

CREATIVE TRANSFER OF COMPETENCE IN 3D FOOTWEAR CAD

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The Creative Transfer of Competence in 3D Footwear CAD to VET Professionals Project, acronym - INGA 3D, aims to transfer and extend innovative software solutions and 3D technologies for computer-aided footwear design. The project brings together universities, research and training centres, adult education providers and IT companies from four European countries. The project products will introduce innovative solutions for e-learning in order to test and to validate new teaching methodologies and approaches suitable for vocational training in footwear computer-aided design. It will contribute to developing skills and competencies of VET professionals in order to face with the future challenges.

Keywords: footwear CAD, vocational training, virtual environment, practical and theoretical knowledge.

INTRODUCTION

The e-learning methods promise to improve human resource capability by using new technological capabilities, and resulted in improvements in organizational capabilities as well (Brasche, 2013).

Although 3D CAD is a widely used and highly effective tool in design, it also has its drawbacks: mastery of CAD skills is rather complex and time-consuming, e-learning could be used in a successful CAD training (Bodein *et al.*, 2011; Ionesi *et al.*, 2014).

E-learning refers to training initiatives which provide learning material, course communications, and it delivers the course content electronically, through technology mediation (Johnson *et al.*, 2008). Learning systems do not generally adapt to learners' profiles (Paraskevi *et al.*, 2008), proving that the footwear area selected for developing this multimedia tool is an appropriated one. Such a tool has to implement the adaptive self-consistent learning object as visual language, in order to define classes of learners by stereotypes and to specify the more suited adaptive learning process for each class of learners (Gennaro *et al.*, 2008; Avadanei *et al.*, 2014).

A student-centred approach is required for online learning and it can be used to create a community of learners (Ursache *et al.*, 2010; Mihai *et al.*, 2013). A flexible teaching strategy has to be developed and it has to be oriented towards the students' needs for training and learning (Mihai *et al.*, 2013; Dan and Ursache, 2010).

SUMMARY

INGA 3D project aims to transfer and extend innovative software solutions and 3D technologies for computer-aided footwear design, namely ICad3D+, produced by Spain. This will be achieved through four complementary activities:

- by transferring the innovation from Spain to other countries, namely Romania, Portugal, and UK;
- by developing skills and competencies in 3D footwear computer-aided design in VET professionals (teachers, trainers and tutors) so that they can teach ICT based technical courses that support creativity and innovation among their own VET students/trainees;

- by developing new training content and supportive e-learning tools based on units of learning outcomes and competencies. This will ensure effective assessment, evaluation and validation;
- by setting up an Online Learning Platform.

The project brings together universities, research and training centres, adult education providers and IT companies. The consortium has partners with great pedagogical experience in development and evaluation of methodologies for education and technical vocational training. Also, there are partners with experience in vocational training, and research and development for the footwear industry.

BACKGROUND

All over the Europe, one critical problem of VET study programs is the gap between the level of technical knowledge and professional skills that the learners acquire and the required competencies expected by employers (European Commission's Report - 'New Skills for New Jobs: Action Now', 2010). Footwear companies all over the Europe can find it challenging to recruit VET graduates competent and skilled in Computer Aided Design (CAD) of footwear. VET providers for footwear sectors could reduce this gap by widening their existing curricula to new available CAD/CAM technologies and software solutions that are developed through the latest research and commercial developments. At this point one main question appears: Do teachers/tutors/trainers from VET institutions have the right skills and competencies to teach Footwear Computer Aided Design?

A preliminary investigation that was undertaken by partners in the preparatory stage of this proposal (in RO, ES, PT and UK) revealed:

- VET institutions which are running study programs for footwear sector have ICT based content in their curriculum, but it is designed to cover the only key competencies for generic skills (keyboarding, word-processing, desktop publishing and using the Internet for research and communication);

- Working with CAD/CAM technologies are occupational specific ICT literacy skills and VET curricula rarely cover these in detail. The reason for this varies, as:

- 1) staff do not have right skills and competencies in CAD;
- 2) there is lack of teaching resources for footwear CAD;
- 3) the software developers for footwear CAD offer tutorials that do not meet pedagogical needs of VET system;
- 4) some training centres use their own curricula and methods for footwear CAD and these differ from those in the public VET schools.

