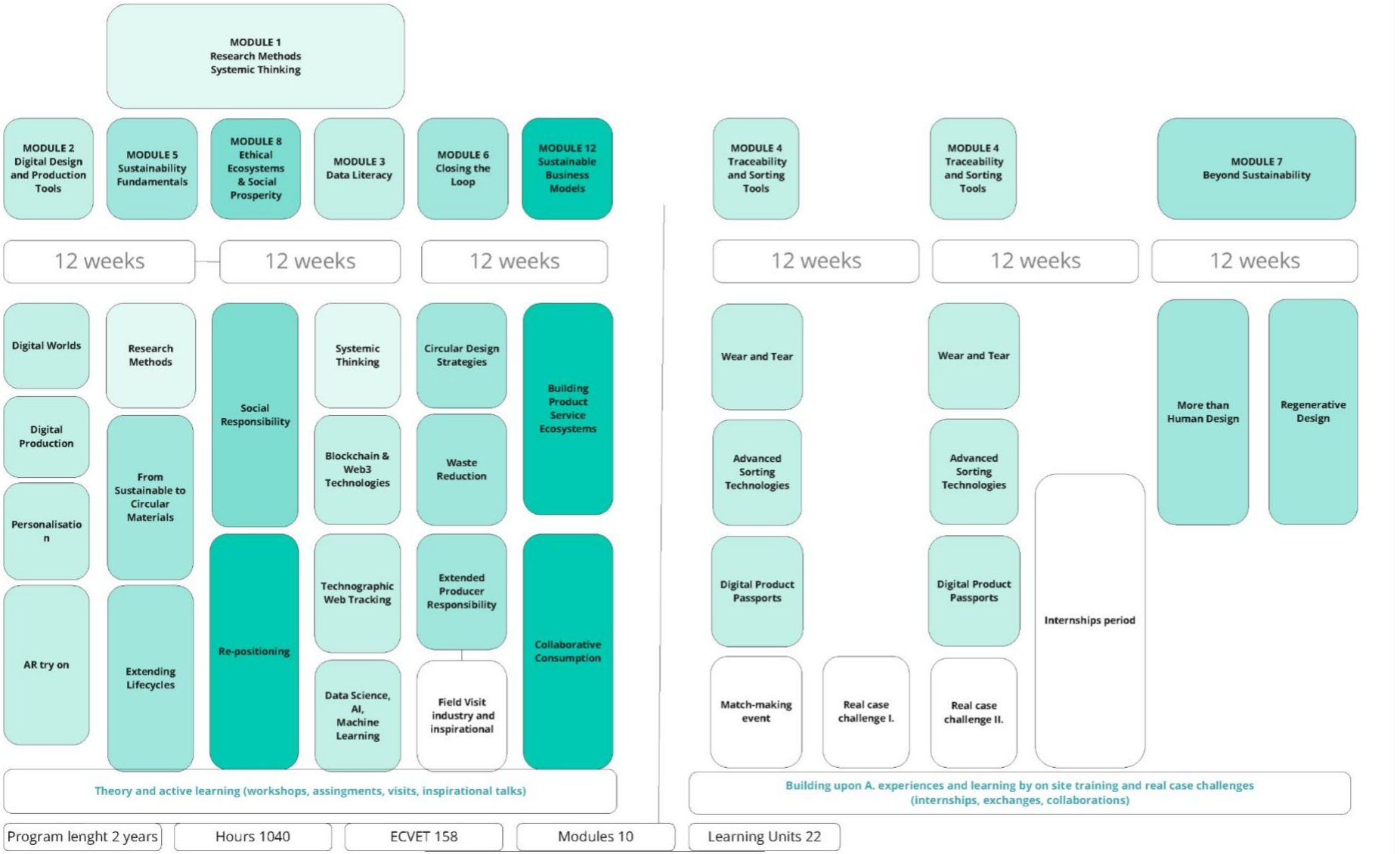
Collaboration and Communication

Teamwork is essential, with students expected to actively contribute to group projects and demonstrate effective collaboration. Clear and persuasive communication skills are evaluated through oral presentations, visual storytelling, and written formats. The ability to engage with stakeholders, understanding their perspectives and incorporating them into solutions, is also key. Peer assessments, group projects, and oral presentations are used to measure these abilities.

Innovation and Creativity

Learners should propose innovative designs or systems that integrate sustainable and digital practices. Entrepreneurial thinking is encouraged, with a focus on developing business ideas that align with circular economy principles. Adaptability in applying new technologies and methods is also valued. These competences are assessed through innovation challenges, prototyping workshops, and creative pitches. This comprehensive evaluation approach ensures that VET students are equipped with the skills and knowledge required to succeed in a dynamic and sustainable fashion and textile industry.

Figure 9: Proposal of a structured training for VET Learning Pathway



Professionals Learning Pathway

Each company has its own challenges, viewpoints and pre-existing knowledge. This means that each company requires a personalized intake discussion to define their specific learning pathway. For this, we believe the Loopholes Toolkit is an excellent tool to map and identify the company's current situation, and its potential opportunities for circular growth. It can also be an effective tool to make a long- term plan on how to transition from a linear model, to a more circular one. The strategy cards of the Loopholes Toolkit are closely aligned with the Transitions curricula learning units and modules and therefore using the toolkit as an introduction gives a strong indication of where a company should focus their learning goals.

- Developed for current industry professionals seeking to update or expand their skills.
- Focuses on upskilling and reskilling to address emerging trends and technologies in the fashion and textile sectors.
- Includes flexible learning options such as short courses, workshops, and online modules.
- Designed to provide practical, actionable knowledge that can be immediately applied in professional settings.

Competences

Upskilling & Reskilling

- Update skills in line with industry advancements in sustainability, digitalization, and circular economy practices.
- Master emerging technologies and methodologies, including digital twins, blockchain for traceability, and eco-design.

Flexibility & Practical Knowledge Application

- Engage in flexible, applied learning formats such as workshops and online modules for immediate workplace integration.

- Apply new knowledge directly to current roles, addressing specific needs in professional practice.

Leadership & Innovation in Industry Trends

- Foster leadership skills in adapting to and implementing industry trends within organizations.
- Develop strategic thinking in sustainable and digital innovation, influencing sustainable change within workplaces.

Network & Stakeholder Engagement

Build and sustain strategic partnerships and networks within the fashion and textile sectors.

Practice stakeholder engagement, co-design, and ethical management skills to foster collaborative and sustainable ecosystems.

Considerations

When working with industry partners, it is important to arrange everything in consultation with the company.

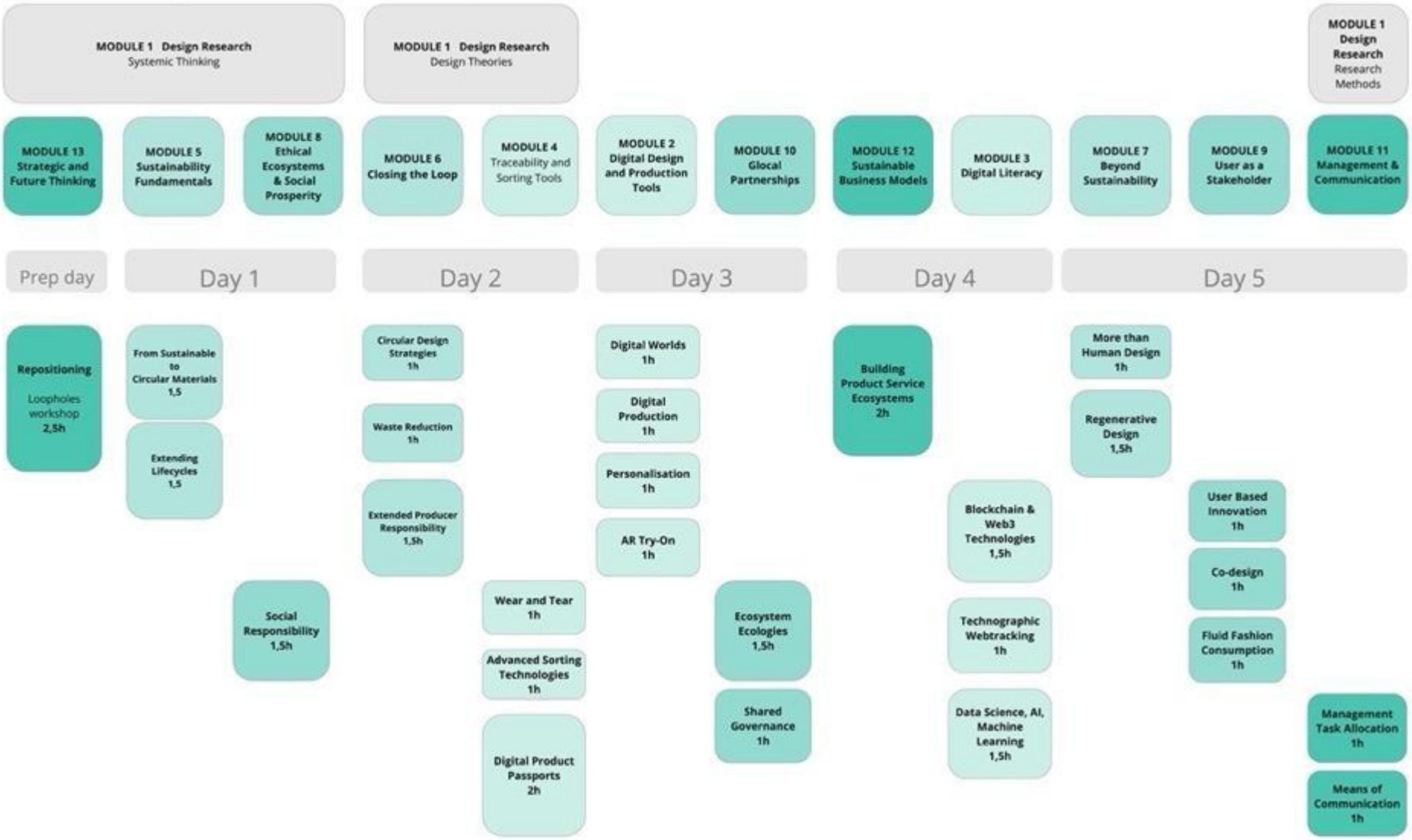
It is commonly understood in the fashion and textile industry that companies do not have much time and/or budget to continuously train staff. Therefore, we have suggested three different time commitments that could be followed to cover the contents of the Transitions curriculum at three different knowledge levels:

- Level 1: commitment of 30 hours
- Level 2: commitment of 60 hours
- Level 3: commitment of 85 hours

In our example we have spread the hours of commitment over a 2.5-year timeline, but both the level of commitment and period of completion should be decided together with the company. For example, if they have 30 hours to spend, they may choose to undertake an intensive 1-year training – or even allocate one working week.

