SCILED

New skills for the design of drastically improved, comfortable, sustainable, fashion-oriented and scientifically-led footwear products



Photo credits: INESCOP's Industry 4.0 Technology Demonstrator.

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FOREWORD

A full year has passed since the previous SCILED project newsletter. This first year was about laying down strong foundations for developing and incorporating new knowledge in order to provide a scientific basis for drastically improved sustainable and comfortable products.

It was about delineating the scope of the project's work, defining key working concepts and outlining the contours of the project's actions.

Project partners have investigated footwear comfort requirements, footwear sustainability parameters and looked into the role of specific materials in these aspects. They have extensively consulted with companies: qualitative research, taking the form of surveys and focus groups, has been conducted to understand the needs and difficulties of footwear companies in keeping up with the latest patterns of consumption. Together with other companies, research centres and Higher Education providers partners in the project, this Knowledge Alliance has in parallel analysed current footwear qualifications offered in Higher Education. Skills and competences currently taught have been thoroughly reviewed, and innovative learning tools and methods have been identified.

This groundwork has allowed the consortium to determine the required qualifications for Footwear Designers and Product Managers to address comfort and sustainability in footwear, as well as the best ways to teach and engage students. The results of this research are the foundation of the cutting-edge and state-of-the-art training curricula that the project is developing, and which are presented in this newsletter.

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CUTTING-EDGE, HIGHLY FLEXIBLE, AND MODULAR CURRICULA

The versatility and relevance of the SCILED curricula makes them essential for students and people in employment wanting to improve their knowledge of footwear comfort and sustainability parameters.

Comfort and sustainability: essential aspects of high-added value footwear products

Because both comfort and sustainability are highly technical subjects, developing products that integrate these requirements necessitates highly-trained staff possessing adequate knowledge of mechanical and technological determinants affecting the levels of comfort and sustainability of footwear products and production processes.

The two SCILED-developed curricula propose high quality, cutting-edge technical knowledge and skills sets on both topics, developed by the best footwear experts in Europe. Because comfort and sustainability-related skills are so highly valued by footwear companies, the SCILED courses will be stepping stones to employment and career development for courses' participants. The European Sector Skills Council 2014 report estimates that more than 100.000 retiring workers will need to be replaced by 2025.

Two updated qualification profiles: Product Manager and Footwear Designer

The SCILED Erasmus+ Knowledge Alliance has updated two existing qualification profiles by complementing and adapting the main body of knowledge associated with the Product Manager and Footwear Designer profiles with specific comfort and sustainability skills sets.

How are comfort and sustainability incorporated in the product life-cycle through these two occupations?

- For the Product Manager, it means understanding the comfort and sustainability demands of the target consumer base, to pinpoint market opportunities and create effective market strategies. It is about making sure that the product lines developed by the company take into account these new demands, so that every product fits with today's consumers' expectations.

- For the Footwear Designer, focusing on comfort and sustainability means knowing how to select the right materials and components, being able to incorporate engineering solutions that ensure that both criteria are adequately met, and knowing how to apply sustainable technologies to the design process.



> IT WILL BE AN ESSENTIAL COURSE TO DESIGN COMFORTABLE AND SUSTAINABLE FOOTWEAR, BASED ON SCIENTIFIC CRITERIA AND MAKING THE BEST USE OF INNOVATIVE TOOLS

ROSA ANA PÉREZ, HEAD OF TRAINING DEPT., INESCOP FOOTWEAR TECHNOLOGY CENTRE SPAIN

SCILED TRAINING CURRICULA
IN A NUTSHELL

2 Higher Education qualification profiles

FOOTWEAR PRODUCT MANAGER

FOOTWEAR DESIGNER

3 Flexible modules, perfectly blending Face2Face and distance learning

Performance & comfort requirements

Sustainability

Design engineering

5-6 Units per module

What is comfort in footwear?

