



D2.3 Learning Paths: Final Report

Shemakes.eu 101006203 Deliverable n. 2.3

Delivery Date: 31 August 2022



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101006203.

The views expressed herein reflect those of the author and the Shemakes consortium; the EU/Commission is not responsible for any use that may be made of the information it contains.





Deliverable

Project acronym:	shemakes.eu
Grant agreement n.	101006203
Project title:	Opportunity ecosystems bridging the gender gap
Deliverable number	D2.3
Deliverable title	Learning Paths: Final Report
Version	0.8
Date	29 August 2022
Authors	Marion Real, Anastasia Pistofidou (IAAC); Nuria Robles (LEON); Shannon Sykes (ONLFAIT); Beatriz Sandini, Ista Boszhard, Cecilia Raspanti (WAAG)
Reviewers	Adriana Cabrera (MATRIX); Kerstin Junge (TIG); Alexandra Korey (FLOD)
Dissemination level	PU: Public



Executive Summary

The shemakes.eu project aims to empower future female innovators of the sustainable textile and clothing industry through inspiration, skills, and networks. Partners use a three-pronged approach to reach this goal, providing innovative learning paths for girls and women of various ages, concrete business support and connections, and inspiring stories of female role models.

This deliverable focuses on reporting the learning activities carried out in the Transfer Labs (Transfer Labs) for the three targets that are key to WP2: Curiosity (8–18-year-olds), Discovery (18–25-year-olds) and Innovation (25+ year-olds) during the second phase of the project (January 2022 – June 2022).

This document was directed by IAAC as coordinator of WP2 and co-created with the direct partners, especially the three task leaders (T2.2 – LEON, T2.3 – ONLF, T2.4 – WAAG).

The **first chapter** provides an overview of the WP goals, advancements, and methods of organisation, and lists the activities carried out between and by the Shemakes labs.

The **second, third and fourth** chapters explain the details of activities run for each of the three learning paths: Curiosity, Discovery, and Innovation, supported by key lessons learned.

The **last chapter** presents an analysis of the work completed and future steps for the project.

The **more tangible results** are summarised as follows:

- **12 Transfer Labs** have joined in Phase 2 and proposed more than **45 activities** with the participation of more than **400 people**.
- Important support was provided by the **partner labs, gurus, and Ambassadors to foster exchange** both internal and external to the Shemakes ecosystem.
- The Learning Paths models and tools were tested in different European contexts with **various target groups and a rich diversity of labs and stakeholders** from schools, educational centres, universities, museums, rural wool companies or business companies.



- The activities proposed (tested in Phase 1 of the project and made accessible), most specifically the **tech-based workshops of the Curiosity and Discovery paths**, were **easily replicable in all countries involved**.
- The strength of Transfer Labs in the **Innovation path** was the deep understanding of their local context from which they adapted their path to the needs of their community, translating it into a range of activities that actively promotes and supports the improvement towards **employability (Explore, Network, Encourage, Mentor)**.
- A specific success story emerged for each of the paths: **E-monsters in Curiosity, Biomaterial Fabrication in Discovery, and Interviews in Innovation**.
- All Transfer Labs brought new examples, reflections and experiences to make the Shemakes ecosystem more **equal, collaborative, welcoming difference, empowering, and inspiring**.

By proposing a series of activities at the intersection between textile and technologies, Shemakes labs **succeed in reinforcing the gender balance within open technological places** and raising insightful gender findings:

- **Highlighting the importance of looking at gender across generations**, welcoming the difference in each generation and valorising what each can bring during the learning activities whatever their age.
- **Working with and overcoming gender stereotypes**, before, during, and after the learning activities.
- **Recognizing the presence of emerging bubbles outside gender realities**, groups of tech students in an academic context that could distance themselves from gender constraints.
- **Promoting active listening and mutual support** in extended learning ecosystems including labs, partners, and stakeholders.

Overall, the Shemakes network proposes a wider agenda that brings new skills, diverse audiences, and more women into the lab context. It builds upon the methodologies of Fabricademy, TCBL, and the wider textile and Fab Lab network of open sourced and shared knowledge and brings a value proposition to implement in the Shemakes innovation ecosystem. All the activities run in Phase 2 and presented in this deliverable are currently being documented in the Shemakes open toolkit, illustrating the compilation of a series of workshops, activities, methodologies, and best practices that can be a starting point for anyone who wishes to create a more inclusive and diverse enabling lab environment.



Table of Contents

Executive Summary.....	3
Table of Contents.....	5
List of Tables.....	7
List of Figures.....	9
1. INTRODUCTION.....	11
1.1. Context and Objectives from the DoA.....	11
1.2. Methodology.....	12
Learning Path Toolkit revisions (October 2021 - January 2022).....	13
The Transfer Labs.....	15
Overview of WP2 Phase 2 activities.....	20
Supporting Phase 2 Transfer Labs.....	22
Data collection for deliverable 2.3.....	26
1.3. Activities and reach.....	27
Summary of all activities.....	27
Reach of activities.....	31
2. Curiosity Path.....	32
2.1. Update on the Path.....	32
Recap of Curiosity path.....	32
Task management in phase 2.....	32
Ethics and the Curiosity Path.....	33
Description of activities.....	34
2.2. Key Learnings and Reflections.....	48
General Outcomes.....	48
Gender Vision findings.....	51
Reflections on labs' capability and on Ambassadors.....	53
Future Actions.....	54
3. Discovery Path.....	56



3.1. Update on the Path.....	56
Recap of Discovery path.....	56
Task management and data collection in phase 2.....	57
3.2. Description of activities.....	58
Green Fabric: collaboratively testing new activities	59
Rog Centre: a series of Biomaterial events.....	62
TPL: two weeks of activities with university students	66
VIVISTOP: 3 consecutive days around E-Garments.....	70
Icelandic Textile Center, a series of open workshops.....	73
3.3. Key Learnings and reflections for the Discovery Path.....	79
General Outcomes	80
Gender Vision findings.....	84
Reflection on labs' capabilities on conducting activities, creating partnerships and on Ambassadors' roles.....	85
Future actions.....	87
4. The Innovation Path.....	89
4.1. Updated description	89
4.2. Description of activities.....	90
Overview of the Transfer Labs' Innovation path activities.....	91
Documenting & Reporting on Existing Activities.....	92
Documenting & Reporting on New Activities.....	105
4.3. Future Actions	111
5. Conclusion and outlook	112
5.1. Highlights	112
Testing and adapting the activities for various contexts	112
Consolidating Learning path contents.....	113
Shemakes learning paths, a success for onboarding labs in textile and for offering diversification.....	115
Role Models & Cooperation in learning paths	115
Gender findings	117
5.2. Future steps.....	119
Document information	120



List of Tables

Table 1. Distribution of tasks by Transfer Labs	15
Table 2. Detailed list of Lab activities	28
Table 3. Summary of reach by task in phase 2 activities.....	31
Table 4. E-monster activity description.....	35
Table 5. E-slippers activity description.....	36
Table 6. Sew tote bag activity description.	37
Table 7. Sanded T-shirt activity description.....	38
Table 8. E-hero activity description.	39
Table 9. Modular tote bag activity description.....	40
Table 10. E-monster at the museum activity description	41
Table 11. E-SDGs activity description.....	42
Table 12. Digitalizing looms activity description.....	43
Table 13. Textile waste composite activity description.....	44
Table 14. E-dancing shoes activity description.	45
Table 15. Introduction to new textiles activity description.	46
Table 16. International Day of Girl and Woman in Science activity description.	47
Table 17. Feedback on participants' experience by each Transfer Lab.....	49
Table 18, Gender vision findings by each Transfer Lab.....	52
Table 19. Reflection on Labs capability and Ambassadors.	53
Table 20. Comments on next steps by each Transfer Lab.....	54
Table 21. Modular fashion activity description	60
Table 22. Textile and coding activity description	61
Table 23. Knitting machine hack activity description.....	62
Table 24. Online international symposium on Innovative biomaterials in design – description.....	63
Table 25. Cellulosic biomaterials workshops description.....	64
Table 26. Biobased materials workshops description.	65
Table 27. Yarn to textile and Exploring fibres, creating yarns workshops description. .	66
Table 28. E-textile playground workshop description.....	68
Table 29. Smart stitches workshop description	69
Table 30. Thermochromic fabric dyeing workshop description.....	70
Table 31. Draping/moulage technique workshop description.....	71
Table 32. E-garments workshop description.....	72



Table 33. Clo3D online workshop description.....	73
Table 34. Biomaterials workshop description.....	75
Table 35. Soft robotics workshop description.....	76
Table 36. Rhino + Grasshopper + 3D printing workshop description	77
Table 37. Bacterial dyes workshop description	78
Table 38. Experience of the Transfer Labs on discovery path activities	83
Table 39. Gender Vision findings of each transfer lab.....	84
Table 40. Goal and description of Innovation path areas.....	91
Table 41. Documenting the existing Innovation path activities.....	92
Table 42. Lab context & Activity description.....	93
Table 43. Approaches to local innovation.....	94
Table 44. Outcomes & Key learnings.....	95
Table 45. Gender vision findings.....	96
Table 46. Activity description.....	98
Table 47. Approaches to local innovation.....	99
Table 48. Key outcomes on gender and innovation.....	99
Table 49. Reflection on Labs' capability.....	100
Table 50. Lab context & activity description.....	101
Table 51. General outcomes.....	102
Table 52. Gender vision findings.....	103
Table 53. Reflection on lab's capability.....	104
Table 54. Industry visits activity description.....	106
Table 55. Opportunity newsletter activity description.....	107
Table 56 Shemakes values and Learning paths.....	118



List of Figures

Figure 1. Toolkit illustration for the Discovery path.....	13
Figure 2. Structure of the Learning Path section of the toolkit.....	14
Figure 3. Summary of WP2 Phase 2 activities	21
Figure 4. Timeline of the process.....	22
Figure 5. Miro board extract: Lab blueprint.....	23
Figure 6. Miro board extract: Lab matrix of activities.....	24
Figure 7. Miro board extract: Pitch your idea and Illustrate values.....	25
Figure 8. Miro board extract : Activity canvas.....	25
Figure 9. Miro board extract: Interaction between gurus and Ambassadors and Ambassadors profile map.....	26
Figure 10. Overview of Curiosity path activities.....	34
Figure 11. E-monster activity pictures.....	35
Figure 12. E-slippers activity pictures.....	36
Figure 13. Sew tote bag activity pictures.....	37
Figure 14. Sanded T-shirt activity pictures.....	38
Figure 15. E-hero activity pictures.....	39
Figure 16. Modular tote bag activity pictures.....	40
Figure 17. E-monster at the museum activity pictures.....	41
Figure 18. E-SDGs activity pictures	42
Figure 19, Digitalizing looms activity pictures.....	43
Figure 20. Textile waste composite activity pictures.....	44
Figure 21. E-dancing shoes activity pictures.....	45
Figure 22. Introduction to new textiles activity pictures.....	46
Figure 23. International Day of Girl and Woman in Science activity pictures.....	47
Figure 24. Word clouds summarising the importance of STEM.....	47
Figure 25. Key learnings of phase 1.....	57
Figure 26. Overview of Discovery path activities in Phase 2.....	58
Figure 27.Modular fashion activity pictures.....	59
Figure 28. Textile and coding activity pictures.....	61
Figure 29. Knitting machine hack activity pictures.....	61
Figure 30. Online international symposium on Innovative biomaterials in design – pictures.....	63
Figure 31. Cellulosic biomaterials workshops pictures.....	64



Figure 32. Biobased materials workshops pictures.....	65
Figure 33. Yarn to textile and Exploring fibres, creating yarns workshops pictures.....	66
Figure 34. E-textile playground workshop pictures.....	68
Figure 35. Smart stitches workshop pictures.....	69
Figure 36. Thermo-chromic fabric dyeing workshop pictures.....	70
Figure 37. Draping/moulage technique workshop pictures.....	71
Figure 38. E-garments workshop pictures.....	72
Figure 39. Clo3D online workshop pictures.....	73
Figure 40. Biomaterials workshop pictures.....	74
Figure 41. Soft robotics workshop pictures.....	76
Figure 42. Rhino + Grasshopper + 3D printing workshop pictures	77
Figure 43. Bacterial dyes workshop pictures.....	78
Figure 44- Contribution by the transfer labs to the project	79
Figure 45. Innovation Path Activity's Model.....	90
Figure 46. Transfer Labs customised action plan for Innovation path.....	92
Figure 47. Fragment of the Career Mapping done by FarmLab on Miro board.....	97
Figure 48. Adaptation of the Career Mapping at Ziphouse's Fashion Brunch event.....	97
Figure 49. Adaptation of the Career Mapping at Ziphouse's Fashion Brunch event.....	98
Figure 50. Key collective pictures of the activity.....	101
Figure 51. Key collective pictures of the activity.....	105
Figure 52. Key collective pictures of the activity	109



1. INTRODUCTION

1.1. Context and Objectives from the DoA

WP2 aims to define and test Learning Paths from young girls to women innovators, incorporating elements of the Fabricademy courses into existing projects and curricula for three age groups. This WP:

- Adapts, expands, and diversifies the Fabricademy model and tools for curricular pathways for different age groups and gender targets.
- Develops and deploys the Curiosity path for girls aged 8-18 in collaboration with schools, museums, etc. The nature of the activities developed for the Curiosity path ranges from 3-hour workshops in collaboration with cultural institutions to after-school programs conducted in Fab Labs promoting girls in STEM.
- Develops and deploys the Discovery path for young women aged 18-25 in collaboration with academies, universities, etc. The nature of the activities developed for the Discovery path range from workshops conducted in museums to modules that are offered to existing University programs.
- Develops and deploys the Innovation path for women ages 25 and up in collaboration with T&C businesses, research and training institutes or start-up and accelerator programmes. The nature of the activities developed for the Innovation path range from interviews to women innovators to inspiring talks and gatherings.

The project runs in 2 loops of implementation. The first loop was initiated in 2021 with the 6 partner labs (IAAC, WAAG, LEON, ONLFAIT, REDU, MAKE) who developed, ran, and documented a series of activities for each path. The second loop started in 2022 with 12 additional Transfer Labs who have replicated, adapted, and contributed to activities from 3 paths supported by the partner labs, Shemakes Ambassadors, lab gurus and the online open access documentation of the Shemakes toolkit.

For WP2, these two loops led to the following deliverables:

- *D2.1 Learning Paths: Launch Toolkit* draws the first skeleton of the three Learning Paths (Curiosity, Discovery, Innovation), providing a set of contents to the 6 core Shemakes Labs so they could start their learning experiences



and creating a methodology for crafting their intervention and co-producing new and original contents *in itinere*. The 6 partner labs shared and exchanged best practices, the Fabricademy curricula was revisited, and the activities were developed and tested.

- *D2.2 Learning Paths: Interim Report* describes and synthesises the results of the first phase of the Learning Paths, reports on the results of the activities of the six partner Labs and provides an updated version of the Learning Path Toolkit.
- *D2.3 Learning Paths: Final Report*, this document, describes, and synthesises the results of the second phase of the Learning Paths on the activities and engagement realised with the 6 core Labs collaborating with the 12 Transfer Labs.

1.2. Methodology

After delivering D2.2, WP2 partner labs were engaged in creating and revising the documentation of the learning paths to make them accessible for the Transfer Labs. In parallel, as *D1.2, Shemakes Network* will report in detail, WP2 partners joined all Shemakes partners to support network development activities (T1.3) and cooperated in the Open Call to select 12 new labs, applying criteria aligned with WP2's objectives. After successfully selecting the labs, all partners worked closely on designing the onboarding process and supporting the new Transfer Labs in planning and running their activities. This process has been shaped in four main steps: 1) Connect and Explore; 2) Prepare; 3) Act; 4) Reflect and Report; and finally, Celebrating the collective work achieved (5).

Each WP2 task engaged at least 4 Transfer Labs distributed according to their interests expressed during the selection process. Task leaders (LEON for Curiosity Path, ONLF for Discovery Path and WAAG for Innovation Path) oversaw guiding and helping Transfer Labs to frame, plan, run, and report and were free to use an adapted mode of management according to the objectives of the task and the contexts. Moreover, during the Transfer Labs onboarding meetings, interactions between gurus and Transfer Labs were created and helped in guiding the Transfer Labs to understand and choose from the existing activities and topics.

Altogether, from January to June, Partners, Labs, and Transfer Labs took part in Shemakes - Phase 2 with regular meetings in plenary sessions alternating meetings by task group (Curiosity Path, Discovery Path, and Innovation Path) with one-to-one



lab meetings to work in greater depth with the four Transfer Labs and their dedicated tasks.

Learning Path Toolkit revisions (October 2021 – January 2022)

Between October 2021 and January 2022, all WP2 partner labs contributed to finalise the documentation before starting Phase 2 and onboarding the Transfer Labs. They revised the Toolkit to make both the structure and the contents more readable and accessible to the Transfer Labs who were to use it. The main page now presents a matrix of activities by path, with an illustration of each activity with a title (see figure below), helping the reader to visually explore the content and choose the activity they wish to replicate.

Maker Clubs	Fashion and technology Weeks	Biomaterial Workshops
Rosin Biocomposites	3D printed potatoes	Alginate Bioplastic
 ROSLN BIOCOMPOSITES	 BIOPRINTING	 ALGINATE BIOPLASTICS
Leather Moulding Bag	E-textile Bag	Modular Fashion Bag
 LEATHER MOULDING	 E-TEXTILE BAG	 MODULAR BAG
Bioshades	Mycelium	Bacterial Cellulose Leather
 BACTERIAL DYES	 MYCELIUM BIOCOMPOSITES	 BACTERIAL CELLULOSE LEATHER

Figure 1. Toolkit illustration for the Discovery path

In addition, the structure of each path has been revised and simplified, not only to insist on the type of activities but also to add consistency to the type of format offered by each path (see figure below).

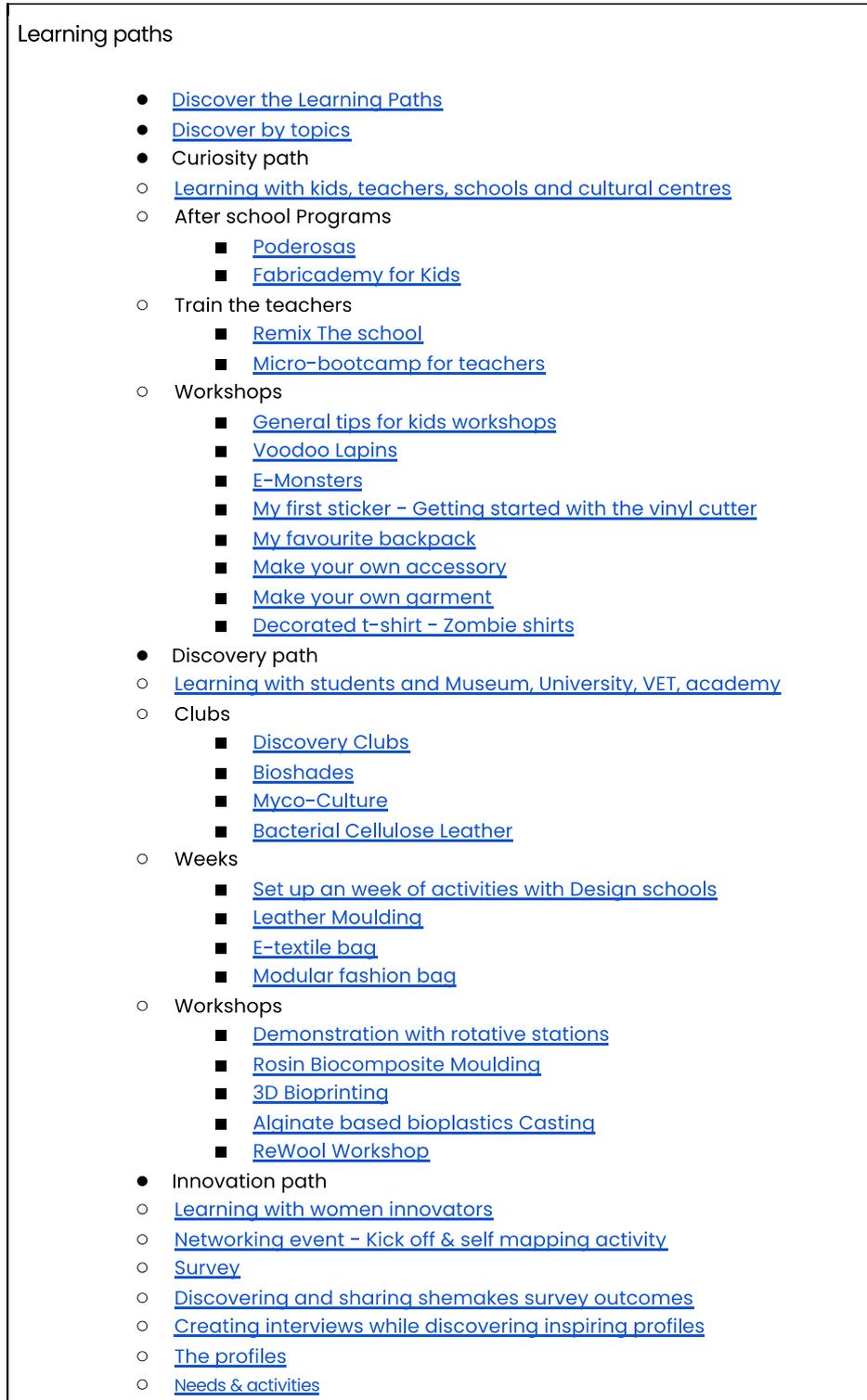


Figure 2. Structure of the Learning Path section of the toolkit.



The Transfer Labs

11 out of the 12 Transfer Labs were engaged in running activities inside WP2: VIVA Lab (Portugal), VIVISTOP (Estonia), Le Textile Lab Lyon (France), Decode Lab (Greece), Green Fabric (Belgium), Rog Centre (Slovenia), Textile Prototyping Lab - TPL (Germany), FarmLab (Austria), Icelandic Textile Center - ICT (Iceland), Lottozero (Italy) and Ziphouse (Moldavia). After the selection process, each Transfer Lab was allocated two activities between WP2 and WP3, distributed as shown in the table below. In addition, all labs were free to contribute to additional tasks according to their interests and availability.

Table 1. Distribution of tasks by Transfer Labs

	Curiosity (LEON)	Dis- covery (ONLF)	Innova- tion (WAAG)	Com- munity (REDU)	Lab projects (IAAC)	Business (MAKE)
FarmLab (Austria)			X		X	
Decode (Athens)	X			X		
The Icelandic Textile Center		(X)	X		X	
VIVISTOP Užupis (Lithuania)	X	X				
ZipHouse (Moldova)			X			X
RogLab (Ljubliana)		X		X		
Green Fabric (Brussels)		X			X	
VIVA Lab (Porto)	X			X		
Lottozero (Prato)			X			X
Textile Prototyping Lab (TPL)(Berlin)		X				X
Centre for Circular Design (London)				X	X	
Le Textile Lab Lyon (Lyon)	X					X

Following is a more detailed description of each of the Transfer Labs and their participation in WP2 activities.

Decode Fab Lab - Athens, Greece

Decode Fab Lab is a digital fabrication laboratory in Athens, Greece. Together with its external collaborators, it brings knowledge and practice around computational



design, digital fabrication, electronics, and programming, always in line with the latest technologies and with respect to the environment and the society.

With the Curiosity path, Decode Fab Lab seeks to expand their knowledge transfer to younger ages. Together with a mobile lab team, they reach young audiences in remote areas in Greece where kids typically have no access to such tools or knowledge. Decode Fab Lab took part in the **Curiosity Path** with five activities delivered both in the city of Athens and in remote places throughout Greece including the islands, from digital textile recycling, digital loom making, and e-monsters.

Le Textile Lab Lyon – Lyon, France

Le Textile Lab Lyon in France, is a collaborative workspace dedicated to textile creation, established in Lyon in October 2018 by Fabricademy Alumna Pauline Gamore. Le Textile Lab Lyon is a space designed as a tool to inspire, research, and prototype collective solutions to rethink the textile industry and try to make it more open and circular, more respectful of the environment, more viable and sustainable for young designers and especially for women.

Le Textile Lab Lyon took part in the **Curiosity Path**, organising two different activities on textile waste composite and e-dancing shoes targeting girls, aged 16 to 18 years old.

VIVA Lab – Porto, Portugal

VIVA Lab in Porto (Portugal), seeks to inspire people to learn and innovate through making, so that together they change the world for the better. They are a co-creation hub with an approach that merges machines and highly qualified people, helping communities to develop new concepts and to take their ideas to the next levels of innovation.

VIVA Lab took part in the **Curiosity path**, conducting five activities integrating textiles and technology. For some of these activities, they welcomed one of the young Ambassadors, her mother, and the guru from their referent lab (LEON) to foster mutual learning.

VIVISTOP Uzupis – Vilnius, Lithuania

VIVISTOP Užupis in Vilnius (Lithuania), is part of VIVITA, an international community of creators. Their fab lab is a kid- and teenager- friendly, open-plan workshop and innovation studio where kids can discover, experiment, and create by themselves.



Their activities are supported by hardware and software tools for prototyping, robotics, and other creative tasks developed by VIVITA.

VIVISTOP participates in both the **Curiosity and Discovery path**. In Curiosity, they conducted 2 activities in close collaboration with Secondary Schools, including modular tote bags and e-heroes workshops. In Discovery, they organize a 3-day e-garment workshop with three activities (thermochromic fabric dyeing, draping and moulage, e-textile).

Green Fabric – Brussels, Belgium

Green Fabric is a textile fab lab established in Brussels (Belgium) in 2019. This is a place dedicated to creation which offers a shared workshop place, a textile fab lab, a creator coworking as well as a second-hand fabrics and haberdashery shop. The textile fab lab is a hands-on and textile experimentation lab aiming at facilitating innovation and empowering our fab lab users. Green Fabric was created by Valentine Fruchart, a Fabricademy alumna.

