

# BRIDGE TO ESCO

DESIGN4CIRCLE

Grant Agreement number 2018-1-LV01-KA202-046977



Co-funded by the  
Erasmus+ Programme  
of the European Union



circular economy  
design training  
in the textile and  
footwear industries



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Innovative design practices for achieving  
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## BRIDGE TO ESCO

Project Title                    **Innovative design practices for achieving  
a new textile circular sector**

Project Acronym              **Design4Circle**

Reference Number            **2018-1-LV01-KA202-046977**

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Project Partners

- P1     RIGA TECHNICAL UNIVERSITY - RTU (Latvia)**
- P2     TECHNICAL UNIVERSITY OF IASI - TUIASI (Romania)**
- P3     ECORES SPRL - ECORES (Belgium)**
- P4     AGRUPACION EMPRESARIAL INNOVADORA DE FABRICANTES DE MUEBLES  
Y AFINES DE LA REGION DE MURCIA- AMUEBLA (Spain)**
- P5     CENTRO TECNOLOGICO DE CALCADO DE PORTUGAL - CTCP (Portugal)**
- P6     TEXTILE TRADE ASSOCIATION - TEXTILE CLUSTER - TTA-TC  
(Macedonia)**



## TABLE OF CONTENTS

1.	Rational of the Output .....	4
2.	What is ESCO .....	6
3.	Bridge to occupations in ESCO .....	10
4.	Bridge to Knowledge and Skills in ESCO .....	22
5.	Conclusions .....	28
6.	References .....	29



## 1. RATIONAL OF THE OUTPUT

The activity "Bridge to ESCO" finds its framework within Output 1 - Activity A2 - DESK RESEARCH ON BEST PRACTICES, LAST RESOURCES AVAILABLE AND NEEDS FOR ECO-DESIGN IN THE TEXTILE SECTOR - and aims at correcting needs and gaps identified in IO-A1 and IO-A2, before the due validation on IO1-A3 - ENDORSEMENT OF THE DEFINED NEEDS AND GAPS - via the workshops with stakeholders implemented in all countries involved.

The Design4Circle partners found essential to consult the European Skills/Competences, qualifications and Occupations European Database (ESCO) to be certain regarding the innovation of the topics to be worked out in the further project activities and to measure the usefulness or applicability of the future contents to the already mapped occupations. ESCO database was used as a support tool to match related occupations with the necessary skills, knowledge and competences.

A first need analysis has been developed during the proposal period to ensure the needs on training in eco-design for a circular textile industry. However, it was essential to know the specific knowledge gaps from current designers and workers of the textile industry in order to guarantee that the content of the trainings meets the needs of future learners and companies within the sector - this was copped in IO1 activities.

This first project output (IO1) - ANALYSIS OF LAST RESOURCES AVAILABLE AND NEEDS FOR ECO-DESIGN AND CURRENT BEST PRACTICES IN THE TEXTILE SECTOR - envisaged to analyse current best practices on eco-design and resources available to be implemented in the textile industry towards a circular business model and the

identification of knowledge and skills gap. In a second step this research was endorsed by the textile industry sector and other stakeholders to validate the project focus.

At the end of the IO1 a key-report was developed describing the current best practices and last resource available for their implementation in the design sector of the textile industry. Other sectors sharing similarities with the textile industry may be integrated in the scope of analysis. Finally, the report specifies the training needs on eco-design that the textile industry needs cover. This "bridge to ESCO" appears as an annex of the IO1-A2, and, together with all the IO1 and its correspondent annexes will be useful for other possible projects, Universities, VET centres, Associations, etc.

In addition, the objectives of this IO extend to the ESCO framework has as the Design4Circle project can be also a tool to improve ESCO itself. The ESCO skill hierarchy is in a continuous process of improvement.

## 2. WHAT IS ESCO

ESCO is a **E**uropean project on **S**kills, **C**ompetences, Qualifications and **O**ccupation  
<https://ec.europa.eu/esco/portal/home>

ESCO works as a map, and provides terminology as a dictionary, describing, identifying and classifying professional occupations, skills, and qualifications relevant for the EU labour market and education and training.

Those concepts and the relationships between them can be understood by electronic systems, which allows different online platforms to use ESCO for services like matching jobseekers to jobs on the basis of their skills, suggesting trainings to people who want to reskill or upskill etc.

The aim of ESCO is to support job mobility across Europe and therefore a more integrated and efficient labour market, by offering a "common language" on occupations and skills that can be used by different stakeholders on employment and education and training topics.