In some cases, companies may already have 'foundational' circular knowledge and wish to spend their 30 hours to follow a few more advanced modules more in depth. Modules and learning units can also work as inspiration for one-off workshops of 1- 3 hours. Following are examples of how to allot the time in the three different levels mentioned above.

Figure 10: Professionals Learning Pathway: – Level 1: 1-week intensive course of 30 hours.



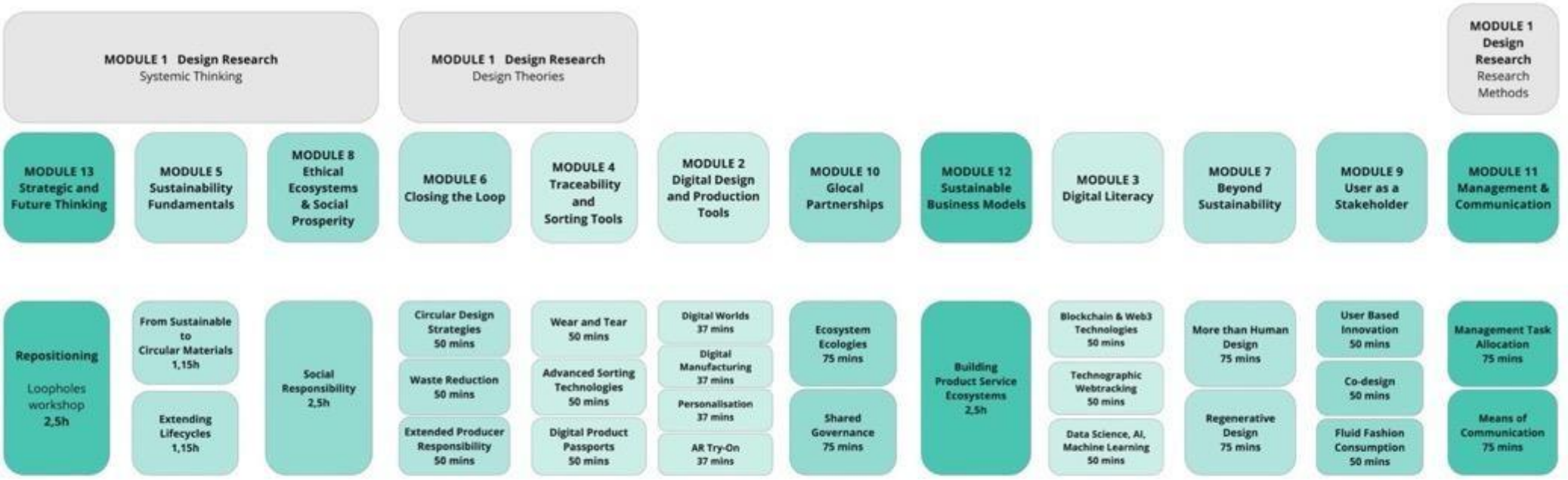


Figure 11: Professionals Learning Pathway – Level 1 – 30h course

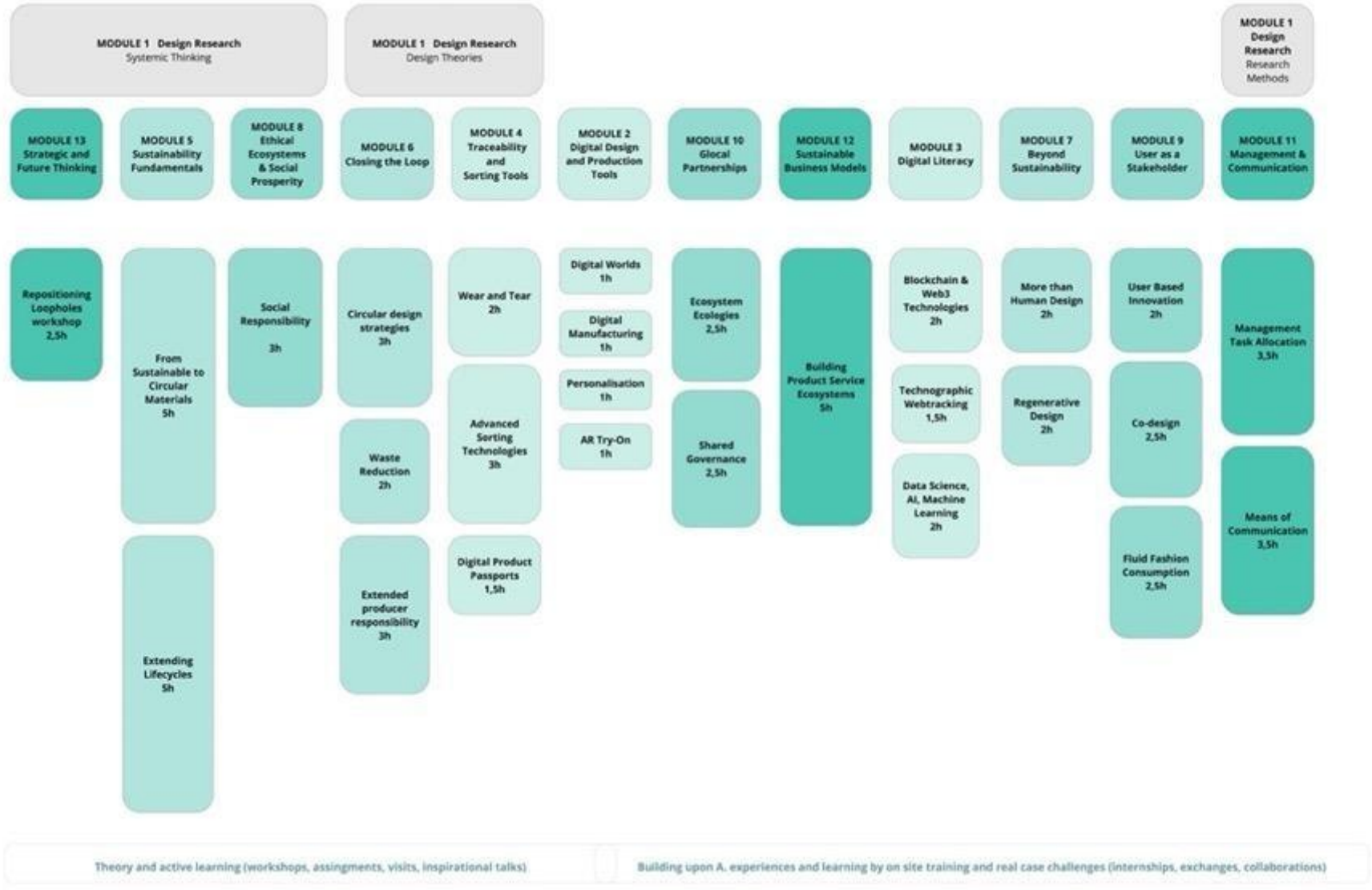


Figure 12: Professionals Learning Pathway – Level 2 – 60 hours course

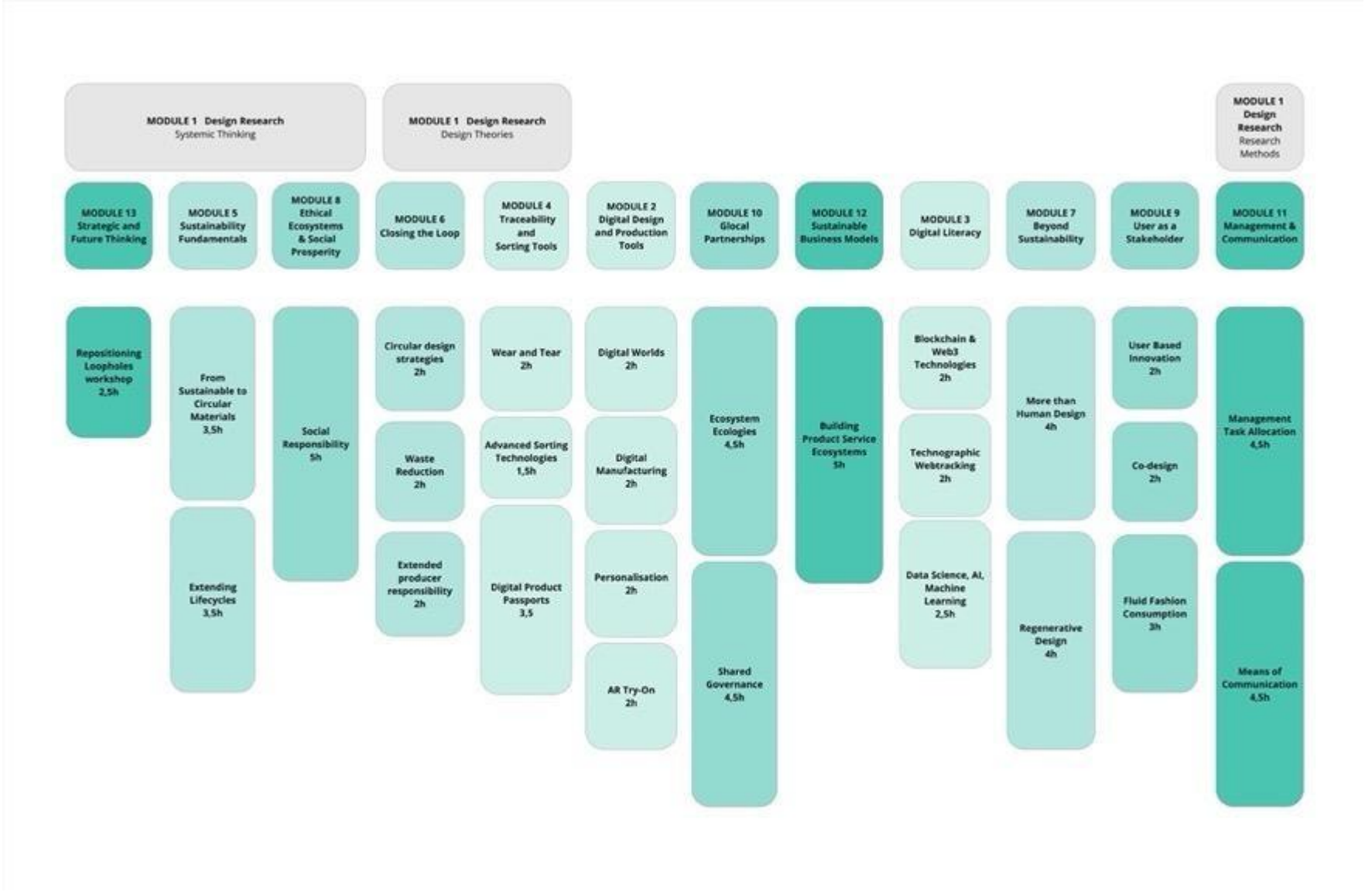


Figure 13: Professionals Learning Pathway – Level 3 – 85 hours course

Teaching methodologies

These are the teaching methodologies we propose for professionals

- Case Study Analysis
- Embodied Learning
- Guest Lectures and Industry Insights
- Informal Learning
- Interactive Discussions
- Microlearning
- Nanolearning
- Project-Based Learning
- Workshops

Activities

Each learning unit of the Transitions curriculum has suggested activities that align with a specific topic. These are presented at the Product, Service, and System level which roughly equates to the required level of understanding of VET, HEI and professionals. However, we see that when working with companies, each of these levels are applicable, and each activity should be tailored to the specific company's needs. Below we give a summary of each activity 'focus' and have included an example that would be relevant to a professional learning audience.

