Digital Fashion Project

Collaborative Online International Learning in Digital Fashion

# REPORT ON ACTIVITIES OF RESULT

# REPORT ON ACTIVITIES OF RESULT 4:

# Curricula for Collaborative Online International Learning in the field of Digital Fashion

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Digital Fashion Project
Collaborative Online International Learning in Digital Fashion

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# 1 Introduction

The aim of PR4 is to elaborate an educational programme of fashion design and technology based on the developed training platform, including general theories, basic concepts, design examples and online design exercises.

PR4 has four points, as follow:

- PR4/A4.1 Define the common and the specific learning outcomes for the module that applies to individual countries
- PR4/A4.2 Control of the learning content created, teaching and assessment methodologies
- PR4/A4.3 Design examples and online design exercises
- PR4/A4.4 Define the evaluation criteria for the training programme of fashion design

The first target was to establish the educational programme of fashion design and technology based on the developed training platform. There were two modules developed and inserted on the platform:

- The user manual that will guide the learners through the goals of Digital Fashion on-line Platform
- The four learning modules, integrated in the platform and translated in the partners' languages.

The User Manual was elaborated by ENSAIT, the partner responsible also with the development of the Digital Fashion on-line platform. For a better and easier understanding of how the platform works, especially for people with disabilities, a YouTube video was inserted.

The teaching modules are as follows:

**1. FASHION DATABASE**
- 1.1 INTRODUCTION
- 1.2 FASHION DATABASE
- 1.3 FASHION REQUIREMENTS
- 1.4 BASIC DESIGN ELEMENTS

**2. FABRIC DATABASE**
- 2.1. INTRODUCTION TO THE FABRIC DATABASE
- 2.2. FABRIC PROPERTIES
- 2.3. REAL FABRICS (PHYSICAL FABRICS) DATABASE
- 2.4. DIGITAL (VIRTUAL) FABRICS AND TRANSITION FROM PHYSICAL FABRIC TO DIGITAL FABRICS
- 2.5. IMPORTANCE OF FABRIC SELECTION IN THE DESIGN PROCESS

**3. GARMENT DATABASE**
- 3.1. DESIGN CASES

3.2. 2D GARMENT DESIGN
3.3. 3D GARMENT DESIGN

**4. GARMENT E-SHOPPING**

4.1. INTRODUCTION
4.2. PERSONALIZED 3D GARMENT FITTING
4.3. VIRTUAL SALESPERSON
4.4. PREDICTION OF THE MARKET EVOLUTION ACCORDING TO THE CUSTOMERS`ACTIONS

All the teaching modules end with Conclusions and Bibliography.

Each partner contributed on the development of the modules.

PR4/A4.1 Define the common learning outcomes and the specific learning outcomes for the module that applies to individual countries. After the discussions held at the last TPM in Maribor and based on the results of the surveys conducted on PR1, it was agreed that there are no specific learning outcomes that applies to partners' countries, so that the modules' content is the same. Each partner developed first the learning outcomes and the specific learning outcomes for the learning modules.

For the first module, ***FASHION DATABASE***, developed by University of Maribor, Slovenia, the learning outcomes are presented in table 1.

**Table 1**

| COMMON LEARNING OUTCOME | EFFECTIVE USE OF THE ONLINE PLATFORM DIGITAL FASHION AND THE FASHION DATABASE MODULE |
|---|---|
| **SPECIFIC LEARNING OUTCOMES** | • describe the basic steps of fashion design<br>• explain the requirements of fashion and the role of design elements in the design of fashion clothing<br>• describe the importance of a technical drawings<br>• explain in detail the basic design elements<br>• explain the use of the basic design elements in virtual 3D prototyping of clothing |

The second module is entitled ***FABRIC DATABASE*** and it was elaborated by two partners, namely, Hogeschool Gent, Belgium and The National Research and Development Institute for Textiles and Leather, Romania. The learning outcomes are presented in table 2.

