

19th

International Technical Footwear Congress

February 03-05, 2016, Chennai, INDIA

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CREATIVE TRANSFER OF SKILLS AND COMPETENCE IN 3D FOOTWEAR CAD

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'Gheorghe Asachi' Technical University of Iasi, Romania

Faculty of Textile, Leather and Industrial Management

BSc programmes

4 years (8 semesters), 240 ECTS



- Industrial Engineering**
 - Textile Technology and Design
 - Knitting and Clothing Technology
 - Footwear and Leather Goods Technology and Design
 - Industrial Design (also in English)
- Chemical Engineering**
 - Textile Chemical Technology
 - Chemical Technology of Leather and Leather Substitutes
- Engineering & Management**
 - Industrial Business Engineering



www.tpmi.tuiasi.ro

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Projects aimed to develop innovative e-learning tools

- ☐ Identified **skill gaps** - future skill needs
- ☐ **Small companies** cannot create internal training departments
- ☐ **Lack of teaching materials**
- ☐ **Ageing teachers/tutors**
- ☐ **Attractiveness** for young generation

• **Virtual Training Centre for Shoe Design** (2007-2009)

• **Training in Innovation, Entrepreneurship and Design for the Footwear Industry** (2011-2013)

• **International Integrated Training Plan for the Footwear Sector** (2011-2013)

• **Creative Transfer of Competence in 3D Footwear CAD to VET Professionals** (2013-2015)

• **STEP TO SUSTAINABILITY - How to Implement Sustainable Manufacturing in Footwear** (2013-2016)

• **Knowledge Platform for Transferring Research and Innovation in Footwear Manufacturing** (2015-2018)

• **Fit to Comfort – Skills Alliance for comfort & healthy footwear manufacturing** (2015-2017)



Lifelong Learning Programme



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

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EU funded project within the framework of the Lifelong Learning Programme/ Leonardo da Vinci in footwear sector



- **AIM:** to transfer and to extend the **Icad3d+** innovative software solutions and the 3D technologies for footwear CAD

- **Partners:**

ROMANIA - 'Gheorghe Asachi' Technical University - Coordinator

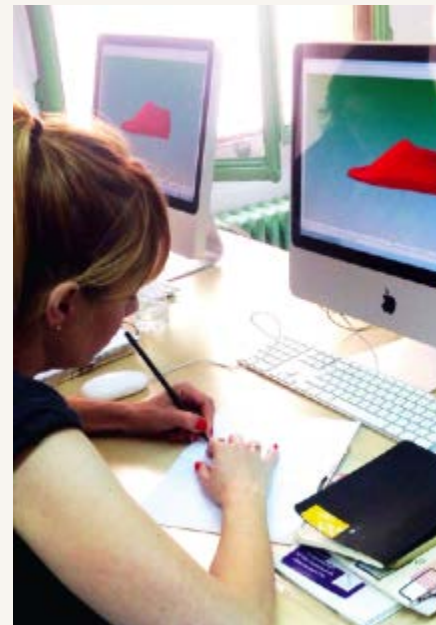
SPAIN - INESCOP-Instituto Tecnológico del Calzado

PORTUGAL - Virtual Campus, Lda

SPAIN - IED Istituto Europeo di Design

UK - University of Salford

SPAIN - RED 21 SL



PARTNERS



Contact:



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EU funded project within the framework of the **Lifelong Learning Programme** in footwear sector



OBJECTIVES:

- to transfer the **INNOVATION** from Spain to other countries, namely Romania, Portugal, and UK
- to develop **skills and competencies in 3D Footwear CAD**. Target group -VET professionals: teachers, trainers and tutors
- to develop **new training content** and supportive **e-learning tools** based on units of learning outcomes
- to set up an **Online Learning Platform**

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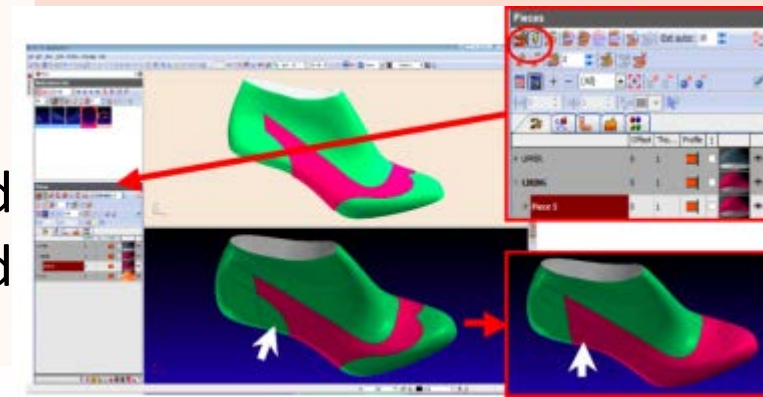
Why Icad 3D+ software solution as basis for INGA 3D project ?