Green Fabric took part in the **Discovery Path** with 5 activities on modular fashion, textile, and coding workshop, and knitting machine hacking, collaborating with 3 different institutions (Academy of Fine Arts of Tournai, Francisco Ferrer institution, Royal Academy of Fine Arts).

Rog Centre – Ljubljana, Slovenia

By revitalising the former Rog factory and turning it into the Rog Centre, the city of Ljubljana is moving one step forward to be a new international creative and social hub with close links to the local environment. Committed to the circular use of space and with a strong cross-sectoral and international focus, while also pursuing sustainable development, the Rog Centre will not only cater to those who directly use it but will also have a positive impact on the life of the community.

Rog Centre's vision is to empower women in STEM including the textile and clothing sector. Offering support and technological equipment in our Fab Lab and specialised Textile lab in the Rog Centre will encourage exploration of the technology at hand. By creating a shared-use space where a democratic system of work can be implemented, they can further encourage future generations to work in the fields of interdisciplinary fashion, innovate and collaborate with other designers, scientists, and makers. We seek to empower women innovators in developing sustainable fashion concepts and material innovations in the clothing industry.



Rog Centre took part in the **Discovery Path** and completed the line of biomaterial activities with the organising of a symposium and two hands-on workshops on cellulosic materials and other biomaterials.

Textile Prototyping Lab (TPL) – Berlin, Germany

The TPL is the first open laboratory for high-tech textiles in Germany and offers the opportunity to implement complex textile projects through a broad prototyping infrastructure and a competent, interdisciplinary team.

Founded as a research project by five organizations from the fields of textile and electronics research, design, and business, the TPL aims to be an open, agile, and interdisciplinary place for textile prototyping with the core topic of open innovation.

The Icelandic Textile Center – Blönduós, Iceland

The TextileLab is part of the Icelandic Textile Center (ITC), a non-profit institution located in Blönduós, northwest Iceland. It aims to develop and promote Icelandic and international textiles and research with collaboration and innovation in the field of textiles, textile art and design. The TextileLab is the first of its kind in Iceland and offers access to state-of-the-art textile equipment and digital technology for makers, students, and artists. Wool is one of the main local and national raw materials. The Ístex wool washery in Blönduós washes 99% of all wool in Iceland. Therefore, innovation and knowledge exchange in connection to wool was a perfect match between ITC and Shemakes.

The Icelandic Textile Center took part in the **Innovation Path** to consolidate their local collaboration with the survey, some interviews and knowledge exchange between mentors. They additionally organised five activities in the **Discovery path** led by their Ambassador Petra Garajova during her visit.

FarmLab – Styria, Austria

The FarmLab is situated in a rural part of the province of Styria, in southeast Austria. Besides being a functioning farm, it is also a fabrication laboratory open to the community, equipped with digital and traditional machines and a place for workshops.

Embracing rural logic but tightly connected with an international network, FarmLab is dedicated to exploring new opportunities for business and communities located in the countryside at the crossover between new technologies, contemporary art & crafts, and circular economy. Some of the areas of research are digital fabrication for farming, contemporary ceramics with traditional techniques, edible mushroom



farming, small scale experimentations in wool processing, and cultivation of tinctorial plants.

FarmLab took part in the **Innovation Path** working closely with their local ecosystem, running surveys, interviews, career mapping and organising an open day, and industry visits.

Lottozero – Prato, Italy

Lottozero is a centre for textile design, art, and culture based in Prato, Italy. It operates both as a consultancy studio and as a creative hub, divided into a gallery/exhibition area, a shared studio space/coworking and an open fab lab for textile production, experimentation, and research. The work done in the Creative Hub is aimed primarily at people operating in textiles and fashion, it responds to a need for space, for connection with other creators and for access to information not available online. Feedback, tutorship, and the possibility to work and exhibit in this environment is provided. The development of emerging talents and brands is supported through scouting and residencies in the Lottozero headquarters and by facilitating the exchange and collaboration with the traditional companies of the Prato textile district.

Lottozero took part in the **Innovation Path** working closely with their wide network, running surveys, interviews, newsletter communication, and one-to-one consulting sessions.

ZipHouse – Chişinău, Moldova

The Design and Technology Excellence Center ZipHouse was created within the Technical University of Moldova in September 2015. Recently in 2020, the centre has opened an NGO, ZipHouse Design Hub as an extension to the centre. ZipHouse is a fashion innovation platform, providing unrivalled opportunities for enriched knowledge, access to production facilities, inspirational resources, and industry collaboration. ZipHouse offers young designers, start-ups, professionals, and academic staff a unique opportunity to sharpen their technological skills and design abilities.

ZipHouse's mission is to connect Moldovan fashion to the global fashion world. Its programmatic pillars are:

- Community building – offering to professionals and young designers from the fashion industry a platform for collaboration, coworking, knowledge exchange, and giving back.



- Acceleration Program – accelerating fashion start-ups, emerging young designers, supporting ZipHouse residents’ growth, introducing mentorship for business model improvements, business support opportunities to explore sales channels, and to penetrate new markets.
- Fashion Academy – develop skills through quality advanced technical education Fashion
- Leadership Program – the development of better professional skills of key personnel from companies and academic staff.

ZipHouse took part in the **Innovation Path**, where they contributed by conducting a survey, career mapping, interviews, and organising two Fashion Brunch and online sessions with Fabricademy alumni.

Overview of WP2 Phase 2 activities

Below is the summary of activities conducted by WP2 labs in phase 2 of the shemakes.eu project. These activities will be described in detail in sections 2, 3 and 4.



CURIOSITY	TOPICS			AGE		
	Sustainability	Industry 4.0	Wearables	8-15	16-18	Others
VIVA LAB	✓ Sanded My T-Shirt Sew Totem Bag Sanded Totem Bag		✓ e-Slippers E-monsters	✓		
VIVI STOP		✓ Modular tote bag	✓ E-hero	✓		
LE TEXTILE LAB			✓ e-Dance Shoes		✓	
DECODE	✓ Digital textile recycling	✓ Digital Looms	✓ E-monster	✓		

DISCOVERY	TOPICS			COOPERATION			
	Sustainability	Industry 4.0	Wearables	HEI DSchools	Vocational Training	Open Call to students	Public 18+
GREEN FABRIC		✓ Modular fashion Textile and code Hack knitting machine		✓	✓		
ROG CENTRE	✓ Symposium: Innovative Biomaterials in Design Cellulosic materials workshop Biomaterials workshop			✓		✓	✓
TPL		✓ From Yarn to textile Exploring Fibre creating yarn	✓	✓			✓
VIVISTOP	✓ Thermochromic Dyeing	✓ Draping and Moulage	✓ E-textile	✓			
ICT	✓ Biomaterial Bacterial Dye	✓ CLO3D 3D Printing Little Wool Factory	✓ Soft robotics				✓

INNOVATION	RESEARCH ACTIONS DOCUMENTED ACTIVITIES PHASE 1			SUPPORT ACTIONS + MAPPING TOOLS NEW ADDITIONAL ACTIVITIES PHASE 2			
	SURVEY	CAREER MAPPING	INTERVIEWS & PROFILES	NETWORK	EXPLORE	ENCOURAGE	MENTOR
	FARMLAB	✓	✓	✓	Open Day	Industry Visits	
ICELANDIC TC	✓		✓				
LOTTOZERO	✓		✓	Opportunity Newsletter			One on One consulting
ZIPHOUSE	✓	✓	✓	Fashion Brunch	Fashion Brunch	Online sessions with Fabricademy alumni	micro

Figure 3. Summary of WP2 Phase 2 activities



Supporting Phase 2 Transfer Labs

A process and a timeline

A timeline was designed in co-creation with all partners to support the development of phase 2, following four steps:

- **Connect and explore:** All partners and Transfer Labs get to know each other and discover the Shemakes values and activities.
- **Prepare:** Transfer Labs define a plan for their activities, task by task, in cooperation with their task leader.
- **Act:** Transfer Labs run the activities.
- **Reflect and Report:** Transfer Labs are guided to reflect, report, and document their activities, task by task.

An agenda for all Transfer Labs was set up with general meetings and task meetings. The general meetings lasted 3 to 4 hours each with all partners, Transfer Labs and Ambassadors and were split between plenary sessions and work on specific concerns in smaller task groups.

The dates of the plenary WP2 meetings were as follows:

- 19.01/20.01: Presentation of WP2 and each related task.
- 02.02, 16.02, 02.03 and 16.03: Breakrooms per each WP2 task (1h 30m), to present tasks, envision activities, progress, Q&A.
- 22.06: Debrief of the activities, task by task.

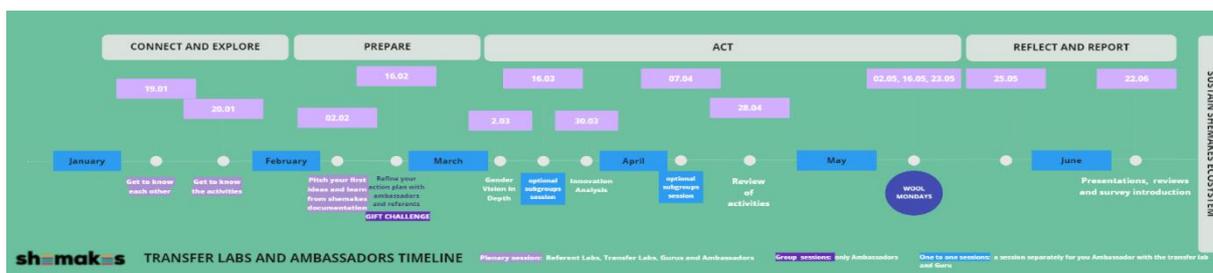


Figure 4. Timeline of the process.

The task meetings were also organised by each WP2 task leader (Curiosity, Discovery, and Innovation paths) to foster exchanges with the four Transfer Labs allocated to the task, to clarify unsolved issues, check progress and organise the reporting. These meetings followed an agenda specific to each task.

A set of co-creation tools to support Transfer Labs

Interactions in a transfer lab between partners and Transfer Labs were supported by tools developed for better connecting, overviewing, planning, and developing all activities. Transfer Labs were trained to use a Miro board

(<https://miro.com/app/board/uXjVOUWpLkK=/>) associated with a series of tools that were prepared to better “connect and explore” and “prepare” their activities. This Miro board was also used throughout the development of activities as a compass, a shared space to gather information on the go and to capture the full picture of all Transfer Labs, thus fostering peer-learning exchanges.

The Miro board tools are described and illustrated below.

Lab Blueprint

This tool, adapted from the TCBL model and previous WP3 work, gathers information about the lab such as the people that are involved in the project, some photos to capture the feel of the lab, the previous experience and background, some thoughts on the gender vision, and more technical details such as: demographic data, revenue model, type of activities performed, values generated and nature of community.



Figure 5. Miro board extract: Lab blueprint.

Lab Matrix of Activities

Labs filled in the activities they wished to conduct, choosing one activity from WP2 and one activity from WP3, and described them by adding Inspirations based on previous experiences, getting inspired by the Shemakes toolkit, ideas of how they could implement their activities and what they wanted to focus on, the stakeholders that they wished to engage with, and their target audience.

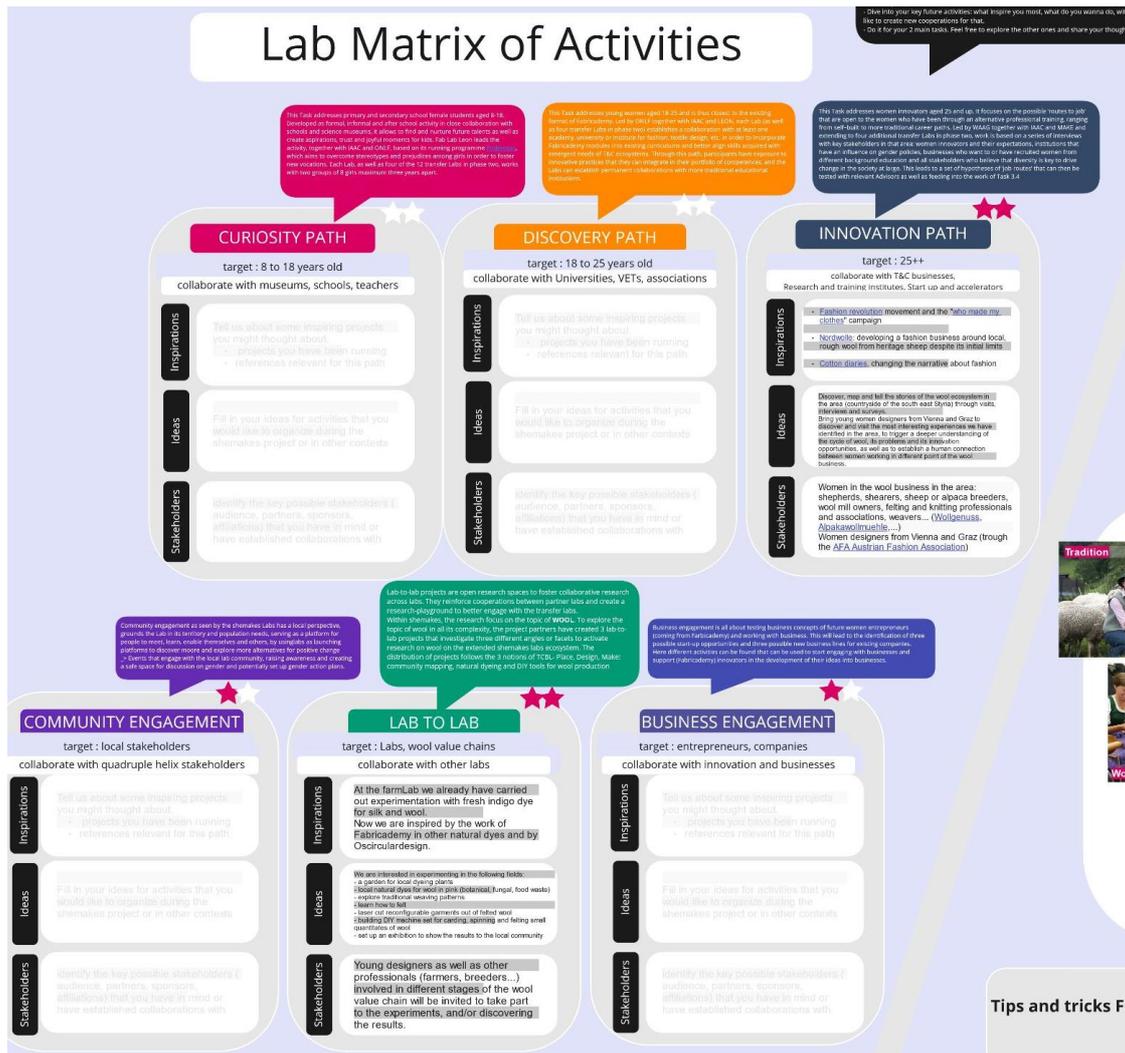


Figure 6. Miro board extract: Lab matrix of activities.

Pitch your idea

This tool lists for each activity the Transfer Labs chose to develop:

- The seven Whys - what, why, when, where, how, for who and what for.
- The values they wish to transmit and work with.
- The skills and competencies they would generate with the chosen activities.



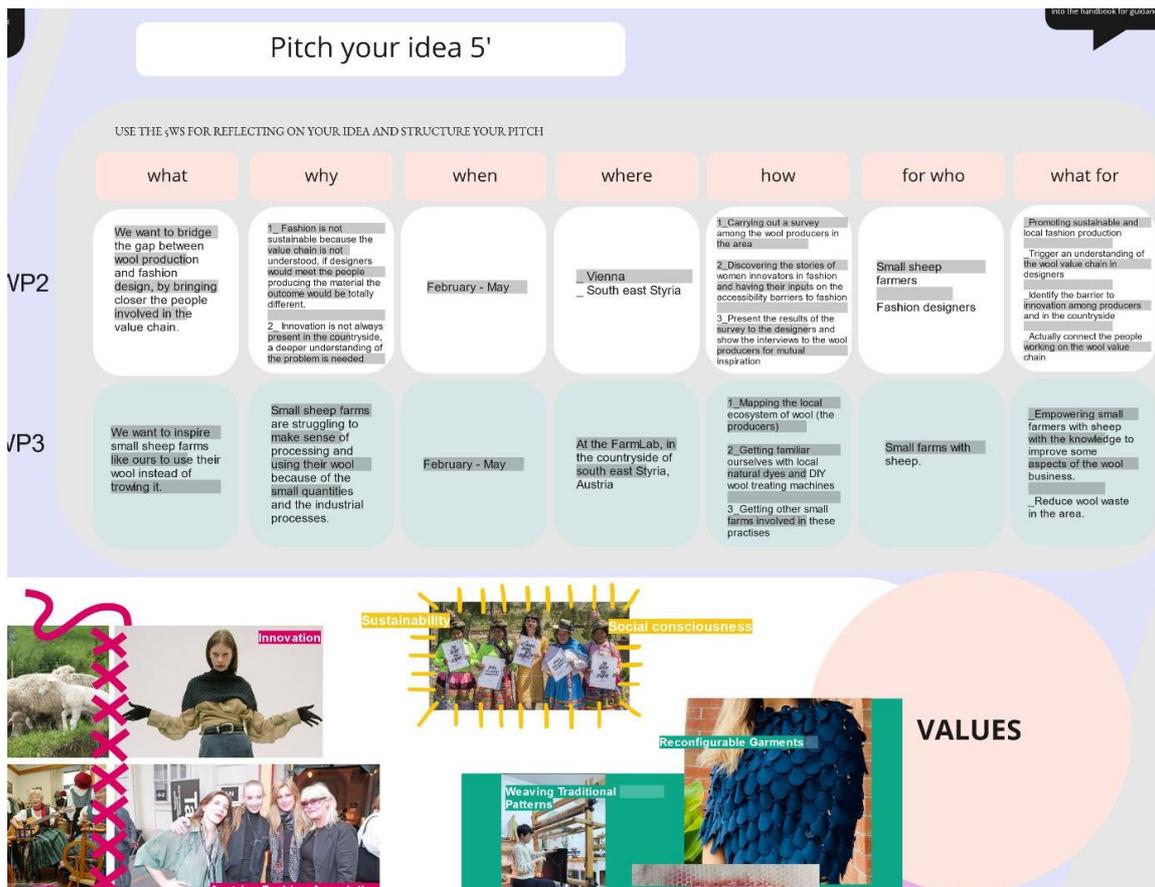


Figure 7. Miro board extract: Pitch your idea and Illustrate values.

Roadmap of your task journey

This tool proposes a timeline and an activity canvas. Transfer Labs used the timeline to plan their activities and an activity canvas to provide a checklist to fill from objectives to KPIs. This activity canvas includes a part to show how the activities would resonate with Shemakes values.



Figure 8. Miro board extract: Activity canvas.

Interaction between gurus and Ambassadors

This is a dedicated space for the Transfer Labs to get to know the profile of the Ambassadors, the competencies that they can transfer, and the Shemakes activities they were part of.



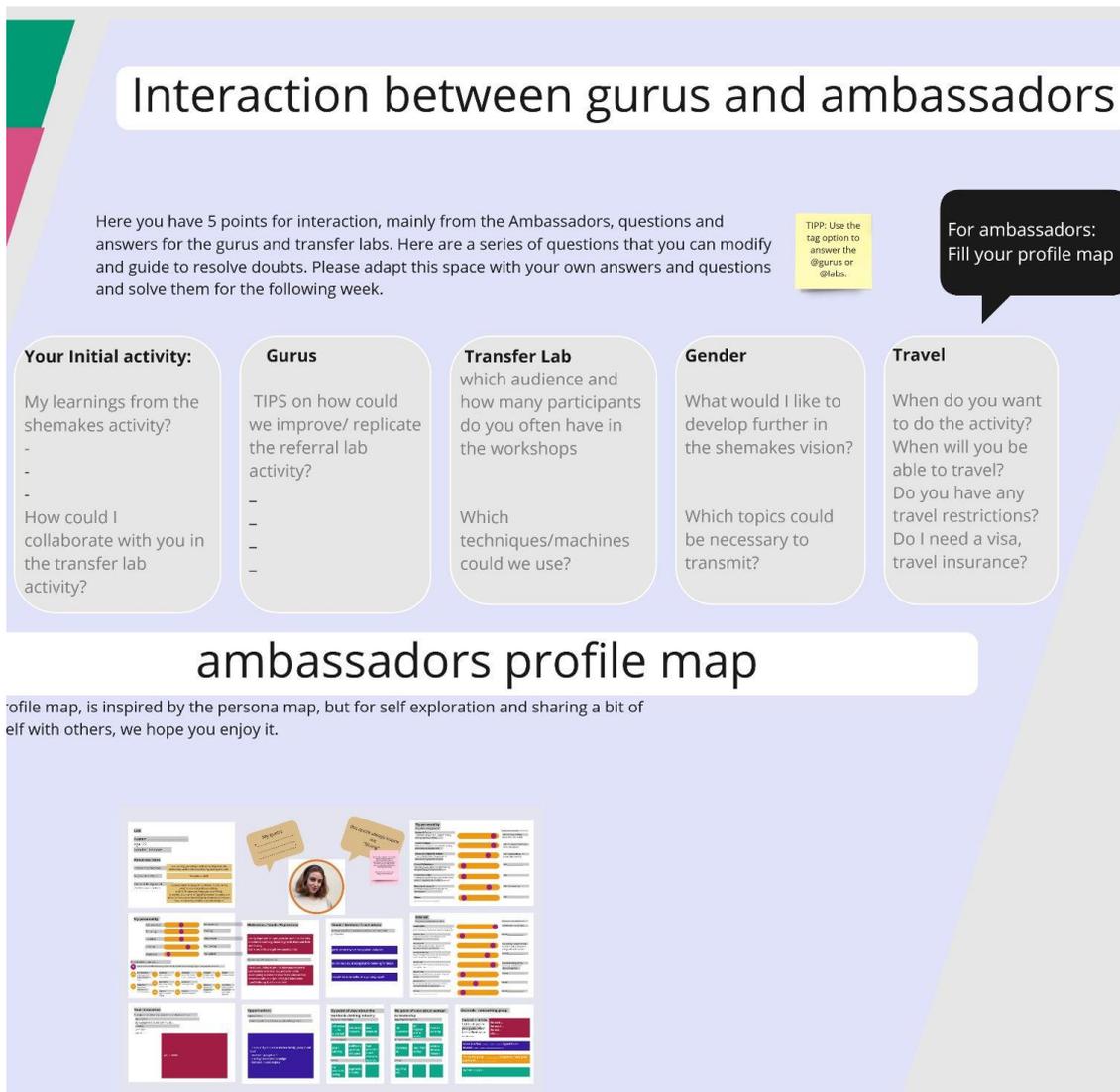


Figure 9. Miro board extract: Interaction between gurus and Ambassadors and Ambassadors profile map.

The onboarding activities served as a common space for the labs to share and interact, and also helped everyone involved to have a visual overview of objectives and tasks. It also helped connect the labs and better establish the network feeding into task 1.3.

Data collection for deliverable 2.3

Each task leader worked with their four Transfer Labs to collect data for the deliverable 2.3. The WP leader (Iaac) created and shared a template for each transfer lab and gave a plan for reporting each subsection. This includes the following information:



- **Updates on the path** with a synthesis of the objectives, specificities in terms of task management and detailed list of activities.
- **Description of activities**, differentiating the activities replicated from the first phase and adapted to the local contexts from the new activities created by the Transfer Labs in phase 2. Each activity has been synthesised with:
 - Title of the activity + subtitle
 - 3 photos to illustrate the activity
 - A table with goals and formats, location, key outputs, participants, and reach.
- **Key Learnings and reflections on the task.** In this section, labs were invited to reflect on the task at four levels:
 - **General Outcomes and lessons learnt** general reflections on the Shemakes experience and feedback for the future.
 - **Gender Vision findings**, thinking about how the [5 gender values](#) are reflected in the activities of that path; how and why Transfer Labs think that they are important for promoting an enabling environment for girls and women, and which value was most experienced.
 - **Reflection of the lab and Ambassador** on the learning path to provide ideas for further implementation.
 - **Future actions**, reflecting on next steps the short- and long-term future.

Each task leader adapted this strategy of data collection according to the task they were leading, keeping the consistency between the description of each path.

1.3. Activities and reach

Summary of all activities

The table below shows the detailed summary of all activities conducted by Labs for WP2 in Phase 2, expanding on the overview that was already presented in section 1.2. As already mentioned, each lab engaged in the learning path by replicating activities and adapting them to its cultural context and by suggesting and adding new ones to locally expand the learning experience further.