Product: activities around products could either be focused on improving a product by re-designing it with a circular design method and improving it through the whole process. It could also mean looking at your suppliers and the material streams.

> *Example from the learning unit Personalization: Develop a Customizable Fashion Line: Task learners with designing a fashion line that incorporates elements of personalization, such as customizable colors, styles, or fits, emphasizing the reduction of waste and enhancement of customer satisfaction.*

Service: what kind of circular business model could you implement? What would be relevant for your customers and other stakeholders?

Example from the learning unit Extending lifecycles: Undertake a garment lifecycle extension service design challenge through case study analysis and Masterclass delivery. The masterclass should highlight current challenges and opportunities in the fashion industry related to lifecycle extension, emphasize the importance of understanding consumer preferences and industry practices, and engage learners to identify key components of a service that can effectively extend the lifecycle of fashion products. Learners should produce a service blueprint, including backend processes and digital integrations.

Systems: processes, how do you currently function? Loopholes. Change? We recommend using the Loopholes toolkit to map and evaluate current processes and systems to identify possible changes.

Example from the learning unit Social Responsibility: Develop a service model that enhances social responsibility within the fashion ecosystem, utilizing best practices to improve worker welfare and consumer engagement.

Assessment Methods

There are limited methods for assessing professional learning pathways, as professional learning in the Transitions curriculum does not equate to following an accredited course of study. However, it is of course, important to monitor a learner's knowledge throughout the educational process. We have selected several methods, outlined below, which work together to give a formative assessment of each learner's journey.

- **Diagnostic assessment** - evaluates learners' current knowledge at the beginning of a course.
  Example: do a quick Menti-survey with 2-3 questions, such as: 1) what

do you know about (today's topic)? One-word answers. 2) What do you hope to know more about after today's session? Needs to be done together with ipsative assessment.

- **Ipsative assessment** - compares the learner with him/herself and not to external references so that the learner's development can be gauged. Needs to be done together with a diagnostic assessment. *Example: do another quick Menti-survey at the end of the session to gauge what they learnt during the session. Questions could be: 1) What did you learn today? Short answers. 2) Rate the amount of new knowledge you gained in today's session, regarding today's topic (1-5, 1 being the lowest amount of knowledge gained).*

- **Project-based assessments** - participants work on real-world projects that directly apply learning outcomes to their own professional contexts. *Example: let the company prepare a case from their business, maybe something they've been putting off. Engagement is higher when working with something that will be useful and helpful back in the office, and it will also create a natural implementation of new knowledge into the company.*

- **Workplace implementation plans** - participants create and present implementation plans showing how they will integrate what they've learnt into their organization. This could follow a project or a workshop.

Assessment can also be based on the Kirkpatrick Model *(figure 13)*:

- Level 1: Reaction - Do participants find the training favorable, engaging, and relevant to their jobs?
- Level 2: Learning - What do the trainees learnt and not learnt? What do they think they'll be able to do (and with how much confidence) differently from

now on, and what is the motivation they have to make changes?
- Level 3: Behavior - How well do people apply what they learnt during training when they return to their work? Does any person need help?
- Level 4: Results - Here, the training generates the targeted outcomes. Evaluation of whether the outcomes (decided by the organization) are suitable for the business and the participants and if they demonstrate a good return on investment (ROI).

Evaluation criteria

The Professionals level is the least unified of the three but must be considered to correlate to advanced knowledge. Often the professional has a shallow-to-mid-level understanding of most of the business or industry they operate in, as well as a specific area of expertise which changes depending on their role within the industry.

This pathway emphasizes the need to understand where in their sustainability journey we find the learner or the company and what areas should be in focus moving forward. It's also important to take stock of the learner's preexisting skills. Training is then put together specifically to meet the needs identified.

The professional's level is tailored to those who:

- Aim to level up their sustainability practices
- Want to add circular business models to their preexisting (linear) model
- Seek to change career paths and want to upskill
- Managers and leading positions who seek to better identify and utilize the knowledge found within their company/organization

Evaluation is then based entirely on each learner's or company's preexisting knowledge base and their expected outcome with the education. Evaluation is best done over time by following the Kirkpatrick Model:

1. **Reaction**

- **Purpose:** Measures how learners feel about the training.
- **Focus:** Learner satisfaction, engagement, and perceptions of the training's relevance.

- **Methods:** Surveys, feedback forms, or informal discussions.
- **Example Question:** "Did you find the training relevant to your job?"

2. **Learning**

- **Purpose:** Assesses the increase in knowledge, skills, or attitude changes because of the training in the context of preexisting knowledge.
- **Focus:** What learners have learnt or retained.
- **Methods:** Surveys, feedback forms, or informal discussions.
- **Example Question:** "What new skills or knowledge did you gain from this session?"

3. **Behavior**

- **Purpose:** Evaluates whether learners apply what they learnt on the job.
- **Focus:** Changes in behavior and application of skills in the workplace.
- **Methods:** Observations, performance reviews, or feedback from supervisors and peers.
- **Example Question:** "Are the new practices or skills being applied in daily work activities?"

4. **Results**

- **Purpose:** Examines the broader organizational impact of the training.
- **Focus:** Measurable outcomes, such as improved productivity, quality, and/or new sustainability practices put in place.
- **Methods:** Key performance indicators (KPIs), return on investment (ROI) analysis, or business metrics such as sustainability performance metrics.
- **Example Question:** "How has training contributed to achieving organizational goals?"

Figure 14: Kirkpatrick Learning Assessment Model (Kirkpatrick J, Kirkpatrick WK. An introduction to the new world Kirkpatrick Model. Kirkpatrick Partners, 2021)

The three Learning Pathways show that the Transitions Training Program can be adapted to the diverse needs of learners across different educational and professional contexts.

5.5 Transitions Labs Design

Transitions Laboratories (Transitions Labs) serve as centers to pilot the training program. These labs have been set up in various locations, involving key stakeholders who take part in a series of activities and workshops focusing on the whole value chain and the circular economy. In Transitions Labs, participants are involved in work-based, hands-on learning experiences where project partners introduce a common language and collaborative pedagogical tools. The workshops provide opportunities for hands-on learning, allowing participants to apply previously developed knowledge, tools and skills to drive innovation or solve real-world problems.

Definition

- Laboratories for supporting transitions towards sustainability and digitalization in Textile and Fashion ecosystems.
- Playgrounds for testing the modular curriculum framework Cooperation between vocational training, professionals and higher education institutions
- Spaces for grounding circular projects, appropriating local realities, emerging innovative concepts and fostering territorial policies related to innovative education in T&F.

Transitions Lab values highlight the importance of such experimentation to be context-based, with active learning, openness and a cooperative mindset for circular and digital transitions.

The Transitions Lab consists of:

- A coordination node composed of one or several partners
- A selected program of activities based on learning arches developed in Transitions, customized from Learning pathways elaborated in WP4.
- Teachers, lecturers' networks and external partners involved in content provision.
- Challenges identified with local partners, with associated target groups

Transitions Lab Framework

Drawing inspiration from the double diamond design process (Design Council, 2005), the Transition Labs framework facilitates understanding, envisioning, implementing, and reflecting on the outcomes of the labs in various training contexts. This methodology is an expanded version of the double diamond, consisting of six steps: discover, define, develop, deliver, reflect, and share. Each step is outlined in *Figures 14-15*, accompanied by a set of tools designed to ideate and document the activities within the Transition Labs. Moreover, in Report Transitions Labs Prototypes, an extensive and detailed report on the creation, making and evaluating of the Pilots has been performed. This approach enables us to replicate the successful aspects and modify the suggested methods for improved performance.

Figure 15. Transitions Lab Design Framework

5.6 Curriculum Assessment trough TLabs

The Transitions curriculum required continuous assessment, especially since it operates under the Erasmus+ program. The assessment process considered several factors, including relevance, comparability, compatibility, transparency, mobility, and attractiveness.

During the Transitions project, we approached the curriculum assessment in two main ways:

1) Pilot Testing: two TLABs were conducted in each of the partners´ countries, providing participants with the opportunity to give feedback on the pilots. Based on this input, project partners updated the curriculum to better align with the needs of the Transitions project target. A final TLAB was held in February 2025, which helped finalize the curriculum assessment by addressing any remaining gaps or necessary adjustments.
2) Regular Meetings with project partners to implement continuous monitoring and refinement of Modules and Learning Units, ensuring their relevance and effectiveness.

Additionally, we have established a set of indicators to evaluate the curriculum's implementation, focusing on:

- Collaboration between educational and non-educational partners
- Compliance with national and international rules
- Selection and admission of participants
- Mobility
- Means of instruction (language, teaching methodologies, digital tools)
- Definition of Learning Outcomes
- Inclusivity
- Feedback from Learners, Trainers and Stakeholders for the continuous improvement

Learning assessment tracks student progress against the curriculum, evaluating their academic achievements and identifying areas where they may need additional support.

