

E-LEARNING INSTRUMENTS TO SUPPORT TEXTILE FIELDS

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EXTENDED ABSTRACT

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1. INTRODUCTION

Main aim of this paper is to highlight progress of e-learning in textile field, achieved within three Erasmus+ projects for Vocational Education and Training. Main idea of the projects was to improve innovation in textile enterprises by training of professionals and to skill up young students for the world-of-work by blended learning. Blended learning is a modern and effective concept of education, combining both classroom courses and e-learning.

E-learning has multiple advantages, for it enables: flexible learning hours with 24/24 access, distance learning, possibility to watch multimedia content with working modalities of textile machines, attractively content towards classic learning materials for young trainees and possibility to consult tutors via synchronous or asynchronous communication. However, it is of great benefit to support single e-learning courses, with traditional classroom courses, for this enables direct contact with the tutor, detailed explanations and a model to follow.

Vocational Education and Training (VET) is a concept for improving knowledge and skills of trainees in apprentices type of learning and is often supported by e-learning [1]. Textile industry is an important scientific field with rapidly changing technologies and trainees have to be kept informed and trained on up-to-date knowledge [2]. Textile professionals need to cope with the latest advancement of technology in order to improve processes in own enterprise, while decision makers may implement new research results, offered by research providers. VET for young students and entrepreneurs in textiles is also a priority, due to need of acquisition of complementary skills to existing curricula.

The concept of blended learning for VET in textiles, including special e-learning instruments was applied in two Erasmus+ strategic partnership projects and is going to be applied in a third, ongoing project [3].

2. THE ERASMUS+ PROJECTS

All of the three Erasmus+ projects developed VET e-learning courses as follows:

- Advan2Tex - E-learning course for innovative textile fields (2014-2016): supports textile professionals, young entrepreneurs and students to implement advanced textile knowledge within their enterprises, via 7 modules in innovative textile fields (www.advan2tex.eu);

- TexMatrix - Matrix of knowledge for innovation and competitiveness in textile enterprises (2016-2018): supports decision makers in enterprises and employees with new research solutions, via the Knowledge matrix for innovation instrument (www.texmatrix.eu);
- Skills4Smartex - Smart textiles for STEM training (2018-2020): offers knowledge in basic multidisciplinary fields (mathematics, physics, chemistry and electrics) via training and showcasing of smart textiles (www.skills4smartex.eu).

Project's partners of these three projects coordinated by INCDTP-Bucharest are described in table 1.

Table 1. Project's partners

		
INCDTP – Bucharest, RO	INCDTP – Bucharest, RO	INCDTP – Bucharest, RO
University of Minho, PT	TecMinho, PT	TecMinho, PT
University of Maribor, SI	Centrocot, IT	Gent University, BE
TZU, CZ	University of Maribor, SI	University of Maribor, SI
Technical University Iasi, RO	Technical University Iasi, RO	Technical University Iasi, RO
		TZU, CZ

The educational materials achieved within these projects were implemented as e-learning content on a Moodle Learning Management System (LMS), having the URL address www.advan2tex.eu/portal/. The following educational materials are available at the moment with open access on the e-learning platform:

A. Advan2Tex - E-learning course for innovative textile fields (2014-2016)

- Seven modules in advanced textile fields on the following themes:
 - o Advanced knitting technology; Virtual prototyping of garments, 3D scanning, clothing for people with special needs; New methods for testing textile materials; Standardization of textile testing; Sustainability of textile technologies; Entrepreneurship and Innovation management
- The modules contain about 50 pages of text, pictures, graphs and diagrams, implemented via Moodle Book resources with navigation buttons and table of contents.
- Multiple choice tests on each of these modules: a test comprises 12 questions, randomly selected out of a pool of 50 questions, on three levels of difficulty. The access to questions requires authentication on the Moodle platform, while free registration is granted by the national coordinators.
- Four guides have implemented results of the training activities (both joint staff events and blended courses):
 - o Guide for new business and research ideas; Guide for courses evaluation and upgrading; Guide for best practices of the courses; Guide for intercultural partnership.
- Synchronous and asynchronous communication tools between tutors and trainees, ensured via Chat and Forum activities

B. TexMatrix - Matrix of knowledge for innovation and competitiveness in textile enterprises (2016-2018)

- The Knowledge matrix for innovation and the Benchmarking questionnaire adapted for textile enterprises

- Benchmarking Reports on European, national and enterprise level resulted of benchmarking study with 64 European textile enterprises
- A SWOT analysis on European benchmarking report
- 35 project solutions (research, market, training) clustered on the Opportunities of SWOT analysis, as Moodle Glossary activity
- Three guides on textile enterprise innovation, as Moodle Book resources:
 - o Elements specific to innovation; Instruments for supporting and promoting innovation; Legislative framework for protecting innovation
- Multiple choice tests on each module
- Videos with interviews with national coordinators on project's outcomes.

C. Skills4Smartex – Smart textiles for STEM training (2018-2020) is an ongoing project envisaging the following outcomes:

- A Guide for smart practices aiming to transfer practices from enterprises performing in the field of smart textiles to other enterprises and VET schools, by identifying state-of-the-art work profiles for young trainees
- A Course in smart textiles aiming to provide multidisciplinary knowledge in STEM fields (Maths, Physics, Chemistry and Electrics) via smart prototypes applications
- A dedicated e-learning instrument provided direct access on the course's modules

The Open Educational Resources (OER) of the first two projects are available as e-learning courses with open access on the e-learning platform with URL address: www.advan2tex.eu/portal/, while the OERs of the third project are going to be implemented in the near future. Various e-learning instruments were applied in order to meet the logical content of the educational materials, such as hyperlinking project solutions with opportunities (SWOT), via cluster tables within TexMatrix e-learning course [3]. Based on the experience with previous e-learning content, direct access on educational resources for the 56 modules within Skills4Smartex is going to be enabled, within an attractive interface with a filter for dynamic selection of a module. Both dedicated e-learning instrument and Moodle platform will host educational materials.

3. CONCLUSIONS

All three Erasmus+ projects provide e-learning solutions for VET in textiles. Various e-learning instruments were adapted on Moodle LMS in order to support trainees in textiles. The e-learning platform counts currently more than 680 user accounts: a number of 199 professionals in textiles and 137 young trainees were prepared in TexMatrix, while a number of 165 professionals and 176 young trainees were prepared in Advan2Tex, within Multitier events and Blended courses. Many enterprise decision makers expressed their interest in implementing project solutions provided by TexMatrix and project's impact is still ongoing.

4. ACKNOWLEDGMENT

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