Table 2. Detailed list of Lab activities

Path	Lab	Date	Title and short description	Number of participants (women)
Curiosity	VIVA Lab	7.04	E-monsters (Special School: Teach the students how to make a RGB circuit and hand sew an e-monster). Activity with the Ambassador.	23 (12)
	VIVA Lab	5.03	E-Slippers (Celebration of the Women Day with an electronics & textile activity).	8(4)
	VIVA Lab	11.02	Sanded T-Shirt (Celebration of the Day of Women in Science to Inspire young girls how we can upcycle textiles with new techniques with 21st tech).	10(10)
	VIVA Lab	7.04	Sanded Tote Bag (Teaching young people about a new technique with the laser cutter on fabrics).	18 (9)
	VIVA Lab	7.04	Sew Tote Bag (Teaching young teenagers how to laser cut and sew a fabric tote bag).	6(1)
	VIVISTOP	9.04/ 14.04/ 15.04	E-hero (Learn basics of electronics, soft sensors, sewing and modular textile construction).	35 (30)
	VIVISTOP	9.04/ 14.04/ 15.04	Modular tote bag (Use pre-cut felt to assemble zero waste accessory).	35 (30)
	VIVISTOP	15.04	E-hero on modular tote bag (Learn basics of electronics, soft sensors, sewing and modular textile construction).	14 (13)
	Decode	9.04	Digitalizing Looms (Assembling a laser cutter loom and create a wool project).	12 (6)
	Decode	16.04	E-monster in the museum. Activity with the Ambassador.	24 (12)
	Decode	4.05	E-SDG (E-monster adaptation explaining Sustainable Development Goals).	30 (16)
	Decode	5.06	E-SDG (E-monster adaptation explaining Sustainable Development Goals).	13 (6)
	Decode	25.06	Digital textile recycling (Fabricate stamps for tote bags for recycling) ¹ .	30 (9)
	Le Textile Lyon	7.04	e-Dancing Shoes (Explore new technologies associated with textiles.)	19 (19)

¹ This activity is not reported in this Deliverable, however, it is being finalised in the Shemakes Toolkit

Path	Lab	Date	Title and short description	Number of participants (women)
Discovery	Le Textile Lyon	9.05 10.05 11.05 12.05	Textile Waste Composite (Explore textile waste problem by making a new biomaterial composite).	15 (8)
	LEON	03.02	Biomaterials exhibition Introduction to New textiles to Santa Maria Micaela School.	26 (5)
	LEON	12.02	International Day of Girl and Woman in Science: Exhibition of the textile projects developed by the girls.	52(25)
	Green Fabric	14-03 15-03 16-03	Modular fashion: How to make laser cut modules in order to create objects or garment from leftovers fabric.	14 (9)
	Green Fabric	25-04 26-04	Textile and coding: How to make embroidery patterns from code with turtlestitch.org.	7 (6)
	Green Fabric	09-05 12-05	Hack knitting machine: How to use spreadsheet and a hack knitting machine to generate knit patterns.	4 (4)
	Rog Centre	21. 03	Online International Symposium: Innovative Biomaterials in Design.	48 (40)
	Rog Centre	21. 04. 23-24. 04	Cellulosic materials workshops: How to make cellulosic materials out of kombucha, onion peels, garlic skins, coffee husks, ginger, apple, etc.	11 (8)
	Rog Centre	16. 05 21. – 22. 05	Biomaterials workshops: how to make biopolymers with gelatine, agar-agar, sodium alginate, apple pomace.	10 (10)
	TPL	25.04-27.04	From Yarn to textile: making yarns and twines using conventional and unconventional materials using the Hilo spinning machine and turned them into knitted and woven textiles.	10 (10)
	TPL	25-26.04	Exploring Fibre creating yarn: learning the basics of yarn and twine making and use the Hilo machine to create their own threads from different materials.	6 (6)
	TPL	28-29.04	E-Textile Playground: learning the basics of e-textiles and using the TPL toolkit to realise their own e-textile projects in small groups.	6 (6)



Path	Lab	Date	Title and short description	Number of participants (women)
Innovation	TPL	2.05	Smart Stitches: Learning to make simple circuits and communicate inspiring messages using cross stitching.	9 (1)
	VIVISTOP	11.04	E-garment #1: Thermochromic fabric dyeing.	15 (13)
	VIVISTOP	12.04	E-garment #2: Draping/mouflage technique.	
	VIVISTOP	13.04	E-garment #3: E-textiles.	
	ICT	22.04	Clo3D, 3D fashion design software tutorial and inspiring talk, led by the Ambassador and a guest lecturer.	17 (17)
	ICT	23.04	Biomaterials Workshop, led by the Ambassador.	7 (6)
	ICT	24.04	Soft robotics Workshop, led by the Ambassador.	10 (8)
	ICT	25.04	Rhino+Grasshopper + 3D printing, led by the Ambassador.	4 (3)
	ICT	26.04	Bacterial Dyes Workshop, led by the Ambassador	7 (6)
	Lottozero	February	Directory Newsletter	200 (160)
	Lottozero	February	Survey of the members of The Lottozero Directory.	
	Lottozero	18, 20, 22.04	3 interviews- portrait special edition for Fashion revolution Week.	3 (3)
	Lottozero	10 -30.04	8 business management sessions.	8 (8)
	ZipHouse	7.03 - 8.04	Survey for the representatives of the T&C sector.	10 (10)
	ZipHouse	22 - 29.04	Interviews	4 (4)
	ZipHouse	14.05	Networking event "Fashion Brunch Party".	20 (19)
	ZipHouse	27.05	Visit to Romania at Romanian Creative Week, participating at the workshop on Biomaterials.	4(4)
	FarmLab	15.04 22.05	Survey about women innovators.	10 (8)
	FarmLab	21.05-10.06	In depth video interviews.	6 (4)
	FarmLab	21.05	Visit of the FarmLab to Wool Mill.	4 (2)
FarmLab	05.02-08.05	Visit of the FarmLab to Wollgenüss.	4 (2)	
FarmLab	21.05	Visit of the FarmLab to Erikawollwerkstatt.	4 (2)	
ITC	March /April	Survey researching female textile innovators in Iceland.	74 (67)	



Path	Lab	Date	Title and short description	Number of participants (women)
	ITC	March /April	In depth written interviews.	2 (2)

Reach of activities

As already noticed in the activities that were proposed in Phase 1, the reach of participants in Phase 2 was impressive and quite beyond the quantitative key performance indicators expected, as can be seen in the table below.

Table 3. Summary of reach by task in phase 2 activities.

	Curiosity	Discovery	Innovation
Objective for phase 2	100 girls aged 8 to 18	50 girls aged 18–25.	25 women aged 25+
Total targeted groups	321 participants 170 girls Cooperation with primary, secondary, vocational schools, museums, and associations.	200 participants 153 young women > 50 participants in open workshops targeted to the general audience. Cooperation with art and design schools, textile technical schools, high education centres, vocational training, and the general public.	115 survey respondents 12 interviewed > 300 reached via newsletters and events
Nb of Activities	17 activities in all labs in different formats from 2h to 4 days	18 activities in all Transfer Labs reported with various formats from 2h to weeklong events.	15 activities in all Transfer Labs including industry visits, consulting, interviews, surveys, Fashion brunch



2. Curiosity Path

2.1. Update on the Path

Recap of Curiosity path

This path addresses primary and secondary school girls aged 8–18. Developed as a formal, informal, and **after-school activity** in close collaboration with **schools** and **science or design museums**, it allows finding and nurturing future talents as well as creating aspirations, trust, and joyful moments for kids.

In phase 2, there are 4 transfer labs in the curiosity path which are **VIVA Lab, Decode FabLab, Textile Lyon** and **VIVISTOP**. Their Ambassadors both come from the reference lab of the curiosity task, **Fab Lab León**. In the beginning of the 2nd phase of the curiosity task, the focus was to transfer knowledge learned during the first phase, to help them identify possible stakeholders and to allow them to create new activities or adapt previous ones to their local context. The two young Ambassadors accompanied by their guru (LEON) travelled to VIVA Lab and Decode FabLab and carried out different activities with children. VIVISTOP and Le Textile Lab Lyon held their activities under the guidance of the Task Leader, with Le Textile Lab Lyon focussing on the 16–18-year-old participants.

Task management in phase 2

During phase 2, there were scheduled meetings with the Curiosity Labs every two weeks that lasted 30 to 60 minutes. These meetings were dedicated to the definition of the activities with Transfer Labs.

After the communication of the Ethics Check Report issued on 21 March 2022, some of the focus of these meetings turned to ethics, first with a small Shemakes partner group dedicated to ethics, which included LEON, then between the task leader and the transfer labs.



Curiosity path activities were suspended twice, between 21 March – 5 April and then between 19 April – 27 May², which slowed down the initial energy to conduct activities. However, this helped all labs better understand and integrate ethics considerations and contributed to build resilience, so that despite having less time, Transfer Labs could still reach the targeted KPIs and run a series of creative activities for the Curiosity path.

Ethics and the Curiosity Path

The independent Ethics Check Report issued on 21 March 2022 outlined some ethical issues as applied to children, notably on Involvement of 8-18yrs minors/girls in the shemakes.eu research and consent forms, on issues that are related to (individual) interaction with this target and on Ethics approval procedures with minors/girls.

This helped improve the topic of ethics management for activities with minors in the following ways:

- *Our objectives:* to work with girls and train girls and boys alike when it is about innovation; to safeguard them in coherence with the universal principles that protect children (completed by the local reference texts regarding ethics with children), to guide Transfer Labs' work with learning and pedagogic advice, sometimes taking into account the right of children to "express their voice and be heard".
- *Our practices:* to care all along the process of information, pre-registration, and attendance to the activity, that parents who are responsible for their children, sign the consent forms and take them to the activities (even if a minor friendly consent form was used as a secondary step for minors, to be used with their parents); to embed the safeguarding of the children by design (hands-on and group activities to be adapted in terms of time and interest to age groups of children, grouped at a maximum of three years apart; guarantee full anonymity when conducting activities with minors such as not using their faces in communication); to choose teams of people who have embraced the Shemakes values, two of which being respect and diversity; to produce general guidelines for interacting with minors that have been supplemented by the national rules in each subcontractor's country;

² Some activities were planned during school holidays or within established collaboration. They were exceptionally maintained, taking into account the first ethics guidance. This is the case of one of the E-SDG workshops of Decode and the Textile Waste Composite workshops of Le Textile Lab Lyon.



- *Our processes:* an Ethics committee that includes an expert advisor on ethics for minors as a main governance body; ethics monitoring (based on a table of risks) to foster constant improvement of the Ethics issues in Shemakes, e.g., reviewing and adapting the list of materials used in the activities that were suitable for children, using illustrations or simplifying questionnaires for gathering feedback on the activities

Description of activities

Like in Phase 1, this Phase 2 curiosity activities were quite diverse. Labs **adapted** or **created** activities among the three Fabricademy subtopics: Industry 4.0, Sustainability, Wearable, targeting different age groups as follow:

CURIOSITY	TOPICS			AGE		
	Sustainability	Industry 4.0	Wearables	8-15	16-18	Others
VIVA LAB		<ul style="list-style-type: none"> ✓ Sanded My T-Shirt ✓ Sew Totem Bag ✓ Sanded Totem Bag 	<ul style="list-style-type: none"> ✓ e-Slippers ✓ E-monsters 	✓		
VIVI STOP		<ul style="list-style-type: none"> ✓ Modular tote bag 	<ul style="list-style-type: none"> ✓ E-hero 	✓		
LE TEXTILE LAB	<ul style="list-style-type: none"> ✓ Textile Waste Composite 		<ul style="list-style-type: none"> ✓ e-Dance Shoes 		✓	
DECODE	<ul style="list-style-type: none"> ✓ Digital textile recycling 	<ul style="list-style-type: none"> ✓ Digital Looms 	<ul style="list-style-type: none"> ✓ E-monster ✓ E-SDG 	✓		

Figure 10. Overview of Curiosity path activities

The activities of each Transfer Lab are described below in the following order.

- VIVA Lab
 - E-monsters
 - E-Slippers
 - Sew Tote bag
 - Sanded T-shirt and Sanded tote-bag
- VIVISTOP
 - E-Hero
 - Modular Tote Bag
 - Decode
 - E-monsters from museum
 - E-SDGs
 - Digital fabrication of Looms designs for wool cycle
- Le Textile Lab Lyon



- Textile Waste Composite
- E-dancing shoes
- Leon
 - Introduction to new textiles
 - International Day of Girl and Woman in Science

VIVA Lab

E-monsters

This activity was adapted by VIVA Lab from a similar activity in Phase 1.



Figure 11. E-monster activity pictures.

Table 4. E-monster activity description.

Goals & Formats	The Ambassador delivered training on the original e-monster activity without any changes but the environment.
Location	Tangerina Primary School, Porto.
Participants & Reach	This activity was taught to students (boys and girls) of a regular class of Primary School with no computers. The students had to follow the instructions of the Ambassador, which were translated into Portuguese by VIVA Lab. They used a big screen to present the PowerPoint and some prototypes of all stages of the e-monster that were circulating between the kids so that they could concretely see each step of the activity. Collaborators that contributed to this activity were: the school (Tangerina Primary School), Fab Lab Leon (Ambassador, her mother, and the guru) and two volunteers from VIVA Lab. As this activity was conducted in a regular class, the number of participants was the whole class: 23 pupils, with 12 girls.

E-slippers

This VIVA Lab activity brings the opportunity to make customised interactive slippers by cutting them on the laser cutter, decorate them with an e-textile circuit and then sew them.



Figure 12. E-slippers activity pictures.

Table 5. E-slippers activity description.

<p>Goals & Formats</p>	<p>Why? Understand that the laser cutter can be used to cut textile moulds. Learn how to make a textile simple circuit to decorate an item. Hand-sew the slippers.</p> <p>General topics:</p> <ul style="list-style-type: none"> • Laser cutting • Wearables • Sewing and embroidery <p>Process:</p> <ul style="list-style-type: none"> • Cut your own size mould of the slippers. • Decide which pre-cut decorations are going to be used. • Decide your electric circuit “drawing” and where to put the battery holder. • Start sewing the electric circuit. • Sew the decorations. • Sew the slippers.
<p>Location</p>	<p>VIVA Lab</p>
<p>Outputs</p>	<p>The participants realised that it is possible to make a product like a “shoe” by using digital fabrication and that it is easy to adapt the different sizes before cutting them. Everyone took home a pair of slippers.</p>
<p>Participants & Reach</p>	<p>This activity was designed for participants from 8-18 but there was one family (mother, father, and daughter) that participated together, and it was very nice to see the involvement of all the family and the help they gave each other.</p> <p>There were 8 participants, with 4 girls aged from 9-17.</p>

Sew tote bag

The aim of this VIVA Lab workshop is to laser cut the mould of a tote bag and then learn how to sew it with a sewing machine. By doing this, participants can understand the possibility of vectorizing any kind of textile mould and fabricating it using the laser cutter.



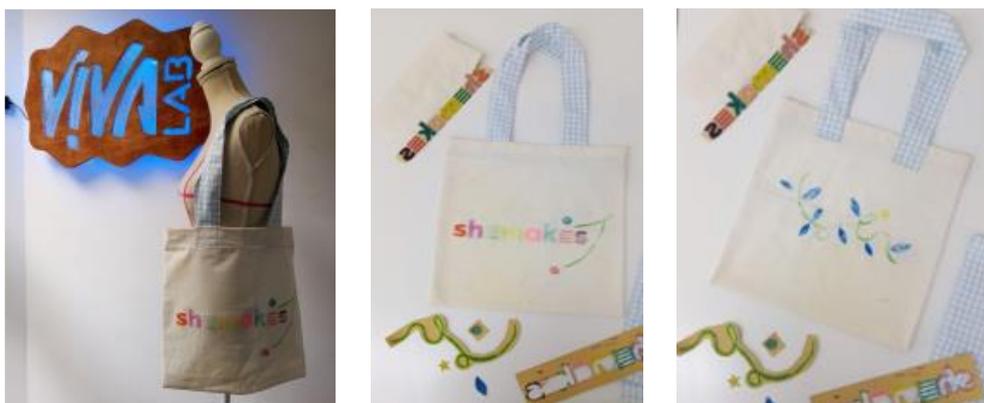


Figure 13. Sew tote bag activity pictures.

Table 6. Sew tote bag activity description.

Goals & Formats

Why? When making your own clothes, the step of cutting the pattern is the preliminary step. By learning how to do it with the laser, it can help girls to want to learn to work with textiles. The common use of this piece (tote bag) around the world makes it an interesting and recognizable piece for any person interested in sewing.

The activity aims at introducing participants to sewing techniques and to develop logic regarding fabric assembly.

General topics:

- Sewing
- Textiles
- Laser cutting

Process:

- Cut the fabric.
- Measure.
- Iron.
- Sew the strips.
- Sew the main piece.
- Sew to close the bag.
- Join the pieces by sewing.

Location

VIVA Lab

Outputs

- Get an overview of the creation process of a usable clothes/accessory.
- Understand how sewing machine works.
- Create a ready to wear piece.
- Understand how plain textile becomes a structured piece.
- Get in touch with some materials that have already been used e.g., clothes, with the point of view of a creator.

Participants & Reach

This activity was for girls from 8 to 18 but young women also attended the workshop older than 18.
The total number of participants was 6, with 1 girl aged 8-18.

Sanded T-shirt and Sanded tote bag

This activity brings the opportunity to merge art, textile, and digital fabrication. First the process is explained to all the participants: they draw a design on sandpaper, and they have to colour and cut the design so they can transfer it to a t-shirt by ironing. They will watch the laser working and then go to their tables to paint. When the drawings are ready, they will be able to print them by ironing them on the t-shirt or the bag, with the help of a cardboard (to put inside the t-shirt so the drawing will not transfer to the other side and a newspaper sheet to stay between the sandpaper and the iron.)



Figure 14. Sanded T-shirt activity pictures.

Table 7. Sanded T-shirt activity description.

<p>Goals & Formats</p>	<p>Why? To make girls understand the applications of the laser cutter and learn a different printing technique through a hands-on activity.</p> <p>General topics:</p> <ul style="list-style-type: none"> • Laser cutting. • Textile printing <p>Process:</p> <ul style="list-style-type: none"> • Cut the Shemakes logo on sandpaper (mirrored). • Paint the laser cut sandpaper Shemakes logo with leftover crayons. • Decorate a T-shirt or tote bag by painting sandpaper using your own creativity. • Iron the painted sandpapers on the T-shirt or the tote-bag.
<p>Location</p>	<p>VIVA Lab</p>
<p>Outputs</p>	<p>All the participants understood the potential of the laser cutter and made a personalised textile garment through an eco-friendly technique.</p>
<p>Participants & Reach</p>	<p>This activity was for participants from 8-18. Some of the girls came from a primary school near the fab lab.</p>

VIVISTOP

E-hero

The E-hero activity at VIVISTOP was an adapted version of the e-monster, that was allowing for positive heroes and their inspirational value to be represented rather than monsters.



Figure 15. E-hero activity pictures.

Table 8. E-hero activity description.

Goals & Formats	An adapted version of e-monster was taught to Secondary school students in groups from 7 up to 13 people that created their own e-hero doll with LED electronic circuit. This activity consisted of two parts: in the first part, kids assembled the LED circuit, in the second part kids created an e-hero doll with an incorporated circuit.
Location	VIVISTOP Užupis
Participants & Reach	8–15 years old girls and boys, 30 girls and 5 boys. Secondary school students. Secondary school teachers.
Adaptations	The participants used scissors and textile markers instead of the laser cutter because of safety considerations combined with the shorter workshop duration. They used initial documentation for e-monsters, adapted it for the participants and printed a one-pager with materials attached to it. They also translated the step-by-step process for the activity in a PowerPoint presentation in Lithuanian.

Modular tote bag workshop

Modular tote bag is a VIVISTOP adaptation from the original activity “Make your own accessory” developed in Phase I. This activity brings together digital manufacturing and circular economy through interlocking modular pieces to create a Zero Waste accessory.



Figure 16. Modular tote bag activity pictures.

Table 9. Modular tote bag activity description.

Goals & Formats	<p>Secondary school students in groups from 7 up to 13 created modular tote bags from pre-cut felt parts.</p> <p>The workshop consisted of two parts: in the first part kids created various objects from pre-cut materials available and not felt; in the second part kids created their own modular tote bags.</p>
Location	<p>VIVISTOP Užupis</p>
Participants & Reach	<p>8-15 years old girls, Secondary school students. Secondary school teachers. 8-15 years old girls and boys, 30 girls and 5 boys.</p>
Adaptations	<p>VIVISTOP used pre-cut coloured felt sheets to let the kids understand how to connect modular parts. On those sheets there was space left to make their own designs with textile markers and scissors. In modular tote bags, kids were able to construct from the pre-cut-coloured parts. They encouraged students to play around with all the available felt sheet parts.</p>

Decode Lab

E-monster at the museum

In this activity, Decode Lab also adapted the e-monster prototype of Phase 1, allowing participants to select a painting or a sculpture in a museum to inspire their creations.



Figure 17. E-monster at the museum activity pictures.

Table 10. E-monster at the museum activity description

<p>Goals & Formats</p>	<p>The Ambassador from the referent lab that travelled to Athens replicated the e-monster activity and added characters that were inspired by the museum collection</p> <p>Process: The presentation (projected) as well as printed step by step guidance was shared. Kids were working in pairs. They chose which character to make, and each character had all its components in a bag. There were also shared scissors (for left and right-handed kids), and tape.</p> <p>Outputs: Empowerment through making, inspiration and attraction to new technologies.</p>
<p>Location</p>	<p>A space for educational activities in the museum Basil and Elise Goulandri Foundation, Athens, Greece.</p>
<p>Participants & Reach</p>	<p>This activity was taught to kids aged 8-14 years.</p> <p>The Ambassador, Lucia, her mother, and the guru from the referent Lab (LEON) led the activity together.</p> <p>The number of participants was 24 with 12 girls 8-18 years old.</p>
<p>Adaptations</p>	<p>They designed three new characters inspired by two works in the museum collection: Red Fish (painting by A.R.Penck³) and Six forms (sculpture by Barbara Hepworth⁴). The workshop used parts of the original presentation translated in Greek with some extra slides which explained a bit more about the laser cutting method.</p>

E-SDGs

This activity was a Decode Lab variant of e-monster, using the 17 Sustainable Development Goals as models to make connected felt projects.

³ <https://goulandris.gr/en/shop/category/a-r-penck-the-red-fish-1982>

⁴ <https://goulandris.gr/en/artwork/hepworth-barbara-six-forms-2-x-3>





Figure 18. E-SDGs activity pictures

Table 11. E-SDGs activity description

<p>Goals & Formats</p>	<p>They replicated the e-monster workshop and replaced the monster designs with the SDG shapes: a small 20 x 10cm ca. character made from felt, which is interactive by touch and pressure, making a RGB LED light go on/off and changing colours. Each character represents one of the 17 SDGs.</p> <p>Process: Kids were working in pairs and chose together one SDG they wanted to make. Each SDG had all its components in a plastic bag. There were shared scissors (for left and right-handed kids), and tape.</p> <p>Outputs: SDGs making is meaningful making and one contribution to what we can do locally with the Agenda 2030. Empowerment through making, inspiration, and attraction to new technologies.</p>
<p>Location</p>	<p>Chios island.</p>
<p>Participants & Reach</p>	<p>Kids were 9–11 years old: 43 kids attended (22 girls). Local stakeholders were the local school in the main town of the island. (5th elementary school).</p>
<p>Adaptations</p>	<p>They discussed the 17 Sustainable development goals before the kids got to choose which goal/character they would make. From this discussion, the instructors got ideas from the kids to do local characters illustrating the Agenda 2030.</p>

Digitalizing looms

In this activity, Decode Lab participants learnt how to assemble some mini looms with pre-cut pieces and 3D printed shuttles.





Figure 19, Digitalizing looms activity pictures.

Table 12. Digitalizing looms activity description.

<p>Goals & Formats</p>	<p>The aim of this workshop is to explain the wool cycle by showing all steps one takes to arrive at the result: weave a design made out of wool using laser cut mini looms.</p> <p>Process:</p> <ul style="list-style-type: none"> • Pre-cut different designs of wooden looms. • Use pre-3D printed different models of shuttles. • Explain how loom pieces have been made through Digital Fabrication. • Assemble the looms. • Weave the wool object with the loom and the shuttles.
<p>Location</p>	<p>Elaforotopos, Zagori, Northern Greece. The loom workshop took 2 hours, but there were enough materials and looms for the kids and parents until 5pm. The workshop took place outdoors in a courtyard. There were tables and chairs and refreshments, so people stayed the whole time, and everyone had the chance to engage with the project.</p>
<p>Outputs</p>	<p>The participants used looms fabricated with different digital techniques and choose one to make their own wool object.</p>
<p>Participants & Reach</p>	<p>This activity is targeted to participants 8-15 years old. Collaborators in this activity were: Pokari project, Eco Museum Zagori, The High Mountains. The participants of this activity were mainly families with kids 8-15 years old (total 12 kids, 6 girls).</p> <p>This activity was offered during the European wool day⁵ to connect the local knowledge to the European one. There was a projector streaming the conference in a room indoors with comfortable seating and tables so that people could watch the presentations.</p>

⁵ <https://www.ewe.network/2nd-european-wool-day>

Le Textile Lab Lyon

Textile waste composite by Textile Lab Lyon

The main objective of this activity, developed by the Textile Lab Lyon, was to explore the textile waste problem and get inspired by the by Jérôme Bosch visual vocabulary, to make new biomaterial composite objects or garments.

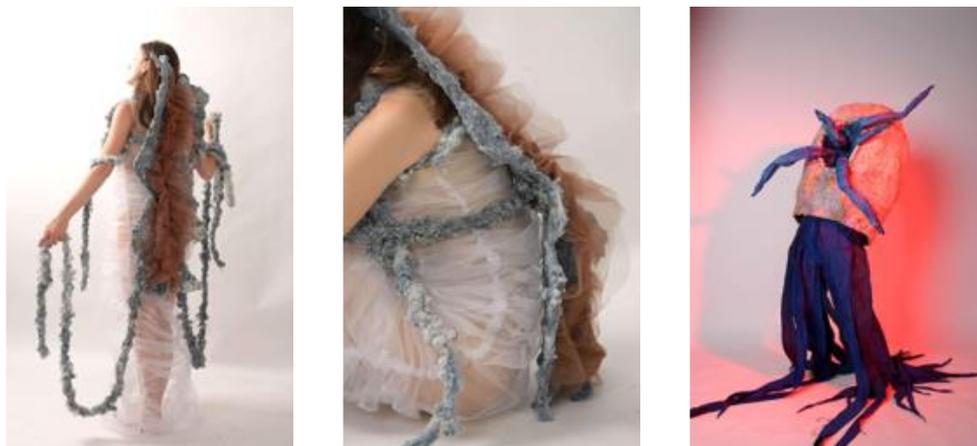


Figure 20. Textile waste composite activity pictures.

Table 13. Textile waste composite activity description.