Curriculum Indicators

Indicator	Focus	Questions	Method	Frequency
Qi1.1 Partner Collaboration	Educational + non-educational collaboration	Are contents shared? Are stakeholders engaged?	Interview	While designing
Qi1.2 Standards Compliance	National/EU quality & recognition standards	Is the program EU-compliant?	Assessment	Continuous
Qi1.3 Admission Process	Fair, inclusive, transparent selection	Fairness, inclusivity, publicity, clear criteria, fees	Assessment	Before program
Qi1.4 Alumni Engagement	Newsletters and job offers	Is alumni engagement present?	Newsletter	Bi-annual
Qi1.5 Mobility	Erasmus/international mobility	Are Erasmus mobility requirements met?	Assessment	Continuous
Qi1.6 Language Instruction	Language clarity & learner comprehension	Is language declared and learners proficient?	Tests	Before program

Quality Indicator 2 – Qualitative Requirements

Indicator	Focus	Questions	Method	Frequency
Qi2.1 Learning Outcomes	LOs aligned with market and learner needs	Are LOs clearly defined and relevant?	Assessment	While designing
Qi2.2 Assessment & Grading	Transparency and communication	Are methods clear? Is grading info provided?	Assessment	Continuous
Qi2.3 Innovation & Interdisciplinarity	Promote innovation, entrepreneurship & transversal skills	Are these promoted?	Assessment	While designing
Qi2.4 Teaching Methodologies	Innovative, learner-centered	Are methods hands-on and impactful?	Assessment	Continuous
Qi2.5 International Engagement	Mobility and international course integration	Is international participation promoted?	Assessment	Continuous
Qi2.6 Geographic Inclusion	European/global openness, language handling	Is program open and language managed?	Assessment	Continuous
Qi2.7 Inclusion & Diversity	Social inclusion, support, gender balance	Is it inclusive and supported?	Interview	Continuous

Quality Indicator 3 – Results, Achievements & Impacts

Indicator	Focus	Questions	Method	Frequency
Qi3.1 Green/Digital Skills	Integration into curriculum	Are these skills included?	Assessment	While designing
Qi3.2 Learning Outcomes Achieved	Defined and verified LOs	Are outcomes met? Are they stored?	Test	Before/after program
Qi3.3 Completion Rates	Learner completion tracking	Completion rate? Dropout handling?	Data verification	After program
Qi3.4 Career Outcomes	Post-training progression	Is progress tracked? Is support offered?	Interview	Continuous

Quality Indicator 4 – Stakeholder Feedback & Improvement

Indicator	Focus	Questions	Method	Frequency
Qi4.1 Learner Feedback	Evaluation of program	Are views collected and useful?	Survey	During/after program
Qi4.2 Trainer Feedback	Program/trainer reflection	Are trainers consulted and results useful?	Survey	During/after program
Qi4.3 External Feedback	Stakeholder input	Are external voices gathered?	Survey	During/after program
Qi4.4 Continuous Improvement	Program refinement via feedback	Is feedback used to improve?	Report	After program

Outcomes of Curriculum Testing through the TLABs

The curriculum was tested through three Transitions Labs (TLABs) in different countries: Netherlands, Spain, Italy and Sweden. This section provides an analysis of the key changes needed in the learning units/modules tested during the LAB and adjustments related to the learning pathways (HEI - VET - PROFESSIONAL) based on the feedback and insights from the TRANSITIONS LAB held on 4-5-6 February 2025 at Città Studi Biella. During the TLAB, various educational modules were tested to support transitions in the textile and fashion ecosystem. Feedback highlighted the need to better align content, format, and delivery with diverse learner backgrounds and professional expectations. Several enhancements were suggested across thematic areas, focusing on contextualization, interactivity, and hands-on engagement.

1. Evolving Module Content & Delivery

Modules across topics such as systemic thinking, sustainability, digital design, and partnerships underwent evaluation. Common themes for improvement included:

- Tailoring content to better reflect participants' backgrounds and expectations.
- Expanding experiential learning, especially through software use and practical workshops.
- Integrating storytelling and case studies to connect theoretical concepts with real-world practices.
- Reconsidering conceptual pairings, ensuring foundational understanding before merging complex approaches.

2. Enhancing Interactions and Group Dynamics

Feedback emphasized a desire for:

- More interactive formats that spark dialogue between learners and external stakeholders (e.g., industry actors).
- Strengthened facilitation roles to manage group processes, promote

inclusivity, and foster shared governance concepts.
- Tools like the Loopholes Toolkit and stakeholder canvases were seen as promising, though requiring further refinement to navigate complexity.

3. Adjusting Learning Pathways

Different educational levels—higher education, vocational training, and professional learning—were assessed for integration:

- Higher education students appreciated collaborative and scenario-based methods but asked for stronger connections to local textile contexts.
- Vocational learners benefitted from digital tools and sustainable design practices but needed more time for technical refinement.
- Professionals valued site visits and strategic insights but sought greater opportunities to co-develop transition roadmaps with peers.

4. Structural and Strategic Improvements

Recommendations also targeted broader program structures:

- Extend the duration of hands-on sessions and create smoother transitions between workshops.
- Foster continuity across labs and cultivate stronger links between local and global initiatives.
- Introduce clearer timelines and structured evaluation frameworks to monitor outcomes and learning impact over time.

5. Streamlining and Consolidation

As a result of this comprehensive feedback, the number of learning modules was reduced—from 15 to 13—to focus on the most impactful and integrated topics.

5.7 Quality Guidelines

The quality guidelines for curriculum in European projects, particularly under the Erasmus+ Program, are detailed comprehensively in several documents; as for Transitions project, they were listed and analyzed in D4.5. These guidelines aim to ensure that courses under the Erasmus+ Program deliver high-quality educational experiences that are inclusive, interactive, and aligned with European values and policies.

Information and Transparency

Every program needs to have advanced and complete information (both general and more specific educational information); its application process, together with the selection of participants, must be clear and transparent. The transparency must involve also the costs connected to the program.

Content and Pedagogy

The program needs to have high-quality teaching, and the subsequent modality of learning – the pedagogical approaches and the creation of an excellent learning environment – is key. Connected to these aspects, we must highlight the content, which needs to be always up-to-date, and the use of digital tools to support learning.

European Dimension

Programs must reflect EU values and offer networking opportunities, facilitating the mobility and the sharing of practices among different countries.

Services and Facilities

These aspects refer to the correct management of the program, and include support to participants, which has to be timely and effective; schedule, which has to be coherent with the programs objectives; staff, which have to be qualified and able to interact with different learners; and finally venue, which has to be adequate and accessible to disabled people.

Inclusion and Diversity

Inclusivity is mandatory, and people with special education needs must be guaranteed the same possibilities.

Feedback and Follow-up

Participants need to provide feedback for the continuous improvement of the program. Learners have to be informed of further possible learning steps, together with a clear and detailed certification of the program followed, using EU recognition instruments.

Project Management and Quality Assurance

A quality assurance plan (including qualitative and quantitative KPIs) has to be established, together with solid project management, which will continuously monitor and evaluate the execution of the program. Considering and aiming at fulfilling these principles, specific guidelines for the program have been defined:

Learning outcomes approach

Clearly defining what learners should know and be able to do after the training ensures the relevance and focus of the program. This is crucial across all levels to guarantee that training meets educational and professional standards.

Stakeholder involvement

Involving industry experts, employers, educators, and learners in developing and evaluating programs ensures that training is aligned with real-world needs and current industry practices.

Alignment with market needs

Regularly updating training content to match labour market requirements ensures that learners gain relevant skills, enhancing their employability and meeting employers' needs.

Quality Assurance

Implementing internal and external evaluations maintains high standards and credibility of the qualifications awarded, which is essential for trust and recognition across all levels.

Learner-centered approach

Tailoring learning experiences to individual needs and providing comprehensive support services boosts learner engagement and success by accommodating diverse backgrounds and learning styles.

Teacher and trainer qualifications

Ensuring that instructors have up-to-date knowledge and effective teaching skills improves the quality of education and training, leading to better learning outcomes.

Competence-based assessment

Using assessments that measure actual skills and competences ensures that learners can apply their knowledge in practical situations, which is critical for both academic and professional success.

Self and Peer Assessments

Encouraging self-reflection and peer feedback to foster a collaborative learning environment.

Mobility and flexibility

Recognizing qualifications across different countries and institutions facilitates the movement of learners and professionals for further study or employment, promoting international mobility.

Use of technology

Integrating digital tools and e-learning platforms into training programs enhances accessibility and ensures that training remains relevant and up to date.

Sustainability

Ensure the curriculum supports sustainable development by integrating relevant competencies and fostering an understanding of sustainability issues among learners.

Inclusiveness

Ensuring equal access to training opportunities for all individuals promotes diversity and inclusion, which are essential for a fair and equitable education and professional environment.

Ethical standards

Including training on ethics and professional standards helps learners understand and follow the correct practices in their field. This is important for keeping integrity and trust in their profession.

Inspired by these guidelines, a series of indicators were set to have a "checklist" to which to refer. These indicators are organized in 4 general categories:

1. **Compulsory requirements:** connected to the creation of the curriculum and organization of the programs
2. **Qualitative requirements:** connected with the actuation of the program
3. **Results, achievement and Impact:** connected to skills and learners' personal development
4. **Stakeholder experiences and continuous improvement:** connected to feedback and continuous improvement

Each indicator has a description (what it is), a series of connected questions (checklist to be done), a Method (how it will be checked) and a frequency (when it will be checked).

6. Resources

To support educators and learners in navigating the Transitions modular curriculum framework and implementing the Transitions Training program within their

institutions, Transitions partners developed a set of tools through the Transitions project. These tools are designed to embody the program's systemic, collaborative, and practice-oriented approach:

1. Transitions Labs (TLABs) Guidelines (IAAC)
2. The Loopholes Toolkit (HVA)
3. Training Material (all partners)
    3.1. Knowledge Areas
    3.2. Modules Presentations
    3.3. Case Studies
    3.4. Materials for Trainers
    3.5. Loopholes
4. Curriculum Guidelines (Città and Elisava)
5. Glossary of Teaching Methodologies (all partners)

6.1 Transitions Labs (TLABs) Guidelines

In this section we provide you with the guidelines and the tools for educators that would like to design and develop their own Transition Lab.

The resource is structured in four parts: It starts with defining what a TLAB is and sharing some illustrations of TLABs thanks to a gallery. It then deep dives into the TLAB design process, helping future practitioners to better envision and run their learning experiences. The guideline ends with an open space to foster interactions between TLABs.

1. What is a TLAB?

This section onboards readers in what a TLAB is, giving some definitions, introducing the core values, and sharing its basic composition and the different configuration in which it can be deployed.