- Icad 3D+ was developed by INESCOP and RED 21 (Spain) within the framework of several **EU funded research projects**.

- **detailed and accurate visualization** of footwear prototypes in a virtual space.

- **immediate feedback** both to teacher and to student/trainee.

- **learning by doing** - Knowledge and skills are transmitted in a dynamic and effective way



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INGA 3D RESULTS

Peer Learning Scenarios in Footwear CAD

AIM: To analyse needs for skills and competencies in footwear CAD

Methodology:

- **Peer learning** and **peer teaching** - Literature review
- **Desk research** on the Skills and Competence - available training courses and study programs
- **Field research** - Questionnaires and Interviews

Findings:

- Directions for further **developments** of the INGA 3D curriculum and training content
- **Competence mapping** and designing the **matrices of skills** for 4 training modules



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INGA 3D RESULTS

Peer Learning Scenarios in Footwear CAD

- <http://www.inga3d.eu/reports/>

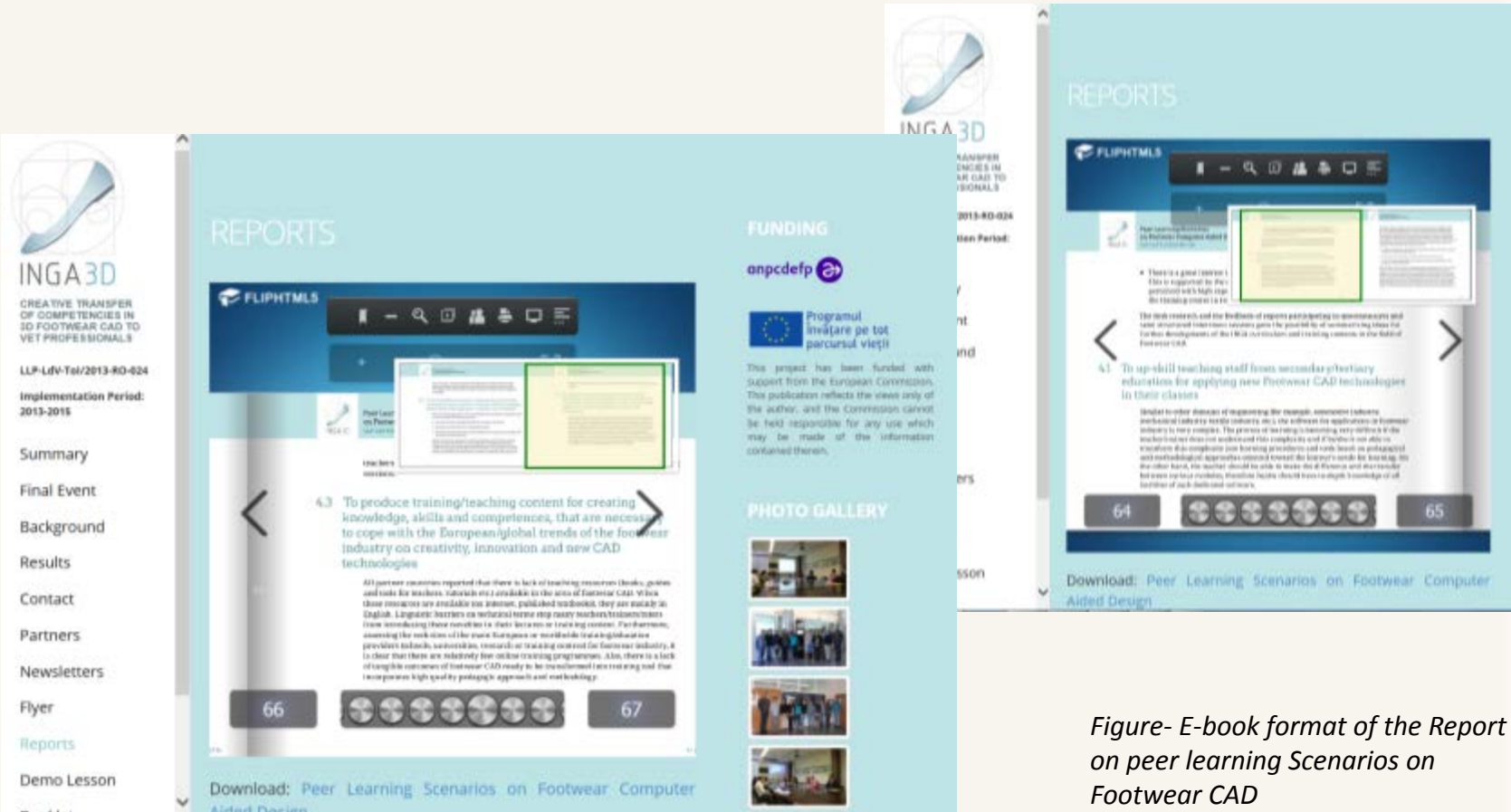


Figure- E-book format of the Report on peer learning Scenarios on Footwear CAD

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INGA 3D RESULTS

Training program in Footwear CAD

MODULE I: FOOTWEAR CAD BY ICAD3D+ SOFTWARE

http://www.inga3d.eu/site/assets/files/1012/r3_training_program_module_i.pdf

MODULE II: 3D CAD –APPLICATIONS TO BASIC FOOTWEAR CONSTRUCTIONS

http://www.inga3d.eu/site/assets/files/1012/r3_training_program_module_ii.pdf