In this way, ESCO has 3 pillars:

- **Occupations** (which is taken here as the main approach for job profiles) - It organises the occupation concepts in ESCO. It uses hierarchical relationships between them, metadata as well as mappings to the International Standard Classification of Occupations (ISCO) in order to structure the occupations. Each occupation concept contains one preferred term and any number of non-preferred terms and

hidden terms in each of the ESCO languages. Each occupation also comes with an occupational profile. The profiles contain an explanation of the occupation in the form of description, scope note and definition. Furthermore, they list the knowledge, skills and competences that experts considered relevant terminology for this occupation on a European scale. So far it gathers 2942 occupations mapped, **located at level 5 and lower.**

- **Knowledge/Skills** (KS method, the description of fields of knowledge, related the abilities, and proven abilities) - The ESCO skills pillar distinguishes between i) skill/competence concepts and ii) knowledge concepts by indicating the skill type. There is however no distinction between skills and competences. Each of these concepts comes with one preferred term and a number of non-preferred terms in each of the 27 ESCO languages. Every concept also includes an explanation in the form of description. The knowledge/skills pillar of ESCO contains 13,485 concepts structured in a hierarchy which contains four sub-classifications. Each sub-classification targets different types of knowledge and skill/competence concepts:

- Knowledge
- Skills
- Attitudes and values
- Language skills and knowledge

In addition to the hierarchy, subsets of skills can be accessed through:

- A transversal skill hierarchy
- A collection of languages
- A collection of digital skills



- **Qualifications** - Qualifications are the formal outcome of an assessment and validation process which is obtained when a competent body determines that an individual has achieved learning outcomes to given standards. Information on qualifications at European level is now displayed in Europass, and comes from databases of national qualifications reflecting the National Qualifications Frameworks that are owned and managed by the European Member States.

ESCO is the best and faster tool to describe the panorama around the countries involved. ESCO applies the same definition of "skill" as the [European Qualifications Framework \(EQF\)](#). According to this, "skill" means the ability to apply knowledge and use know-how to complete tasks and solve problems". They can be described as cognitive (involving the use of logical, intuitive and creative thinking) or practical (involving manual dexterity and the use of methods, materials, tools and instruments).

The term skill refers typically to the use of methods or instruments in a setting and in relation to defined tasks.

By other hand "**Knowledge**" is described as the "Outcome of the assimilation of information through learning" and the "Body of facts, principles, theories and practices that is related to a field of work or study".

The ESCO portal can be used by everyone, it's opened to anyone who have some background in training/education and be able to make the due searches.



The vision behind ESCO is the provision of a common reference language that could support transparency, translation, comparison, identification and analysis of the content of a qualification, thus helping to indicate how those relate to the skills and occupations needed across occupations and sectors. ESCO does so in multiple ways.

### 3. BRIDGE TO OCCUPATIONS IN ESCO

In this section a study on the existing occupations related to textile, fashion, footwear, leather goods, furniture and upholstery is presented.

One of ESCO's main missions is to build stronger bridges between the world of education and training and the world of work, contributing to reduce skill mismatches and supporting the better functioning of the labour market. The partners decided to explore the bridge between the already mapped occupation and the potential of the new knowledge and skills developed within the project.

The idea is to understand:

- How innovative is the future professional profile to be drafted in the project framework on ECO-DESIGN FOR CIRCULAR ECONOMY IN THE TEXTILE AND FASHION INDUSTRIES
- How already mapped occupations in ESCO, in the field of textile and fashion, footwear, leather goods, furniture and upholstery, can benefit with the new pedagogical materials to be drafted within the project and which will correspond to the training needs identified.

Table 1 compiles several occupations found in ESCO with relations to the sectors mentioned above, to whom the curriculum and future pedagogical material will impact positively. For each occupation encountered, related knowledge and skills/competences also mapped in ESCO are identified.

The curriculum will impact on at least 21 occupations found in ESCO.



Table 1

Bridge Design4Circle to ESCO occupation pillar

OCCUPATIONS	SKILLS & COMPETENCES	KNOWLEDGE	ESCO DATABASE LINK
<b>Clothing CAD technician</b>	<ul style="list-style-type: none"> <li>• Create patterns for garments</li> <li>• Draw sketches to develop textile articles using softwares</li> <li>• Grade patterns for wearing apparel</li> <li>• Inspect wearing apparel products</li> <li>• Make technical drawings of fashion pieces</li> <li>• Operate computerised control systems</li> <li>• Perform process control in the wearing apparel industry</li> <li>• Prepare production prototypes</li> </ul>	<ul style="list-style-type: none"> <li>• 3D body scanning technologies</li> <li>• CAD for garment manufacturing</li> <li>• Apparel manufacturing technology</li> <li>• history of fashion</li> <li>• Manufacturing of made-up textile articles</li> <li>• Manufacturing of wearing apparel</li> <li>• Marker making</li> <li>• Standard sizing systems for clothing</li> </ul>	<a href="http://data.europa.eu/esco/occupation/849a656c-8559-4471-91ed-442c42b0b641">http://data.europa.eu/esco/occupation/849a656c-8559-4471-91ed-442c42b0b641</a>
<b>Clothing fashion designer</b>	<ul style="list-style-type: none"> <li>• Alter wearing apparel</li> <li>• Create mood boards</li> <li>• Design wearing apparel</li> <li>• Draw sketches to develop textile articles</li> <li>• Manage briefs for clothing manufacturing</li> </ul>	<ul style="list-style-type: none"> <li>• Portfolio management in textile manufacturing</li> <li>• Properties of fabrics</li> <li>• Standard sizing systems for clothing</li> </ul>	<a href="http://data.europa.eu/esco/occupation/d1a554d0-7ad6-4d42-897e-ed31d022fb0b">http://data.europa.eu/esco/occupation/d1a554d0-7ad6-4d42-897e-ed31d022fb0b</a>