2. Gallery of TLAB communities

The Gallery of TLAB communities is composed of a map showcasing the TLABs that were organized during the Transitions projects. Each local TLAB is then described with infographics, introducing the partners involved, the learning program and the main results generated in each place. A dedicated section is proposed to the International TLAB that was organized in Biella, sharing the core elements of the training, the shared agenda of the 3 onsite days, as well as the video created for the events.

3. TLAB Design process & tools

The TLAB Design process aimed to support the design and implementation of TLABs in local or international contexts. It is a step-by-step process that helps facilitators and teachers from the onboarding with the Transitions Curriculum to the development of local programs of activities. It is based on the Double Diamond Design Process combined with a series of co-creation & Kaospilot designing learning space tools. The process contains six steps with two main tools proposed by steps, as follows:

Table 6: Description of the TLAB Framework and associated tools

Steps	Description	Tools
Discover	• Get to know the Transitions project key resources • Situate your context and identify potential stakeholders for your TLAB experience	• Transitions Modular Curriculum Framework • Stakeholder Map
Define	• Identify the needs and motivations of your community • Use backcasting to define a long-term plan for your community	• Loopholes Toolkit • Backcasting Tool
Develop	• Design the content of the TLAB	• Learning Arches

	• Plan and organize the activities their format, the timing and logistics	• Program Matrix
Deliver	• Manage stakeholder engagement and event logistics • Create shared spaces for exchanging contents & information about the courses	• TLAB Activity Plan Spreadsheet • Online space for participants
Reflect	• Take time to evaluate the learning of participants • Get feedback from participants & envision what could be the next steps for your community	• Evaluation grid • Feedback tools
Share	• Communicate about TLAB experience in your network and within TLAB communities • Document original contents developed	• Transitions stories • New contents

The TLAB Tools can be found in Annexes.

4. Open Space for TLAB Communities

Within the Transitions project, we could see the importance of Peer-Learning Exchanges while you are designing and experiencing new learning experiences In the TLAB guideline, we are creating a space for existing and future TLabs to interact to each other, having the possibility to present themselves, sharing ideas of collaborative projects and learning experiences, and inviting them to other projects & networks of Labs they could benefit from.

The TLAB guideline is accessible via the dedicated section in the Transitions website (as shown in Fig. 16-17-18-19-20) so people can easily navigate in the findings and get ready to develop TLABs.

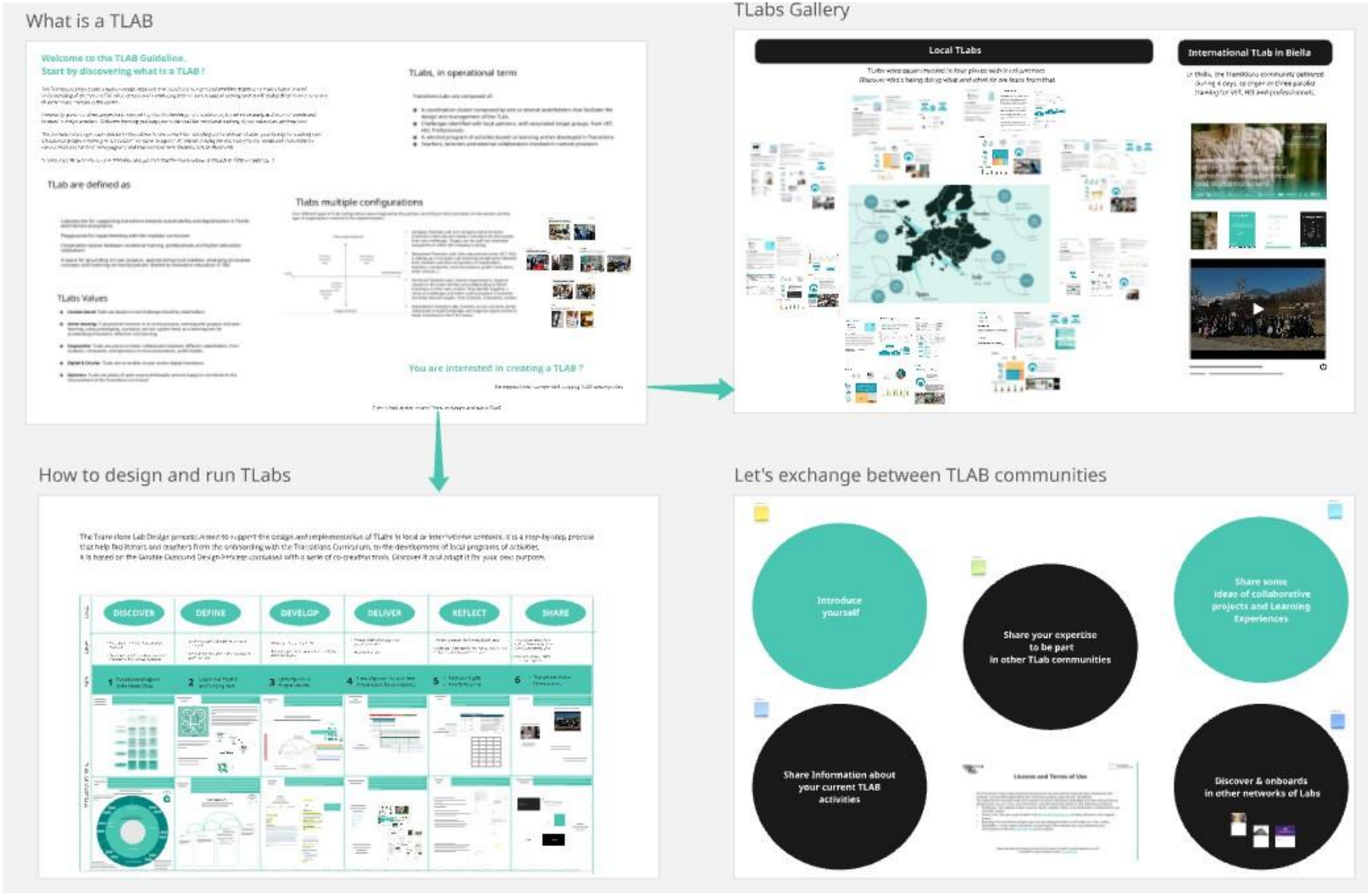


Figure 16: TLAB guideline

Welcome to the TLab Guideline.
Start by discovering what is a TLab !

The Transitions project uses a system-design approach that consists in bringing stakeholders together to have a better shared understanding of the current T&F value-chains, and introducing them to a multitude of strategies that will enable them to intervene and directly create changes in the system.

Concretely, partners of the project have worked together in the design of a curriculum, based on an analysis of current trends and innovative design practices. Different learning pathways are envisioned for vocational training, higher education, professionals

The curriculum strength is its modularity that allows for customization according to the context of uses, positioning the teaching staff, educational program managers, consultants as active designers of content, having the autonomy to use, adapt and customize the various modules for their own programs and interventions with students and professionals.

Transitions Labs are born to operationalize and put into practice this modular approach in different settings.

TLabs, in operational term

Transitions Labs are composed of:

- A coordination cluster composed by one or several stakeholders that facilitate the design and management of the TLab.
- Challenges identified with local partners, with associated target groups, from VET, HEI, Professionals.
- A selected program of activities based on learning arches developed in Transitions
- Teachers, lecturers and external collaborators involved in content provision

TLab are defined as

Laboratories for supporting transitions towards sustainability and digitalization in Textile and Fashion ecosystems.

Playgrounds for experimenting with the modular curriculum

Cooperation spaces between vocational training, professionals and higher education institutions

A space for grounding circular projects, appropriating local realities, emerging innovative concepts and fostering territorial policies related to innovative education in T&F.

TLabs Values

- ***Context-based:*** Tlabs are based on real challenges faced by stakeholders
- ***Active learning:*** TLab position learners in an active posture, working with projects and peer-learning, using prototyping a product, service, system level, as a learning lens for accelerating innovation, reflection and learning
- ***Cooperative:*** TLabs are places to foster collaboration between different stakeholders, from students, companies, entrepreneurs to local associations, public bodies.
- ***Digital & Circular:*** TLabs aim to enable circular and/or digital transitions.
- ***Openness:*** TLabs are aware of open source philosophy and are happy to contribute to the improvement of the Transitions curriculum

Tlabs multiple configurations

Four different types of TLab configurations were imagined by the partners according to their perimeter of intervention and the type of organizations involved in the implementation.

- *Company Transition Lab:* one company wants to foster transitions internally and create a transition lab that tackles their own challenges. Targets are the staff and extended ecosystems in which the company is acting.
- *Educational Transition Labs:* One educational center (VET, HEI) is setting up a Transition Lab fostering collaboration between their students and their ecosystems of stakeholders (teachers, companies, local associations, public institutions, other schools...)
- *Territorial Transition Labs:* Several organizations, regional clusters in the same territory are collaborating to foster transitions in their own context. They identify together a series of challenges and define a joint program of activities involving relevant targets, from students, companies, citizens
- *International Transition Labs:* Partners across countries jointly collaborate to build knowledge and organize (open) events to foster transitions in the T & F sector.

You are interested in creating a TLAB ?