Mechanical comfort and footwear performance

Fitting and dimensional comfort

Introduction to hydrothermal comfort

Testing standards and equipment for evaluating comfort and performance

Design for comfort and footwear performance

Modern concepts on footwear sustainability

Framework for sustainability in footwear

Materials and technologies for sustainable footwear manufacturing

Product Lifecycle Management approach for sustainability

Footwear design for sustainability

CAD/CAM/CAE systems for supporting integrated footwear design

Introduction to materials engineering

Engineering footwear for mechanical and thermal comfort

Footwear functional modelling

Footwear 3D/2D CAD. Virtual & Rapid prototyping

Fashionable, comfortable and sustainable footwear

A highly flexible, modular approach, in line with the European Higher Education ECTS credits system

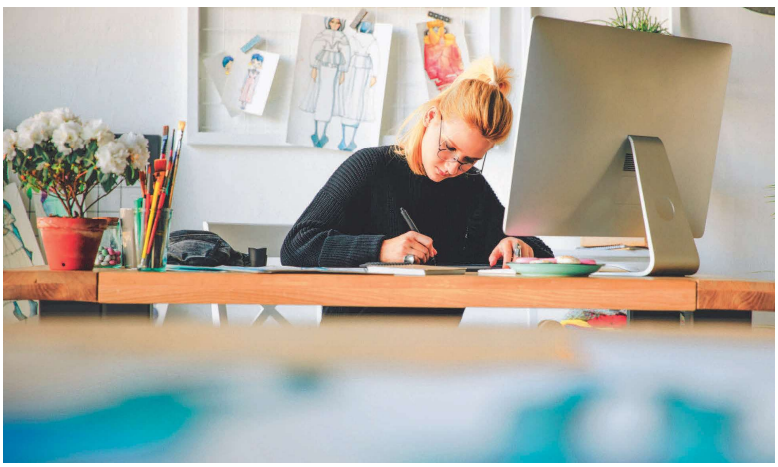
Besides the quality of the content developed by SCILED Knowledge Alliance partners, the strength of the SCILED curricula lies in its flexibility. The SCILED curricula are not full training programmes. The content has been instead divided into modules, and each module focuses on a specific topic: (1) Performance and comfort requirements, (2) Sustainability, and (3) Design engineering.

Each of the modules comprises 5 to 6 Units of Learning (see the infographic on p. 3). Each module equals 5 credits aligned with the European Credit Transfer and Accumulation System (ECTS), ensuring the easy transferability of the credits across the European Union.

The modules are therefore intended as a complement to already existing training programmes to enrich universities' current undergraduate or graduate programmes. The modules have also been designed to upskill footwear professionals with the latest knowledge and skills in comfort and sustainability.

Excellent learning content, backed up by innovative teaching and learning methods

Thanks to new technologies, students can change from passively accepting knowledge to actively learning knowledge. The SCILED curricula have been developed to make the best use of the most innovative tools in science education.





Distance learning to complement Face2Face teaching: MOOCs are online courses, easily accessible on the web regardless of the physical location of the student and/or worker.

The multiplicity of student profiles means that institutions must respond to students' need for learning options that are more flexible in terms of duration and/or pace. In addition, online learning is also highly interactive and makes room to forums or social media discussions that support community interactions among students and professors.

Furthermore, MOOCs are a particularly effective tool for supplementing and complementing existing training curricula. They can provide teachers and instructors with extra, up-to-date material that can easily be combined and integrated into their current educational material and practice.

Virtual Fab-Lab: Both Product Designers and Product Managers can learn a lot from theoretical courses, but hands-on knowledge is fundamental. Virtual Fab-Labs are an excellent tool to combine the need for practical training with the demand for more flexible education. The SCILED-developed virtual Fab-Lab will be directly linked to the content and the methodology of the MOOCs. It will include real experiments based on real-world phenomena and will incorporate scientific methodologies. The virtual Fab-Lab will create a learning environment that encourages students to innovate, create, collaborate and be actively involved.