<p><b>Clothing technologist</b></p>	<ul style="list-style-type: none"> <li>• Alter wearing apparel</li> <li>• Analyse supply chain strategies</li> <li>• Coordinate manufacturing production activities</li> <li>• Create patterns for garments</li> <li>• Distinguish accessories</li> <li>• Distinguish fabrics</li> <li>• Evaluate garment quality</li> <li>• Inspect wearing apparel products</li> <li>• Make technical drawings of fashion pieces</li> <li>• Manage briefs for clothing manufacturing</li> <li>• Manufacture wearing apparel products</li> <li>• Operate computerised control systems</li> <li>• Operate garment manufacturing machines</li> <li>• Perform process control in the wearing apparel industry</li> <li>• Prepare production prototypes</li> <li>• Use textile technique for hand-made products</li> </ul>	<ul style="list-style-type: none"> <li>• Apparel manufacturing technology</li> <li>• History of fashion</li> <li>• Manufacturing of made-up textile articles</li> <li>• Manufacturing of wearing apparel</li> <li>• Standard sizing systems for clothing</li> </ul>	<p><a href="http://data.europa.eu/esco/occupation/2bf5169b-2c89-451a-9274-e2b4bc1f9487">http://data.europa.eu/esco/occupation/2bf5169b-2c89-451a-9274-e2b4bc1f9487</a></p>
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<b>Embroiderer</b>	<ul style="list-style-type: none"> <li>• Decorate textile articles</li> <li>• Draw sketches to develop textile articles using softwares</li> <li>• Embroider fabrics</li> <li>• Manufacture wearing apparel products</li> <li>• Operate garment manufacturing machines</li> <li>• Sew textile-based articles</li> </ul>	<ul style="list-style-type: none"> <li>• Apparel manufacturing technology</li> <li>• Properties of fabrics</li> </ul>	<a href="http://data.europa.eu/esco/occupation/7324e9f5-0f94-497e-af2f-42142e939a94">http://data.europa.eu/esco/occupation/7324e9f5-0f94-497e-af2f-42142e939a94</a>
<b>Fashion designer</b>	<ul style="list-style-type: none"> <li>• Collaborate with designers</li> <li>• Design wearing apparel</li> <li>• Develop design ideas cooperatively</li> <li>• Gather reference materials for artwork</li> <li>• Identify target markets for designs</li> <li>• Modify textile designs</li> <li>• Monitor developments in technology used for design</li> <li>• Monitor textile manufacturing developments</li> <li>• Produce textile designs</li> <li>• Produce textile samples</li> <li>• Seek innovation in current practices</li> <li>• Use specialised design software</li> <li>• Use textile technique for hand-made products</li> </ul>	<ul style="list-style-type: none"> <li>• Art history</li> <li>• History of fashion</li> <li>• Portfolio management in textile manufacturing</li> <li>• Textile materials</li> <li>• Textile techniques</li> </ul>	<a href="http://data.europa.eu/esco/occupation/77bfd6e7-5598-4818-84cb-31e2651eb046">http://data.europa.eu/esco/occupation/77bfd6e7-5598-4818-84cb-31e2651eb046</a>
<b>Footwear designer</b>	<ul style="list-style-type: none"> <li>• Apply fashion trends to footwear and leather goods</li> <li>• Communicate commercial and technical issues in foreign languages</li> </ul>	<ul style="list-style-type: none"> <li>• Ergonomics in footwear and leather goods design</li> <li>• Footwear and leather goods marketing</li> </ul>	<a href="http://data.europa.eu/esco/occupation/06f89f2c-c6e9-40c5-a4a5-0e34d5fbc184">http://data.europa.eu/esco/occupation/06f89f2c-c6e9-40c5-a4a5-0e34d5fbc184</a>



	<ul style="list-style-type: none"> <li>• Create mood boards</li> <li>• Create patterns for footwear</li> <li>• Create technical sketches for footwear</li> <li>• Develop footwear and leather goods marketing plans</li> <li>• Develop footwear collection</li> <li>• Implement footwear marketing plan</li> <li>• Make technical drawings of fashion pieces</li> <li>• Perform market research in footwear</li> <li>• Practice innovative thinking in the footwear and leather goods industries</li> <li>• Reduce environmental impact of footwear manufacturing</li> <li>• Use IT tools</li> <li>• Use communication techniques</li> <li>• Work in textile manufacturing teams</li> </ul>	<p>planning</p> <ul style="list-style-type: none"> <li>• Footwear components</li> <li>• Footwear creation process</li> <li>• Footwear manufacturing technology</li> <li>• Footwear materials</li> <li>• Footwear quality</li> <li>• Pattern grading</li> </ul>	
<b>Furniture designer</b>	<ul style="list-style-type: none"> <li>• Adapt to new design materials</li> <li>• Attend design meetings</li> <li>• Consult with design team</li> <li>• Design original furniture</li> <li>• Develop design concept</li> <li>• Gather reference materials for artwork</li> <li>• Monitor art scene developments</li> <li>• Monitor exhibition designs</li> <li>• Monitor sociological trends</li> <li>• Monitor textile manufacturing</li> </ul>	<ul style="list-style-type: none"> <li>• Art history</li> </ul>	<a href="http://data.europa.eu/esco/occupation/bc4d1659-6860-488e-bc13-e87eb0e36f67">http://data.europa.eu/esco/occupation/bc4d1659-6860-488e-bc13-e87eb0e36f67</a>



