

# K4Footwear – Knowledge4Innovation

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## Notice



Knowledge Platform for Transferring Research and  
Innovation in Footwear Manufacturing

PROJECT 2015-1-RO01-KA203-015198



K4Footwear was in the high education group of projects (HE) under the general name Knowledge4Innovation and label KA2-Strategical partnership for high education (AGREEMENT NO. 2015-1-RO01-KA203-015198). The project lasted from 2015 until 2018.

The aim of the project was to combine training and education for design, product development, engineering and management by connecting the three areas of the knowledge triangle: education, research, and business. The general contribution of the project is innovation in the footwear production by transferring knowledge between three European universities as well as the promotion of European excellence and high quality in higher education. The Romanian National Agency for the EU ranked the K4F project among the top three “good-practice” projects “ in the ERASMUS + project group over the past 30 years.

The project manager in charge of entire project was Professor Aura Mihai (TU Iasi, RO), the Croatian project manager was Professor Ana Marija Grancarić (TTF, Zagreb, HR), the Greek project manager was Professor Nikolaos Bilalis (PUES, Chania, GR).

The Project partners were: TUIASI – Universitatea Tehnica Gheorghe Asachi Din Iasi (Romania), CEC – European Confederation Of The Footwear Industry (Belgium), Virtual Campus Lda (Portugal), Inescop – Instituto Tecnológico Del Calzado Y Conexas (Spain), CTCP- Centro Tecnológico De Calcado De Portugal (Portugal), University of Zagreb – Faculty Of Textile Technology (TTF, Croatia), The Research Committee of The Technical University Of Crete (Greece), INCDTP – Institutul National De Cercetare-Dezvoltare Pentru Textile Si Pielarie (Romania), CRE.THI.DEV- Creative Thinking Development (Greece).

The project introduced innovative tools for the adaptation and updating of higher education curricula for managers, designers, and engineers. The goal of the project was the achievement of greater creativity, innovation, and high performance in the European footwear manufacturing and related sectors. The specific objectives of the project were: development of active collaboration among universities, business communities and research centres to assess the skills needed for innovation and technological transfer; to design, test, and implement a common curriculum for virtual internships and the related e-learning content which incorporates a creative thinking and problem-solving approach; to set up a Knowledge Platform that facilitates the transfer of innovation in footwear manufacturing by simulating the development stages of the research projects. The target groups were students enrolled in higher education and top and middle management in footwear companies (managers, designers, engineers and technicians).

An online platform was developed in the first phase of the project containing modules with lectures made by researchers, professors and professionals from partner institutions. The online platform operated as an area where students could follow online courses with the possibility of contacting lecturers at any time, and could exchange information and knowledge with other students involved. The platform was launched in 2017.

In the first phase of the training program, in November 2017, 60 students from TUI Iasi (RO), TTF (HR), and PUAS (GR) enrolled in two on-line training modules: Creativity and Innovation for Research in the Footwear Industry and Technological Transfer in Footwear Production. After completing the modules, students took online tests on the platform. Based on the online test results, some students were chosen for the second phase of training and 10 multinational teams were formed (from Romania, Croatia and Greece).

In the second phase, from January until March 2018, ten international student teams participated in on-line training in project design for research and innovation in footwear production. Each team elaborated and submitted a project proposal for research and innovation needs in small and medium-sized businesses from partner countries (RO, GR, ES, PT and HR) based on topics selected by footwear manufacturers. Each project proposal was evaluated by experts and 5 teams were given awards.

#### **On selected projects:**

##### **1. Redesigning high-heels for 3D printing: midsoles and materials**

Team leader: Evi Sovatzidi

Members: Eleni Kokkinaki, Barbara Radenica, Loufardaki Ammarilis

The idea is to add a 3D printed TPU materials midsoles (thermoplastic polyurethane) customized to ease the pressure or evenly distribute the load on soft part of the feet avoiding the use of customizable and detachable soles that had already been tested.