THE SCILED MANIFESTO TO FOSTER BUSINESS-EDUCATION-RESEARCH COLLABORATION

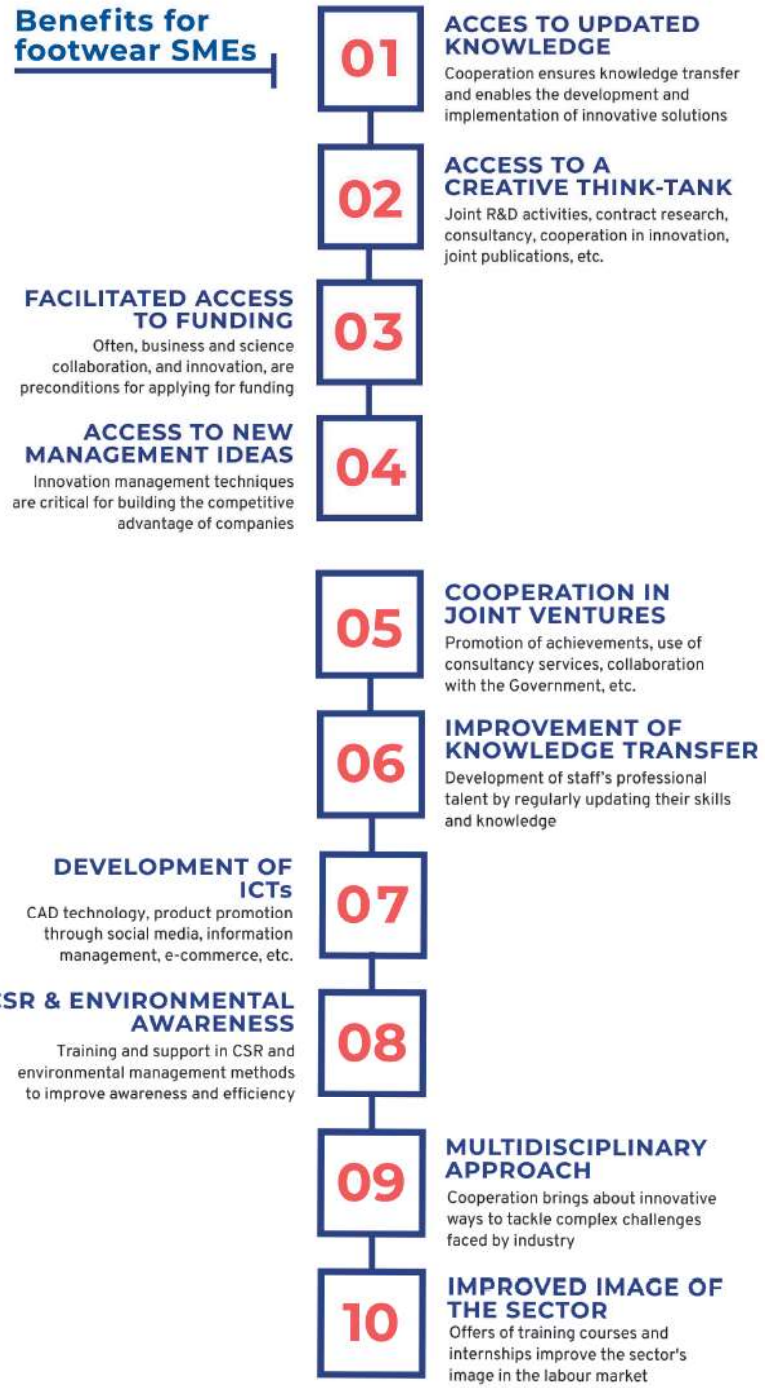
The SCILED project partners insist on the huge need to increase the level of involvement of research, innovation, and creativity in the footwear sector to remain competitive.

The SCILED partners have developed a Manifesto to highlight and explain the competitive advantages of collaboration between Higher Education, Research and Business for supporting the competitiveness and growth of the footwear industry.