	<p>developments</p> <ul style="list-style-type: none"> <li>• Present detailed design proposals</li> <li>transfer designs</li> </ul>		
<b>Glove maker</b>	<ul style="list-style-type: none"> <li>• Distinguish accessories</li> <li>• Distinguish fabrics</li> <li>• Manufacture wearing apparel products</li> <li>• Sew pieces of fabric</li> </ul>	<ul style="list-style-type: none"> <li>• Apparel manufacturing technology</li> </ul>	<a href="http://data.europa.eu/esco/occupation/7c6fc2f0-6e16-4429-8190-f6faac0c3853">http://data.europa.eu/esco/occupation/7c6fc2f0-6e16-4429-8190-f6faac0c3853</a>
<b>Industrial designer</b>	<ul style="list-style-type: none"> <li>• Conduct research on trends in design</li> <li>• Determine suitability of materials</li> <li>• Draft design specifications</li> <li>• Draw design sketches</li> <li>• Follow a brief</li> <li>• Liaise with engineers</li> <li>• Meet deadlines</li> <li>• Perform market research</li> <li>• Present detailed design proposals</li> </ul>	<ul style="list-style-type: none"> <li>• Aesthetics</li> <li>• Copyright legislation</li> <li>• Design principles</li> <li>• Engineering principles</li> <li>• Engineering processes</li> <li>• Ergonomics</li> <li>• Industrial design</li> <li>• Manufacturing processes</li> <li>• Mathematics</li> </ul>	<a href="http://data.europa.eu/esco/occupation/ab7bccb2-6f81-4a3d-a0c0-fca5d47d2775">http://data.europa.eu/esco/occupation/ab7bccb2-6f81-4a3d-a0c0-fca5d47d2775</a>
<b>Knitter</b>	<ul style="list-style-type: none"> <li>• Control textile process</li> <li>• Cut textiles</li> <li>• Evaluate textile characteristics</li> <li>• Maintain equipment</li> <li>• Use manual knitting techniques</li> <li>• Use textile technique for hand-made products</li> </ul>	<ul style="list-style-type: none"> <li>• Fabric types</li> <li>• Textile materials</li> <li>• Textile measurement</li> <li>• Types of textile fibres</li> </ul>	<a href="http://data.europa.eu/esco/occupation/3562e70c-016c-455c-b949-521a367418a5">http://data.europa.eu/esco/occupation/3562e70c-016c-455c-b949-521a367418a5</a>



<b>Knitting textile technician</b>	<ul style="list-style-type: none"> <li>• Control textile process</li> <li>• Develop specifications of technical textiles</li> <li>• Distinguish accessories</li> <li>• Distinguish fabrics</li> <li>• Draw sketches to develop textile articles using softwares</li> <li>• Manufacture weft knitted fabrics</li> <li>• Measure yarn count</li> <li>• Set-up weft knitting machines</li> <li>• Use warp knitting technologies</li> <li>• Use weft preparation technologies</li> </ul>	<ul style="list-style-type: none"> <li>• Knitting machine technology</li> </ul>	<a href="http://data.europa.eu/esco/occupation/18b00c9e-3a07-4346-bb86-b1577554cf56">http://data.europa.eu/esco/occupation/18b00c9e-3a07-4346-bb86-b1577554cf56</a>
<b>Leather goods designer</b>	<ul style="list-style-type: none"> <li>• Apply development process to footwear design</li> <li>• Apply fashion trends to footwear and leather goods</li> <li>• Communicate commercial and technical issues in foreign languages</li> <li>• Create mood boards</li> <li>• Develop footwear and leather goods marketing plans</li> <li>• Develop leather goods collection</li> <li>• Implement footwear marketing plan</li> <li>• Practice innovative thinking in the footwear and leather goods industries</li> <li>• Sketch leather goods</li> <li>• Use IT tools</li> <li>• Use communication techniques</li> </ul>	<ul style="list-style-type: none"> <li>• Ergonomics in footwear and leather goods design</li> <li>• Footwear and leather goods marketing planning</li> <li>• Footwear creation process</li> <li>• Leather goods components</li> <li>• Leather goods manufacturing processes</li> <li>• Leather goods materials</li> <li>• Leather goods quality</li> </ul>	<a href="http://data.europa.eu/esco/occupation/a142a645-6e9e-4d86-accd-9816df857c90">http://data.europa.eu/esco/occupation/a142a645-6e9e-4d86-accd-9816df857c90</a>