Be inspired and connect with existing TLAB communities

Take a look at the section "How to design and run a TLAB"

Figure 17: What is a TLab? Panel in TLAB guideline

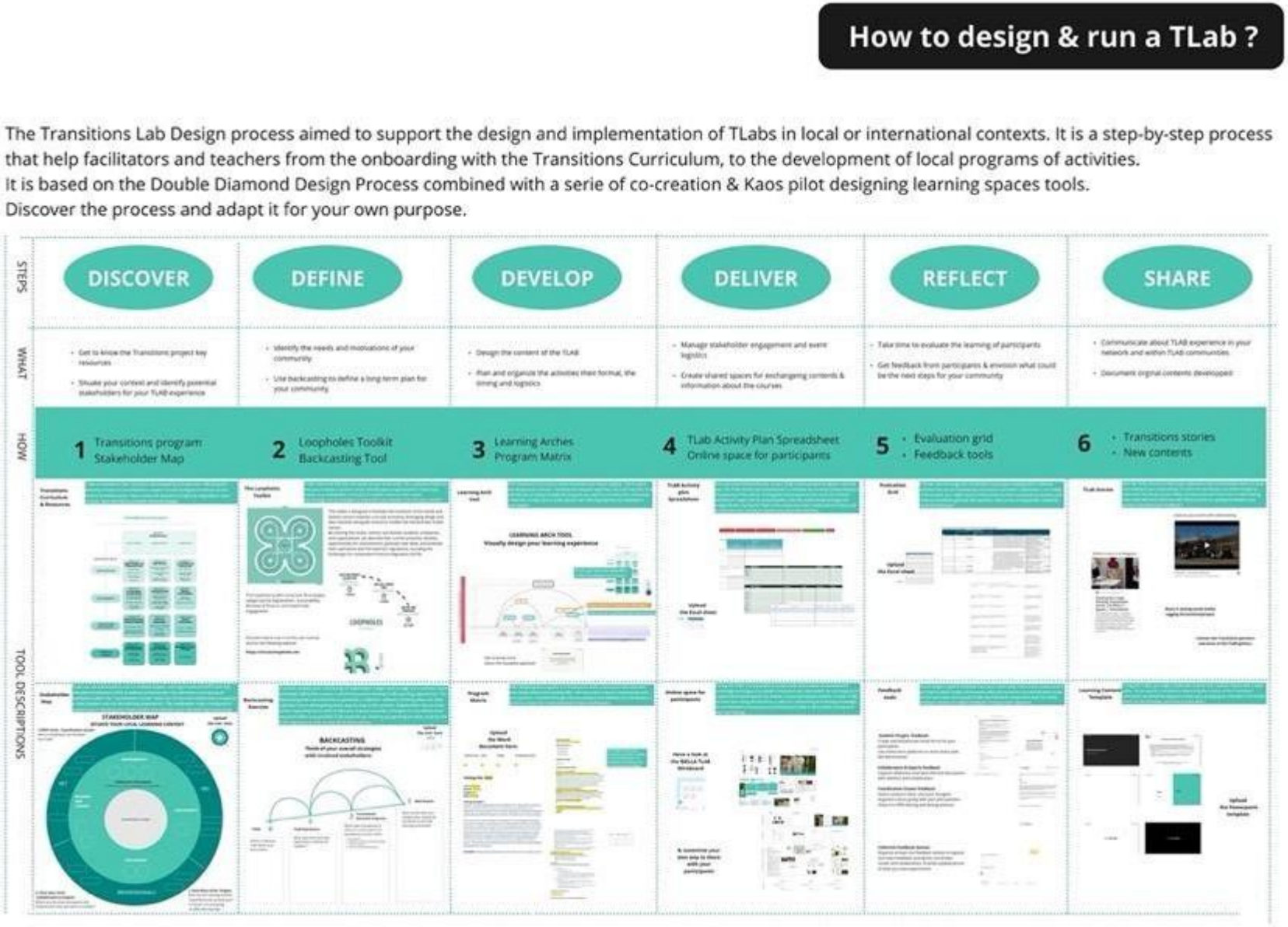


Figure 18: How to design and run a TLAB – panel in TLAB guideline

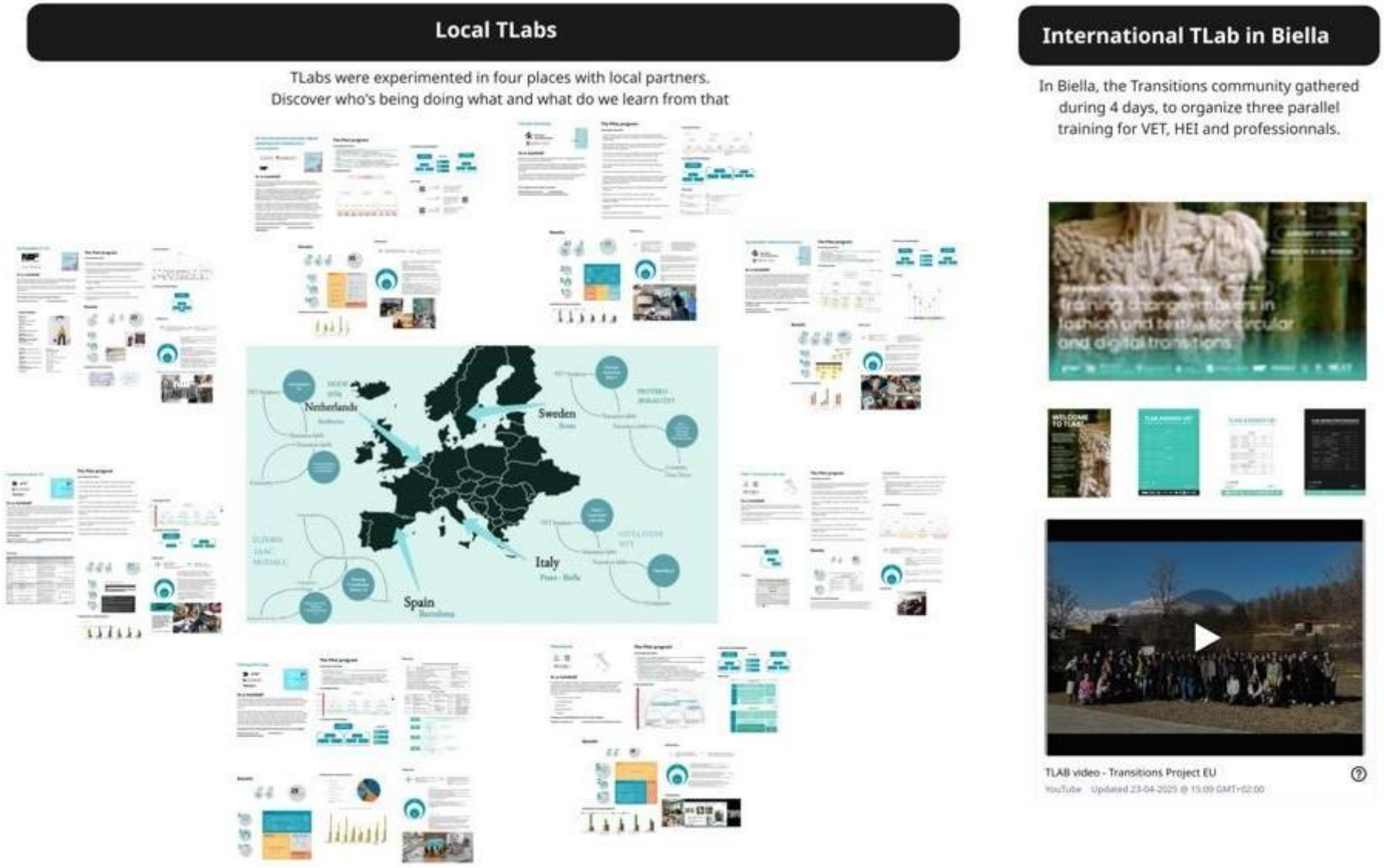


Figure 19: TLABs gallery – panel in TLAB guideline

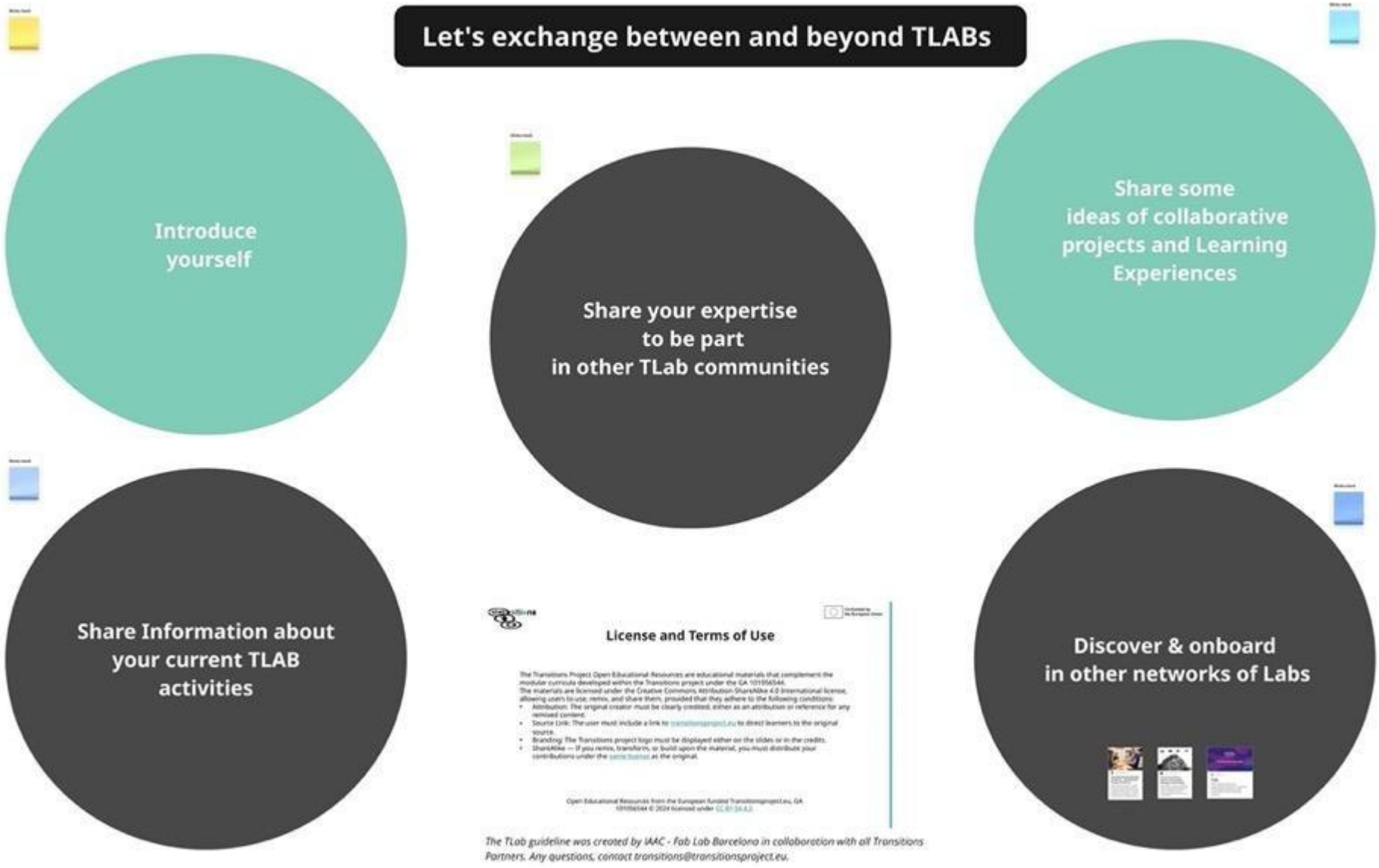


Figure 20: Open space for TLAB communities – panel inTLAB guideli

6.2 The Loopholes Toolkit

Loopholes is a Transitions Roadmap toolkit designed to help companies and students adopt systemic innovation, digital transformation, and circular business strategies. It enables users to identify skill gaps, explore data interoperability, develop roadmaps for digital technology adoption, and evaluate sustainable business opportunities.