MODULE III: 3D CAD-APPLICATIONS TO ORTHOPAEDIC FOOTWEAR

http://www.inga3d.eu/site/assets/files/1012/r3_training_program_module_iii.pdf

MODULE IV: 3D CAD- APPLICATIONS TO FASHIONABLE FOOTWEAR

http://www.inga3d.eu/site/assets/files/1012/r3_training_program_module_iv.pdf

MODULE I: FOOTWEAR CAD BY ICAD3D+ SOFTWARE

Total Teaching Hours – Lectures and Activities in class: 50 hours

Individual Study: 50 hours

ECVET : 4

Objectives

- To initiate learners in the operation of Icad3D+ (footwear-specific software).
- To develop skills and competences for creating virtual prototypes on virtual lasts using Icad3D+.
- To develop skills and competences for creating virtual models with accessories and components
- To obtain accurate virtual models using the rendering software and to prepare technical sheets.

UNIT 1: Basics for Footwear CAD (7 Hrs)

Knowledge

- Understand the basic elements of 3D CAD workspace and operations with files
- Know the basic operations with the last
- Understand how the flattening tools work

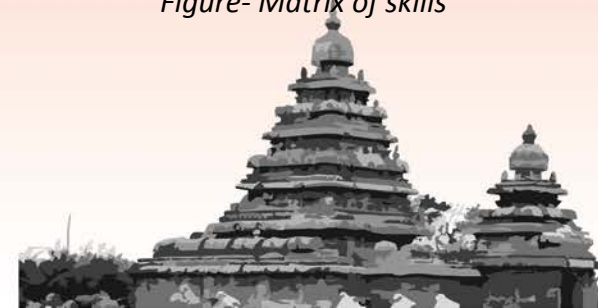
Skills

- To import digital files
- To control the last in the workspace
- To be able to obtain the mean forme and shell

Competences

- To be aware about the main concepts powered by Icad3D+ software
- To understand and to operate in the workspace
- To flatten and to start the modelling process

Figure- Matrix of skills



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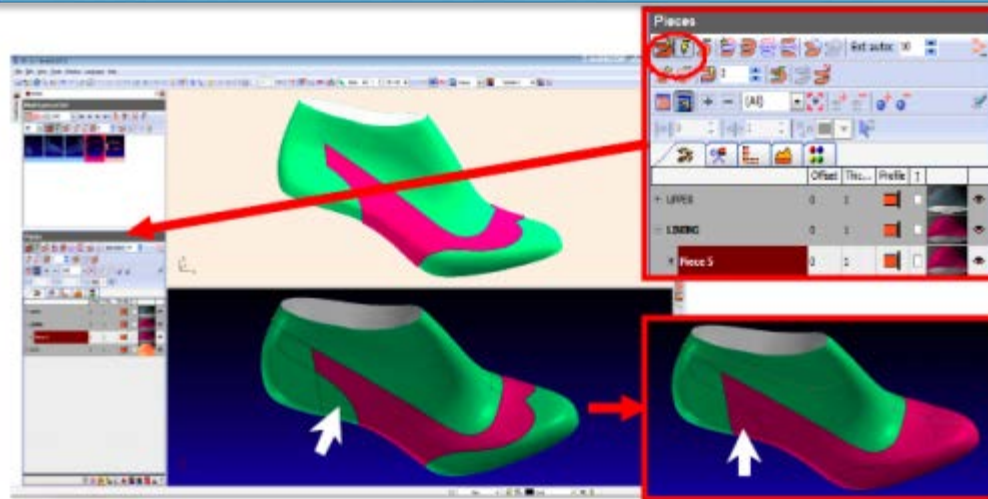
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Training program in Footwear CAD