<b>Textile chemist</b>	<ul style="list-style-type: none"> <li>• conduct textile testing operations</li> <li>• control textile process</li> <li>• design warp knit fabrics</li> <li>• design yarns</li> <li>• develop specifications of technical textiles</li> <li>• evaluate textile characteristics</li> <li>• maintain work standards</li> <li>• use textile finishing machine technologies</li> </ul>	<ul style="list-style-type: none"> <li>• dyeing technology</li> <li>• health and safety in the textile industry</li> <li>• properties of fabrics</li> <li>• research and development in textiles</li> <li>• textile chemistry</li> <li>• textile finishing technology</li> <li>• textile printing technology</li> <li>• textile technologies</li> </ul>	<a href="http://data.europa.eu/esco/occupation/55076d82-52a7-47eb-b882-f12322c42ecd">http://data.europa.eu/esco/occupation/55076d82-52a7-47eb-b882-f12322c42ecd</a>
<b>Textile designer</b>	<ul style="list-style-type: none"> <li>• Create mood boards</li> <li>• Decorate textile articles</li> <li>• Design warp knit fabrics</li> <li>• Design weft knitted fabrics</li> <li>• Design woven fabrics</li> <li>• Design yarns</li> <li>• Distinguish accessories</li> <li>• Distinguish fabrics</li> <li>• Draw sketches to develop textile articles</li> <li>• Draw sketches to develop textile articles using softwares</li> <li>• Gather reference materials for artwork</li> <li>• Measure yarn count</li> <li>• Seek innovation in current practices</li> <li>• Use textile technique for hand-made products</li> </ul>	<ul style="list-style-type: none"> <li>• Portfolio management in textile manufacturing</li> <li>• Properties of fabrics</li> <li>• Textile marketing techniques</li> <li>• Textile printing technology</li> </ul>	<a href="http://data.europa.eu/esco/occupation/0f7c84c5-1c0d-4fc1-8949-07dbe8bd34ef">http://data.europa.eu/esco/occupation/0f7c84c5-1c0d-4fc1-8949-07dbe8bd34ef</a>





<b>Textile dyeing technician</b>	<ul style="list-style-type: none"> <li>• Maintain work standards</li> </ul>	<ul style="list-style-type: none"> <li>• Dyeing technology</li> <li>• Health and safety in the textile industry</li> <li>• Properties of fabrics</li> <li>• Textile chemistry</li> <li>• Textile finishing technology</li> <li>• Textile printing technology</li> </ul>	<a href="http://data.europa.eu/esco/occupation/2229a024-21e4-43ef-b3fd-2444ab41bfb8">http://data.europa.eu/esco/occupation/2229a024-21e4-43ef-b3fd-2444ab41bfb8</a>
<b>Textile machine operator</b>	<ul style="list-style-type: none"> <li>• Control textile process</li> <li>• Manufacture braided products</li> <li>• Manufacture knitted textiles</li> <li>• Manufacture man-made fibres</li> <li>• Manufacture non-woven filament products</li> <li>• Manufacture nonwoven staple products</li> <li>• Tend spinning machines</li> <li>• Tend textile drying machines</li> <li>• Tend textile dyeing machines</li> <li>• Tend textile finishing machines</li> <li>• Tend textile printing machines</li> <li>• Tend textile washing machines</li> <li>• Tend weaving machines</li> <li>• Use textile finishing machine technologies</li> <li>• Use textile technique for hand-made products</li> </ul>	<ul style="list-style-type: none"> <li>• Textile techniques</li> <li>• Textile technologies</li> </ul>	<a href="http://data.europa.eu/esco/occupation/2b136e51-154b-4cb2-8130-f73228f14b11">http://data.europa.eu/esco/occupation/2b136e51-154b-4cb2-8130-f73228f14b11</a>



<b>Textile pattern making machine operator</b>	<ul style="list-style-type: none"> <li>• Adhere to organisational guidelines</li> <li>• Apply health and safety standards</li> <li>• Decorate textile articles</li> <li>• Modify textile designs</li> </ul>	<ul style="list-style-type: none"> <li>• Properties of fabrics</li> <li>• Textile materials</li> <li>• Textile techniques</li> </ul>	<a href="http://data.europa.eu/esco/occupation/0a9eb24a-13e7-4847-8f6e-a776771ac96b">http://data.europa.eu/esco/occupation/0a9eb24a-13e7-4847-8f6e-a776771ac96b</a>
<b>Textile process controller</b>	<ul style="list-style-type: none"> <li>• Check quality of products in textile production line</li> <li>• Control textile process</li> <li>• Convert textile fibres into sliver</li> <li>• Evaluate textile characteristics</li> <li>• Maintain work standards</li> <li>• Set-up weft knitting machines</li> <li>• Test physical properties of textiles</li> <li>• Use textile finishing machine technologies</li> </ul>	<ul style="list-style-type: none"> <li>• Health and safety in the textile industry</li> <li>• Properties of fabrics</li> <li>• Staple spinning machine technology</li> <li>• Textile printing technology</li> </ul>	<a href="http://data.europa.eu/esco/occupation/745c8bb3-b50b-4380-9377-1b68a6576986">http://data.europa.eu/esco/occupation/745c8bb3-b50b-4380-9377-1b68a6576986</a>
<b>Textile product developer</b>	<ul style="list-style-type: none"> <li>• Conduct textile testing operations</li> <li>• Decorate textile articles</li> <li>• Design warp knit fabrics</li> <li>• Design weft knitted fabrics</li> <li>• Design woven fabrics</li> <li>• Develop specifications of technical textiles</li> <li>• Distinguish accessories</li> <li>• Distinguish fabrics</li> <li>• Draw sketches to develop textile articles</li> <li>• Draw sketches to develop textile articles using softwares</li> <li>• Maintain work</li> </ul>	<ul style="list-style-type: none"> <li>• Braiding technology</li> <li>• Challenging issues in the textile industry</li> <li>• Health and safety in the textile industry</li> <li>• Nonwoven machine technology</li> <li>• Portfolio management in textile manufacturing</li> <li>• Properties of fabrics</li> <li>• Research and development in textiles</li> <li>• Textile marketing techniques</li> <li>• Textile printing</li> </ul>	<a href="http://data.europa.eu/esco/occupation/6833077e-e521-4605-bc1a-893f4b3d811c">http://data.europa.eu/esco/occupation/6833077e-e521-4605-bc1a-893f4b3d811c</a>



