IMPACT OF INTENSIVE STUDY PROGRAMS ON HIGHER EDUCATION STUDENTS IN THE FIELD OF DESIGN AND MODELLING OF TEXTILE MATERIALS

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The knowledge of software for design and modelling of textiles offers a competitive advantage within the world of work for young textile creatives. The Erasmus+ project OptimTex – "Software tools for textile creatives" has created a large set of educational materials and the corresponding e-learning resources in this competitive domain. Six educational modules, one Moodle e-learning platform with courses in six national languages, one e-learning instrument for quick access to the content and one glossary of terms were implemented during the two-year's project 2020-2022 (www.optimtex.eu). Two Intensive Study Programs (ISPs) of five days were already organized by the project's partners: one virtual ISP with the host Technical University of Iasi and one mobility ISP with the host University of Maribor. A total number of 27 students and 15 lecturers participated in the first ISP and a total number of 17 students and 12 lecturers participated in the second ISP. The six modules for Design and Modelling of woven structures, knitted structures, virtual prototyping of clothing, embroidered e-textiles, design of experiments, and TechTransfer had a high impact on the students. The impact was measured by feedback questionnaires and the interest in e-learning resources by the number of accesses (www.advan2tex.eu/portal/). This paper presents the impact of the educational materials on Higher Education students in relation to the envisaged objectives of the project.

Keywords: intensive study, textile design, modelling, virtual prototyping.

INTRODUCTION

The modelling of the digital future of Europe is our way to a better life and a big step to "green transition" and "climatic neutrality until 2050" (European Parliament, 2021).

While digitization represents the transition from analogue data to digital formats, and digitization is the way to use digitized information in current activity, digital transformation represents a significant pillar of development and implies the creation of completely new business concepts taking advantage of digitization (Webactiv, 2020). In the actual era, this concept is continuing wide spreading in every technical and technological domain. More, the concept is a common instrument in every daily life.

The use of digital tools in all sectors of activity is growing exponentially (Díaz Redondo *et al*., 2021). It is also the case in the textile industry, where many types of textile design software have been created to make the work of the textile industry easier

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and faster (Avadanei *et al*., 2020). Several textile design software is available as work and control tools, fast and efficient for both students and employees, ranging from design and graphic tools to business administration and quality control tools.

Educational systems have to adapt to the latest IT development, as beyond traditional education, the virtual education provides excellent opportunities for both teaching and learning (Rusu *et al*., 2018). The e-learning and micro-learning instruments are effective at achieving good outcomes, and the advantages they offer are especially great, compared to traditional instruments (Andron and Kifor, 2021). Research shows that on average, students retain between 25-60% more through online learning than they do in traditional classroom settings. Other studies show that, because it is self-paced, e-learning leads to increased student satisfaction and reduced stress. Today's learners want bite-sized information fast and on demand. And research suggests that this kind of microlearning makes learning 17 % more effective.

By implementing its objectives: preparing new educational materials on up-to-date textile design software applications; improving the employability of textile creatives within industry & research using adequate tools; fostering digital skills uptake by implementing e-learning instruments and creating educational synergies by enabling student mobility, the Erasmus+ project "Software tools for textile creatives - OptimTex" promotes the use of digital resources in the learning process (Radulescu *et al*., 2022). In this regard, the two intensive study programs (ISPs): one virtual ISP with the host Technical University of Iasi and one mobility ISP with the host University of Maribor were special exploitation activities accomplished within the second year of the project 2022, based on the educational materials conceived in the first year of the project 2021.

INTENSIVE STUDY PROGRAMS (ISP)

The organization of the ISPs with educational purpose is a major task within the implementation of the project's objectives, having as benefit the creation of inter-disciplinary and multi-cultural synergies between partner universities' expertise. Within these ISPs, the 6 modules (Figure 1) were presented interactively. The modules are available as e-learning courses on the Moodle platform (www.advan2tex.eu/portal/), in all the national languages of the project (CZ, DU, EN, PT, RO, SI).