Module I

**FOOTWEAR CAD BY ICAD3D+
SOFTWARE**

PROGRAM UNITS

- Basics of Footwear CAD
- Virtual Model
- Presenting Virtual Models-
Rendering and Producing
Technical Sheets

Objectives

- ☐ to operate with various features of Icad3D+ specific software;
- ☐ to create footwear prototypes on virtual lasts, including accessories and components;
- ☐ to obtain accurate virtual models using the rendering software and to prepare technical sheets.

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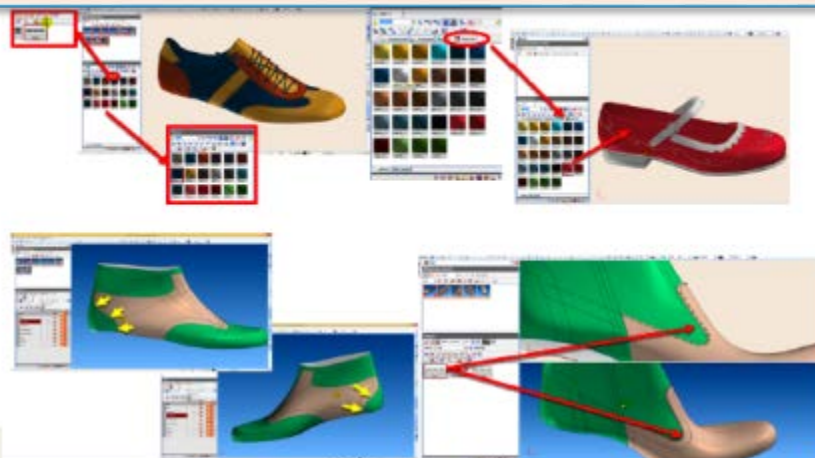


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INGA 3D RESULTS

Training program in Footwear CAD



Module II

3D CAD - APPLICATIONS TO BASIC FOOTWEAR CONSTRUCTIONS

PROGRAM UNITS

- Basic Constructions for Women's Footwear
- Basic Constructions for Men's Footwear
- Basic Constructions for Children's Footwear

Objectives

- to apply the 3D CAD technology powered by Icad3D+ software for designing basic footwear constructions types;
- to practice the 3D modelling process to a range of different footwear styles, characteristics and features which are compatible with design requirements and expectations;
- to develop skills and competences in producing detailed virtual models of women's, men's and children's footwear.

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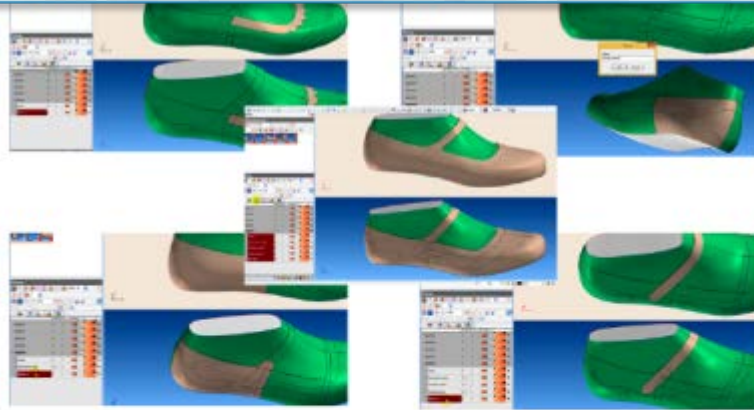
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INGA 3D RESULTS

Training program in Footwear CAD



Module III

3D CAD - APPLICATIONS TO ORTHOPAEDIC FOOTWEAR

PROGRAM UNITS

- Orthopaedic Last Selection
- Orthopaedic Footwear Design
- Orthopaedic Footwear - Modified Features

Objectives

- ☐ to apply knowledge of 3D CAD technology powered by Icad3D+ software in order to select orthopaedic lasts appropriate for the specific foot pathology;
- ☐ to practice the 3D modelling process to a range of different footwear styles, therapeutic features and modifications which are compatible with the specific foot pathology and users expectations;
- ☐ to develop the skills and competences to produce virtual models of women's and men's orthopaedic footwear designs.