	standards <ul style="list-style-type: none"> <li>• Measure yarn count</li> <li>• Use textile finishing machine technologies</li> <li>• Use textile technique for hand-made products</li> </ul>	technology <ul style="list-style-type: none"> <li>• Textile technologies</li> </ul>	
<b>Textile quality inspector</b>	<ul style="list-style-type: none"> <li>• Check quality of products in textile production line</li> <li>• Conduct textile testing operations</li> <li>• Control textile process</li> <li>• Define data quality criteria</li> <li>• Distinguish accessories</li> <li>• Distinguish fabrics</li> <li>• Ensure quality assurance standards for vehicles</li> <li>• Evaluate textile characteristics</li> <li>• Maintain work standards</li> <li>• Manage quality of leather throughout the production process</li> <li>• Measure yarn count</li> <li>• Oversee quality control</li> <li>• Test physical properties of textiles</li> </ul>	<ul style="list-style-type: none"> <li>• Challenging issues in the textile industry</li> <li>• Data quality assessment</li> <li>• Database quality standards</li> <li>• Health and safety in the textile industry</li> <li>• Textile measurement</li> <li>• Textile technologies</li> </ul>	<a href="http://data.europa.eu/esco/occupation/85fdd1cb-98d3-4c40-a868-1078ce770440">http://data.europa.eu/esco/occupation/85fdd1cb-98d3-4c40-a868-1078ce770440</a>
<b>Textile technologist</b>	<ul style="list-style-type: none"> <li>• Conduct textile testing operations</li> <li>• Control textile process</li> <li>• Convert textile fibres into sliver</li> <li>• Develop specifications of technical textiles</li> <li>• Distinguish accessories</li> <li>• Distinguish fabrics</li> <li>• Evaluate textile</li> </ul>	<ul style="list-style-type: none"> <li>• Braiding technology</li> <li>• Challenging issues in the textile industry</li> <li>• Health and safety in the textile industry</li> <li>• Portfolio management in textile manufacturing</li> <li>• Properties of fabrics</li> </ul>	<a href="http://data.europa.eu/esco/occupation/85acc7e9-1fac-4e91-962b-8b8031f39487">http://data.europa.eu/esco/occupation/85acc7e9-1fac-4e91-962b-8b8031f39487</a>



	<p>characteristics</p> <ul style="list-style-type: none"><li>• Maintain work standards</li><li>• Manufacture braided products</li><li>• Manufacture knitted textiles</li><li>• Manufacture man-made fibres</li><li>• Manufacture non-woven filament products</li><li>• Manufacture nonwoven staple products</li><li>• Manufacture staple yarns</li><li>• Manufacture texturised filament yarns</li><li>• Manufacture woven fabrics</li><li>• Measure yarn count</li><li>• Seek innovation in current practices</li><li>• Set-up weft knitting machines</li><li>• Use textile technique for hand-made products</li></ul>	<ul style="list-style-type: none"><li>• Research and development in textiles</li><li>• Staple spinning machine technology</li><li>• Textile printing technology</li><li>• Textile technologies</li></ul>	
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## 4. BRIDGE TO KNOWLEDGE AND SKILLS IN ESCO

In the same way as for the occupations' previously presented, in the last section, this document reflects the bridging the knowledge and skills mismatches and gaps identified in Design4Circle IO1-A2 to the already existing ones and mapped in ESCO.

Again, the idea here is to:

- Test if the topics on knowledge and skills pointed out in Design4Circle training needs research correspond exactly to mismatch and gaps found in the labour market, in other words, they are not mapped in ESCO and therefore they correspond to real training needs.
- Correct terminology of the topics pointed out as training needs to the ones presented in ESCO.
- Provide information to improve ESCO in terms of knowledge and skills pillar in a future stage.

The following table presents the bridge between the knowledge and skills mismatches/gaps pointed in Design4Circle project, during activity IO1-A1 and A2, as training needs, before being submitted to validation within the country workshops with stakeholders during IO1-A3 - ENDORSEMENT OF THE DEFINED NEEDS AND GAPS.