<p>Goals & Formats</p>	<p>Why? Understand the textile waste problem. Fabricate new material from textile waste. Develop a strange silhouette inspired by the painting <i>The Garden of Delights</i> by Jerôme Bosch. Work in collaboration.</p> <p>General topics:</p> <ul style="list-style-type: none"> • How to shred textiles with low tech. • Recipes for Textile Composite. <p>Process:</p> <ul style="list-style-type: none"> • <i>Day 1:</i> Presentation of the Lab, the textile waste problem, and inspirational projects. Set up the group of 3 students, mixing the classes. Discovering the painting <i>Garden of Delights</i> by Jérôme Bosch, immersion. Sketches and forms work with wire mesh. Select, sort the textile materials, cut & shred. • <i>Days 2-4:</i> Making recipes with agar, corn starch, or alginate. Make a small sample to understand the characteristics. Choose the right recipe for their project and cover the wire mesh with textile composite, repeat.
<p>Location</p>	<p>Le Textile Lab Lyon Oullins.</p>
<p>Outputs</p>	<p>Photoshoot of the creation, catwalk, or exhibition.</p>
<p>Participants & Reach</p>	<p>Targets: teenagers 14-18 years. Collaboration with Lycée La Martinière Diderot.</p>

Participants: 15 students, with 8 girls in the target (under 18) and 3 teachers.

E-dancing shoes

The main objective of this Textile Lab activity was to explore a range of technologies, from drawing to using sensors connected to *Playtronica*, in order to produce music through e-dancing shoes.



Figure 21. E-dancing shoes activity pictures.

Table 14. E-dancing shoes activity description.

<p>Goals & Formats</p>	<p>Why? To inspire teenage girls currently in a career path in care and personal services. Engage their curiosity to explore new technologies associated with textiles in a fun and joyful way. Create a link between innovation and rapid prototyping and their future career.</p> <p>General topics:</p> <ul style="list-style-type: none"> • E-textile • Laser cutting • Rapid prototyping <p>Skills required:</p> <ul style="list-style-type: none"> • Manual work • Hand sewing • Ironing <p>Process:</p> <ul style="list-style-type: none"> • Step 1: Make the soles by combining different conductive fabrics. • Step 2: Make the dance shoes. Drawing, paper and tape prototype, variation of a proposed pattern, laser cutting of fabric, assembly. • Step 3: Join the sole and the shoe, connect to the Playtronica (playtronica.com) Touch Me board, and dance!
<p>Location</p>	<p>Le Textile Lab Lyon Oullins</p>
<p>Outputs</p>	<p>Textile shoes and sole, laser cut and seamless ready to connect to the PLAYtronica Board.</p>
<p>Participants & Reach</p>	<p>Target: Professional bachelor's in <i>Support, care, and services to the person</i>.</p> <p>Stakeholders: The school based in Annecy, their teachers.</p>



Participants: 19 girls and 3 teachers.

LEON

Introduction to New textiles with the Santa Maria Micaela School.

In order to establish relationships between LEON and a Secondary School of Fashion Design, a group of 26 participants experimented with new ways of creating fabrics with biomaterials and discovered how to embed electronics and sensors in textiles, which was totally new for them. The teachers who attended expressed interest in conducting such activities in their school to attract –students with modern hands-on practices.



Figure 22. Introduction to new textiles activity pictures.

Table 15. Introduction to new textiles activity description.

Goals & Formats

Why? This activity aims at introducing beginners to biomaterials and e-textiles as new applications in the Fashion Design Industry, to understand how to embed electronics in textiles. How to create a biomaterial.

General topics:

- Digital Fabrication
- Industry 4.0

Process:

- Explanation of the different conductive materials that can be applied in textiles.
- Explanation of some recipes to make a biomaterial that can be used in textiles.

Location

Fab Lab LEON.

Participants & Reach

Target: Students of Fashion Design (+16).
Stakeholders: Santa Maria Micaela School (Valladolid, Spain).
26 participants with 5 girls aged 16-18 years old.

International Day of Girls and Women in Science: Exhibition of textile projects from girls

The International Day of Women and Girls in Science was celebrated on 12 February. LEON created an exhibition of the Poderosas textile projects that 25 girls had carried

out in 2021, including 7 of the participants of Shemakes Phase 1, and that were presented to families and friends. The two young Ambassadors were also part of the event and talked through their experience of the shemakes.eu project to the public, which produced great inspiration among the girls and admiration among the families that attended with the girls.

The participants were asked to answer some questions related to their main concerns about the future of their girls and the answers were reflected in the below word clouds. The red word cloud illustrates the interest of young girls to become scientists; the green word cloud shows how important it is for parents to transmit strong values to children, so that they can face their future with greater serenity.



Figure 23. International Day of Girl and Woman in Science activity pictures.

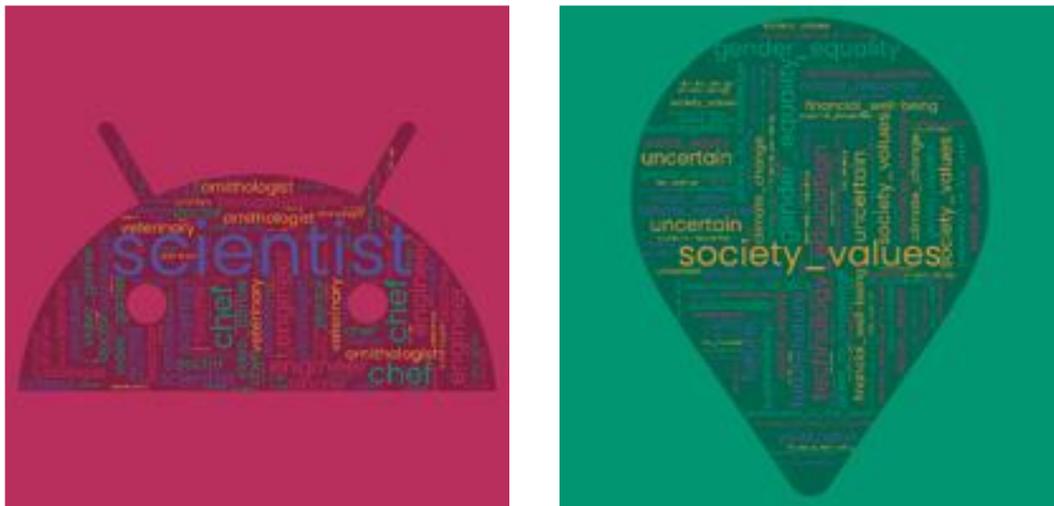


Figure 24. Word clouds summarising the importance of STEM.

Table 16. International Day of Girl and Woman in Science activity description.

Goals & Formats

Why? This activity aims at presenting the textile projects developed by girls to the families attending to the event. It was also an opportunity to reflect on STEM preferred careers for girls, main concerns about the future of their children for parents.

Process

- Presentation of Shemakes project and the Curiosity path.
- Exhibition of the projects on tables explained by the girls.

Video: <https://www.youtube.com/watch?v=9uSk74Ms-QA>

Location

Fab Lab LEON

Participants &
Reach

Targets: Girls and their families (8-18).
52 participants with 25 girls aged 8-18 years old.

2.2. Key Learnings and reflections

General Outcomes

Consolidation of Curiosity activities

"E-monster" adaptations and new contexts of use

In most of the cases, the e-monster activity has been replicated by labs in the same format that was used in Phase 1. There, the labs stated that the documentation was very clear and that it was easy to replicate with many participants and be part of a regular class in schools where both girls and boys have been attracted by the character to be made.

This *monster* has been adapted: renamed as an e-hero, to symbolise the proactive attitude of girls in the world (instead of their fears) and to give them freedom to create a doll from scratch with their own creativity; given a shape of one of the 17 Sustainable Development Goals in order to make children conscious, in a ludic way, of what and how important the SDGs are; inspired from a painting or a sculpture exhibited in a local museum to engage the children's attention and engagement with art and culture.

Some of these activities have been carried out on rural islands in Greece where reception among children and their families was great, and the activity helped to bring notions on how to apply technology and digitalization to rural areas.

"Make your own accessory" adaptations and new contexts of uses

The activity was adapted and conducted several times, mainly as a (modular) tote bag but also as e-slippers, with different groups of different ages in secondary school, and great acceptance was observed among all participants. Transfer Labs stated that it was a clearly documented activity and that it was easy to replicate even in larger groups. Older participants (teenagers) allowed themselves to be more creative in their final designs, choices of colours, and shapes.



Teachers from secondary school were also involved in the activity, which helped in transmitting the knowledge for future replications (training the trainers).

“Exhibitions” with kids as part of innovation narratives

Combined with 11 February *Day for Girls and Women in Science*, an exhibition of the projects realised by Poderosas Girls, some of which had participated in Phase 1, were a great opportunity to bring kids and families together as a safe community. The children were able to explain their projects to their families and the families of their peers. Explaining the techniques they had used to carry out their textile projects helped the kids to strengthen their public speaking, in addition to internalising the learning they had done in the previous months. In the same way, the families were aware of the technological skills of the children and the possibilities that textiles have in a wide range of projects.

Feedback on participants’ experience

As detailed in the below figure, there was a consensus on the fact that activities were fun and joy to the participants, a good driver to encourage tech and science among girls.

Improvements were mentioned mainly on time (e.g., with more breaks, more time), management of the group (e.g., rotating pairs or sub-groups to encourage group feel) and activities themselves (e.g., minute preparation of every participant’s material for younger ones or more autonomy in creating one’s material for older ones).

Table 17. Feedback on participants’ experience by each Transfer Lab.

VIVA Lab

They consider that this kind of activity is welcome by the kids and young people. The feedback from the participants and families is **positive**. For future activities with kids, they suggest improving a few things such as the **duration** of the activities and the **preparation** of the materials in a more attractive way. They also recommend **promoting** the activities in schools, with face-to-face communication about the project so that kids are more likely to get involved.

Decode

This type of activity **worked well** both in Athens and remote places. They delivered the activities for mixed groups (boys and girls aged 8-18) to make them more inclusive. When the activities took place **outdoors**, the challenge was that nature was an extra point of attraction and joy for the kids. Also consent forms could have been attached to the invitation and filled in **before** arriving at the workshop. Another suggestion for this type of activity is to add a



	break where informal discussion can take place between the participants.
Le Textile Lab Lyon	Activities were very much welcome . Their activity "Textile waste activity" will need more time so that the biomaterial work can dry easier and better.
VIVISTOP	The duration of the e-hero workshop was very suitable for achieving the results of all participants. They considered that the creative part where kids created their own designs was very inspiring for them. This part led to unexpected, funny results and trained kids to adapt their design patterns to the circuit part. For the future, 2D drawing and laser cutting could benefit from more time to explain and experience. (To overcome that, VIVISTOP contributed to this activity by adding extra drawings, designs, and posters with attached materials for this adapted activity, which were very useful for the children to get to know components and materials). Each activity presentation could be more playful , with more child-friendly drawings and pictures (for example the scheme of how RGB LED works might be presented in bigger and clearer pictures with coloured legs). Managing the group could benefit from changing the seats of kids after the first session to improve kid-to-kid mentoring and to observe in greater detail each child's abilities. Managing the activity might work better and help get personalised results , either with a larger range of pre-cut different designs of modular parts or by letting kids create their own modular parts as was done in the "Make your own accessory" activity.

Specific tips for running curiosity activities with kids

In their reflections, Labs emphasised specific good practices to run curiosity activities. They are well aligned with and complete well the tips provided in the first phase of Shemakes project.

Most relevant good practices from Phase 2.

Tips	Examples from the labs
A clear documentation in hand.	(VIVISTOP) "E-Monsters activity documented in Phase 1 is very clearly documented and easy to replicate". They made a great contribution, the one-pager: a poster with printed materials and components that participant can physically put in place before starting the activity to get familiar with all the materials.
Contents in local languages	(VIVA Lab) "The language was a challenge that was overcome with the help of volunteers who translated the instructions from Spanish to



Tips	Examples from the labs
Materials preparation	<p>Portuguese and also some kids that took advantage of the opportunity to practise Spanish and teach Portuguese.”</p> <p>(VIVISTOP) “Kits have to be developed fully beforehand, so that the participants can find everything they need in their workshop bags.”</p>
Agile and caring facilitators	<p>(Decode) “A good tip would be to think of alternative scenarios if things do not go according to plan”.</p> <p>Besides, facilitators of Decode and VIVA Lab learnt from the Ambassadors to prepare the kits of materials in advance as she did in her lab, what was very helpful for finishing the workshop in time.</p>
A key role for families and relatives	<p>(Leon) “Families are a very active community. The girls can experiment as a first experience presenting their projects to a safe public that are the families that ask and show their interest to the girls.”</p>

Differences between kids of 8-14 and teenagers from 15-18

The age of kids participating in the Curiosity activities ranged from 8-18. As in Phase 1, most of the workshops in Phase 2 engaged with a target of younger kids, from 8 to 14. Thus, few adaptations related to the kids' age were done by the labs; facilitators opted for providing a step-by-step process, described in a pedagogical way with a lot of care and support.

For younger ones, improvements such as *“increase the measures of bag’s hem from 1 to 2 cm and from 1,5 to 2,5 cm”* or *“use right- and left-handed round tipped scissors”* were noted.

Thanks to a collaboration with high schools, Le Textile Lab Lyon ran activities for teenagers 15-18 and could complete the current offer provided by the Curiosity path. The activities of Textile Waste Composite and Dancing E-shoes were chosen according to the interests and preoccupations of this target age and slightly add on the complexity of the activities. This target group, which has left the teenage stage and has not yet entered the young women one, demonstrates that there is some proximity between curiosity and discovery activities which is specific and deserves further research.

Gender Vision findings

In general, the Curiosity Transfer labs observed that activities were conducted in a highly **collaborative** environment with children teaching and helping each other.



Having the young Ambassadors in two of the transfer labs (VIVA Lab and Decode FabLab) was very **inspiring** for the participating children and conversely, the Ambassadors, who gave the workshops felt **empowered**. Activities were open and proposed to everyone. Most of them were attended by mixed groups of girls and boys, which contributed to build **equality** and consider that **difference is welcome**. There was some indication that girls formed sub-groups more easily when they were as important or less important than boys in the activity. More generally, the five values of the Shemakes gender vision were present throughout all the activities of the curiosity path.

Table 18, Gender vision findings by each Transfer Lab.

<p>VIVA Lab</p>	<p>Being part of Shemakes was a big learning experience and a way to promote activities with young girls (and boys) in the textile and technology areas. Sometimes, it is not easy to bring girls to these kinds of activities because once they think about technology, they “run away” from them. Bridging textiles with tech is an excellent path to bring girls to this kind of environment. On the other hand, it is also an excellent way to bring boys to the textile world. In a way, these two worlds complete each other and together build bridges between genders providing a way to bring equality and to empower young women and girls. This way of mixing areas is also a fabulous way to spark creativity and inspire future generations on everything that is happening in the tech world and the fab labs.</p>
<p>VIVISTOP</p>	<p>Both girls and boys were very involved in all the activities and enjoyed the process and were proud of the results. It shows that when they are up to the hands-on activities with the same goals e.g., circuit making or tote bag design, both boys and girls work together. In terms of dynamics, the VIVISTOP team observed that when boys were involved but still formed a minority, girls were less likely to form groups and more likely to work independently.</p>
<p>Le Textile Lab Lyon</p>	<p>The “inspiring” value kept the girls curious and involved. The activities engaged them in imagining what can be done with this new knowledge in textile, electronics, or new materials. The Textile Lab Lyon also worked with students in a professional course, boosting the accessibility of the activity to all, no matter their social class or gender, a “yes, we can” attitude.</p>
<p>Decode</p>	<p>In general, participating kids respected and helped each other. In terms of gender, there was a good complementary collaboration between girls and boys: girls were very much interested in the technical side of the projects and boys in sewing and crafts and girls were much better in handcrafts and boys on electronics or understanding how the machines work.</p>



There were discussions on traditional ways of making and gender stereotypes that come with it, and how new technologies and new ideas can improve both the way we make but also the way genders collaborate in the process. A harmony between old and new as well as gender with **mutual respect** was observed.

It was easier to see the different behaviours of **boys vs girls in mixed groups** than in single sex group (only girls).

The **inspiring** value was applied by providing the opportunity to girls to use new tools and technologies and consider the possibilities for the T+C sector.

Reflections on labs' capability and on Ambassadors

In their report, Transfer Labs demonstrated that Shemakes is bringing great opportunities for the development of local connections with different stakeholders such as local communities, city hall, schools, and museums. The main difficulty they found is related to the promotion of the activities so that more people can be involved. Most of them are planning to get funding to maintain these activities in the future.

The experience with the young Ambassadors has been very fruitful, not only for the two labs where Ambassadors went, but for the two girls themselves. Giving the workshops in English to a foreign audience pushed them out of their comfort zone, strengthened their self-confidence and was an inspiring example for the other girls.

Table 19. Reflection on Labs capability and Ambassadors.

VIVA Lab

Being part of Shemakes has been a great experience for VIVA Lab. They are planning to look for some support from the textile industry and local city hall so they can continue offering these activities to the public in the future. There is a lot to do in the textile district in Portugal, a country where the textile industry is given high importance (almost everyone had someone in their family working in the sector in the 80's and 90's). They consider that it is important to bring technology and innovation to contribute to the rebirth of the textile industry through entrepreneurship. Regarding the Ambassador, they consider it a great experience to see a young girl such as Carla make her own workshop for young girls, helping them and passing on knowledge. Teaching something is the best way to solidify learning.

Decode

They are planning and looking for funding to continue creating similar activities and mixed gender workshops, especially the ones in remote areas.

Regarding the interaction and collaboration with their Ambassador, Lucia, it was a fruitful and interesting experience! First of all, it was great



to have a 13-year-old girl collaborating in workshops that are addressed to her age or younger. She was eager to find out about Greek culture and the FabLab working model. The activity that Lucia co-delivered was a known activity as it is an adaptation of the e-monsters workshop she had previously done in Spain, in Fab Lab Leon, and she was very good at it. The workshop was conducted in English, a second language to both Lucia and the other participants and there was Olivia Kotsifa from Decode who translated what Lucia presented into Greek for the kids who did not understand English. Decode hopes to continue the collaboration with both Fab Lab Leon and Lucia as it was a fantastic experience.

Future Actions

Refine the documentation

The Transfer Labs will upload adapted activities to the Open Toolkit to better document existing ones. Some of the Transfer Labs created new presentations and booklets in local languages and these will also be uploaded. For the new activities, the Transfer Labs will upload the documentation to the Open Toolkit, including the presentations and the booklets and enrich the educational content of Shemakes.

Next steps

All the Transfer Labs stated that they were very satisfied with the results of the Shemakes project. For the near future, they will look for new funding to be able to continue offering this type of activity, in such an accessible way.

Table 20. Comments on next steps by each Transfer Lab.

VIVA Lab

VIVA Lab would love to have more activities in the textile area and make it a real strength in their FabLab. For the moment they will replicate these activities in different environments and make them more efficient. They have already replicated the “e-monster” and the “sanded T-shirt” activities in their summer school camp. They would like to bring more makers and experts of the sector to the lab to discuss the future of textile and how VIVA Lab as a Fab Lab can support the local community. The visit to Covilhã strengthened the partnership between cities and there is a lot of potential to create impactful projects that can bridge maker exchanges in the textile and wool sector.

Le Textile Lab Lyon

Le Textile Lab Lyon will continue organising this kind of activity. They aim to use the results of these first experiences as **a model** to present them to new schools and find stakeholders in order to sustain it financially.



Decode

Decode would like to continue to conduct activities in their Lab and in **remote places with the Mobile lab.**

VIVISTOP

According to VIVISTOP, open-source platforms, documentation and workshops are key to spreading inspiration and developing courage to try new things. The government already understands the importance of this movement and finances this kind of activity. As private, **informal after-school education** might lack support from parents and be unable to provide tech equipment and materials for workshops, other solutions need to be found.



3. Discovery Path

3.1. Update on the Path

Recap of Discovery path

This task addresses young women of age **18 to 25**. The main goal is for labs to establish a collaboration with at least one academy, **university** or institute for fashion, textile design, etc. to **incorporate learning modules into existing curriculums**. Through this path, participants are exposed to innovative practices, materials, and digital manufacturing techniques that they can integrate in their portfolio of competences, and the Labs can establish permanent collaborations with more **traditional T&C educational institutions**.

In phase 2, 5 transfer labs joined the discovery path: **Green Fabric, Rog Centre, TPL VIVISTOP and the Icelandic Textile Center**. They were guided by the referent lab of the discovery task, **ONL'FAIT**. In the beginning of the 2nd phase of the discovery task, the focus was to transfer knowledge learned during the first phase by finding possible stakeholders, their target audience and giving them the freedom to create or adapt previous activities to their local context. The Transfer Labs then conducted new or adapted activities that are being documented in the open toolkit.

Phase 2 also allowed us to see the evolution with the key learnings from Phase 1 (figure 2) and those of the transfer labs, which helped supporting key learnings that are developed at the end of this chapter.



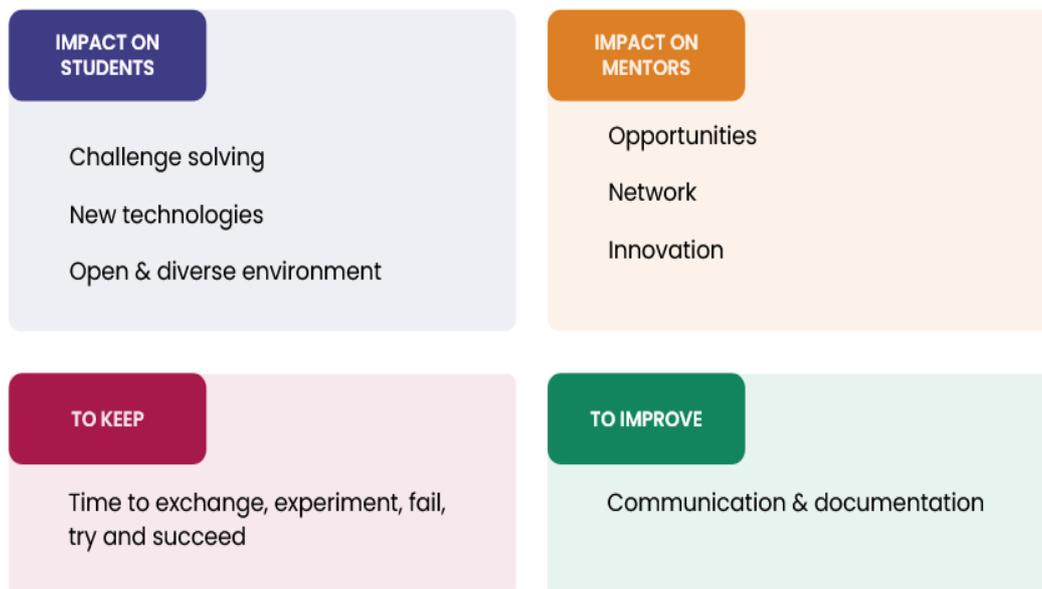


Figure 25. Key learnings of Phase 1.

Task management and data collection in Phase 2

During this second phase, ONL'FAIT managed the discovery path through regular meetings with the transfer labs besides the general meetings that punctuated the general timeline of this phase. They also guided Transfer Labs with tools to help them prepare their activities and execute them.

Meetings

ONL'FAIT and the Transfer labs had specific meetings through the different stages of Phase 2. The timeframe was set up by the general Shemakes meetings where each transfer lab talked about how their projects were coming along and where general questions were raised and answered. If there was not enough time during a set meeting, ONL'FAIT organised another meeting during that week or the next to keep the pace and rhythm going.

In addition, the task leader had meetings with individual labs on demand. There were four main one-to-one meetings between each transfer lab and task leader.

- The first at the beginning of the year was an introduction between the task leader and the Transfer Lab, to learn and brainstorm on what type of activities the transfer labs wanted to explore.
- The second meeting was not mandatory, but it was for any transfer lab that had questions before starting their activities.

- The third meeting was after the activities. This was meant to share and exchange on how the activities were experienced and their main outcomes. It was also a time to help the transfer labs with any missing information for their documentation of the activities in the toolkit.
- The final meeting was to collect data, KPIs and visuals on the transfer labs' activities.

Data collection

For the deliverable, each lab filled and sent their individual report based on the template provided by the WP leader (see annex Template for Data Collection). Individual meetings were proposed to answer questions and co-design the learning for the discovery path.

3.2. Description of activities

As in phase 1, in phase 2 discovery activities were very diverse. Labs **adapted** or **created** activities among the three subtopics: Industry 4.0, Sustainability, Wearable, as follows.

DISCOVERY	TOPICS			COOPERATION			
	Sustainability	Industry 4.0	Wearables	HEI DSchools	Vocational Training	Open Call to students	Public 18+
GREEN FABRIC	✓ Modular fashion Textile and code Hack knitting machine			✓	✓		
ROG CENTRE	✓ Symposium: Innovative Biomaterials in Design Cellulosic materials workshop Biomaterials workshop			✓		✓	✓
TPL	✓ From Yarn to textile Exploring Fibre creating yarn ✓			✓			✓
VIVISTOP	✓ Thermo-chromic Dyeing ✓	✓ Draping and Moulage ✓	✓ E-textile ✓	✓			
ICT	✓ Biomaterial Bacterial Dye ✓	✓ CLO3D 3D Printing ✓	✓ Soft robotics ✓				✓

Figure 26. Overview of Discovery path activities in Phase 2.

In the following section, discovery path activities are detailed lab by lab in the following order, including replicated/adapted to contexts or new activities.

- **Green Fabric:** collaboratively testing new activities
 - Modular Fashion
 - Textile and coding
 - Knitting machine hack
- **RogLab:** a series of Biomaterial events

- Innovative Biomaterials in Design: A Shemakes Symposium
- Cellulosic materials workshop
- Biomaterials workshop
- **TPL:** One week full of varied workshops with 2 different institutions
 - From Yarn to Textile and Exploring fibres
 - E-Textile Playground
 - Smart Stitches
- **VIVISTOP:** 3 consecutive days around E-Garments
 - Thermo-chromic fabric dyeing
 - Draping/mouflage technique
 - E-textiles
- **Icelandic Textile Center**, a series of workshops open to the public
 - Clo3D, led by the Ambassador and a guest lecturer
 - Biomaterials Workshop, led by the Ambassador
 - Soft robotics Workshop, led by the Ambassador
 - Rhino+Grasshopper + 3D printing, led by the Ambassador
 - Bacterial Dyes Workshop, led by the Ambassador in collaboration with Marine and Biology institute Biopol

Green Fabric: collaboratively testing new activities

Modular Fashion (replicated)

This workshop aimed at how to make laser cut modules in order to create objects or garments from leftover fabric, with the Inkscape software and a laser cutting machine. This was a Phase 1 activity that was replicated by Green Fabric on the basis of an existing tutorial.