RESULTS

The footwear CAD solution Icad 3D was developed by INESCOP (partner P1) and RED 21 (partner P5) is faster and more precise than other commercial products, and gives an immediate feedback both to teacher and to student/trainee. It allows detailed and accurate visualization of footwear prototypes in a virtual space. Through INGA 3D, the knowledge and the skills for developing patterns and footwear prototypes will be transmitted by VET teachers and trainers to their students and trainees in a dynamic and effective way. It will stimulate creative thinking among VET students and trainees, and it will increase attractiveness of VET study/training programs.

In order to develop the structure of the course, a questionnaire was applied in 3 countries, Romania, Spain and Portugal. In Romania, there were 21 respondents to this questionnaire.

The analysis is structured as the 2 parts of the questionnaire:

- General aspects on the training/teaching process.
- Technical dimensions on Footwear CAD.

In Romania's case, further interest for technical aspects of the course is expressed in gaining relevant theoretical knowledge on principles and techniques for footwear CAD, nearly 90% of respondent have chosen "To a large extent" (see figure 1).

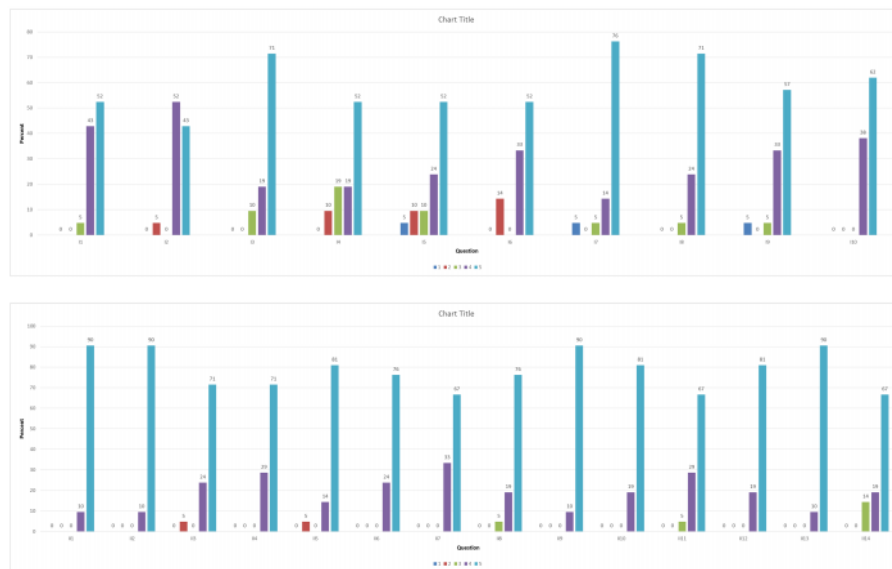


Figure 1. INGA 3D questionnaire's results

"To understand the main differences and advantages of 2D and 3D footwear CAD systems" is also an important topic that the respondents would like to improve. Also, "To produce footwear virtual prototypes by creating panels, adding texture, stitches and decorative elements" and "To draw accurate sketches, panels, boards and technical drawings in order to prepare the collection of models with CAD software" with 90% interest from the participants are aspects to be considered when developing the courses.

Lower values were obtained by the general aspects, like for example "To acknowledge my personal learning needs", "To overcome obstacles, to achieve success in the learning process", "To turn my ideas into action", which demonstrates the fact that these persons already have these knowledge.

CONCLUSIONS

The project products will introduce innovative solutions for e-learning in order to test and to validate new teaching methodologies and approaches suitable for vocational training in footwear computer-aided design. The online platform will integrate various

flexible learning scenarios and supportive tools for learning. The new training content and its supportive guide will be designed, developed, tested and evaluated in line with the best practices identified by partners in their institutions, countries and elsewhere in Europe. It will contribute to developing skills and competencies of VET professionals in order to face with the future challenges.

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