Table 2

Bridge Design4Circle pointed training need to ESCO knowledge/skills  
pillar

D4C pointed knowledge and skills mismatches/gaps	Bridge to knowledge and skills in ESCO	Conclusions
<b>Resources and materials</b>		
<b><i>Knowledge and skills in finding the right suppliers of ecological materials</i></b>	<ul style="list-style-type: none"> <li>▪ identify suppliers</li> <li>▪ ecological principles</li> <li>▪ negotiate improvement with suppliers</li> <li>▪ negotiate terms with suppliers</li> <li>▪ textile products, textile semi-finished products and raw materials</li> <li>▪ textile materials</li> <li>▪ use environmentally friendly materials</li> </ul>	<p>Knowledge or skill not found in ESCO</p> <p>Knowledge/Skills pillar. All terms can be found in ESCO, such as supplier, ecological, material, but as a result of a joint action.</p> <p>It seems to be new in ESCO. Suggestion: to substitute word "finding" by "identity".</p>
<b><i>New knowledge and skills to process reclaimed material</i></b>	<ul style="list-style-type: none"> <li>▪ use substitute materials</li> <li>▪ select material to process</li> <li>▪ segregate raw materials</li> <li>▪ gather reference materials</li> <li>▪ use substitute materials</li> <li>▪ production processes</li> <li>▪ operate recycling processing equipment</li> <li>▪ identify new recycling opportunities</li> <li>▪ research recycling grant opportunities</li> </ul>	<p>The join of different concepts is not new and it finds a basis in ESCO. The concepts "materials, process, recycling" appears in ESCO different times and in different concepts, also allied to opportunities. The joint of "recycling/reclaimed and process" oriented to materials in fashion is actually new.</p> <p>Suggestion: substitute reclaim by recycled</p>
<b>Eco design skills</b>		
<b><i>Adopting, mastering and implementing eco-design skills</i></b>	<ul style="list-style-type: none"> <li>▪ industrial design</li> <li>▪ develop product design</li> <li>▪ design principles</li> <li>▪ fashion, interior and industrial design</li> <li>▪ modify textile designs</li> <li>▪ produce textile designs</li> <li>▪ design wearing apparel</li> </ul>	<p>The research of "eco-design" or "eco-design" return on several results related to the general concept of design and industry, fashion, textile, but doesn't stand together with ecology nor with environment. Therefore, the term is new and</p>



		totally adequate to be use in knowledge/skills terminology
<b>Manufacturing and recycling skills</b>		
<b><i>Skills in zero waste manufacturing</i></b>	<ul style="list-style-type: none"> <li>▪ waste management</li> <li>▪ mitigate waste of resources</li> <li>▪ manufacturing and processing</li> </ul>	<p>The research of "zero waste" in ESCO simply doesn't return in any result. So, it's totally new for ESCO which proof its innovation.</p> <p>The nearest term which was found in the research within ESCO database was "zero-energy building design" which indicates design concept with zero-energy preoccupations but in construction sector, not fashion.</p>
<b><i>Reverse thinking skills</i></b>	<ul style="list-style-type: none"> <li>▪ systems thinking</li> <li>▪ apply conceptual thinking</li> <li>▪ apply strategic thinking</li> <li>▪ apply reverse engineering</li> <li>▪ practice innovative thinking in the footwear and leather goods industries</li> <li>▪ reverse engineering</li> </ul>	<p>ESCO includes knowledge and skills related to "thinking" concepts and "reverse engineering" which are connected to "reverse thinking". The term "reverse thinking" is a joint of the two concepts, innovative and adequate to a future curriculum</p>
<b><i>Applying new technologies to support eco-friendly and circular (re)manufacturing</i></b>	<ul style="list-style-type: none"> <li>▪ manufacturing and processing</li> <li>▪ develop manufacturing policies</li> <li>▪ adjust manufacturing equipment</li> <li>▪ optical manufacturing process</li> <li>▪ apply advanced manufacturing</li> <li>▪ coordinate manufacturing production activities</li> <li>▪ use environmental friendly material</li> </ul>	<p>The word manufacturing is a centred term in ESCO but never allied to circularity or eco-friendly.</p> <p>The spirit of the term "technologies to support eco-friendly and circular (re)manufacturing" is new and totally adapt to the future curriculum</p>
<b>Retail and consumption skills</b>		
<b><i>New business models</i></b>	<ul style="list-style-type: none"> <li>▪ business model</li> <li>▪ create business process models</li> <li>▪ identify new business opportunities</li> </ul>	<p>The term used in management is very common in ESCO but not related to circularity or sustainability. The</p>



	<ul style="list-style-type: none"> <li>business process modelling</li> </ul>	relation to "new business opportunities" includes the extension to sustainability term. "Circularity" simply does not appear in ESCO terminology
<b>Skills on servicing</b>	<ul style="list-style-type: none"> <li>services not further defined</li> <li>services not elsewhere classified</li> <li>focus on service</li> </ul>	The spirit of the term "servicizing" within Design4Circle project is narrower than in ESCO
<b>Skills on choosing the right customer segment</b>	<ul style="list-style-type: none"> <li>customer segmentation</li> </ul>	Term found in ESCO correspondent to a similar concept than the propose of the knowledge/skill pointed in the Design4Circle project. In this last the
<b>Knowledge and Skills on green marketing</b>	<ul style="list-style-type: none"> <li>adapt to change in marketing</li> <li>textile marketing techniques</li> <li>implement marketing strategies</li> <li>execute marketing plan</li> <li>brand marketing techniques</li> <li>marketing mix</li> <li>plan marketing strategy</li> </ul>	The research of "Green marketing" doesn't return in any result. The term green to regularly connected to digital, and to environmental responsibility but never related to marketing. This relationship is innovative and it's an asset to the future curricula on eco-design.
<b>Transversal skills and competences</b>		
<b>Sustainability and environmental management</b>		
<b>Sustainability</b>	<ul style="list-style-type: none"> <li>promote sustainability</li> <li>advise on social responsibility and sustainability matters</li> <li>advising on environmental issues</li> <li>follow environmentally-sustainable work practices</li> <li>promote environmental awareness</li> <li>promote sustainable management</li> </ul>	The term "sustainability" is very common in ESCO, although not showing sectorial specificity. The innovation of the knowledge/skills appears as a result of its liaison to the fashion industry
<b>Environmental management</b>	<ul style="list-style-type: none"> <li>manage environmental</li> <li>implement environmental action plans</li> </ul>	The topic is widely use in ESCO and related to