Innovation holds the key to long-term competitiveness

European footwear enjoys global recognition as a distinctive added-value product that associates traditional values, craftsmanship, and innovation, resulting in the creation of high-quality products. However, European companies need to build up an even higher capacity of innovation if they want to remain competitive.

Innovation opportunities in footwear manufacturing takes place at different levels: (1) innovation in products, by being able to translate consumers' demands into products that fit consumers' desires and needs, (2) innovation in materials, (3) innovation in design and engineering, to increase the performance of footwear products by incorporating new equipment for product engineering.

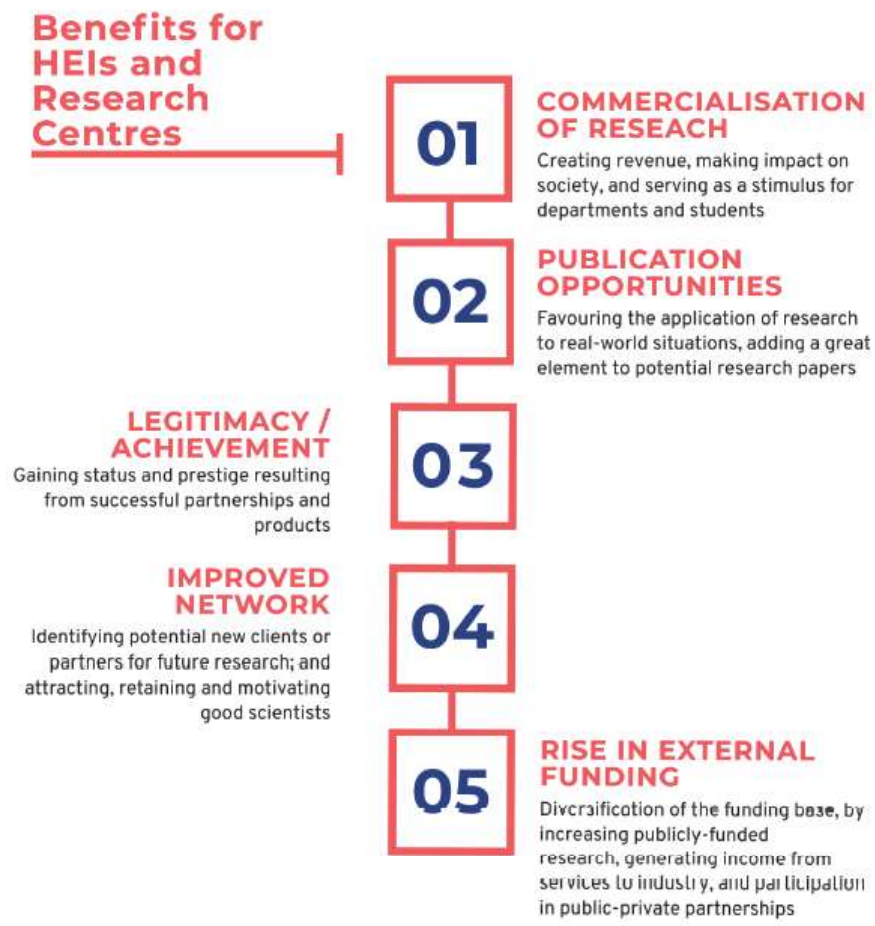


A win-win situation for all parties involved

Collaboration between Companies, Universities and Research Centres generally takes the form of transfers of knowledge, creation of new useful products, new jobs, and business models.

However, efficient knowledge transfer in European research institutions is hindered by a range of factors. A recent SCILED survey showed that just 50% of surveyed companies have collaborated with Universities/Research Centres in the last 5 years.

For SMEs, collaborating with Universities and Research centres can be very beneficial, and it can facilitate access to the latest knowledge in different fields. New knowledge can be incorporated into product design and development to conceive inventive and forward-looking products, and it can also allow companies to modernise the production process, streamline production and make the manufacturing process more sustainable. It is a win both in terms of costs savings and reduced environmental footprint.