Figure 27. Modular fashion activity pictures.

Table 21. Modular fashion activity description

<p>Goals & Formats</p>	<p>In a tutorial participants explore how to make laser cut modules to create objects or garments from leftover fabric with Inkscape software and a laser cutting machine. The activity is based on Fabricademy Open-Source Circular Fashion Module.</p> <p>Why? This workshop aims to raise awareness about the fabric leftover uses and upcycling into a new object with the use of the laser cutter. In detail, it aims to:</p> <ul style="list-style-type: none"> • Understand the importance of recycling materials. • Have an overview of the use of laser cutting machines. • Discover Open-Source creation software like Inkscape. • With time: Be able to design a personalised piece by yourself; Make an object, an accessory or a garment with the modules created. <p>General topics:</p> <ul style="list-style-type: none"> • Digital Fabrication and Craft • Industry 4.0 <p>Process:</p> <ul style="list-style-type: none"> • Modules creation. • Zero waste. • Laser cutting.
<p>Location</p>	<p>Green Fabric lab in Brussels.</p>
<p>Participants & Reach</p>	<p>Targets: Students 18-25. With: Textile Design from Academy of Fine Arts of Tournai. Participants: 14 students: 9 women / 5 men and 2 teachers.</p>

Textile and coding

This Green Fabric workshop aims at introducing beginners to coding with turtlestitch.org by using a tangible medium, here embroidery on textile. It also aims at using the gender bias of textile to counterbalance the gender bias of new technologies.



Figure 28. Textile and coding activity pictures.

Table 22. Textile and coding activity description.

<p>Goals & Formats</p>	<p>The workshop aims in detail:</p> <ul style="list-style-type: none"> • Feel more relaxed towards programming. • Understand the basic concepts of programming. • Have an overview of the use of a hacked knitting machine. <p>General topic:</p> <ul style="list-style-type: none"> • Digital Fabrication and crafts <p>Process:</p> <ul style="list-style-type: none"> • Introduction and context. • Presentation of TurtleStitch.org. • Drawing commands. • Embroidery commands. • Programming elements. • Embroider.
<p>Location</p>	<p>Green Fabric.</p>
<p>Outputs</p>	<p>After learning turtlestitch, participants embroidered their own design made with a set programme.</p>
<p>Participants & Reach</p>	<p>Targets: Students 18-25. With: Francisco Ferrer, a fashion designer. Participants: Francisco Ferrer fashion; 7 design students: (6 women / 1 man); 1 teacher, 1 Ambassador.</p>

Knitting machine hack

This Green Fabric workshop aimed at introducing beginners to using spreadsheet and hack a knitting machine to generate knit patterns.



Figure 29. Knitting machine hack activity pictures.

Table 23. Knitting machine hack activity description.

<p>Goals & Formats</p>	<p>The main goal of the activity is to introduce beginners to hacking digital machines and therefore having access to alternative solutions to make knitted patterns.</p> <p>General topics:</p> <ul style="list-style-type: none"> • Digital Fabrication and crafts • Industry 4.0 <p>Process:</p> <ul style="list-style-type: none"> • Understand how IT can help the design process. • Produce an object/prop/pattern using a spreadsheet to grasp some coding aspects. • Learn to use a hacked knitting machine.
<p>Location</p>	<p>Green Fabric.</p>
<p>Outputs</p>	<p>Each participant made their own complex pattern generated by spreadsheets to hack the knitting machine.</p>
<p>Participants & Reach</p>	<p>Targets: Students in Executive Master in Knitting design (18-25). With: Royal Academy of Fine Arts (Brussels).</p> <p>Participants:</p> <ul style="list-style-type: none"> • Day 1: 4 students, 4 women. • Day 2: 4 students, 3 women / 1 man.

Rog Centre: a series of Biomaterial events

Innovative biomaterials in design: A Shemakes Symposium by Rog Centre

The main objective of this symposium was to gather international and local experts whose research and development work is focused on biomass, cellulose materials and biomaterials, and exchange with them about these innovative biomaterials, that are perceived as one of the future roadmaps in textile. This symposium also aimed at introducing the series of workshops on innovative biomaterials that were conducted afterwards.



Figure 30. Online international symposium on Innovative biomaterials in design – pictures.

Table 24. Online international symposium on Innovative biomaterials in design – description.

<p>Goals & Formats</p>	<p>The aim of this event was a first introduction to the topic of innovative biomaterials to prepare the later workshops for the students.</p> <p>General topics:</p> <ul style="list-style-type: none"> • Bio-Fabrication • Sustainability <p>Process:</p> <ul style="list-style-type: none"> • The guests joined us in a discussion about innovative biomaterials, widely considered to be the future of design. • They were both international and local experts whose research and development work is focused on biomass, cellulose materials, and biomaterials. • The event was held in English and was aimed at anyone with an interest in the use of biomaterials in design and sustainable development in the spirit of the shemakes.eu project, which seeks to empower women innovators in the textile and clothing sector. • The symposium showcased local and international examples of material research – covering from complex solutions to simple practical ones. • The 2-hour session was split between 1 hour of lecture and presentations followed by 1 hour of a moderated discussion about the future and role of women innovators in the textile and clothing sector and a Q&A session.
<p>Location</p>	<p>Online, https://fb.me/e/4j7qA1skW</p>
<p>Participants & Reach</p>	<p>The lab connected with 8 different stakeholders, national and international.</p> <p>Participants:</p> <ul style="list-style-type: none"> • 48 registered = 40 female, 8 male • 27 present = 23 female, 4 male • 8 guest lecturers = 6 female, 2 male • Facebook Live: 473 views

Cellulosic materials workshops

These Rog Centre workshops focused on making paper with different cellulosic materials extracted out of kombucha, onion peels, garlic skins, coffee husks, ginger, apple etc. They were organised and led in partnership with IAAC – FabLab Barcelona and the Pulp and Paper Institute (ICP) in Ljubljana, Slovenia.





Figure 31. Cellulosic biomaterials workshops pictures.

Table 25. Cellulosic biomaterials workshops description.

<p>Goals & Formats</p>	<p>The workshop was an introduction to microorganisms, symbiosis, fermentation, and cellulosic materials from paper pulp to bacterial cellulose.</p> <ul style="list-style-type: none"> • Experiment with cellulose based recipes based on the Chemarts book. • Learn how to grow bacterial cellulose. • Learn about the traditional process of paper making and make paper with different agents. <p>General topics:</p> <ul style="list-style-type: none"> • Biofabrication • Sustainability <p>Three workshops were conducted</p> <ul style="list-style-type: none"> • One half day online workshop to present the subject from the theoretical point of view (Anastasia Pistofidou - IAAC and Igor Karlovits - ICP), present the methodology of production workshops (Lucija Jankovec - Rog Centre) and ask for preliminary work from students. • One full day cellulose production workshop to make a variety of cellulosic materials, led by Anastasia Pistofidou (IAAC). • One full day paper production workshop to make paper and led by Tea Kapun, Igor Karlovits and Anastasia Pistofidou (ICP & IAAC).
<p>Location</p>	<p>Online and onsite at Rog Centre current offices.</p>
<p>Participants & Reach</p>	<p>Targets: Students from the University of Ljubljana - Faculty of Design, Academy of arts, Faculty of Chemistry, Biology, etc. They were selected through a local open call application based on their profile/motivation letter. 3 international students also came from the Balkans and Turkey.</p> <p>Participants:</p> <ul style="list-style-type: none"> • 11 students - 9 local, 2 international • 8 Female, 1 male, 2 non-binary

- + 3 mentors: 2 female, 1 male

Biobased materials (replicated)

These Rog Centre workshops were focused on raising awareness on biobased solutions that could be alternatives to textiles, specifically working on how to make biopolymers from gelatine, agar-agar, sodium alginate, or apple pomace. They were organised and led in partnership with the Strano Microfactory (Fabricademy alumna) and the National Chemistry Institute (KI) in Ljubljana, Slovenia.



Figure 32. Biobased materials workshops pictures.

Table 26. Biobased materials workshops description.

Goals & Formats

Workshops aims:

- Raise awareness around emerging biobased solutions and material innovation.
- Introduce participants to different processes of bio fabricating materials using recipes that combine dried food waste and different possible polymers and plasticizers.
- Generate an added value to organic food waste and introduce them to biodesign practices.

General topics:

- Biofabrication
- Sustainability

Three workshops were conducted:

- One 2-hour online workshop to present the subject from the theoretical point of view.
- One full day production workshop based on gelatine, agar-agar then based on apple pomace and Cellulose materials.
- One half day production workshop based on Alginate sheets and Biothreads, Kombucha harvesting concluding on the design process to use such materials.

Location

Online and onsite at Rog Centre current offices.

Participants & Reach

Targets: Students from the University of Ljubljana – Faculty of Design, Academy of arts, Faculty of Chemistry, Biology, etc. They were selected through a local open call application based on their profile/motivation letter. 3 international students also came from the Balkans and Turkey.

Participants:

- 10 Students – 10 Female
- 7 local, 3 international
- + 2 mentors: 1 female, 1 male
- + technical assistance: 1 male

TPL: two weeks of activities with university students

From yarn to textile (3 days) and Exploring fibres, creating yarns (2 days)

This first week of workshops was dedicated to learning the basics of spinning with the open-source Hilo machine and test different parameters on yarn properties in order to create their own yarn. It was led by the artist Sara Diaz, who mentored the whole process. Two sets of workshops were repeated in the same week, one with three days and one with two days, the third day allowing students to weave their own garment.



Figure 33. Yarn to textile and Exploring fibres, creating yarns workshops pictures.

Table 27. Yarn to textile and Exploring fibres, creating yarns workshops description.

Goals & Formats

In two workshops, students learned about the basics of yarn making, the properties of different fibres and the effect of different spinning and fibre parameters on yarn properties.

General topics:

- Digital Fabrication and crafts
- Industry 4.0

Process (common to both workshops):

- Day 1: The artist Sara Diaz who led the workshops, introduced herself and gave the students a short insight into the



	<p>development phases of her Hilo machine. Then, students were invited to try out spinning and twining with a Hilo machine, and hand-spinning with an electric hand spindle to get acquainted with the process and the machines.</p> <ul style="list-style-type: none"> • Day 2: The students could create their own threads using common fibre materials like wool or linen, but also bring their own materials. Yarns from recycled pantyhose-strips were created, conductive twines, multicolour yarns, and much more. • In the "From yarn to textile" workshop only, the third day was used to knit and weave textiles from their own yarns.
Location	At TPL.
Outputs	Each participant made and used the Hilo machine to create their own threads from different materials. Many of the students took offer to come back to make more yarn and textiles.
Participants & Reach	<p>Targets: Students came from the HTW Berlin – University of Applied Sciences (program: clothing technology) for the <i>Exploring fibres</i> workshop. Students from KHB – Weißensee Academy of Art Berlin (program: textile design) for the <i>From Yarn to Textile</i> workshop.</p> <p>In partnership with:</p> <ul style="list-style-type: none"> • HTW Berlin (clothing technology). • Sara Diaz, the creator of the Studio Hilo prototyping spinning machine. <p>Participants:</p> <ul style="list-style-type: none"> • 6 students • 2 spinning instructors • 2 TPL staff • 100% female

E-textile playground

This TPL workshop was dedicated to creating E-Textile Applications using the TPL toolkit and provide consultation and assistance to shape the students' own interactive e-textile projects that will be implemented during the semester.



Figure 34. E-textile playground workshop pictures.

Table 28. E-textile playground workshop description.

<p>Goals & Formats</p>	<p>The main objective of this workshop is to explore different concepts related to the basics of building soft circuits and wearables using e-textiles materials and TPL modular kit to make interesting interactive smart garments.</p> <p>Learning Outcomes:</p> <ul style="list-style-type: none"> • Understand the basics of the e-textiles and smart materials to make interactive projects. • Use Arduino programming with TPL tool kit modules to enable control or design of smart or automated circuits. • Identify and formulate ideas for the wearable projects. <p>General topic:</p> <ul style="list-style-type: none"> • E-textiles <p>Process:</p> <p>During a two-day workshop, students could create their own e-textile projects using the TPL prototyping toolkit.</p> <ul style="list-style-type: none"> • 1st Day: Intro into e-textiles including an overview of the different single-function modules from the toolkit and the requirements and special properties that e-textiles possess. Developing concepts for e-textile projects in small groups of students. • 2nd Day: Groups gave a short presentation of their idea to get feedback from the TPL workshop leaders, the other groups as well as the Shemakes Ambassador Tasneem who co-led the workshop. The rest of the day was spent making mock-up circuits using the toolkit and testing different functionalities. Plans for the e-textile systems were made.
<p>Location</p>	<p>At the TPL lab.</p>
<p>Participants & Reach</p>	<p>Targets: Master students studying Textile and Surface Design from Weißensee Kunsthochschule Berlin (KHB) and another group of students of Garment Technology at the University of Applied Sciences Berlin (HTW) as a part of Material Innovation master course.</p> <p>With:</p> <ul style="list-style-type: none"> • HTW: University of Applied Sciences Berlin • KHB: Weißensee Kunsthochschule Berlin <p>Participants:</p> <ul style="list-style-type: none"> • 6 students, all female • 2 TPL staff, 1 Male and 1 Female • 1 Shemakes Ambassador (Female)

Smart stitches

E-Textile newbies learn to make simple circuits and communicate inspiring messages using the age-old crafting technique of cross-stitching. Cross-stitching

has a lot of overlap with binary computer language and is easy to learn, making it ideal for an entry into textile electronics. It also makes it very easy to incorporate inspiring and empowering messages into the e-textile projects.



Figure 35. Smart stitches workshop pictures.

Table 29. Smart stitches workshop description.

Goals & Formats	<p>The Smart Stitches workshop aimed at giving a playful introduction to e-textiles to people who did not previously work on the topic, to:</p> <ul style="list-style-type: none"> • Understand the basics of the e-textiles and cross stitching. • Design and stitch simple circuits using e-textile fibres and threads. • Design an interactive piece of art to tell a story (bonus). <p>Learning Outcomes</p> <ul style="list-style-type: none"> • Understand how to use cross stitching embroidery can be integrated with smart threads/ fibres to add new values to art pieces. • Get an overview of e-textiles and smart materials. • Be able to build interactive circuits (e.g., sensors, switches and actuators or a combination of all) using a traditional embroidery technique. • Get inspired by cross stitching analogy with programming and its power for storytelling and textile narratives. <p>General topic:</p> <ul style="list-style-type: none"> • E-textiles <p>Process: After a short introduction into e-textiles and cross-stitching, the participants realised their own projects under the guidance of Ambassador Tasneem and the TPL staff. Besides rather decorative pieces, some of the participants also crafted interactive peace messages and feminist statements.</p>
Location	TPL Lab.
Participants & Reach	<p>Targets: Open to all young adults (18-25).</p> <p>Participants:</p> <ul style="list-style-type: none"> • 6 participants (all female)

- 2 TPL staff (1 male, 1 female)
- 1 Shemakes Ambassador (female)

VIVISTOP: 3 consecutive days around E-Garments

Three consecutive full day workshops were conducted in partnership with the Vileisio Progymnasium of Vilnius. Fifteen students (thirteen women) attended the three workshops that covered new techniques: thermochromic fabric dyeing, draping, and moulage techniques and E-garments. All workshops happened at the VIVISTOP location, who had equipment and materials to help students learn about these matters and were led by the Ambassador in conjunction with a member of the VIVISTOP team.

Thermochromic fabric dyeing

The thermochromic fabric dyeing was the first of three different full day workshops on new textile techniques that were conducted for the students of the Vileisio Progymnasium of Vilnius at VIVISTOP lab.

Students learned about the theoretical framework behind thermochromic dyeing technique and experienced it on various prototypes.



Figure 36. Thermochromic fabric dyeing workshop pictures.

Table 30. Thermochromic fabric dyeing workshop description

Goals & Formats

The objective of the thermochromic dyeing workshop was to make students discover new techniques of dyeing, their variability through heat and the suitable fabrics for such dyeing process.

Learning Outcomes:

- Know the suitable fabrics for dyeing.
- Discover how different thermochromic dyes work.
- Learn the technique of thermochromic dyeing.

	<p>General topics:</p> <ul style="list-style-type: none"> • Digital Fabrication and crafts • Industry 4.0 <p>Process: This activity was led by the Ambassador, who first presented her background and activities, then introduced the conceptual framework of thermochromic dyes before mentoring students in their experimentation of thermochromic dyeing on multiple fabrics.</p>
Location	VIVISTOP.
Participants & Reach	<p>Targets: Fashion Design students aged 18-25.</p> <p>With: P. Vileisio Progymnasium in Vilnius.</p> <p>Participants: 15 students, 13 Women and 2 Men</p>

Draping/moulage technique

This second VIVISTOP workshop was dedicated to learning the draping and moulage techniques, using a piece of white fabric to create their own garment design.



Figure 37. Draping/moulage technique workshop pictures.

Table 31. Draping/moulage technique workshop description.

Goals & Formats	<p>Draping and Moulage techniques are often considered as too traditional a basic to be taught to students. However, this is a key step to build a garment with a nice shape and fit for a piece of clothing.</p> <p>Learning Outcomes:</p> <ul style="list-style-type: none"> • Draping and moulage history and cultural knowledge • Pattern and its role in reproduction of a garment • New skills and crafting techniques <p>General topics:</p> <ul style="list-style-type: none"> • Digital Fabrication and crafts • Industry 4.0 <p>Process:</p> <ul style="list-style-type: none"> • Presentation of the activity. • Introduction to draping and moulage techniques.
-----------------	--



- Mood board production to contextualise and inspire creation of a garment piece.
- Pattern making range of techniques and potential choice for garment design.
- Creative fabric draping techniques, experimentations, and applications to the garment design.

E-Textiles

The third VIVISTOP workshop gave the opportunity to students to make the garments they had designed, using the previous results of draping, adding the Shibori embroidery technique as an inspiration for conductive threads and using the power supply of the conductive threads to observe how the dyed fabric would change colour with the heat intensity. Mixing Shibori with basics in electronics was very close to the *Smart stitches workshop for newbies*, mentioned in the previous section on TPL.



Figure 38. E-garments workshop pictures.

Table 32. E-garments workshop description.

Goals & Formats

The workshop aimed at discovering and learning another set of embroidery techniques and basic electronics, to finalise the garment they had designed, draped, and dyed in the previous two workshops.

Learning Outcomes:

- Shibori technique.
- Circuit design and basic electronics.
- Adaptation of Shibori to electronics.
- Experimenting with the results.

General topic:

- E-Textile

Process:

- Presentation of the activity.
- Introduction to e-textiles.

- Shibori embroidery with conductive thread and thermo-dyed fabric (from previous workshop).
- Understanding the circuit basics.
- Experiments with the power supply to get the results and explore the thermos-dyed fabric's limits.

Icelandic Textile Center, a series of open workshops

Clo3D

This two-hour online workshop combined an inspirational lecture about 3D digital fashion design that was followed by a one-hour tutorial of how to use the CLO3D software and some example applications. The recording can be found [here](#).

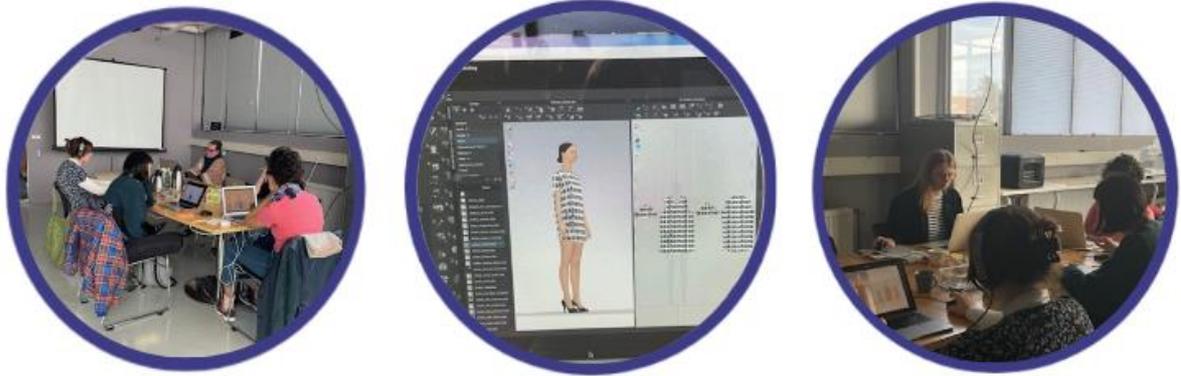


Figure 39. Clo3D online workshop pictures.

Table 33. Clo3D online workshop description

Goals & Formats

3D modelling and virtual design in the textile and clothing sector is one of the most emerging necessary skills for young designers. It allows the virtual representation, simulation, and animation of garments without the need of physical prototyping them.

Learning Outcomes:

- Understand 3D modelling and virtual design,
- Get introduced to 3D modelling and virtual design in fashion, its possibilities, and current trends.
- Obtain a beginner's level understanding of the interface of Clo3D software

General topics:

- Fashion Design
- Digital Design

Process:

- The online workshop started with an online presentation of digital design by the international designer Julia Žil Vostalová from

	<p>Gizmolab and Anastasia Pistofidou from laac, followed by a Q&A session.</p> <ul style="list-style-type: none"> • Then a tutorial online introduced the Clo3D interface, followed by 5 exercises for beginners such as 3D coordination, arrangement, sewing, appearance, or rendering. The tasks were adapted to the different capabilities of the 3D software which should motivate the participants to explore it further and implement it in their own projects. <p>Pre-requirements: For this workshop participants used their own computers with their computer mouse, and had to install a free trial of Clo3D before the workshop started.</p> <p>Optional: 2D patterns can be prepared in advance on Illustrator or downloaded from a library of available patterns.</p>
Location	At the ICT lab.
Outputs	Participants were able to create their digital garment pattern in the Clo3D software
Participants & Reach	<p>Targets: all designers interested in learning a new software on 3D design for fashion.</p> <p>Participants included members of Icelandic Fab Labs and designers and a few people from abroad. 17 attendees altogether, all women.</p> <p>Leaders: the activity was led by the international designer Julia Zil Vostalova and the Ambassador Petra Garajova.</p>

Biomaterials workshop

This 8-hour workshop introduced ITC participants to bio design and guided them through all the steps needed to make biomaterials out of different recipes. The workshop was free, and all equipment and materials were provided.



Figure 40. Biomaterials workshop pictures.

Table 34. Biomaterials workshop description

Goals & Formats	<p>Biodesign is an emerging field towards sustainability and circularity. It is an introduction to bioengineering and basic concepts of new material abundancies, resources, and life cycle design.</p> <p>Learning Outcomes:</p> <ul style="list-style-type: none"> • Biomaterial recipes. • Concepts of circular design. • Biodegradable and regenerative design. • Open-source material culture. <p>General topic:</p> <ul style="list-style-type: none"> • Sustainability <p>Process:</p> <ul style="list-style-type: none"> • Introduction and short presentation on biomaterials was illustrated by several Fabricademy real projects for the participants to get a general idea of biomaterials and their applications. 6 recipes in total were presented by the Ambassador – lecturer Petra Garajova. A range of bioplastic options for future individual developments was also presented. • Experimentation with pine resin recipe, a fast fabrication process. Various material samples were created by participants with local waste materials. • Experimentation with alginate recipe. Numerous material samples were fabricated using laser cut moulds that were designed during another Shemakes workshop (3D modelling). • Experimentation with gelatine recipe. A few of the participants already had experience with gelatine recipes and their fabrication. • The lecturer assisted participants in their projects and experiments.
Location	At the ITC lab.
Outputs	Each participant was able to ideate and make their own creations, based on experimentation with open-source recipes with pine resin, alginate, gelatine, and other additives.
Participants & Reach	<p>Targets: Anyone interested in bio design, sustainability, bioengineering, circular design, from artists to biologists.</p> <p>Participants: 7 attendees (6 women / 1 man) – Local people, fab lab managers, artists from the artistic residency.</p> <p>The activity was led by the Ambassador Petra Garajova.</p>

Soft robotics

This 8-hour workshop helped participants to learn how to design movement and to make inflatables and soft robots out of different materials like silicone and textiles.



The workshop was free, and all equipment and materials were provided to the participants.



Figure 41. Soft robotics workshop pictures.

Table 35. Soft robotics workshop description.

<p>Goals & Formats</p>	<p>The emerging field of soft robotics finds applications from solutions in custom assistive devices and technologies for care to wearable haptic feedback and inflatables.</p> <p>Learning Outcomes:</p> <ul style="list-style-type: none"> • Learn the process of designing vectors and using the vinyl cutter. • Learn the process of moulding and casting. • Understand the concepts of soft robotics and inflatables. <p>General topic:</p> <ul style="list-style-type: none"> • Industry 4.0 <p>Process:</p> <ul style="list-style-type: none"> • A brief presentation of soft robotics, existing projects and possible applications was shown. • A short introduction of a vinyl cutting machine and silicone casting technique was introduced to the participants. The aim was to see different options of the introduced subject. • The lecturer explained each process above with an example, and after that, the participants were invited to try them on their own projects and experiment them with their designs. The lecturer assisted participants in their projects and experiments.
<p>Location</p>	<p>At the ITC lab.</p>
<p>Outputs</p>	<p>Each participant was able to design and assemble their inflatable design. Some are experimenting with moulding and casting silicone.</p>
<p>Participants & Reach</p>	<p>Targets: anyone interested in assistive technologies, learning advanced digital fabrication processes such as moulding and casting, and wants to learn novel methods of designing with airflow and movement.</p> <p>Participants</p> <ul style="list-style-type: none"> • 10 attendees (8 women / 2 men)

- Local people, fab lab managers, artists in residence.
- The activity was led by the Ambassador Petra Garagova.