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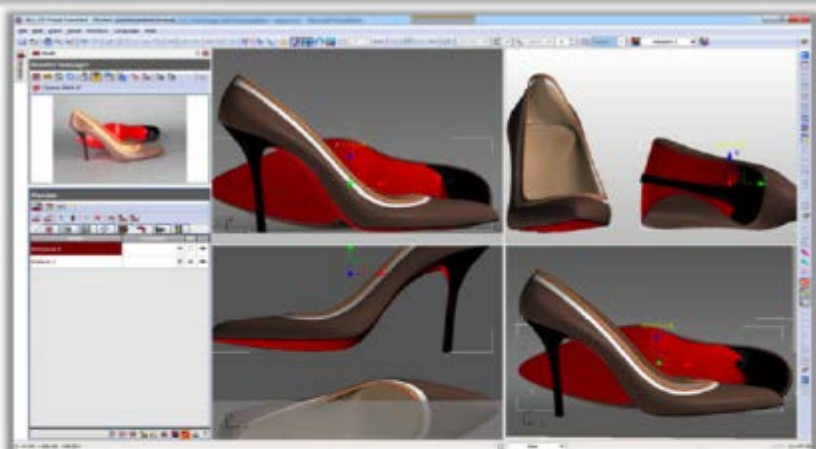
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INGA 3D RESULTS

Training program in Footwear CAD



Module IV

3D CAD - APPLICATIONS TO FASHIONABLE FOOTWEAR

PROGRAM UNITS

- Structure of Footwear Collections
- Heels and Outsoles
- Materials, Trimmings and Ornamentation

Objectives

- to apply 3D CAD technology powered by Icad 3D+ software for fashionable footwear through collection development;
- to practice the 3D modelling process to a range of different styles, characteristics and features which are compatible with design specifications of the fashionable footwear;
- to design footwear collections mainly focused on operating with various materials, footwear components, trimmings and ornamentations.

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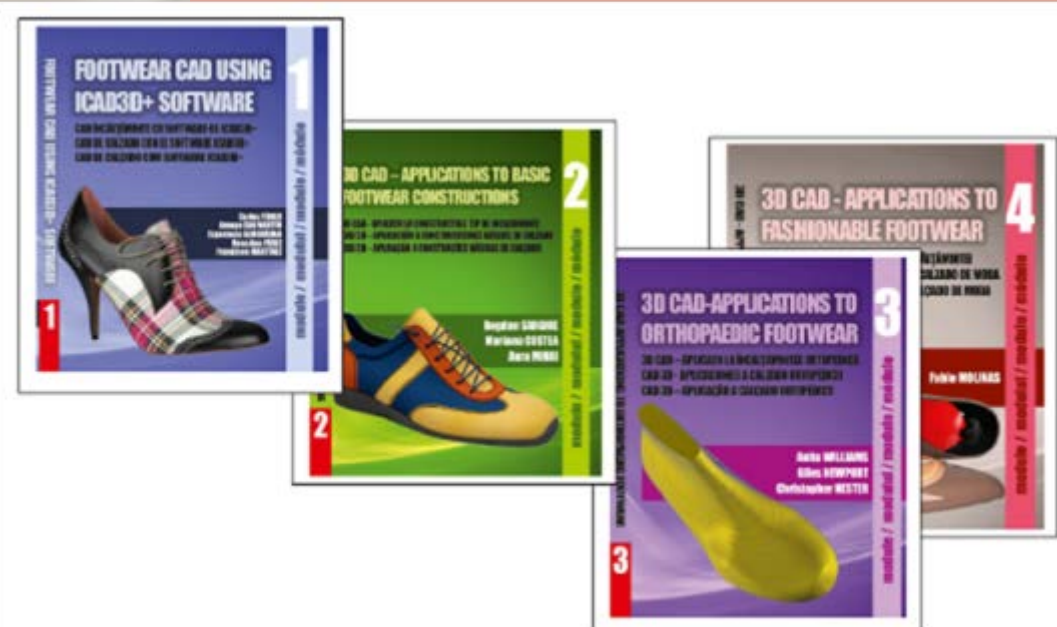
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INGA 3D RESULTS Footwear CAD Handbook



- 4 volumes, more than 900 pages
- effective educational approach to modules and units of learning outcomes: Knowledge, Skills and Competences
- 4 languages: EN, ES, PT, RO

Sample content available at:
<http://www.inga3d.eu/results/>



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INGA 3D RESULTS

Multimedia supportive guide for teachers and trainers

58 tools developed by INGA 3D projects for teachers and trainers:

- **Training Program:** Description, Methodology, Objectives, Learning Outcomes- Skills, Competences and Knowledge, Number of hours, ECVET etc)
- **Guide** for Navigating on INGA Online Learning Platform
- **Presentations** of each lesson
- Multimedia resources - **Videos**
- **Assessment Tests**
- **Examples** of projects/ study cases