Collaboration with Education and Research institutions also helps companies become more attractive to potential workers. By jointly setting-up training courses and internship schemes, for example, SMEs will have it easier to find and recruit qualified and motivated employees.

Research carried out by Education and Research institutions, when collaborating with SMEs, has a wider audience and is easier to commercialise, thus creating more revenue and allowing research efforts to have a bigger impact on society. In addition, the broader network to which Education and Research institutions have access will make it easier to attract future partners and good scientists.

It is clear how this collaboration is creating a virtuous circle for Education and Research institutions that collaborate with SMEs: research becomes more widely recognised, thus making institutions more prestigious. Higher prestige makes it easier to attract new scientists, and these scientists participate in making better research, which in turn attracts more companies to engage in collaboration.

Join the SCILED Knowledge Alliance

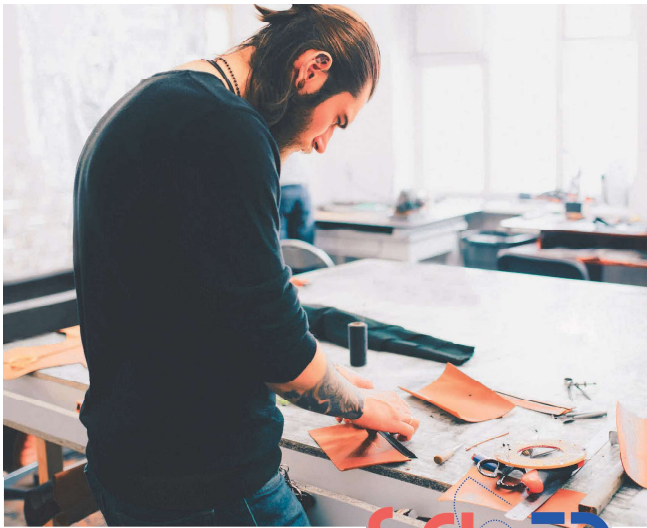
Piloting of training curricula to start by the end of 2020!

The piloting phase of the project is expected to begin in November 2020. It will test, verify and validate the concepts and the content of the material developed by the consortium.

It is your opportunity to get involved in the project! The SCILED Team will communicate the date, time and location of all piloting actions in due time on the project website, so you can sign-up and benefit from our project's work. The piloting of the SCILED curricula proposes three types of activities:

Physical seminars and hands-on workshops in Greece, Italy, Portugal, Romania, and Spain

The curricula developed will be presented to students, universities and companies in two main ways. First, five physical seminars specifically aimed at Footwear Designers and Product Managers will be organised in Greece, Italy, Portugal, Romania and Spain. Practical workshops will also be the occasion to get hands-on experience of the training programmes: shoe designers will be invited to develop new product concepts that take into account the new comfort and sustainability parameters developed by the SCILED experts.





Online piloting activities to develop virtual prototypes

These physical seminars and workshops will be complemented by virtual pilot actions, where teams of students, mentors from companies, researchers and academic staff will get together to produce virtual prototypes of comfortable and sustainable pieces of footwear. A Virtual FabLab, an innovative e-learning tool specifically developed under the project, will be made available.

Mobility action to develop physical prototypes

In addition, a two-week mobility action involving students and companies' collaborators will be held in a FabLab in Portugal to materialise the project ideas and concepts into footwear prototypes that integrate sustainability, comfort and fashion design features.

> Why is comfortable, sustainable, and fashion-oriented footwear so difficult to find? One possible answer is that designers and product managers do not create drastically improved products. The SCILED training modules adequately prepare students to apply the latest science in the design and development process.
>
> **AURA MIHAI, PHD - PROFESSOR OF FOOTWEAR DESIGN AND PATTERN ENGINEERING GHEORGHE ASACHI TECHNICAL UNIVERSITY OF IAŞI, ROMANIA**

Connect with the SCILED Knowledge Alliance

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