Rhino+Grasshopper+3D printing

In this 8-hour workshop, participants were guided through all of the steps needed to create a three-dimensional object with parametric design in the Rhinoceros + Grasshopper software and learn how to print them on the 3D printer. All participants were requested to bring their own computers and have downloaded Rhinoceros and Grasshopper to their computer before the workshop.



Figure 42. Rhino + Grasshopper + 3D printing workshop pictures

Table 36. Rhino + Grasshopper + 3D printing workshop description

Goals & Formats

3D printing is one of the most disruptive fabrication technologies in manufacturing and the potential of parametric design opens new ways in designing customizable systems and not just products.

Learning Outcomes:

- Understand the basic concepts of 3D modelling, parametric design and 3D printing.
- Get to learn the interface of Rhinoceros and Grasshopper software.

General topic:

- Industry 4.0

Process:

- A brief presentation of existing projects and studios working at the intersection of parametric design and digital manufacturing.
- An introduction of Rhinoceros and basic commands, 3D navigation and modelling.
- An introduction of Grasshopper and basic commands, plugins, and scripts.
- An introduction to 3D printing: PLA & TPU, types of machines and differences.
- An introduction of 3D printing settings - Prusa 3D printer: slicing, mesh editing and sending to 3D print.

	<ul style="list-style-type: none"> • The class was more focused on designing with Grasshopper as the participants already had initial experience with 3D printing and they were less experienced with the Grasshopper software itself. • A short introduction of bio 3D printing was presented as well about Repetier software and Grasshopper slicing.
Location	ITC lab.
Outputs	Participants were able to experiment with varied software, following step by step indications to get 3D printed results.
Participants & Reach	<p>Targets: Anyone interested in innovation in design and manufacturing.</p> <p>Participants:</p> <ul style="list-style-type: none"> • 4 attendees (3 women / 1 man) • Fab lab members, artists. • The activity was led by the Ambassador Petra Garagova.

Bacterial dyes

In this 8-hour workshop, participants were guided through all of the steps needed to dye textiles with bacteria, understand the environmental impact of chemical dyeing and the novel applications of bioengineering in fashion.



Figure 43. Bacterial dyes workshop pictures.

Table 37. Bacterial dyes workshop description

Goals & Formats

This workshop introduced the skills needed to dye textiles with bacteria and the tendencies about the science of fashion and symbiotic/ interspecies design.

Learning Outcomes:

- Understand the process of sterilisation and basic vocabulary and processes of biology.
- Understand basic chemistry concepts and crystallisation.
- Learn about bioengineering trends and sustainable alternatives to chemical dyeing.

	<p>General topic:</p> <ul style="list-style-type: none"> • Sustainability <p>Process:</p> <ul style="list-style-type: none"> • A brief presentation of existing projects, possible applications and current research of textile dyeing with bacteria was shown. • Scouring: Cotton, linen, silk, (wool). • Recipes: Medium for the bacteria. • Inoculation: Bacteria. • Crystallisation: Alum & Copper sulphate. • Personal project and material exploration.
Location	ITC lab.
Outputs	Each participant was able to experiment with the process of bacterial dyeing and crystallisation.
Participants & Reach	<p>Targets: Anyone interested in basic concepts of biology, bioengineering, sustainable alternative ways of dyeing fabrics.</p> <p>Partnership: It was done in collaboration with the biolab Biopol, marine and biology centre and led by the Ambassador Petra.</p> <p>Participants:</p> <ul style="list-style-type: none"> • 7 attendees (6 women / 1 man) • Artists in residencies, fab lab members, local people, designers.

3.3. Key Learnings and reflections for the Discovery Path

The Transfer Labs have contributed with multiple values, **Inspiration**, **Creativity**, **Empowerment** and **New skills** to new participants.

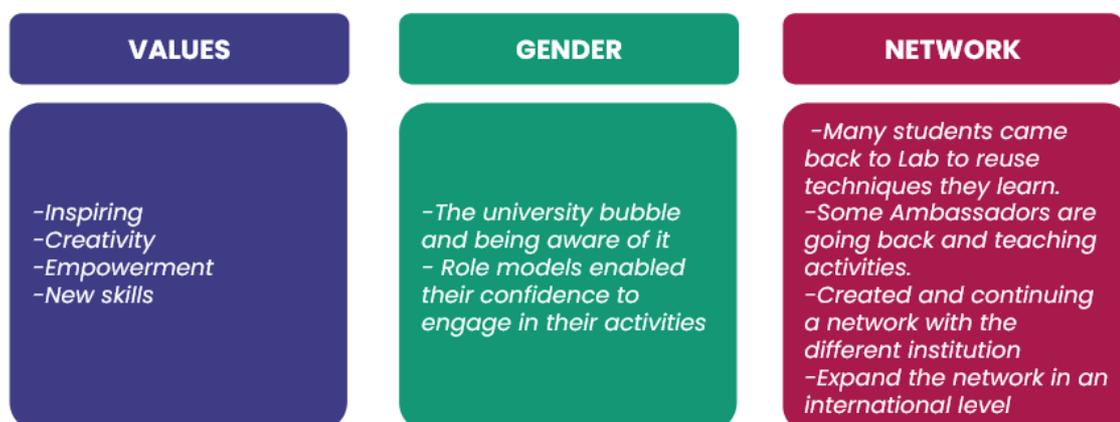


Figure 44- Contribution by the transfer labs to the project.

General Outcomes

Diversity and consolidation of topics

Looking back at the discovery path, we can conclude that all workshops that were led by the transfer labs were very **diverse**, even if they referred to the three general topics of **Biofabrication – Sustainability**, **E-textiles** and **Digital Fabrication and crafts – Industry 4.0**.

Some transfer labs, such as Rog Centre, had all their activities under one general topic which was Biofabrication with symposium and workshops all linked to one another but with diverse activities within that topic. On the contrary, Icelandic Textile Center conducted all their open workshops on different topics.

Only two activities were similar: TPL Smart stitches and VIVISTOP's E-garments workshop. Both used the same material and process which were stitching with conductive thread. However, even then, while TPL used the stitches to make an electronics circuit, VIVISTOP used the power supply to allow stitches to change the colour of the thermal dye fabric.

Additionally, the activities inspired from Phase 1 were adapted in their **contents** or **structures**. For example, Green Fabric used recycled materials for the modular fashion and added another layer of **sustainability** in the workshop, whereas Rog Centre adapted their bioplastics workshops because of a small and limited infrastructure but succeeded in creating “a simple production space making to discover the complex gigantic world of cellulose”.

Altogether, **Phase 2 activities clearly added diversity** to the original workshops from Phase 1.

Diversity of Discovery formats

In Phase 1, various formats were proposed to initiate and sustain collaborations with schools, universities. Formats of the open toolkit ranged from one workshop to a week of workshops, passing through the idea of a Discovery Club, with regular moments in the year where students would meet and do hands-on activities.

In phase 2, a great diversity of formats was tested:

- Small series of workshops, where each workshop builds on the previous one, to allow for repetition and in-depth learning and to create step by step the final piece (VIVISTOP).



- Repetition of the same workshop twice, to allow for personal mentorship of each of the participants and sometimes to address such straightforward constraints as space or equipment (Green Fabric).
- Introductory symposium before a series of workshops, to allow for information, raise interest and generate an open call for participation (Rog Centre).

All new formats brought new benefits to the quality of the contents and learning.

Specific tips for running Discovery Workshops

In their reflections, the Discovery path Transfer Labs emphasised specific good practices to run discovery activities. Well aligned with the tips provided in the first phase of Shemakes project, they also provided new tips to run these workshops.

Level of knowledge and specialisation in the topics varies between participants and facing beginners or specialised participants are challenges.

When participants were **beginners** and completely **new** to the workshops, they were most often **very enthusiastic in learning** a new topic however were more distant to the hands-on experience of the workshops.

- Most of the Rog Centre participants had never done Biomaterials activities before, which imposed a preliminary symposium online to introduce Biomaterials and its theory by expert guest speakers from stakeholders and the Shemakes community, to help participants have an overall understanding of the topic and foresee some of its challenges. So, a tip would be to prepare an **introductory session** for all participants who don't know about the topic, having experts in the session to give **perspectives** that help participants **understand and foresee** the benefits and issues of the subject matter. The side benefit would also be **up to date** on the topic and to **keep up with the innovation** within it.
- During ITC workshops, most participants were beginners and used the Shemakes Ambassador to help them run activities which were not the lab's expertise. If the transfer lab is trying a new activity **on a new subject** for the first time, a tip would be to **have people in the Shemakes community, such as an Ambassador or an expert, to lead a part or the whole workshop** and help widen the expertise of the participants and the lab.

Some workshops had participants who were already **specialised** in the machine or the process that they used in the activity. This could create a feeling of boredom or a



lack of purpose when the participants did not see the value of the workshop. However, even then, there were some benefits to the hands-on discovery.

- In Green Fabric activities, some participants were specialised in the knitting machine. As they got introduced to hacking with a set machine, they added a new layer of control on making patterns and they **discovered** that they could use their machine in a **different** and **new** way, which made them enthusiastic.
- VIVISTOP had participants who knew the draping techniques. As the **structure** of workshops was based on a **series** of activities which ended with a finished E-garment, that allowed all participants, even specialist ones, to try a wider **mix of techniques** and **focus even more** on the final piece.
- In the Textile Playground workshop by TPL (dedicated to design the first step of their interactive textile projects), participants were already familiar with E-textiles but did not have the possibility to experiment any prototyping. TPL helped them with a tutorial that was designed for beginners to create their first prototypes, but it was felt to be **slightly too complex** to get a good grip on the functions in a very short time. So, a proposed tip would be to produce a **step by step thorough handbook** to help when necessary.

Learning requires time and rhythm

Time is very important when running activities with students because most institutions have **limited such workshop time** and because students who are new to a subject need more **time** to fully understand it.

- ITC found that workshops worked best **during the weekend** because students did not miss academic courses, particularly when the workshop was not included in the curriculum.
- In the case of TPL, their workshop on yarn and textiles was repeated twice in the week, which meant that some students had three days when others had only two. So, a proposed improvement would be to keep the same timing or allow a shorter time to specialised students and a longer time to beginners.

Informal moments contribute to a better pace and better learning.

Workshops with students can become too formal and fall in the trap of a “top” expert teaching to a “down” crowd of students. To avoid this, the agenda should allow participants to regularly refresh themselves and create something personal.

Rog Centre participants were **very enthusiastic to** visit the Paper Pulp Institute, as it provided some extra space for creativity and insights and TPL found that a **smaller**



group size was better to help students work on their project, connect, and support each other without long breaks.

Nurturing a good relationship between students and facilitators

A successful workshop relies on a good relationship between students and facilitators. Some participants can have a **lack of confidence** within themselves when faced with a new subject that they aren't comfortable about. So, it is important to **guide** them and help them gain back their confidence in their skills.

- In the Textile and coding workshop by Green Fabric, participants had never coded before and were intimidated. The facilitator and the Shemakes Ambassador who was an expert in coding both enabled participants to actively try to code. This trial led them to realise that they could achieve such a technique and resulted in a **gain of confidence** within the students who were **proud** of themselves.

Transfer lab's experience on key outcomes

Table 38. Experience of the Transfer Labs on discovery path activities

Green Fabric	Green Fabric was very happy with the workshops that they gave. They mentioned: <i>"it really helps connect to the design and textile school in Belgium. The participants were really enthusiastic about the workshops, and we had good feedback from both students and teachers. We are hoping to give more workshops in the following years to the design school in Belgium."</i>
Rog Centre	In the Rog Centre experience, they mentioned that they greatly benefited from the Shemakes activities, they created new networks, gained new audiences, and opened international collaboration and network opportunities. They mentioned that it <i>"gains and strengthens collaboration with [their] local institutes - to together share and create applicative innovations that [they] can offer to either professionals or students as well."</i>
TPL	The feedback from the participants was overwhelmingly positive and encourages us to pursue a similar line of events in the future. Especially niche and innovative topics that fall short in regular textile university education like the ones covered in the workshops were felt to be very beneficial for the students. The resulting e-textile and yarn projects were great and have been exhibited at the end-of-semester presentations of the two participating universities.
VIVISTOP	According to VIVISTOP, students got very creative results and an inspiration to go deeper into the electronics part. They were able to



explore design and fashion in a new cultural context, which is a very rich tool for the transfer lab's development. It was the first-time fashion students from the arts academia worked on E-textiles because there are no electronics modules in their program.

Icelandic Textile Center

The ICT was very satisfied with the knowledge transfer coming from the Ambassador, both from the contents and the coordination - organisation skills. They have decided to include such activities during their information open days.

Gender Vision findings

One major reflection was underlined in this Discovery Path: students, who are young women, do not really feel the gender gap in their academic institutions which serve as a protective bubble, compared to the industry. This was hypothesised in Phase 1 and confirmed in Phase 2 as we had a high number of participants and a diverse range of institutions to emphasise this point. It is important to reflect that, if we organise activities in the discovery path in the future, we should open the gender discussion and acknowledge that students can be "in a bubble", the rules of which are much softer than in the real world of industry.

A second reflection was that the transfer labs created an environment which empowered these young women by having them try new practices and techniques, which resulted in giving them confidence in themselves. Additionally, the Ambassadors and members of the transfer labs served as role models demonstrating and teaching the workshop to the participants, sharing their career path with them, which motivated them to try these processes. In some workshops, participants were in groups which enabled collaboration by helping each other to achieve the same goal.

Thirdly, from the labs' perspective, all this is a starting point to hope for an increase of mixed male and female participation to Shemakes discovery path workshops, and a platform for the potential break of gender stereotypes.

Table 39. Gender Vision findings of each transfer lab

Green Fabric

Green Fabric's workshop and discussions with textile design students showed us that the students were not really concerned about the gender gap in the textile field. They said that they consider each other as **equal** and that's what they've seen during the workshops. Green Fabric thinks that the gender gap and differences are more evident **after** studies and that the student years appear as a **little "bubble" far from gender considerations.**



Rog Centre	What was most noticeable than gender was the possibility to create equal opportunities for students with different backgrounds and knowledge, experiences, and motivations . Rog Centre wanted to create an inspiring environment for the students by offering them informal and closer contact with mentors and with the community. They noticed that women participants were a majority (70%), which is repeatedly seen with textile workshops compared to hands-on technical workshops (which are normally equally split).
TPL	As the students were working together in small groups , the collaborative aspect was very present. The contents of the workshops were also equally inspiring and empowering for the participants, as they learned new techniques and technologies and had the chance to meet successful women in textile.
VIVISTOP	Students were encouraged to try out new techniques, especially electronics and embroidery with conductive thread. Differences were welcome and inspired each participant to bring their own approach but different in the same activity.
Icelandic Textile Center	The strong connection of the centre with the local people brought diverse public from the village such as families. They hope that opening activities to the public may diversify the audience of the centre which is now predominantly female.

Reflection on labs' capabilities on conducting activities, creating partnerships and on Ambassadors' roles

Time was one key challenge for all transfer labs

All transfer labs activities went smoothly and were successful. The major difficulty that was felt was the perceived lack of time to reach out to a broad audience and to develop or consolidate their relations with key stakeholders in the activities. Solutions to these challenges were that some labs who felt that they had a very short period to find participants, developed tips to engage a great number of participants e.g., through a symposium, a call or thanks to spreading the words within varied communities and other labs programmed a set of follow-up sessions even after the workshops finished.

Focus on partnerships and networks

Fostering local cooperation with schools, cultural centres, research institutes, educational networks.



All transfer labs were able to collaborate with universities, research centres and schools which created a network between the institutions and the lab. This leaves the door open for the transfer labs to continue their collaboration: Green Fabric will continue doing their workshop with institutions they worked with. There are already students coming back and applying the equipment and techniques they learnt to their academic projects. TPL created activities where participants can receive credits. This will continue next year. RogLab will continue the collaboration in the biomaterials field with the National Chemistry Institute (KI).

Fostering International collaboration

RogLab not only focused on local participants but opened a call for participation to their neighbouring countries making the workshop international. Additionally, they did an online event which expanded the Shemakes network even more. They brought together international experts with local institutions and demonstrated how to co-organise activities by having input from both stakeholders.

Inter-connections/exchanges in Shemakes

In this Phase 2, Rog Centre was especially interested in the field of Biomaterials and Biofabrication which created connections between them and the Guru of Iaac for guidance, suggestions on finding guest speakers for their symposium, help in developing the content of the workshops and technical implementation by overviewing and sharing the list of the required materials and equipment. This is one example, among many, that shows the exchange and collaboration between all labs in the Shemakes network.

Ambassadors' contribution to the activities

Some of the Ambassadors were able to lead and teach workshops.

- The Green Fabric Ambassador was from France, which facilitated the interactions in the same language. With a background in computer science and having graduated from Fabricademy, she had knowledge in coding, a new competence for the activities of the transfer lab. This resulted in the activity of textile and code to be new and run smoothly.
- Rog Centre main activities were around biofabrication and sustainability which was not their Ambassador's strength. However, their Ambassador organised an E-textile workshop, which is her specialty, where she brought a scientific perspective to it for the staff members of the transfer lab. This enabled the exchange of knowledge between the transfer lab and



Ambassador, allowed the extension of innovation and their engagement in the community.

- TPL Ambassador co-led workshops when she was there. This was a great sharing of knowledge and co-creation of the common activities. She also developed and led a specific workshop combining gender related messages and e-textiles and brought an alternative approach to teach the same subjects.
- VIVISTOP's Ambassador was present and taught the participants the main techniques and practices during the activities. They will continue their collaboration in future workshops online later in the year.
- The Icelandic Textile Center's Ambassador developed very good relationships with the local team, and they established a longer-term collaboration during the Shemakes period for helping them to equip and establish new topics in their labs. The Ambassador showed them different ways of coordinating and organising activities through her experience and knowledge which is very insightful for their growth.

Future actions

All transfer Labs will work together to finalise the documentation on their activities in the coming month.

More specific next steps are described below for each Transfer lab.

- **Green Fabric** wants to *continue to work with design textile schools and students*. They appreciate the interaction between the textile fab lab and the schools, feeling that it is nice for students to learn about textile and technologies, open source and Fabricademy projects. It is also a great way to promote the Green Fabric textile fab lab to the people who would be interested in using the place and machines afterward. At least 2 of the 3 schools are interested in conducting more workshops next year.
- **RogLab** wishes to continue exploring the biomaterial and biofabrication fields, but mostly wants to *continue collaborating with the different stakeholders*, and to get a *closer collaboration with other Shemakes labs*. They also want to continue their collaboration with their Ambassador by hosting her in their educational programme with other inspiring makers, innovators and creatives to *continue exchanging knowledge, and experience and empowering students, professionals and women in the STEM and Textile industry*.



- **TPL** will try to get funding to grow TPL as “the” space for *university education outside of universities*. There are many universities in Berlin offering textile studies, but there is little to no collaboration between them when it comes to education. The TPL team strongly believes that through intermediate spaces like the TPL lab, it is possible to *connect the universities and the students*. Workshops, lectures, joint Bachelor- or Master theses and projects during the semester breaks are just some of the ideas that TPL are thinking of.
- **VIVISTOP** wants to *continue collaborating with fashion students* from the Arts Academia. This is an opportunity for VIVISTOP to *create and adapt more workshops directed to students* because most of their activities are destined for kids and *opportunities to fashion students to experiment with electronics* which they are unable to do in their academic institutions. They want to continue *exploring some areas of expertise* that were completely new to the lab, such as the techniques of *draping* and *thermochromic dyeing*. VIVISTOP will also *develop the collaboration online with their Ambassador* who introduced and led those workshops. VIVISTOP believes that continuing their workshops.
- **The Icelandic Textile Center** will start the Fabricademy program and will integrate some workshops activities during their weekly *open days*. They will continue and empower their *relationship* with the Marine and Biology Centre Biopol to enable cross disciplinary projects between biology and textiles.



4. The Innovation Path

4.1. Updated description

This task addresses women innovators aged 25 and up. It focuses on the possible 'routes to job' that are open to women who have been through alternative professional training, ranging from self-built to more traditional career paths.

Mapping out these possible 'routes to job' helps us gain insight in the hypothesis that a Fabricademy-based Shemakes Innovation path will enable women to thrive in the T&C sector by teaching them certain skills and tools. **The aim is to formulate an Innovation Path for the empowerment of individual women innovators, and to strengthen and improve the network as a whole.** Should certain difficulties or missing skills on the 'routes to job' arise that have not (yet) been fully covered or noticed by the network, new labs can propose these routes by replicating, tweaking, and adding new activities. From there, the network will design Innovation Paths with activities such as workshops, mentoring programmes and challenges to best enable future women innovators on their 'routes to job'.

The course of the Innovation Path was done in two main phases. First, activities were suggested in order to situate and understand the departing point of each lab's network of female innovators. This initial research moment was composed of **networking events, career mapping exercises, surveys, interviews, and profile making.** The research also gives the insights needed to serve as a base for further program development of activities.

As an additional outcome, yet as relevant as the first one, a series of supporting materials were created to share the stories of these innovators. Videos, articles, and profiles were made available to inspire other women who might not have been directly involved locally by the lab's activities. The innovation path highlights the power of storytelling as means for change, showcasing the innovators of our communities, cheering the role models and their journeys.

By understanding the role that innovative educational programs play on unconventional career paths and identifying skills that are not yet included in the existing traditional or alternative curricula, the network could formulate a set of



additional tools (in the form of activities) to empower future women innovators for future transition.

During the **Shemakes' Phase 2 of innovation actions**, the focus was to transfer the knowledge learned during the first moment, understanding the differences in local contexts for each transfer lab and giving them the freedom to test, adapt and adjust the initial model. The Transfer Labs therefore executed a series of activities that are documented in the open toolkit (described on the chapter 4.2.2 *Documenting & Reporting on Existing Activities*) and also suggested, based on their local needs and strategy, new activities to be executed in the Innovation Path (described on the chapter 4.2.3 *Documenting & Reporting on New Activities*).

The model below summarises the Innovation Path that delineates new routes to unconventional, yet needed, jobs, while also reflecting the Shemakes' values and gender vision, through the role and active support of Labs as the enabling environments in which these women innovators can grow and feel supported, connected, and empowered.

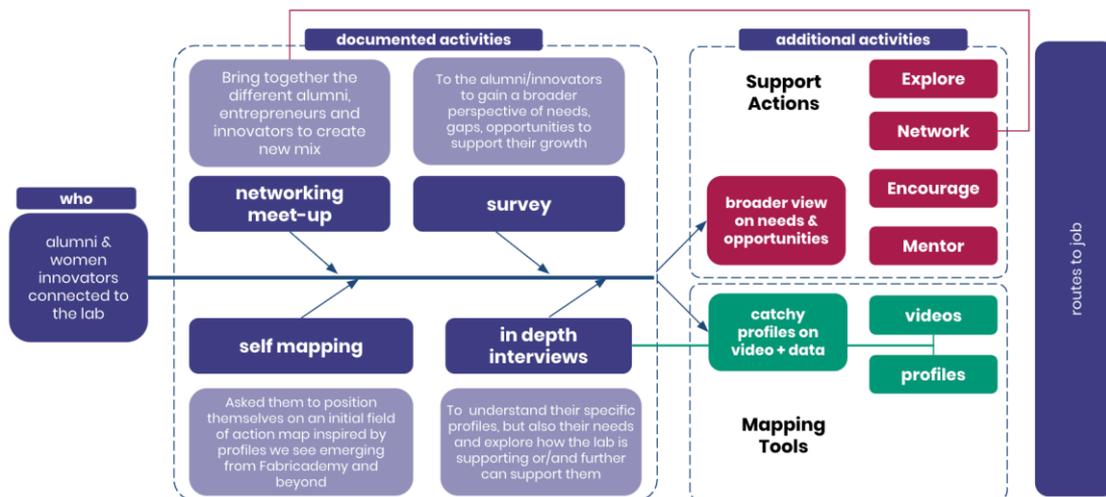


Figure 45. Innovation Path Activity's Model.

4.2. Description of activities

As a result of the previous phase, a set of new activities has been developed in order to fit the different needs of the young women entrepreneurs/innovators, which were then grouped as **network, explore, encourage, and mentor**. These areas of activities could be further developed by transfer labs, enriching together the shared set of activities that support the women innovators, and are further detailed in the below table.

Table 40. Goal and description of Innovation path areas.

Activity Type	Goal and Description
Network	Activities that promote networking among women and other actors, where different groups within Shemakes can meet and get to know each other. Goal: To be driving force for a change as a collective.
Explore	Businesses, Factories, Ateliers, Manufactory Facilities through Tours & Visits. Goal: To assist the innovators in getting to know the industry that surrounds them better, by organising visits to the local ateliers, manufacturers, producers, or textile studios. Amplifying knowledge to broaden self-positioning and understanding.
Encourage	Activities focused on promoting success stories and sessions that enable women to express themselves in a safe space. Goal: To help them feel more confident, many innovators expressed the need to be better at presenting themselves, not feeling judged for their gender or choices and being able to pitch their ideas well to different public/audiences.
Mentor	Mentoring and guidance for self-development of concepts, pitches and exploring funding paths. Goal: To assist the innovators to further develop their skills, also technically, for example with tailor-made mentoring sessions - in a way learning can be extracted for other innovators too.

Overview of the Transfer Labs' Innovation path activities

The transfer labs were introduced to the work of the first phase, to contextualise, and adapt the models to their own needs. All labs decided to test and implement the survey and interview activities, aiming at collecting insights on where to focus next, fulfilling the local needs expressed by women innovators. In the development of the project, they also proposed a set of new activities to be prototyped and tested according to their possible targets locally. This resulting in a customised plan for each lab taking into consideration their specific networks and goals, which is summarised below.