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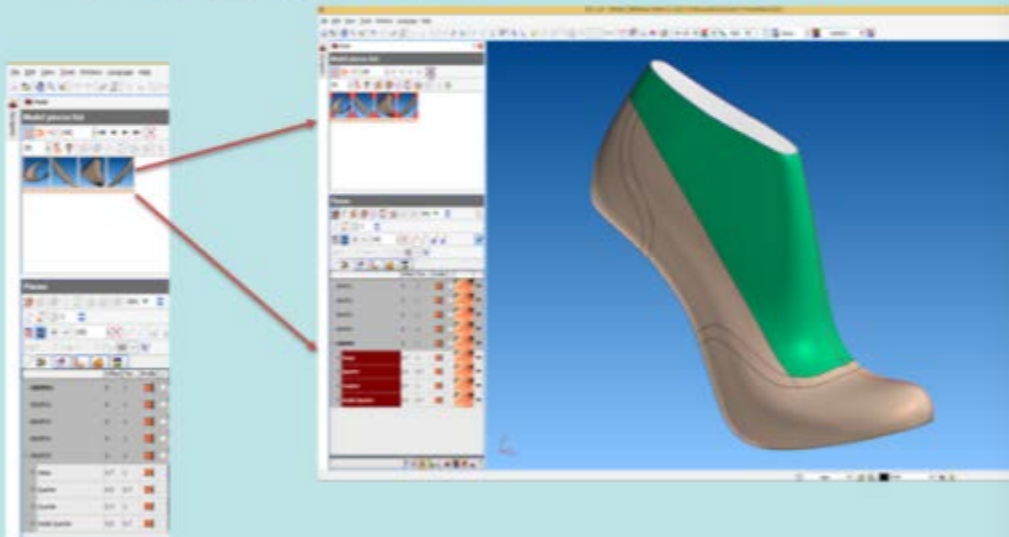
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INGA 3D RESULTS Online Learning Platform

12 complete units that include 40 lessons have been transformed into e-learning format, being enriched with more than 50 videos

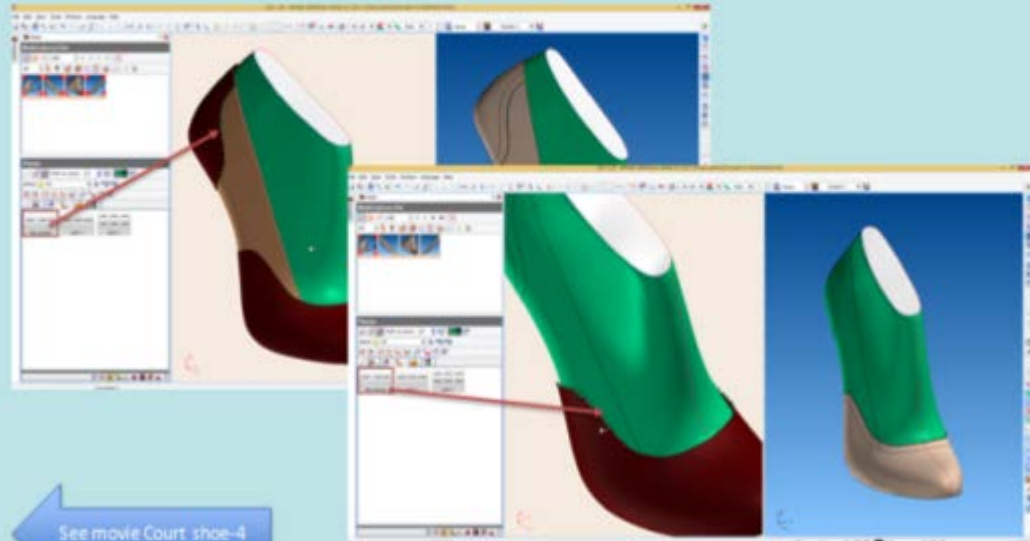
Visualize the patterns

- When all the patterns were created, with Ctrl pressed, select by left clicking all the patterns. You can select it from "Model pieces list", where you see the shape of each pattern or "Pieces" by left clicking on their names.



Select the lines to apply stitches and apply stitches to patterns

- Select the new defined stitch type, left click on the line you want the stitch to be positioned and then right click and the stitch will be marked.