	<ul style="list-style-type: none"> <li>manage environmental impact</li> <li>advise on environmental risk management systems</li> <li>coordinate environmental efforts</li> <li>environmental engineering</li> <li>manage environmental impact of operations</li> <li>promote environmental awareness</li> <li>environmental legislation</li> <li>assess environmental impact</li> <li>environmental policy</li> <li>advising on environmental issues</li> <li>advise on environmental remediation</li> <li>monitor environmental parameters</li> </ul>	<p>several industries/sectors. AS it's possible to see, the topic involves a wide range of knowledge and skills concepts.</p> <p>Design4Circle project intends to use it oriented to fashion industry which give a good level of specificity to the concept.</p>
<b>User-centred approach</b>		
<b>Cocreation</b>	<ul style="list-style-type: none"> <li>collaborate through digital technologies</li> </ul>	<p>The research on "cocreation" is oriented to knowledge and skills on the collaboration through digital technologies.</p> <p>Design4Circle project intends to widen the concept to several ways of collaboration envisaging the creation/design of fashion products which is also innovative</p>
<b>Trust and transparency</b>	<ul style="list-style-type: none"> <li>ensure information transparency</li> <li>follow ethical code of conduct</li> </ul>	<p>Term found in ESCO with similar spirit that it's used in Design4Circle</p>
<b>Personalization</b>	<ul style="list-style-type: none"> <li>tend to clients' personal items</li> <li>assisting with personal needs</li> </ul>	<p>Term found in ESCO with similar spirit that it's used in Design4Circle</p>
<b>Entrepreneurship</b>		
<b>Creativity</b>	<ul style="list-style-type: none"> <li>communication, collaboration and creativity</li> <li>seek innovation in current practices</li> </ul>	<p>Term found in ESCO with similar spirit that it's used in Design4Circle</p>



<b>Innovation</b>	<ul style="list-style-type: none"> <li>▪ develop creative ideas</li> <li>▪ innovation processes</li> <li>▪ research and development in textiles</li> <li>▪ seek innovation in current practices</li> <li>▪ research new ideas</li> <li>▪ adapt to new design materials</li> </ul>	The term "innovation" in ESCO is very connected to R&D, new ideas, new design which totally fits the spirit of its use in Design4Circle project. D4C provides it with an additional input regarding circularity.
<b>Systems thinking and network competences</b>		
<b>Systems thinking</b>	<ul style="list-style-type: none"> <li>▪ systems thinking</li> </ul>	Term found in ESCO
<b>Collaboration and networking</b>	<ul style="list-style-type: none"> <li>▪ liaising and networking</li> <li>▪ digital communication and collaboration</li> <li>▪ using digital tools for collaboration and productivity</li> <li>▪ using digital tools for collaboration, content creation and problem solving</li> <li>▪ cooperate with colleagues</li> </ul>	The spirit of the pointed knowledge/skill mismatch is correlated with circularity and sustainability. ESCO maps knowledge and skills related to collaboration and networking, that can be extended to circularity and eco-design. The term totally find framework in ESCO.



## 5. CONCLUSIONS

The last exercise resulted in the following inputs for the further work in the Design4Circle project, namely the curricula design:

- Confirmation that pointed knowledge and skills correspond to real need in labour market, regarding eco-design for circularity in fashion industry;
- Suggestions to correct some terminology of knowledge and skills needs;
- Widen some terms in ESCO, making them extending to design and fashion;
- Narrow down some terms, providing them sectorial specificity
- Provide information to improve ESCO in terms of knowledge and skills pillar in a future stage - innovative knowledge and skills training needs to add to ESCO.

Both exercises - the bridge to occupation pillar and the bridge of the pointed knowledge and skills mismatches and gap to the knowledge and skills pillar - confirm the innovation of the future curriculum on design for circularity and frame the pointed knowledge/skills in ESCO spirit and tools.

Both exercises proved the innovation of the future professional profile to be drafted in the project framework and pointed in advance possible benefit on curriculum improvements and pedagogical materials for several occupations mapped in ESCO, in the field of textile and fashion, footwear, leather goods, furniture and upholstery.



The result of these two exercises can also provide improvements in ESCO in terms of knowledge and skills pillar in a future stage, via the diligence of delegates belonging to the ESCO TEXTAN working group (Textile, Cloths, Footwear and Leather), to occupation and qualification pillar.

## 6. REFERENCES

ESCO portal - <https://ec.europa.eu/esco/portal/>