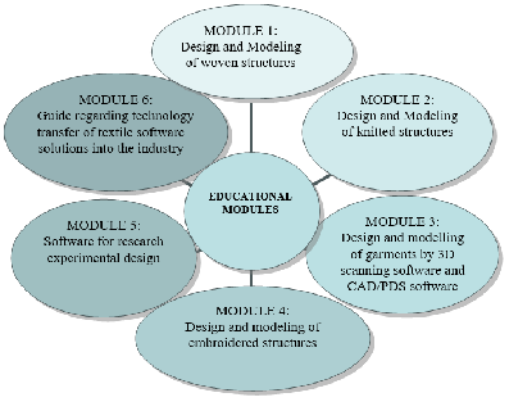

Figure 1. The 6 modules for design of e-textiles

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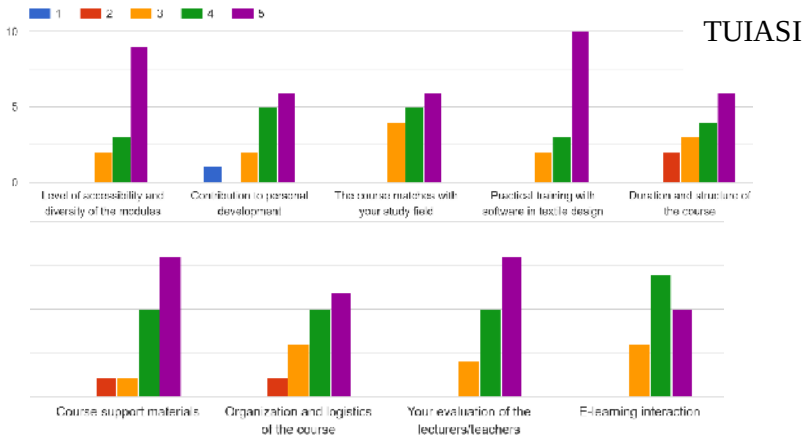
All the project partners have participated in the development of the ISPs. The main data of the already organized two ISPs every five days are presented in Table 1:

Table 1. Main information about the two ISPs

ISP	1st ISP – 21-25.03.2022	2nd ISP – 30.05 – 03.06.2022
Coordinator	The National Research & Development Institute for Textiles and Leather (INCDTP)	
Host	"Gheorghe Asachi" Technical University of Iasi (TUIASI)	University of Maribor (UM) University West Bohemia (UWB)
Presence	Virtual – Webex meetings (pandemic context)	With mobility of students and lecturers
Participants	27 students and 15 lecturers	17 students and 12 lecturers
Study modules	Design software for weaving; Design software for knitting; Design software for virtual prototyping of clothing; Design software for embroidery; Design software for experimental design of e-textiles;	
Main focus	Design and modelling of knitted structures - TUIASI	Design software for virtual prototyping of clothing – UM Design software for embroidery - UWB
Virtual platform	Project website www.optimtex.eu TAB E-learning (Moodle)	
E-learning instrument	Project website www.optimtex.eu TAB Instrument (JavaScript)	
Glossary of terms	Project website www.optimtex.eu TAB Glossary (PHP / MySQL)	
Q&A and Forum	yes	yes
Certificates	yes	yes

RESULTS

Beneficiary students of ISPs participated in completing an online feedback questionnaire. The content of the questionnaire includes 9 topics, which reflected the level of accessibility and diversity of the modules, the degree of matching of the course with each student's field of study, practical training with software in textile design, contribution to personal development, duration and structure of the course, course support materials, organization and logistics of the course, evaluation of the lecturers/teachers and the e-learning interaction.



TUIASI

Figure 2. The level of appreciation regarding the organization of the course, by scores from 1 to 5 – ISP TUIASI

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The level of perception and satisfaction throughout the duration of the 1st ISP with host TUIASI are presented in Figure 2 (organization of the course) and Figure 3 (modules).

In the second section of the questionnaire, that means evaluation of lecturers and practical work of the modules, the students ranked the 6 studied modules according to their level of appreciation with scores from 1 to 6.

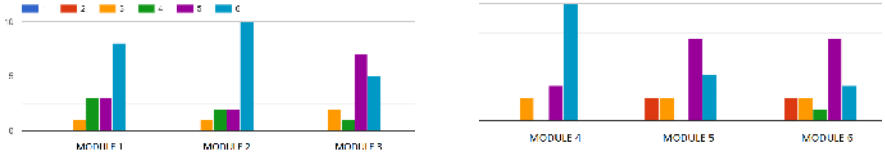

Figure 3. Ranking, by the respondents, lecturers and practical work of the modules, from the point of view of the degree of appreciation – ISP TUIASI

At section one of the questionnaire, the level of satisfaction regarding the organization of the 1st ISP courses was very high, the scores of 4-5 representing about 86% of the received responses. Special good impact was achieved at level of the accessibility of the course and practical training, as well as course support materials and support of lecturers. Less impact was related to personal development and matching with the study field, an aspect to be improved. Regarding e-learning interaction, the trainees had three weeks to study on Moodle the modules of the course, after the ISP course week. One reason the e-learning indicator was less evaluated is the completion of the questionnaire just at the end of the first ISP course week.