##### **2. ALL-IN-ONE-shoes with changeable upper and sole**

Team leader: Zrinka Tomašić

Members: Danica Habulan, Laura Elena Cojocar, Florin Ciocoiu

The idea is to design footwear that can be upgraded, e.g. if it is sunny and suddenly starts raining, simply remove the sandals' upper and put on a shoe or an ankle boot upper to protect the feet from rain, moisture, etc. The customer decides what kind of shoes he wants and can change the upper, the sole, the colour, the design, and the material.



Figure 1. K4Footwear students from TU (Iasi, RO), PAUS (Chania, GR) and UNIZG TTF (Zagreb, HR), in Athens, May 2018

### 3. Multifunctional insole to prolong active and healthy life for pregnant woman

Team leader: Mia Makšan

Members: Maria Antoniou, Anna Maria Ciulei, Matej Šišić

In shoe 1, there are two layers of magnets that create a magnetic field which reduces vibrations in walking and make it as comfortable as possible. In shoe 2, a high-quality foam layer and a layer of “climatic” condition are used. The latter helps the feet to breathe and can be modified by the user. This footwear should be made of natural leather which would allow flexibility when the foot spreads.

### 4. Modular shoes with adjustable size

Team leader: Theodoros Marionpoulos

Members: Ida Leskošek, Yolanda Blazquez Lopez

Designed for children whose feet are growing. Variable size footwear would solve the problem of constantly searching and purchasing appropriate footwear and thus help the parents. Variable size footwear is modular.

### 5. Applying bio-inspiration and bio-mimetic design to the development of the footwear concept

Team leader: Alexandra Vlad

Members: Palmada Christina, Dora Hranilović, Paula-Elena Prutan, George Beladakis, Andreea Croitoru  
Footwear that changes colour and image with a LED display on one part of the shoe while the other is made of pineapple leather. The LED screen changes using the smart phone app. The goal is to make a novelty in footwear to eliminate the no need for buying more shoes. In addition, such footwear should be comfortable and aesthetically attractive as well as interesting and unique with the help of new technologies.

Rewarded teams had the opportunity to participate in the Intensive training program organised by P1-Gheorghe Asachi Technical University of Iasi (TUIAISI) and P9 Creative Thinking Development (CRETHIDEV) in Athens, Greece. The programme aimed to provide participants with conceptual frames (lectures) and practical tools (workshops) in order to equip the trainees with entrepreneurial, team work, and creative thinking skills. 16 students/trainees from three different countries (Romania, Croatia and Greece) participated in the Intensive training program for higher education learners held in Athens from 22 until 28 April 2018. They participated in lectures and workshops held by 15 lecturers (11 teachers and trainers and 4 representatives of footwear companies). The intensive training program was an opportunity for the students to gain new knowledge during lectures and workshops and to present their project in an international environment, initially communicating on the platform with colleagues speaking different languages, exchanging ideas and knowledge; and afterwards meeting in person for the first time and immediately presenting their work in front of experts. While presenting at lectures and practical workshops, the students faced various situations and scenarios as they would in a real business environment. The five days of training in Athens included visiting footwear factories as well. The outcome of the intensive program for the students is gaining knowledge and skills to transform innovative ideas into start-up businesses in the footwear sector.

The projects had 5 outputs or results (detailed on the project website: <http://knowledge4foot.eu>)

**Output 1:** Mapping the knowledge triangle for research and innovation transfer in footwear manufacturing;

**Output 2:** Training programme and e-learning content for research and innovation transfer;

**Output 3:** Multimedia handbook for project-based training and virtual placement of HE students and trainees from SMEs;

**Output 4:** Knowledge4Foot Platform for Transferring Research and Innovation in Footwear Manufacturing;

**Output 5:** Entrepreneurial thinking in footwear manufacturing – Book of lectures of the Intensive Summer Training Course. The final conference of the Knowledge4Foot project had the aim of presenting the project results and outputs, as well the experiences and good practice of implementing this project.

This event took place on July 11, in Bucharest and was organised by INCDTP – Institutul National de Cercetare-Dezvoltare pentruTextile si Pielarie. It targeted professionals in the footwear industry, students, and experts in higher education and professional training.