INNOVATION	RESEARCH ACTIONS DOCUMENTED ACTIVITIES PHASE 1			SUPPORT ACTIONS + MAPPING TOOLS NEW ADDITIONAL ACTIVITIES PHASE 2			
	SURVEY	CAREER MAPPING	INTERVIEWS & PROFILES	NETWORK	EXPLORE	ENCOURAGE	MENTOR
	FARMLAB	✓	✓	✓	Open Day	Industry Visits	
ICELANDIC TC	✓		✓				
LOTTOZERO	✓		✓	Opportunity Newsletter			One on One consulting
ZIPHOUSE	✓	✓	✓	Fashion Brunch	Fashion Brunch	Online sessions with Fabricademy alumni	

Figure 46. Transfer Labs customised action plan for Innovation path.

In the following sections, existing and additional activities will be reported separately, however will follow the same structure, allowing a variation of focus from one activity to the other.

- Key collective pictures of the activity.
- Lab context & Activity description.
- Approaches for local innovation.
- Outcomes & Key Learnings.
- Gender Vision Findings.
- Reflection on lab's capability and ambassador.

Documenting & Reporting on Existing Activities

The existing activities form a structural base from which new parts are being developed. This section reports on how Transfer Labs have expanded the concepts, made them their own and further developed into new learnings. Below is the list of existing activities that were replicated and adapted by Transfer Labs, documented in the Shemakes toolkit.

Table 41. Documenting the existing Innovation path activities.

Activity Template Title	Link to the Open Toolkit
Network event & Career mapping	http://fabricademy.fabcloud.io/shemakes/handbook/1.-learning-paths/innovation-path/2-Kickoff-selfmapping-activity/
Innovation Path Survey	http://fabricademy.fabcloud.io/shemakes/handbook/1.-learning-paths/innovation-path/3-the-survey/
Analysis	http://fabricademy.fabcloud.io/shemakes/handbook/1.-learning-paths/innovation-path/4-survey-outcomes/



Activity Template Title	Link to the Open Toolkit
In-depth interviews	http://fabricademy.fabcloud.io/shemakes/handbook/1.-learning-paths/innovation-path/5-interviews/
Profiles	http://fabricademy.fabcloud.io/shemakes/handbook/1.-learning-paths/innovation-path/6-profiles/

Innovation Path Survey – All Transfer Labs

Lab context & activity description

During the first phase of activities a survey was co-designed and conducted by the core labs involved in the T2.4 (WAAG, IAAC and MAKE). This first research gave us very valuable insights and led to a *base survey*, serving as the starting point for the surveys done by Transfer Labs in this phase.

Each survey aimed to collect data offering insights about the different job routes and the steps that are taken to achieve these. By understanding the different job routes, we were able to map the opportunities to better support female innovators in our network.

The targets approached and the answers to the questionnaires were mainly qualitative in the case of FarmLab and ZipHouse, and quantitative for Icelandic Textile Center or Lottozero, with varied levels of answer rates.

Table 42. Lab context & Activity description.

Goals & Formats	Launch a research survey with alumni/innovators to gain a broader perspective of needs, gaps, opportunities to support their growth. The survey was conducted both online and offline, adapting to the reality of each lab.
Time & Location	The surveys took place during the months of April and May. Each lab adapted the geographic location / reach to its needs, some had a very local and personalised approach while others expanded its reach to have a broader overview of the innovation scenario on a regional level (still within the country borders).
Participants & Reach	<p>Below the summary on the amount of people approached by the survey and its respondents. The lab's different approaches when it came to the target group are also reflected in the size of the survey's base (further explored in the coming tables).</p> <ul style="list-style-type: none"> • FarmLab: Sent out 10 > 8 replies. • Icelandic: Sent out 140 > 80 replies. • Lottozero: Sent out 100 > 17 replies. • ZipHouse: Sent out 25 > 10 replies.



Approaches to local innovation

Each lab has approached and therefore adapted the use and formulation of the base survey to better match their Innovators and define their needs, focussing on rural territory for FarmLab and Icelandic and designers' needs for Lottozero and ZipHouse.

Table 43. Approaches to local innovation.

FarmLab	<p>Target group: entrepreneurs related to wool (<i>"the women in wool are the successful ones!"</i>).</p> <p>The lab adapted the existing set of questions, keeping the core content aligned, but adapted them to the local context, tackling innovative paths, women & gender in a wool context.</p> <p>Conducting an online questionnaire can be challenging from the technological point of view, given that the target group is in the rural areas of Austria. An additional difficulty found was the language barrier. The lab managed to overcome these with a very personal approach, that:</p> <ul style="list-style-type: none">• Developed the base survey, adding a few questions concerning technology, (digital, etc.) language barrier.• Was conducted face to face with some participants (and combined with visits) or by phone with other participants.• Created a ripple effect on the local community, where the interviewed bring in others.
Icelandic Textile Center	<p>Target group: Female designers, entrepreneurs and others working within the textile and wool industry.</p> <p>The survey was done via "wufoo" in collaboration with the University of Iceland. The lab adapted the base survey to fit local needs of the local community. Questions were reformulated and anonymization of answers was done.</p>
Lottozero	<p>Target group: Survey was first sent out via the lab's newsletter targeting young designers (male & females) and brands + followed by telephone and in person reminders.</p> <p>Since there were not many respondents, a second round of surveys was proposed with an incentive - free half an hour business consulting for all participants in the survey. The lab continued to invite brand to participate throughout the project.</p> <p>The lab used the base survey and adapted it by adding questions focused on sustainability challenges.</p>
ZipHouse	<p>Target group: young designers, start-ups, people that went to the acceleration program, designers interested in innovating their business.</p> <p>The survey was promoted via the lab's newsletter and social media accounts + personal visits in order to have a personalised approach.</p> <p>The lab used the base survey and improved it with specific questions to better fit the local context.</p>



Outcomes & Key Learnings

The survey served to identify the needs of the local innovators and to choose the desired activities to follow. Labs reflected on the key challenges, opportunities, and knowledge gaps from the innovators and what could be the Lab's role in relation to those. All labs reflected on the relationship of new technologies combined with traditions in a local context, and the need for female innovators to have further support on business development skills.

Table 44. Outcomes & Key learnings.

FarmLab	<p>The original online format was not ideal for the local context, as the technology divide was connected to age (especially in the countryside). it is not the same to address +25 or +50! Starting the design from the local reality is a must.</p> <p>The lab can introduce new technologies to the entrepreneurs who master traditional techniques > possibility of reciprocal learning process to come up with something new and relevant.</p> <p>The lab functions as a bridge by mentoring, bringing samples to the local possible innovators, bringing people together (generations, etc.), be a place for experimentation and research of the comfort zone.</p> <p>The process helped identifying respondents and profiles to conduct the second step of the research, in-depth interviews.</p>
Icelandic Textile Center	<p>Via the survey the lab could better understand the needs of those working in the textile and wool industry and get a better view on how the Lab can contribute to innovation and knowledge exchange in its local wool context. Clo3D (3D modelling software) came out as the most interesting tool to help design new patterns.</p>
Lottozero	<p>The principal needs identified through the survey were knowledge in business, sales, financing and funding opportunities, governance, and management. This gave substance to the initial lab hypothesis, given the information we accrue on a day-to-day basis working with female led start-ups in the sustainable fashion sector.</p> <p>The Lab developed one-to-one mentorship to share specific knowledge on these topics and to address them personally according to each project.</p>
ZipHouse	<p>New technologies are seen as a great way to progress and upgrade the current phase of the textile industry. ZipHouse can play an enabling role by giving access to and sharing knowledge about new technologies such as Digital Knitting machines.</p> <p>ZipHouse can serve as a mentor for new technologies by working on enabling the creatives interested in finding innovative ways of creating garments. The lab could have a leading role by offering and facilitating the exchange of experiences for interested young designers; thus, welcoming differences and promoting collaboration.</p>



Gender Vision Findings

The Labs described which of the [5 gender values](#) of Shemakes (equal, collaborative, welcoming differences, empowering, and inspiring) was most relevant in the survey activity. Altogether, the five gender values were used and reflected upon in this activity.

Table 45. Gender vision findings

FarmLab	<p>Welcoming differences: by offering the survey online and offline, it enables everybody to participate and provide insights.</p> <p>Empowering: women by meeting their needs (using the outcomes of the survey and the way it had to be processed).</p>
Icelandic Textile Center	<p>Collaborative: learning together and exchanging knowledge through networking and workshops (on site/online).</p> <p>Inspiring: by sharing interviews, experiences, and routes to jobs with designers working within textiles.</p> <p>Empowering: giving the opportunity to explore, research, network and learn new skills.</p>
Lottozero	<p>Empowering: giving the opportunity to emergent designers to present themselves, promote their vision, business and asking for advice to our community.</p> <p>Inspiring: sharing experienced female entrepreneurs success' stories.</p> <p>Collaborative: meeting each other, sharing experiences, learning about opportunities and foster new collaborations through a big networking event.</p>
ZipHouse	<p>Inspiring and Empowering: women by organising events during which they are given the opportunity to speak about their experience, sharing their success stories.</p> <p>Inspiring: inspire future job opportunities; exploring possibilities to innovate the workplace.</p> <p>Collaborative: learning from each other through networking and common workshops.</p> <p>Equal: speaking about equal reward for the same type of work and skills; encouraging equal pay.</p>

Reflection on labs' capability and on ambassadors

As mentioned above in Approaches to local innovation, the labs developed surveys that were adapted to their contexts and communities. The ambassadors were involved in the survey in all transfer labs but FarmLab, however, did not play an important role in the survey activity, as labs preferred to work with universities or survey experts to do this.

(Self) Career Mapping – Ziphouse and FarmLab

Key collective pictures of the activity

The self-career mapping was conducted by two Transfer labs. As shown in the pictures below, FarmLab replicated the activity as documented after Phase 1 and ZipHouse adapted it, to a more informal context of a Fashion Brunch.

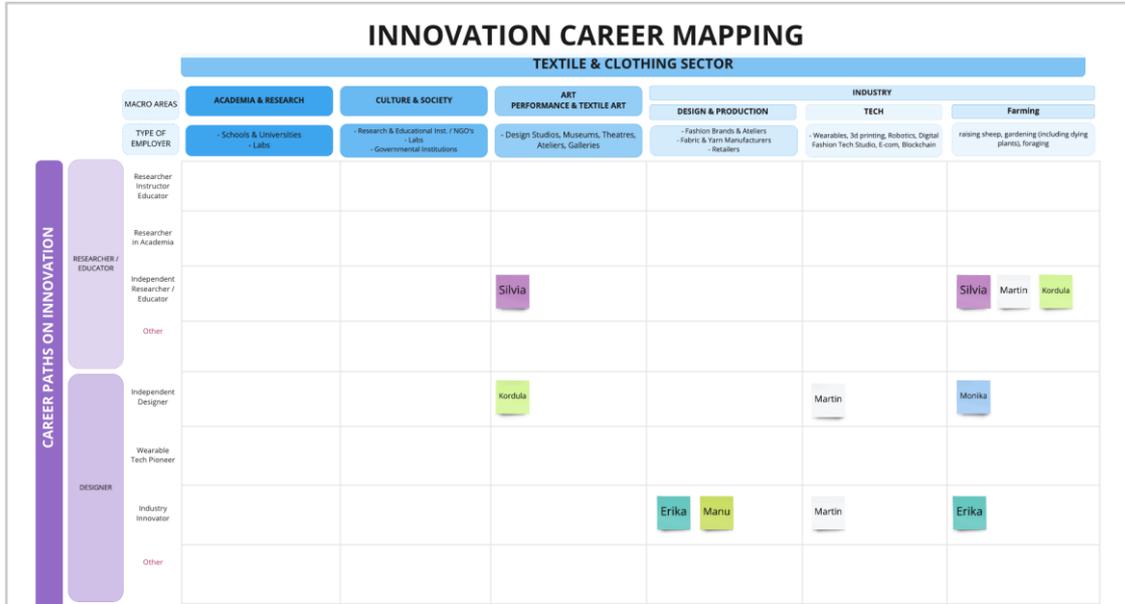


Figure 47. Fragment of the Career Mapping done by FarmLab on [Miro board](#).

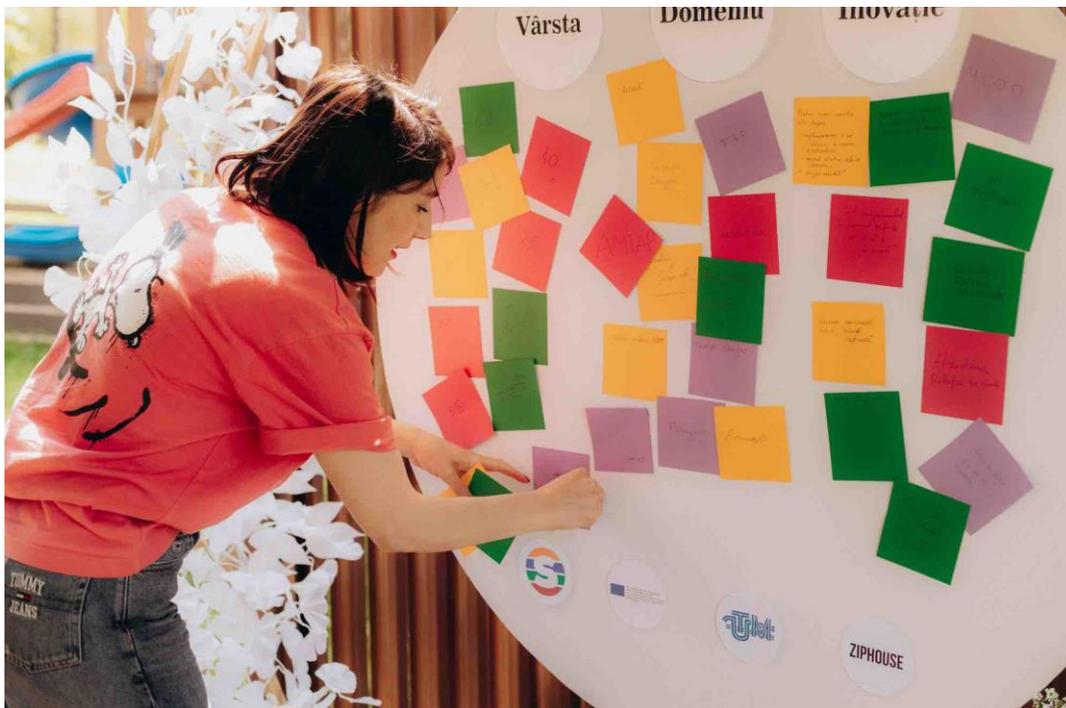


Figure 48. Adaptation of the Career Mapping at Ziphouse’s Fashion Brunch event.

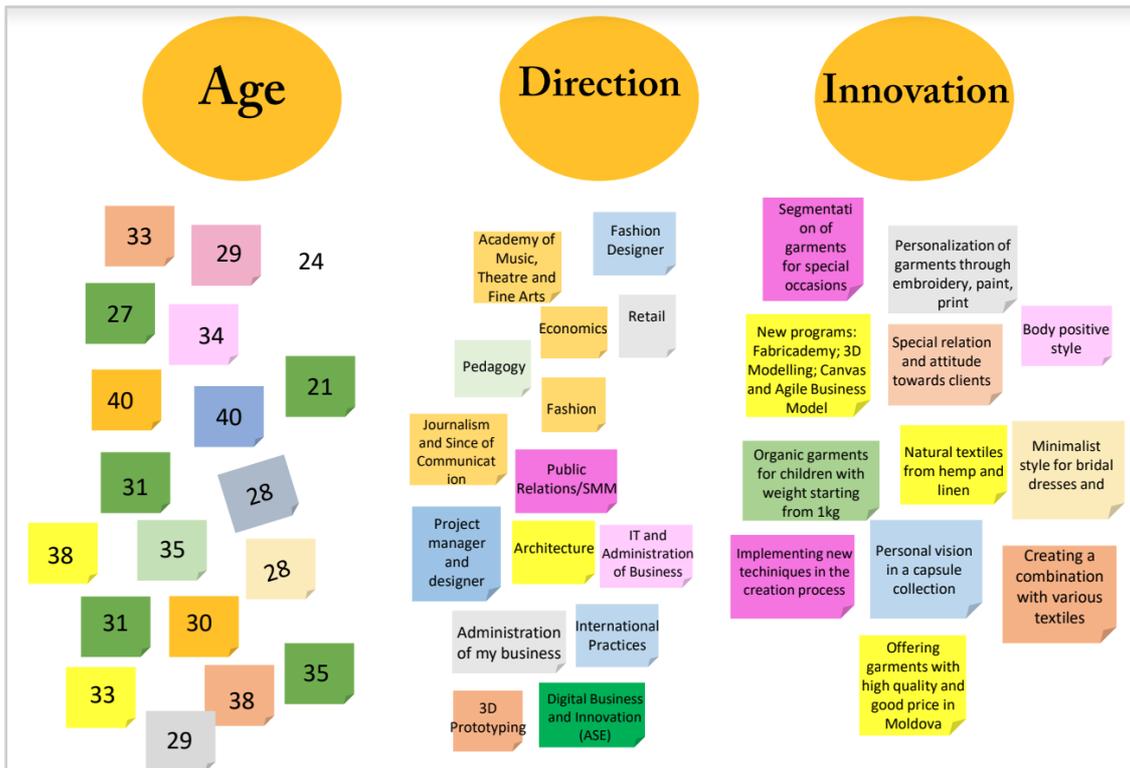


Figure 49. Adaptation of the Career Mapping at Ziphouse's Fashion Brunch event.

Lab context & activity description

The self-career mapping did not have the same role in each of the two labs. FarmLab aimed to open all the scenarios that were available to local rural entrepreneurs working on wool and included the self-positioning of the lab team. ZipHouse targeted designers, entrepreneurs, and founders in their entrepreneurial path, and with them, they explored the meaning of innovation with them, and designed different innovation needs all along the entrepreneurial path in order to better support designers in their future scenarios. As the activity was included in a Fashion Brunch gathering a diversity of people, the lab also created opportunities for networking. This is further detailed in the tables below.

Table 46. Activity description.

Goals & Formats	<p>The mapping helps the lab and the innovators to best position themselves on the innovation scenarios surrounding the lab. It aims to broaden the perspectives on innovation and to make connections that are often not so explicit.</p> <p>FarmLab mapped the women innovators in their region, while Ziphouse used this activity also as an opportunity to do a networking event called "Fashion Brunch", which will be further described below (in this section we</p>
----------------------------	---



describe the finding regarding the career mapping that took place on the event).

Participants & Reach

- FarmLab: entrepreneurs related to wool – 6 people mapped (5 women / 1 man)
- Ziphouse: Women looking for ways to innovate their business, fashion designers, stylists, creative director – total of 20 participants (19 women / 1 man).

Table 47. Approaches to local innovation.

FarmLab

The Lab interviewed women innovators active in the domain of wool and placed sticky notes with their insights on the Miro board. The aim of the exercise was to identify similarities and/or relevant differences in the different paths and current situations. FarmLab also mapped its own team to see where they are in relation to the other women innovators to visualise various innovation perspectives.

ZipHouse

The mapping is used to highlight how the concept of innovation is different for everyone, where each brand also considers their unique way of acting as innovative. Ziphouse wanted to show that at different stages of the entrepreneurial path, fashion designers and founders develop new ways to innovate their activity. The career mapping event was joined by representatives from different fields of activities (economics, fashion, education) and enabled connections and networking between participants.

Outcomes & Key Learnings

The two labs described this activity as a major contributor to gender and innovation findings. For FarmLab, gender is a matter of generations, where younger women observed tended to be more independent, self-confident, and asking for reciprocity with men. ZipHouse insisted on the hunger for innovation by women designers to better stand out of the crowd, the ongoing process of empowerment that requires day by day solutions coming from knowledge sharing. This is further detailed in the tables below

Table 48. Key outcomes on gender and innovation.

FarmLab

Probably due to the common topic, there is quite a similarity between the women who are running wool businesses. The lab noticed a generational difference between women aged 35-45 and 45-60 in how they relate to men: younger women are more confident and have a more collaborative approach in the division of work.



ZipHouse

As an outcome for the career mapping activity, we learned that our community tries to introduce innovative methods in their activities to make their products more attractive to the end customer. Innovation might have many different meanings and interest was manifested towards learning about a wide range of innovations. Career mapping is useful to share stories, successes and also simply talk about challenges met day by day and the way they want to shape their career. The lab had the opportunity to empower women to feel proud of the way they conduct their business with creativity, and we encouraged knowledge sharing.

Reflection on labs' capability

FarmLab and ZipHouse conducted this activity themselves, without any ambassadors. As detailed below, both Transfer Labs conducted the activity with a difference in maturity. FarmLab, being a more recent lab, was inclined to use the self-mapping activity for themselves in parallel to the targets they were working with. ZipHouse, already established in its community of fashion designers and entrepreneurs, focussed this tool to understand better their needs.

Table 49. Reflection on Labs' capability.

FarmLab

This exercise was not only interesting to see the career path of the women entrepreneurs from a different perspective, but also to visualise the Lab's own profiles and careers in relation to their community.

ZipHouse

The role of the lab is to represent the best interests of the local T&C industry; organise events that suit the needs of the community and help them improve the development of their entrepreneurial path. The lab had access directly to the target audience and we knew to whom to send the invitation to engage interested people that manifest interest in our projects and events.



Interviews & Profiles – All Transfer Labs



Lena & Daria – Interview by Ziphouse



Gaia Segattini – Interviewed by Lottozero



Erika Schoberer – Interview by FarmLab



Berglind Ósk – interviewed by ITC

Figure 50. Key collective pictures of the activity.

Lab context & Activity description

Following the surveys, a series of interviews were conducted by the transfer labs with their network of female innovators, to get more in-depth insights of what their main targets needed: FarmLab focused on Wool local entrepreneurs, Lottozero on sustainable fashion designers of their advisory board and ZipHouse on accessible successful entrepreneurs and the Icelandic Textile Center interviewed a younger vs a more experienced woman innovator. Details are shown in the below table.

Table 50. Lab context & activity description.

Goals & Formats

The stories shared by these women allowed each lab to better shape its plan of action for the innovation path and how to further work with their community. Some of them were video recorded, while others took place by phone or in person.

Outputs: As for the first phase, video extracts from the interviews will be slowly released throughout the coming months on social media, website and also integrated in the toolkit under the profiles section.

Participants & Reach

Profile of women interviewed per lab:

FarmLab: 3 participants: Wool entrepreneurs Erika Schoberer, leader of the manufactory Erika's Wollwerkstatt, Monika Reindl, from Wollgenuss an association of 5 women shepherdesses, and Manu Roll, founder of the mill Alpakawollmühle GmbH.

Icelandic: 2 participants: Textile and fashion designers and innovators: Berglind Ósk, Magnea Einarsdóttir (more experienced and younger).

Lottozero: 3 participants, young sustainable female led brands and members of the Lottozero advisory board: Gaia Segatinni, Fili Pari and Denise Bonapece – 3,800 publications on social media accounts.

Ziphouse: 4 participants, female business leaders & women that want to bring innovation to their business: Zorina Moddon, Lena, and Daria from NAAM and Iuliana Chiroasca.

Outcomes & Key Learnings

The main outcome of this activity was to develop portraits of real women achievers from an accessible community, that multiplied their inspiration power. In parallel, the respondents were providing insights on the local wool value chains and new issues on the sustainable fashion sector.

It was felt that such portraits could also be used to engage local conversation with a growing community around the lab. More details are to be found in the below table.

Table 51. General outcomes.

FarmLab	<p>This activity allowed to highlight the personal evolutions, motivations, and career paths of these women, discovering very inspiring stories of success and innovation, as well as granting a deeper understanding of the local wool industry.</p> <p>It seems that the best stories of innovation in wool are related to women with a great initiative and very hard work.</p> <p>The interviews will be promoted via the Shemakes and FarmLab channels to raise the profile of these women and inspire other women innovators.</p>
Icelandic Textile Center	<p>Interviews allowed the lab to highlight different personal experiences and career paths, discovering interesting stories of success and innovation, contrasting the more experienced story of the designer with the less experienced innovator.</p> <p>This also contributed to a deeper understanding of the textile ecosystem in Iceland.</p>
Lottozero	<p>The Portrait interviews that were of a very high storytelling quality, provided unique insights into the interviewees':</p> <ul style="list-style-type: none">• Gender vision and specific gender related issues• Sustainable design thinking• Innovative ideas



- Products and services
- History

The **total number of people (social media accounts) reached by the publications was 3,800**

ZipHouse

Female led businesses are always looking for ways to innovate their activity to have a more competitive market positioning. These videos with women innovators helped us to understand that **female leaders have common goals** – to gain new knowledge, obtain experience and create pieces that would make them stand out on the market.

Gender Vision Findings

Inspiring, empowering, and welcoming differences were the three values that were commonly supported by all labs as they interviewed and portrayed women from each lab's community and network. Such values led to imagine next steps in the labs' activities, such as the regular release of female leaders' interviews to keep the inspiration going (ZipHouse, a full documentary on local women innovators (FarmLab), a necessity to engage in face-to-face conversations notably to reduce the stress of the pandemics (Lottozero) or some usage of these realistic portraits to engage preliminary exchanges at the beginning of workshops (Icelandic Textile Center). Full details are available in the table below.

Table 52. Gender vision findings.

FarmLab

Values. Key value was **Welcoming differences**. There is a clear change of perspective between the generations: where Monika (55) had a more traditional approach/experience with her husband being away to work and her running the farm, the daughters Erika and Manuela (35-45), who took over the farm together with their husbands rather recently, have a shared approach of the workload by supporting each other's activities within the family. This is also true in the *Wollgenuss* project. Next activities. After conducting this activity, the Lab realised there are many inspiring stories to be told from the women in this region, with different **nuances** and depth. So FarmLab is now planning to **further develop this idea into a full documentary about women innovators** in wool.

Icelandic Textile Center

Values: **inspiring other entrepreneurs and designers** starting out or looking for new directions in their work.
Next activities: Have more people share their work and discoveries as that is often **a start of a good conversation and networking** within the industry.

Lottozero

Listening: how important it is to take the female voice into consideration while building a brand.