Beyond fashion and textiles, the toolkit supports planning for traceability, technology integration, and cybersecurity. It aligns with the EU's Textiles Transition Pathway and the Transitions Project, helping companies meet circular economy goals. It also equips students with the foresight to strategically upskill in areas such as digital manufacturing and fabric digitalization. More broadly, Loopholes serves as a systemic innovation guide, allowing other industries to draw parallels and adapt its principles to drive their own transformation.

The Loopholes Toolkit is a central pedagogical asset. Designed to encourage systems thinking, critical reflection, and collaborative problem-solving, it enables learners to map, identify, and act upon gaps and opportunities within the textile and fashion ecosystem. Integrated directly into several modules, it empowers users to engage with real-world transitions dynamically. You can find a description of how this tool was used to develop the project and how it can be used in the future in chapter 5.1. The toolkit is available on the Transitions website https://transitionsproject.eu/loopholes-toolkit/.

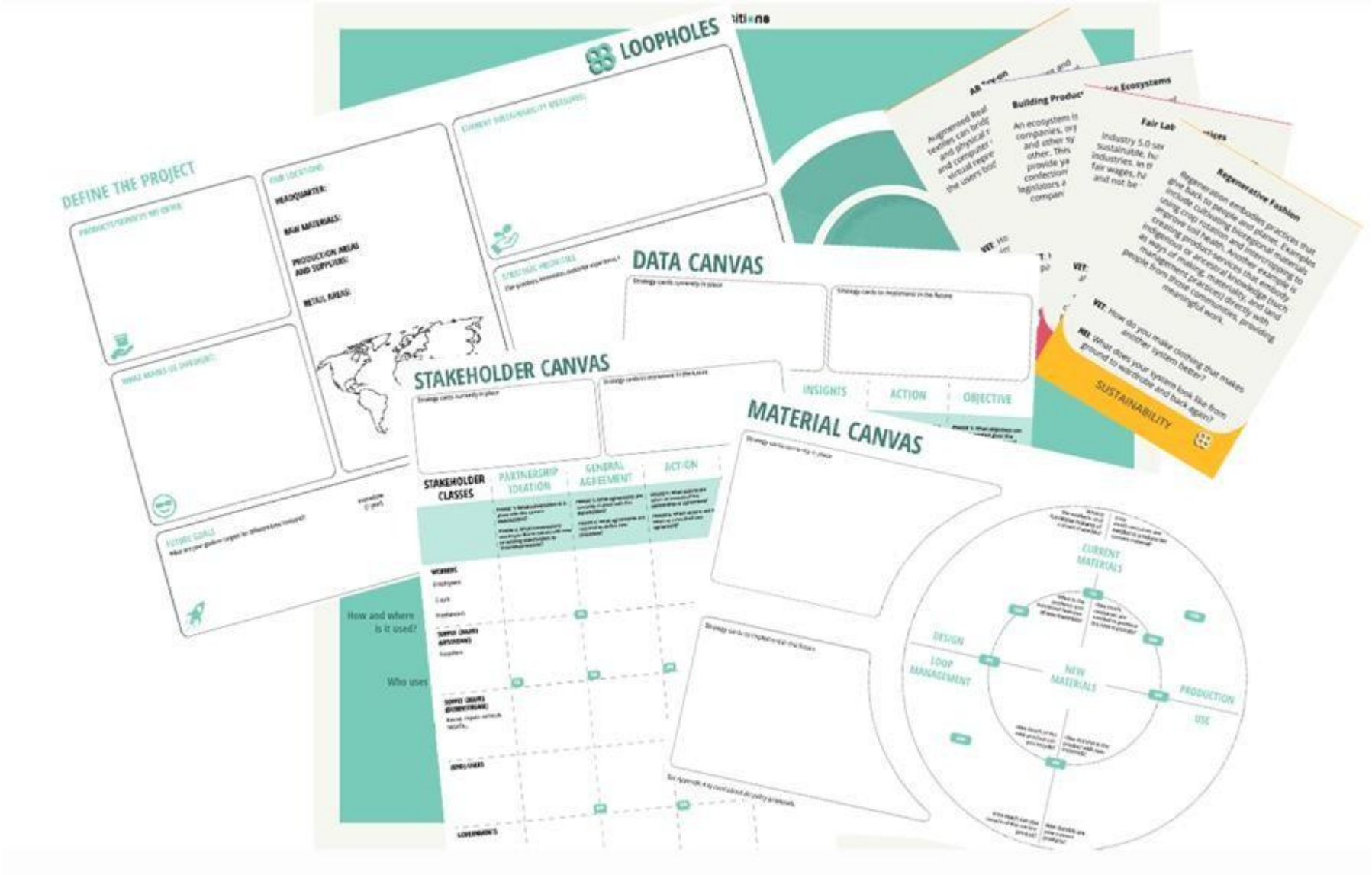


Figure 21: Loopholes Toolkit board, strategy cards and canvases

6.3 Training Material

During the curriculum testing sessions at TLABs in each country, as well as during the online Train the Trainers (ToT) sessions, Transitions partners developed teaching materials in PowerPoint format. These presentations will be made available to the textile and fashion education community on the Transitions website to aid in course delivery. This initiative aims to enhance the outreach of the Transitions project and ensure its sustainability after the project's conclusion.

Table 2: List of Knowledge areas presentations

Knowledge Areas Presentations
1. Digitalization knowledge area
2. Sustainability knowledge area
3.stakeholder engagement knowledge area
4.business and finance knowledge area

Table 7: overview of the presentations categories

KNOWLEDGE AREA	MODULE	LEARNING UNIT	RELATED FILES
INTRODUCTORY TRANSVERSAL MODULE	MODULE 1. DESIGN RESEARCH	SYSTEMIC THINKING	• M01-LU Systemic Thinking-Systemic Design 1 • M01-LU Systemic Thinking-Systemic Design 2
		RESEARCH METHODS	• M01-LU Research Methods-Research Methods
		DESIGN THEORIES	• M01-LU Design Theories-Design Methodologies
DIGITALIZATION	MODULE 2 - DIGITAL DESIGN AND PRODUCTION TOOL	DIGITAL WORLDS	• M02-LU Digital Worlds-3D Digital Fashion Design • M02-LU Digital Worlds-Virtual Sampling • M02-LU Digital Worlds-Digitalization • M02-LU Digital Worlds-Digital Design for Circular Practices

			• M02-LU Digital Worlds-Digital Design Studio • M02-LU Digital Worlds-Fashion Design from Real to Virtual and Vice Versa
		DIGITAL PRODUCTION	• M02-LU Digital Production-Digital design for zero waste
	MODULE 4 - TRACEABILITY AND SORTING TOOLS	DIGITAL PRODUCT PASSPORTS	• M04-LU Digital Product Passport-Digital Product Passports • M04-LU Digital Product Passports-EPR&DPP • M04-LU Digital Product Passports-Circular Textiles 2031 • M04-LU Digital Product Passports-Sustainability certification in the textile sector
SUSTAINABILITY	MODULE 5 - SUSTAINABILITY FUNDAMENTALS	FROM SUSTAINABLE TO CIRCULAR MATERIALS	• M05-LU From Sustainable to Circular Materials-From sustainable to circular materials • M05-LU From Sustainable to Circular Materials-What is Textile • M05-LU From Sustainable to Circular Materials-Sustainable Development
		EXTENDING LIFECYCLES	• M05-LU Extending Lifecycles-Circularity • M05-LU Extending Lifecycles-Inèdit 1 • M05-LU Extending Lifecycles-Inèdit 2
	MODULE 6 – CLOSING THE LOOP	WASTE REDUCTION	• M06-LU Waste Reduction-Waste reduction
		EXTENDED PRODUCER RESPONSIBILITY	• M06-LU Extended Producer Responsibility-Waste Journey • M06-LU Extended Producer Responsibility-EPR&DPP
		CIRCULAR DESIGN STRATEGY	• M06-LU Circular Design Strategy-R-Ladder • M06-LU Circular Design Strategy-Design for disassembly • M06-LU Circular Design Strategy-Circular Design Strategy • M06-LU Circular Design Strategy-Strategies for Circular Design

	MODULE 7 – BEYOND SUSTAINABILITY	MORE THAN HUMAN DESIGN	• M07-LU More than Human Design-More than Human Design • M07-LU More than Human Design-More Than Human • M07-LU More than Human Design-More than Human Workshop
		REGENERATIVE FASHION	• M07-LU Regenerative Fashion-Systemic Design 2 • M07-LU Regenerative Fashion-Regenerative Materials • M07-LU Regenerative Fashion-Fashion and sustainability
STAKEHOLDER ENGAGEMENT	MODULE 8 - ETHICAL ECOSYSTEM & SOCIAL PROSPERITY	SOCIOECONOMIC AND GOVERNMENTAL FACTORS	• M08-LU Socioeconomic and Governmental Factors- Socioeconomic and Governmental Factors
	MODULE 9 - USER AS A STAKEHOLDER	USER BASED INNOVATION	• M09-LU User based innovation-User as a stakeholder
	MODULE 9 - USER AS A STAKEHOLDER	FLUID FASHION CONSUMPTION	• M09-LU Fluid Fashion Consumption-Consumers and service provision
	MODULE 10 - GLOCAL PARTNERSHIPS	ECOSYSTEM ECOLOGIES	• M10-LU Ecosystem Ecologies-Business Models • M10-LU Ecosystem Ecologies-Business Models 2 • M10-LU Ecosystem Ecologies-Supply Chain Reconfiguration Exercise • M10-LU Ecosystem Ecologies-Local Community
		SHARED GOVERNANCE	• M10-LU Shared Governance-Shared Governance
BUSINESS AND FINANCE	MODULE 11 - MANAGEMENT AND COMMUNICATI-ON	MANAGEMENT TASK ALLOCATION	• M11-LU Management Task Allocation-Management Task Allocation

	MODULE 12 - SUSTAINABLE BUSINESS MODELS	COLLABORATIVE CONSUMPTION	• M12-LU Collaborative Consumption-Circular Business Models • M12-LU Collaborative Consumption-Group Project BMC • M12-LU Collaborative Consumption-Collaborative Consumption • M12-LU Collaborative Consumption-The Zara case exercise
	MODULE 13 - STRATEGIC AND FUTURE THINKING	RE-POSITIONING	• M13-LU Repositioning-Repositioning • M13-LU Repositioning-Sustainable trend research • M13-LU Repositioning-T&C Scenario

Case Studies Presentations

The following are presentations developed by the companies that participated in the different Transitions Pilots (TLABs).