See movie Court. shoe-4

<http://www.inga3d.eu/demo-lesson/>

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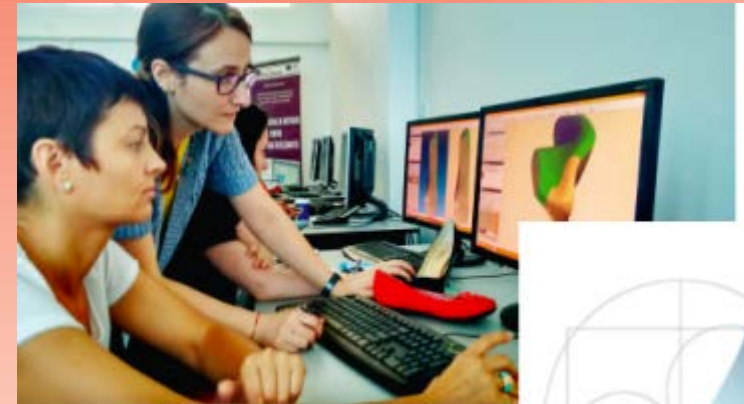
INGA 3D RESULTS Piloting training sessions

- Identification of groups (VET professionals)
- Definition of implementation plan/strategy
- Alfa testing on group of trainers (9). Beta testing on group of trainees (5)

• Piloting Sessions- 45 teachers/tutors/trainers

- ✓ RO: 4 sessions
- ✓ ES: 2 sessions
- ✓ UK: 1 session
- ✓ PT: online course at international level

- On line feedback questionnaire at each stage for improvements of training contents (lessons), OLP and tools



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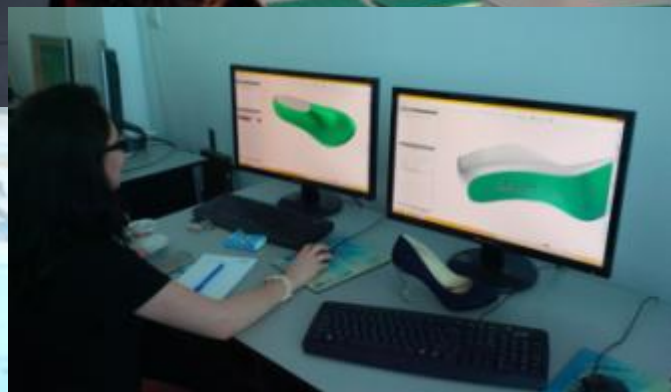


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INGA 3D RESULTS

Piloting training sessions - Feedback

- 'The course has been pleasant to be part of a really great experience as my knowledge of this software is non existent. I feel I have learnt a great deal of information in regards to the use of the software '(participant in UK)
- About 80% of the participants think the course got enough aids and materials delivered, they think too that the teacher aids was good. Nearly all participants feel they have gained skills to use the program and the necessary knowledge of the program which they used for their work. (Spain)
- 'For me this course presented an interesting experience. Even my field of interest is completely different, it was quite easy to follow this course. The contents support the learning objectives and the media used are understandable and well displayed' (participant Romania)



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INGA 3D project– an example of successful partnership in Romania, Spain, UK and Portugal

- To up-skill teaching staff for:
 - adding **new 3D CAD technology** to the traditional education in footwear in order to create a link between education and industry
 - introducing new **teaching/training e- tools** in schools
 - adopting training methodologies and contents that meet the **expectations of new generation** of students/learners
- To train **staff from footwear companies** for performing training/tutoring activities in Footwear CAD technologies toward their own employees
- To produce training/teaching content for creating **Knowledge, Skills and Competences =Learning Outcomes**



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INGA 3D project– an example of successful partnership in Romania, Spain, UK and Portugal



- To experiment various learning scenarios in order to maximize the number of potential users
- To contribute at increasing the attractiveness of the VET study/training programs in the field of footwear design and technology
- To encourage and to motivate VET teachers, trainers and tutors in stimulating innovative thinking and creativity among their students/trainees
- To motivate university graduates for choosing a career as teacher in VET schools