Empowering and inspiring fellow female entrepreneurs and designers, be it the generation before or the generation after.
Welcoming difference: taking advantage of being the only females instead of fearing it as a limit.
Next Activities: What we read from these answers is that there is a huge **request to get together, network, share, discuss, teach which has been reinforced by the pandemic**; we took this into consideration while planning our future activities.

ZipHouse

Values: **empowering, inspiring, welcoming difference.**
 For next activities we want to facilitate the possibility to share the journey of every participant. These videos could be put on a **sharing platform** where women could share their story, their challenges, and future plans. The goal is to have activities that encourage sharing of experience, mutual understanding, and support.

Reflection on lab’s capability

The Transfer labs started the activity with different levels of self-confidence however collectively progressed on useful storytelling for enlarging and engaging their local community (which is detailed below). This activity did not involve any of the ambassadors.

Table 53. Reflection on lab’s capability.

FarmLab	These women were so focused on their work that they barely had time to receive us for the interviews: in this sense we feel it especially relevant to tell their stories and share their example to the community.
Icelandic Textile Center	<i>Same as for survey.</i>
Lottozero	We strongly believe these interviews are incredibly useful to create community, inform, and inspire and they need an even bigger circulation for visibility; we will work on this in the future.
ZipHouse	ZipHouse has been given the possibility to develop a hub where female young designers could find an environment that fits their innovation path. Our lab has the capability to offer the needed platform for development and learn from our participants how to improve our activities.



Documenting & Reporting on New Activities

The following activities were new proposals made by the transfer labs based on their findings from the research phase, filling some of the needs and gaps identified then. The documentation of these actions in the Open Toolkit is a work in progress and the [Innovation Path page](#) will be updated by the end of September.

Industry Visits – FarmLab



Wollgenuss



Alpacas at Erika's Wollwerkstatt



Erika's Wollwerkstatt



Alpakawollmühle

Figure 51. Key collective pictures of the activity.

Lab context & Activity description

Based on Phase 1, FarmLab felt the need to visit a series of women innovators working in wool in their area (Southeast Austria) to better understand their work, their approach, their lives, and their role in the community, and to highlight the role of the women in the innovative entrepreneurial ecosystem. Each visit was made in a group of four, to collectively generate a lot of insights of the above subjects and to feed into the Wool Place Monday (lab to lab projects Task 3.3 is detailed in the Del 3.3). The details of these visits are provided below.

Table 54. Industry visits activity description.

<p>Goals & Formats</p>	<p>These visits were combined with the in-depth interviews conducted. Additional discussion topics: All the women we visited were clear examples of successful business, which were led by women. During the visits we also asked the women innovators to reflect about the role of women in their profession and in their personal experience, and to give us their vision.</p>
<p>Location</p>	<p>FarmLab carried out visits to:</p> <ul style="list-style-type: none"> • Alpakawollmühle: an alpaca farm and wool mill to process alpaca and sheep wool in yarns of different kind for the whole community (5th February 2022). • Wollgenuss: an association of 5 women shepherdesses dedicated to produce felted artcraft and to carry out workshops about felting (8 March 2022, 21 May 2022). • Erika’s Wollwerkstatt: a small manufacture facility to process the second-choice wool for the whole community into duvets (21st May 2022).
<p>Participants & Reach</p>	<p>In each visit, 4 participants were involved, with 2 women and 2 men. The learnings and the documentation of the visits was shared during the Wool Place Monday event (T3.3) as inspirational and educational material from the local upper Austrian ecosystem.</p>

Outcomes & Key Learnings

The industry visits activity generated three key insights:

- **The lack of small size sheep farming and manufacturing.** There are few smaller facilities for sheep farmers to allow them to process small amount of wool, so the few ones are very successful.
- **The heavy investment in machines and work** to start a manufacturing business.
- **The trend in alpaca manufacturing.** The wool manufacturing facilities are related to the **alpaca hype** in the area.

Gender vision findings

These insights were completed with surprising gender findings

- **Almost all the manufacturing projects in the region related to wool/textiles are run by women.**
- It was **more difficult than expected to have entrepreneurs reflect upon their situation** in respect to being a woman and which implications their gender has on the development of their business.

Further explanations of these gender vision findings will be collectively explored in relation to the impact of the shemakes.eu project on women innovators.



Opportunity Newsletter – Lottozero

Lab context & Activity description

Lottozero identified a clear need for their female entrepreneurs to have access to financial and business opportunities in Italy. On such a basis, they developed a monthly newsletter that was sent to 100 subscribers. Details of this activity are listed below.

Table 55. Opportunity newsletter activity description

Goals & formats	Launching once a month an email to inform female entrepreneurs of financial and business opportunities. The target was mainly based in Italy. The information collected and included in the newsletter was meant to be locally relevant. It would be much more complex to have a European wide target as the opportunities are much too varied from country to country. Tools: we did a simple email to increase the likelihood that emails would not be trapped in spam boxes, as this is a risk for newsletter programs.
Location	Online
Participants & Reach	100 newsletter subscribers (80% women), mainly female-led sustainable small brands and designers.

Outcomes & Key Learnings

There was a significant amount of **positive feedback for the opportunity newsletter**, much of which included the explicit request for more personalised information and help, e.g., to apply to some of the featured tenders.

However, the production of this monthly newsletter was very time-consuming, and solutions had to be designed to automate the information collection and the follow up of subscribers' questions.

Gender Vision Findings

As mentioned above, the female entrepreneurs have less access to opportunities for business and finance.

Reflection on lab's capability

This useful project was hand-made in shemakes.eu. However, to make this project viable, any lab would need funding to compensate for such a time-consuming activity.



One-to-One Consulting – By Lottozero

Lab context & Activity description

The consulting sessions were initially thought of as a way to incentivize survey participation. At the same time, knowing that there are few public funding opportunities and that access to credit and business support for self-employed women and/or entrepreneurs is practically non-existent, this activity was an opportunity to reinforce the role of the Lab as an enabling environment for women innovators.

The **main goal of this activity was to give personalised and structured advice to female innovators** (either starting or running a sustainable fashion design business).

8 women benefitted from one half-hour mentoring session with a Lottozero start-up expert, to guide them on their development of their sustainable brands.

Outcomes & Key Learnings

All participants were **satisfied** with their sessions and in follow up emails described how useful this part of the project had been for them **to solve immediate challenges** by receiving an external view and immediate tasks and exercises to help them reach their current goals. However, **small businesses** like the ones who participated in this activity are already extremely overexerted and therefore had **little to no time to invest in any activity** that is not directly related to running the business. Even if our consultancy was free, a limited amount of people took the time to schedule the meeting, and many had to be reminded of this opportunity

Further solutions to the one-to-one mentoring sessions should be explored, some of which being detailed in the Business Engagement task of Del 3.3.

Gender Vision Findings

All entrepreneurs we consulted with described the **difficulty of finding business partners** (in charge of all the administrative, business building, sales, marketing and often also communication activities) together with **the impossibility of getting funding for their businesses** because of their **gender**.

To our understanding and given the very limited insight, some differences can be found between **brands founded and run by female designers** (which are currently more struggling) and brands founded and run by businesspeople **hiring female designers**.



Further explanation on the reasons for this gender exclusion will be reflected in greater detail at the final impact phase of the project.

Fashion Brunch – Ziphouse



Photos taken by Cazacu Madalina

Figure 52. Key collective pictures of the activity.

Lab context & Activity description

Challenge: Our local T&C sector needed to understand where we stood on innovative activities. So, we decided to get together with people from the local industry.

Goals: Gather the representatives of the local fashion community in order to exchange on the current stage of T&C development and provide success stories from brands with experience.

Expected outcome: We wanted to emphasise the fact that local innovation is a concept different for everyone and we encouraged everyone to share their vision.

Target group: Women looking for ways to innovate their business, fashion designers, stylists & Creative directors.

Location: City of Chişinău.

Programme:

- Start with the Career Mapping activity.
- Focus on the exploration of the meaning of Innovation.
- Associate every brand to their perception of innovation.

Reach: 20 people participated, 18 women and 2 men.

Outcomes & Key Learnings

This Fashion Brunch activity helped participants and the lab.

- **Participants** appreciated communication, listening to other brands' work, and sharing knowledge about their work; they manifested their openness to deliver new innovative products that could make their production stand out from the crowd.
- ZipHouse learned that it is crucial to teach society about the large spectrum of **innovation** and create an **environment** to support collaborative work, to welcome differences and invites to innovation

Gender Vision Findings

Through this activity, we assessed that:

- The **local T&C sector is mostly led by women**, that is why we should concentrate our future plans in delivering entrepreneurial skills and raise awareness about the need to offer high paid jobs for women in this sector.
- There is a need to **create a supportive community**, where women can feel heard and that can serve as a first step to welcome innovative techniques.

Reflection on lab's capability

Ziphouse has the opportunity to organise events to listen to the community of the T&C sector. This kind of event allows us to launch solutions specifically addressing the innovators' needs. Reciprocally, working directly with the T&C community is helping shape the views on the fashion and textile industry and its future.

Key Learnings and Reflections on the task

During the second round of activities and interaction with the Transfer labs, we can highlight the following main outcomes and key learnings on local contexts, innovation, and gender vision/values.

Local contexts

- Local contexts/needs always determine the approach for the innovation actions.



- The main strength of Transfer Labs was the deep understanding of local context from which they adapted the innovation path to the needs of their community, translating it into a range of activities that actively promotes and supports the improvement towards employability (Explore, Network, Encourage, Mentor).

Innovation

- Power of storytelling for innovation narratives – sharing stories helps to develop an empathetic environment and serve as source of inspiration.
- The Shemakes Labs showed understanding of the innovation obstacles of their innovators’ community, allowing them to create a better enabling environment as well as opportunities to collaborate in the future.
- Innovation proved to be a multifaceted concept for each lab / women innovator: sustainable entrepreneurship, innovation/technology access, reinterpretation of traditional crafts and enabling community.

Gender vision and values

The Shemakes values that resonated more within the task:

- **Empowering and Inspiring** – by sharing & highlighting stories, as well as acting as innovation hubs (access to tech as enabling environments).
- **Welcoming Differences** – by promoting innovators with different backgrounds and career paths.
- **Collaborative** – by promoting opportunities for female innovators to meet and collaborate on future projects.
- **Equal** – learning has no age, innovation takes different shapes to fill that gap.

4.3. Future Actions

Project Phase as per DoA	Tasks	Date (Timing)
Reputation Building and Diffusion	Report writing and consolidation of all Phase 2 activities on the open toolkit	July – August
Consolidation of Results	Recap the Shemakes journey of multifaceted innovation, and increased value of skills to consolidate the tools and innovation model, and the post-project approach & impact	Oct – Dec



5. Conclusion and outlook

5.1. Highlights

In this section, the key highlights of the Learning path Phase 2 are reported and classified.

Testing and adapting the activities for various contexts

Phase 2 allowed partners to experiment with the Shemakes Learning path approach in various contexts and test its replicability.

The **tech-based workshops in Curiosity and Discovery path** are **replicable whatever the geographical area** in Europe.

The **outputs created** in such workshops could be easily adapted to **fit with a specific context**. The example of the e-monsters and the modular fashion activities illustrated the possibility of diversification and how the lab can customise the exercise to fit with their own objective and the cultural traditions.

Apart from the effective need for translation, what is needed is a clear documentation and peer learning support such as training the trainers' activities and video tutorials.

Another important aspect is the need for adaptation of the activities to the **local sourcing of materials and variations of costs** from country to country. Labs will have to source differently if they want to radically eco-design. An example of local sourcing by design is the topic of biomaterial making which partially depends on using local resources to transform it into materials, fabric, or composites. One of the first activities to prepare a biomaterial workshop is to look at what type of resources are present in the territory and to test/adapt the recipe that is currently shared via biomaterial networks. Then the design is embedded in the natural environment and builds upon the cultural heritage of the place.

Facing potential **crisis and restrictions** has become more important (the covid crisis demonstrated the fragility of our current production system). Some preparation to face complex situations can be documented. An example of crisis management is how the Ukraine war influenced sourcing materials and tools, causing delays or



impossibility to work with specific components, forcing some labs to **revise their sourcing strategies or change locations and contents** of their workshops.

Activities in the **Innovation path were more context-based** as they were closely linked to the labs' strategy and their ecosystem. Based on the type of lab, each could shape the proposed activities differently. The example of the survey illustrates how the strategies of Lottozero in Italy and FarmLab in Austria differ when it comes to getting in touch with their community and gathering feedback. This interest in circular and local fabrication was also enhanced with some visits and events realised within the Innovation narratives.

Beyond geographical features, we touched on the **diversification of processes according to the size of the lab, their core value, and objectives**, as well as their **maturity**. The logic proposed is **enabling labs to shape their path** according to their own innovation strategies.

Consolidating Learning path contents

Inspired by the curricula and main topics of Fabricademy, Shemakes Transfer labs ran a series of activities that reinforce the initial matrix of four topics - Industry 4.0, Wearable technologies, Sustainability, and Entrepreneurship - consolidating the effort realised in Phase 1 by the partner labs and adding new activities to match the needs from Phase 2 Transfer labs.

Existing and adapted activities from Phase 1

E-monsters is the predominant activity of the Curiosity path, that has been highly diffused within Science, Technology, Engineering, and Mathematics (STEM) education for many years to combine engineering with sewing. The extended documentation, the support and guidance from the curiosity task leader and the infinite variations of the characters according to children's trends and local cultures makes it a very popular and successful activity for all labs. Moreover, avoiding any machinery or heavy equipment makes it even easier to adapt to different stakeholders' contexts such as museums, libraries, festivals, summer camps.

Biomaterials is the predominant activity of the Discovery path. Sustainable materials are a very important topic in the field of design, making and within creative spaces that are seeking ways to become more circular and more sustainable in their practice. Especially the field of fashion and textiles that is becoming more and more conscious of the destructive use of resources, the overwhelming disposal of garments and the contamination of the environment with microplastics. The



Biomaterials workshops were highly popular within Shemakes due to many factors. Firstly, because it is a novel topic in fab labs and maker spaces; secondly due to Fabricademy's reputation on the sustainable and alternative materials and the extended documentation in the Fabricademy archive; thirdly, the phase one labs have an extended experience on the topic, and the documentation on the Shemakes toolkit facilitated knowledge transfer.

Interviews and surveys are the predominant activity of the Innovation path. The most direct and effective way to highlight success stories is to bring inspiring examples and to listen to the women innovators through interviews. In Shemakes, we appreciate the fact that self-confidence can be diffused from one innovator to the other by sharing experiences and hearing mindful and positive testimonies directly from the network. Moreover, the interviews serve as a basis to elaborate accessible role models, share insights on gender and explore issues of the local production value chains.

New activities from Phase 2

Circular fabrication. Three labs have created new activities related to circular fabrication. Such activities were closely related with the topic of "Open-Source Hardware: from Fibres to Fabric", conducted in parallel with the lab-to-lab research on wool and shared a common ambition for more sustainable and circular practice inside the textile process. TPL proposed a series of Discovery workshops entitled "From Yarn to textile / Exploring Fibre creating yarn" where participants could discover processes, tools and methods for textile processing by using a DIY open source spinning machine; Green Fabric developed a "Hack knitting machine" activity, getting into repairs and upcycling at machine level for computerising patterns; Le Textile Lab Lyon and Decode lab shared activities on upcycling and recycling processes, to explore solutions to the issue of textile waste.

Wool as a connecting thread. The lab-to-lab research on wool (Task 3.3) has impacted all the learning paths. In the Curiosity path, Decode created a loom making activity for kids, and VIVA Lab visited an old wool factory to create connections with new stakeholders; in the Discovery path, TPL was joined by Le Textile Lab Lyon for the wool processing machines; in the innovation path, the work of FarmLab and Icelandic Textile Center was closely related and enriched their investigations on Wool.



Shemakes learning paths, a success for onboarding labs in textile and for offering diversification

The design of three paths targeting different ages showed a huge potential within the extended Shemakes community. First, labs who did not have any textile activities felt empowered and feel now able to **propose textile activities** in their portfolios. Second, it helped individual labs to redesign their **strategies of educational offers**, customising and expanding it for a wider audience. The toolkit that proposed illustrated applications and specific guidelines according to ages makes labs **able to train kids, youngsters, students, and adults on a wide series of themes**.

Meanwhile, an interesting observation is that **there is no age hierarchy when it comes to education**, and it is much more about **horizontal interactions** and respect between the teachers and the learners. The **youngest can learn and teach to elders** as was clearly illustrated by the Curiosity path ambassadors, and vice-versa. Thus, the categories of Curiosity - Discovery - Innovation can be, beyond age brackets, grouped by value criteria: the **culture of learners** (and teachers), **the maturity of knowledge** (expert vs newbie) **and the type of formats for the workshops** (short vs long, one shot or in series).

Overall, the Shemakes network now proposes a wider agenda that enriches the standard fab lab and maker lab with textile topics, that provides new skills to a more diverse audience, primarily with a younger generation, and to more women interested in tech and creativity. It expands upon the methodologies of Fabricademy, the large fab lab network, the open-source knowledge sharing and builds its value proposition on a compilation of "ready to implement and adapt" workshops, activities, methodologies, and best practices, which can be the first step for any lab wishing to develop an inclusive and diverse enabling environment and can stimulate the younger generation access to tech and creativity.

Role Models & Cooperation in learning paths

Interactions between Role-Models in Learning Paths

The participation of gurus and ambassadors did have a positive impact on the development of the Learning path activities in Phase 2.

Gurus -Transfer labs. Gurus of the first phase acted as guides for the new transfer labs in shaping and consolidating their interventions. Even if there was an allocation of one guru per transfer lab, other exchanges also emerged, such as the strong participation of Anastasia Pistofidou, guru of IAAC, in the biomaterial activities of the



Transfer Lab Rog Centre and the management of innovation activities in Ziphouse and the Icelandic Textile Center.

Ambassadors – Transfer Labs. All transfer labs stated their satisfaction with the presence and contributions of ambassadors in their lab. In Curiosity, the performance of the two young girls as ambassadors was particularly applauded by the teams in Transfer labs, impressed by their courage and empowerment. The ambassador to Icelandic Textile Center, TPL or Green fabric were also much appreciated for their capacity to support and lead new types of workshops there.

Gurus – Ambassadors. Ambassadors received the strong support from Matrix (WP4), which was seconded by each guru to help them structure and adapt contents for new contexts. The level of autonomy of ambassadors or the proximity between gurus and ambassadors evolved according to the context and the level of maturity of the ambassadors concerning their practices.

Transfer Labs – Transfer Labs. Interactions and exchange of knowledge between Transfer labs were stimulated by the specific meetings of four labs on each task (next to the more general meetings). Peer-to-peer meetings were also observed, supporting the exchange of information, the framing of intervention or the analysis of insights.

Exploring and consolidating cooperation

Locally

The limited timeframe for running the activities made it quite difficult to organise new cooperation with Shemakes activities, especially in the Curiosity path. However, Transfer labs were able to connect with their local ecosystem to run the learning activities. Cooperation with schools, museums, universities, research centres, business companies and women innovators was strengthened in Phase 2 and fostered interest for further cooperation. TPL succeeded in integrating the course they offered in the next year's University program; Green Fabric proposes new workshops in their catalogue of training for next year and Rog Centre is planning a residency program to pursue cooperation with their local institutions.

Internationally

Beyond the cooperation amongst Shemakes labs, Transfer labs explored ways to expand their international reach with learning activities. With online events, surveys or symposiums, labs could connect with international communities, institutions, and networks. The learning path and wider agenda of Fabricademy-based workshops



can therefore be deployed in many labs around the world as Shemakes activities, consolidating and enriching the contents and reaching a broader audience.

Gender findings

Bridging the gender gap in STEM and Innovation

By proposing a series of activities at the intersection between textile and technologies, Shemakes labs **succeeded in reinforcing the gender balance within technological places** and **offered space to observe current practices and diffuse an inclusive culture** in the lab's environment. As VIVA Lab mentioned "Connecting textiles with tech is an excellent way to bring girls to this kind of environment. On the other hand, it's also an excellent way to bring boys to the textile world. In a way, these two worlds complete each other and build bridges between genders providing a way to bring equality and to empower young women and girls."

Gender across generations

Several labs emphasised that **gender vision evolves from older generation to younger generation**. A nice illustration was given by the FarmLab team's stories in the Wollgenuss project, where Monika (55) had a more traditional approach/experience with her husband being away to work and her running the farm, while Erika and Manuela (35-45), who took over the farm together with their husbands rather recently, had a sharing approach of the workload by supporting each other's activities within the family.

Labs also mentioned many stories about grandmothers and mothers working with textiles who passed their knowledge to daughters and granddaughters who helped with technology and new types of fabrication, emphasising **the importance of promoting activities of mixed and complementary generations**.

Working with and overcoming gender stereotypes

The most common observations were that women were generally more attracted to handcraft and men to technology and that the gender balance with a workshop drove the cooperative - individualistic attitudes of girls vs work. As VIVISTOP team stated, when boys were involved, girls were less likely to form groups and more likely to work independently.

Once observed, reduction of this gap could be based on a workshop structure fostering cooperation and personal expression, an enabling environment that left space for discussing current behaviours and the expertise of facilitators using alternative techniques to unlock the gender stereotypes.



Opening eyes to emerging “bubbles” outside gender realities

In the Discovery path, it was observed that there was **a lack of awareness concerning gender gaps inside the academic context** mainly because students felt that they were in a safe space, disconnected from other realities. Labs identified a need to better acknowledge the gender gap in the educational environment by better preparing students for complex situations they could face when entering the professional world.

Promoting active listening and mutual support

Stories shared through all paths emphasised the importance of creating communities where women would **feel safe, heard, and supported**. By sharing women’s stories and perceptions, women’s voices are more heard. By using interviews, visits, and co-creation activities, we could **foster the skills of active listening**. As mentioned by Silvia and Martin from the FarmLab, **mutual support in both personal and professional environments is one of the keys for success**.

Learning paths and Shemakes Values

Thanks to the method developed prior to phase 2, Shemakes Transfer labs got attuned to the 6 Shemakes values – Equal, Collaborative, Welcoming Differences, Empowering, Inspiring-, their definitions and examples to illustrate them.

In Phase 2, Transfer Labs widened the examples that could express the values, coming from their own practices, which are summarised in the following table.

Table 56 Shemakes values and Learning paths

Shemakes values	Curiosity	Discovery	Innovation
Equal	Opening activities for mixed groups, empowering young participants to become instructors	Proposing same access to contents whatever the differences	Innovation takes different shapes to fill that gap.
Collaborative	Kids helping each other	Making them work in groups	Promoting opportunities for female innovators to meet and collaborate on future projects
Welcoming differences	Get to know the others by making with	Sharing about the diversity of	Promoting innovators with different



Shemakes values	Curiosity	Discovery	Innovation
		backgrounds and knowledge, experiences, and motivations	backgrounds and career paths
Empowering	Guided by role-models with clear documentation	Try new practices and techniques which resulted in giving them confidence in themselves	Giving the opportunity to explore, research, network and learn new skills
Inspiring	Ambassadors as source of inspiration	Beyond Shemakes role-model, offering contact with external mentors	Sharing interviews, experiences, and routes to jobs with designers working within textiles

5.2. Future steps

An [updated version of the toolkit](#)⁶ is being developed with all the new activities of phase 2. Transfer Labs will finalise their documentation, follow the guidelines for editing in git and thus participate in improving the content of the **handbook**. The results will be presented in the last WP2 deliverable D2.4.

In parallel, the **communication** team will feed the website contents section on learning path with links to the open toolkit and share relevant stories from the Transfer labs inside the blog sections or via social media.

WP2 and WP3 partners will support the WP5 to run the analysis of the project by participating in the feedback survey, attending relevant workshops, and providing a fine granularity when analysing the **project impact**, especially on the roles of learning activities within the dynamic of the Shemakes ecosystem.

From September to December, a series of activities will be organised inside the Shemakes networks where WP2 partners will be proactive in turning WP2 findings into operational outputs for the **consolidation and the expansion of the network** through collaborations and projects.

⁶ All documented activities are here: <http://fabricademy.fabcloud.io/shemakes/handbook/>



Document information

Revision History

Revision	Date	Author	Partner	Description
V 0.1	01.06.22	Real Marion	IAAC	First draft and table of contents
V 0.2	26.07.2022	All authors	IAAC, ONLFAIT, WAAG, LEON + Transfer Labs	Version sent to reviewers
V 0.3	14.08.2022	All reviewers	TIG, FLOD, MATRIX	Comments and revisions sent to main authors
V 0.4	20.08.2022	All authors	IAAC, ONLFAIT, WAAG, LEON	New version integrating revisions sent to TCBL
V 1.0	31.08.2022	F.Thureau	TCBL	Final version uploaded

Statement of Originality

This deliverable contains original unpublished work except where clearly indicated otherwise. Acknowledgement of previously published material and of the work of others has been made through appropriate citation, quotation, or both.

Copyright



This work is licensed by the **Shemakes.eu Consortium** under a Creative Commons Attribution-ShareAlike 4.0 International License, 2021. For details, see <http://creativecommons.org/licenses/by-sa/4.0/>

The Shemakes.eu Consortium consists of: CEDECS-TCBL (FR), Institut d'Architectura Avancada de Catalunya (ES), Stichting Waag Society (NL), Onl'Fait (CH), Fundacion Telice Magnetic Anomaly (ES), makesense (FR), Atelierul REDU (RO), Tavistock Institut GGMBH (DE), Matrix GMBH and CO KG (DE) and Flod srl (IT).

Disclaimer

All information included in this document is subject to change without notice. The Members of the shemakes.eu Consortium make no warranty of any kind with regard to this document, including, but not limited to, the implied warranties of



merchantability and fitness for a particular purpose. The Members of the Shemakes.eu Consortium shall not be held liable for errors contained herein or direct, indirect, special, incidental, or consequential damages in connection with the furnishing, performance, or use of this material.

Acknowledgement

The Shemakes.eu project has received funding from the European Union's Horizon 2020 Programme for research, technology development, and innovation under Grant Agreement n. 101006203.