18 users, 16 new users, 28 pages views and a bounce rate of 70% were achieved on Moodle LMS, according to Google Analytics access monitoring during the four weeks of course. At section two of the questionnaire, the most appreciated module was the Knitting module, due to the practical work and the possibility to access the computer software of the Knitting LAB at TUIASI via TeamViewer. Second and third place was the weaving and embroidery module, also for the good showcasing of design software. During practical work with knitting, there was possible to manufacture the OptimTex flag on the knitted sample (Figure 4).

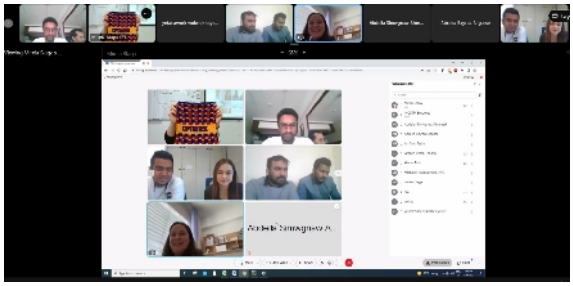

Figure 4. Print screen of the virtual course with the OptimTex flag

11 trainees had responded at the survey of the second ISP with host University of Maribor (Figures 5-6). A great impact was achieved with organization and logistics as well as with the support of the lecturers. Less impact was achieved with the course

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support materials and the matching with the domain of activity, however with a predominant score of 4, which means very satisfied.

Google Analytics presented similar interest regarding Moodle e-learning. The e-learning instrument and the Glossary of terms was accessed by 45 users during first ISP and by 38 users during the second ISP. Section two of the questionnaire shows best scores for the modules of Embroidery and Virtual Prototyping, due to the extensive and very successful practical work. The students had the possibility to design in Inkscape / Inkstich the leaking sensor and to embed some electrical components on the electric circuit of the fabric (Figure 7). They had also the possibility to experience 3D scanning of the own body and virtual prototyping software.

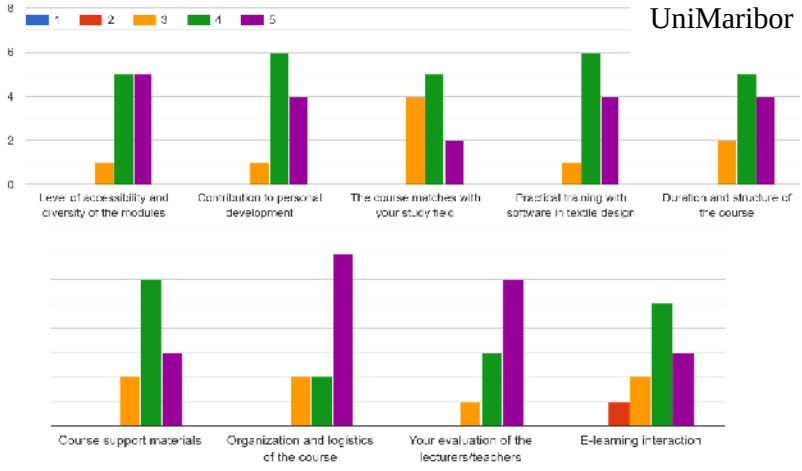

Figure 5. The level of appreciation regarding the organization of the course, by scores from 1 to 5 – ISP UniMaribor

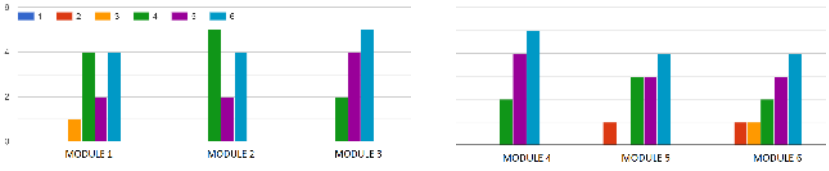

Figure 6. Ranking, by the respondents, of the modules studied, from the point of view of the degree of appreciation – ISP UniMaribor

All students of the ISP UniMaribor received certificates of attendance. The overall impact of the course was especially high and this was also reflected by the interviews registered on the OptimTex Youtube channel at: https://www.youtube.com/channel/UCMOSSavcYoiX2ygrIKx7gGg. The Youtube channel may be accessed via the optimtex.eu website TAB Multimedia.

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Figure 7. Practical work with embroidery of e-textiles at ISP UniMaribor

CONCLUSIONS

The educational materials of Erasmus+ OptimTex project are available in e-learning format on the Moodle platform and on the project's website. Knowledge in software for design of textiles was taught for Higher Education students within two ISP courses. Feed-back questionnaires revealed a high interest of the participants and a good organization of the courses. A third ISP will be organized in October 2022 at Ghent University.

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