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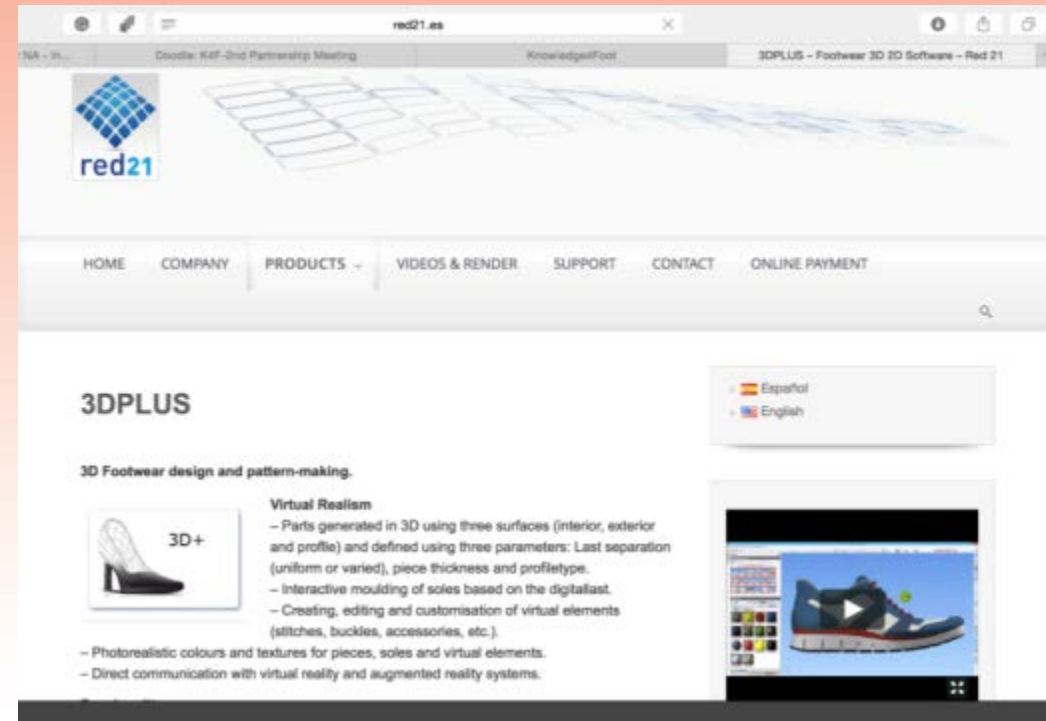
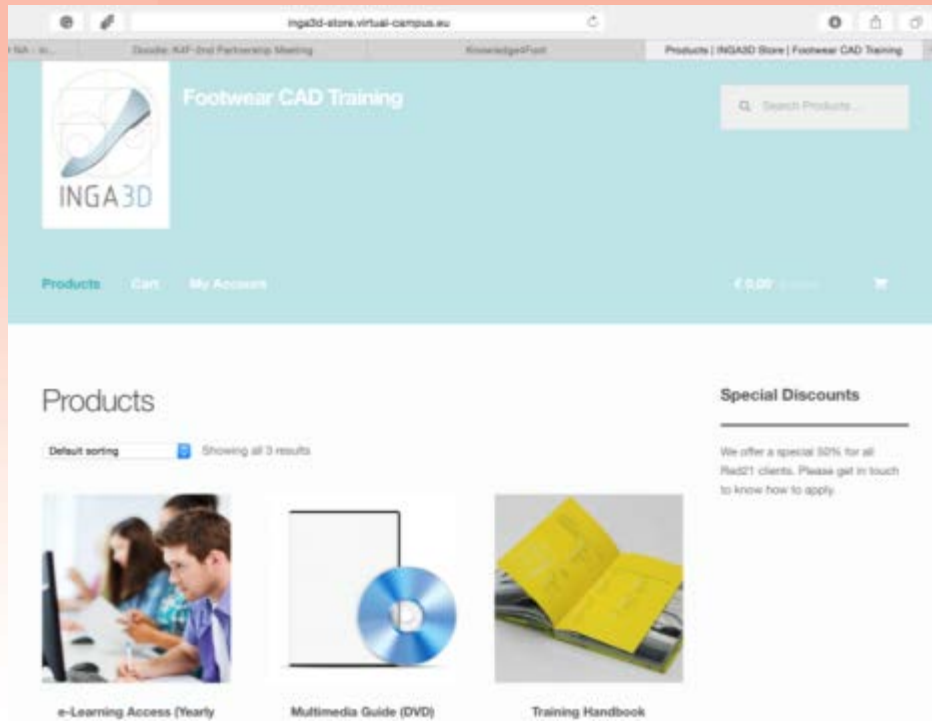


What next ?

Icad 3D+ software
INGA 3D Handbooks
INGA 3D Online Learning Platform

<http://inga3d-store.virtual-campus.eu/>

<http://www.red21.es/en/3d-2/>



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TRAINING FOR VET TEACHERS, TRAINERS AND TUTORS IN THE FOOTWEAR SECTOR

Acknowledgment



The INGA 3D project, titled “Creative Transfer of Competence in 3D Footwear CAD to VET Professionals” (contract LLP-LdV-ToI/2013-RO-024) has been funded by ANPCDEFP Romania within the framework of the European LLP/LdV programme.



Find out more at <http://www.inga3d.eu/>