MODULE 06 Closing the Loop (Spain, Pilot 2)

- M06-FITEX
- M06-Retexcycle
- M06-Solidança
- M06-Infinite Denim
- M06-ECOBULK & NOW LET'S GO

MODULE 11 Closing the Loop (Spain, Pilot 2)

- M11-Sylvia Calvo

MODULE 10 Glocal Partnerships (Italy, final Transitions Lab)

- M10-Artknit
- M10-Biella The Wool Company
- M10-Slow Fiber
- M10-Overview of Biella Textile District
- M10-Technologies for Textile Sorting

Materials for trainers

The following presentations are part of the train-the-trainers sessions developed within the Transitions project to support educators and trainers in discovering important elements of the Transitions Training program:

- Learning Arches
- Learning Pathways Design Approach
- Quality Guidelines
- Quality Guidelines and Evaluation in Transitions
- Quality Guidelines and Indicators for Trainers
- Teaching Methodologies

The Loopholes Toolkit - Video Presentation

- Video presentation of the Loopholes Toolkit and how to use it.

6.4 Curriculum Guidelines

The curriculum guidelines represent a pivotal component of the Transitions project, designed to serve as a comprehensive and accessible tool for educators and facilitators. Presented in a visually engaging and graphically structured format, the curriculum guidelines offer an in-depth understanding of the curriculum's architecture, enabling its effective implementation across a range of educational contexts.

This resource aims to support users in navigating the modular structure of the Transitions curriculum framework, clarifying how its various components—knowledge areas, modules, and learning units—can be adapted and combined to suit diverse pedagogical needs. Through illustrative examples, practical suggestions, and a curated selection of frequently asked questions, the Guidelines provide clear, actionable learning pathways for integrating the curriculum into both formal and non-formal learning environments. By clarifying the flexible nature of the curriculum and offering application strategies, the guidelines are intended to empower educators to make informed decisions on how best to deploy the Transitions curriculum content.

Whether applied in Higher Education Institutions, Vocational Education, or professional development programs, the guidelines aim to ensure the curriculum is both accessible and relevant to the context. The curriculum guidelines can be found in the annexes of this document.

6.5 Teaching Methodologies - Glossary

Introduction

The Transitions program adopts a set of teaching methodologies specifically designed to support collaborative learning, critical reflection, and systems thinking within the textile ecosystem. Rather than relying solely on traditional instructional formats, this program embraces a participatory and experiential approach. These methodologies are chosen to align with the program's core values: fostering dialogue across stakeholders, encouraging innovation, and empowering learners to co-create sustainable futures.

They are designed to adapt to various learner profiles and group dynamics. They include structured group exercises, guided reflection, project-based scenarios, and the use of interactive tools such as canvases, strategy cards, and mapping techniques. These methods are embedded in a flexible framework that allows facilitators to adapt the pace and depth of exploration according to the specific needs of each group. This methodological approach is grounded in the belief that learning is most effective when it is active, situated, and shared. By engaging with real-world challenges and collaboratively exploring transition strategies, participants not only build knowledge but also develop agency and resilience in navigating change within the textile and fashion sector. In the section dedicated to the three different pathways, HE, VET and Professionals (chapter 5.4) you can find the specific teaching methodologies described above. Additionally, a glossary has been included in the annexes.

7. Glossary of Terms

Assessment: tools and methods used to measure student learning and evaluate their progress towards achieving the learning objectives.

Attitudes: predispositions or tendencies that individuals have toward certain ideas, objects, people, or situations. Attitudes influence how individuals feel, think, and behave and can significantly impact learning, performance, and interaction with others. Attitudes encompass elements like motivation, willingness to engage or learn, and openness to change.

Competences: combine skills, knowledge, and other attributes (such as attitudes and behaviors) that enable individuals to perform their roles effectively. Often, we measure competences by an individual's ability to apply their skills and knowledge in practical situations to achieve desired outcomes.

Generic Competences: often referred to as generic skills or soft skills, are broad abilities and traits that are valuable across a wide range of jobs and life contexts (problem-solving, critical thinking, teamwork, etc.).

Generic Modules: Systemic Approach to T&F Design; Research Methods; Data Literacy.

Knowledge Area: Sustainability, Digitalization, Stakeholder Engagement, Business and Finance.

Knowledge relates to the theoretical understanding, information, and facts that individuals possess in a particular area. It's about knowing "what" and "why"—for instance, understanding the principles behind a scientific theory or the historical context of an event.

Learning Module: it is a group of learning units to create a thematic training course.

Learning Outcomes: define the goals that students are expected to achieve by the end of the course or program. These objectives guide the content, teaching methods, and assessments used in the curriculum.

Learning Pathways: structured sequences of educational experiences (courses and activities) to achieve specific competences (skills, knowledge and attitudes).

Learning Unit: it is a component of a curriculum designed to provide a coherent block of content or skills development focused on a specific topic or area of study.

Skills: refer to the practical abilities or techniques that individuals acquire and develop through practice and training. Skills enable people to perform specific tasks effectively. They can be hard skills, such as coding or machinery operation, or soft skills, like communication or teamwork.

Specific Competences: also known as technical skills or hard skills, are the abilities and knowledge necessary to perform specific tasks related to a particular job or profession.

Teaching Material: books, digital resources, multimedia, and other materials that support teaching and learning (PowerPoint presentations of each LU from the TOT sessions).

Teaching Methodologies: strategies and techniques used to engage students in the learning process. The course can include lectures, discussions, project-based learning, hands-on activities, and the use of technology.

8. References

The following list includes core references that have been foundational to the design, development, and validation of the Transitions curriculum and training program. These references reflect key strategic, methodological, and sectoral frameworks relevant to the goals of sustainable and digital transformation in the textile and fashion sectors.

Strategic and Policy References

- European Commission (2020). A New Industrial Strategy for Europe. COM(2020) 102 final.
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- Forlizzi, J. (2013). Provenance, Quality and Relevance of Design Research: A Research Manifesto. Carnegie Mellon University.
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- Murzyn-Kupisz, M., & Hołuj, D. (2021). Designing Sustainability in Fashion Education: Policy and Practice Perspectives.
- TRANSITIONS Project Consortium. (2022–2025). Technology, Sustainability & Industry Toolkit Map and Content Definition. Deliverable D3.1.
- TRANSITIONS Project Consortium. (2022–2025). Quality Guidelines for Training Implementation. Deliverable D4.5.

Related Transitions Deliverables

- D2.1: Mapping of Sectoral Needs and Stakeholders
- D2.2: Technology, Sustainability & Industry Toolkit Map and Content Definition
- D3.1: Curriculum Structure, Learning Units and Knowledge Areas Framework
- D3.2: Methodological Guidelines for Modular Curriculum Development
- D3.3: Loopholes Toolkit and Guidelines for Participatory Co-Creation
- D4.1: Preliminary Curriculum Testing and Pilot Framework
- D4.3: Interim Evaluation Report on T-Labs Testing Activities
- D4.5: Quality Training Guidelines
- D5.2: Dissemination and Exploitation Strategy and Plan (for sustainability and broader use context)

Note on Additional References

Each Learning Unit developed within the Transitions curriculum includes a tailored set of bibliographic and pedagogical references relevant to its specific topic area. For detailed citations and source material underpinning the training content, users are referred to the individual learning units in section 5.3.2 of this deliverable.

9. Conclusions

This deliverable consolidates the final outcomes of the Transitions project, an educational initiative designed to support the systemic digital and sustainable transformation of the textile and fashion industry. The work reflects the culmination of a co-design process by all the Transitions partners involving mapping, piloting, evaluation, and iterative development of a training program addressing HE, VET and Professionals educational levels.

Key achievements of the project include:

- The mapping and analysis of textile materials, sustainability and circularity, and technology and digital tools for Industry 4.0. The mapping of the market and industry needs, the definition of the training profiles, and the collaborations map of the textile and fashion European landscape.

- The establishment of a comprehensive and adaptable modular curriculum framework composed of 13 modules and 34 learning units; each aligned with specific competencies and EU policy priorities.

- The development of the Loopholes Toolkit: a participatory curriculum design and scenario-building tool aimed at supporting learning contextualization and stakeholder engagement.

- The development of tailored learning pathways for three target groups—Higher Education (HE), Vocational Education and Training (VET), and Professional Learners—each addressing distinct needs, profiles, and institutional contexts.

- The implementation and validation of the curriculum through localized Transition Labs (TLABs) across four countries, incorporating real-world challenges and policy frameworks into the training ecosystem.

- The provision of training materials for open educational resources, including a glossary of teaching methodologies, curriculum guidelines, the Loopholes Toolkit, and TLABs Design Frameworks, for broader dissemination and use by educational institutions and professional training providers.

In summary, this deliverable marks the completion of the curriculum development under WP4. It lays the foundation for future use, local adaptation, and integration within both formal and non-formal education systems. The final curriculum is aligned with current EU priorities—including the European Skills Agenda, Green Deal, and Digital Education Action Plan—and provides an adaptable model for training innovation in circular fashion and textiles.

The next steps will focus on dissemination, institutional adoption, and ensuring long- term sustainability beyond the project's duration, leveraging the Transitions platform and strategic partnerships formed throughout the European funded initiative.

10. Annexes

- Training Material Presentations
- Glossary of Teaching Methodologies
- Curriculum Guidelines
- TLABS tools

Please use the following link to download all the annexes. The link will remain available until the 22 of June 2025.
https://we.tl/t-DMobLQRWiw

11. Feedback from Partners on D4.6

FEEDBACK SUMMARY TRANSITIONS PARTNERS ON D4.3			
FEEDBACK AREAS	STRENGHTS	WEAKNESSES / IMPROVEMENT NEEDS	ACTION TAKEN
Content	Good overview of the project results.	The structure could be clearer and maybe explained in the introduction in more detail. Also the consistency in e.g. the references in the LU's could be looked at	Update of the structure and the consistency across the whole document.