**Table 2**

| COMMON LEARNING OUTCOME | UNDERSTANDING FABRIC PROPERTIES, CONSTRUCTION AND REAL VS DIGITAL FABRIC FOR USING FABRICS DATABASE |
|---|---|

| | |
|---|---|
| **SPECIFIC LEARNING OUTCOMES** | • Know important fabric properties<br>• Interpret fabric properties<br>• Understand real fabrics vs digital twin fabrics<br>• Knowledge of fabric construction<br>• Knowledge of fabric visual properties |

The third module, ***GARMENT DATABESE*** has three distinct parts, namely:

3.1. Design Cases
3.2. 2D Garment design
3.3. 3D Garment Design.

The first two chapters, 3.1. and 3.2. were developped by the specialists of „Gheorghe Asachi" Technical University of Iasi and chapter 3.3. was developped by the specialists from Hogeschool Gent, Belgium.

The learning outcomes of ***Design Cases*** are presented in table 3.

**Table 3.**

| COMMON LEARNING OUTCOME | THE ELABORATION AND USE OF SPECIFICATIONS SHEET FOR THE GARMENTS MODELS |
|---|---|
| **SPECIFIC LEARNING OUTCOMES** | • To know the elements of the specifications sheets (technical drawing, description)<br>• To identify the elements of the garments<br>• To be able to select a model from the garments database |

The learning outcome for the next subchapter, ***2D Garment Design*** are presented in table 4.

**Table 4.**

| COMMON LEARNING OUTCOME | THE USE OF DIGITAL TOOLS TO DESIGN THE BASIC 2D SHAPES OF THE SELECTED PRODUCT CATEGORIES |
|---|---|
| **SPECIFIC LEARNING OUTCOMES** | • Interpret measurements and pattern requirements from technical drawings and specifications sheets<br>• Design the shape of basic blocks<br>• Modify patterns to create design features |

3D Garment Design module has the learning outcomes presented in table 5.

**Table 5.**

| COMMON LEARNING OUTCOME | THE USE OF DIGITAL TOOLS TO CREATE A VIRTUAL 3D PROTOTYPE |
|---|---|
| **SPECIFIC LEARNING OUTCOMES** | • Access and prepare the digital workspace<br>• Select the appropriate avatar<br>• Select the materials<br>• Proceed with the 3D garment simulation<br>• Make adjustments or improvements as needed<br>• Create the final shape of the required product, arrange and save it |

The final teaching module, module 4 entitled GARMENT E-SHOPPING, was developped by the partners from CITEVE, Technological Center for Textile and Clothing Industry of Portugal.

The learning outcomes are presented in table 6.

**Table 6**

| COMMON LEARNING OUTCOME | **Learners will demonstrate a proficient understanding of personalized 3D garment fitting technologies, customer journey optimization strategies, and the impact of digital consumer behavior on e-garment and e-shopping industries.** |
|---|---|
| **SPECIFIC LEARNING OUTCOMES** | • Learners will be able to demonstrate proficiency in using advanced technologies such as 3D scanning and virtual fitting rooms to enhance the online shopping experience<br>• Learners will be capable of identifying key touch points and designing seamless experiences that foster customer engagement and loyalty, ultimately driving conversions and revenue growth<br>• Learners will be able to leverage consumer insights to tailor marketing strategies, product offerings, and customer interactions, thereby maximizing customer satisfaction and retention in an increasingly competitive digital marketplace |

# 2 PR4/A4.2 Control of the learning content created, teaching and assessment methodologies

The next step after establishing the learning outcomes was to elaborate the teaching modules. It was agreed, for each module to have between 25 and 30 pages, so that the learning content to be equally distributed.

Each module was than revised by another partner and the suggested modifications were made.

It was agreed that the final modules will be translated in all the partners' languages and uploaded on the Digital Fashion Platform.

The teaching methodology assures that the learner has the best support for using the Digital Fashion on line Platform and the teaching modules. The proposed teaching methodology is suitable with the purpose of the Erasmus project.

The teaching methodology agreed by all the partners was individual learning based on the lecture of the modules. The teaching modules are individually designed so that the learner may follow one, two or all the modules. The modules can be learned in the proposed order or not.

In order for these modules to be accessible for the people with different types of disabilities it was proposed that each module to be also presented as a Power Point file, with few words and big pictures on each slide. So, each module can be accessible in two formats: .pdf or .ppt.

The learning modules, in all the partners' languages are accessible from www.digitalfashionproject.eu, Project Results, PR4, or on the E-learning section /Simulation Platform/ Training Sources, the English versions of the learning modules can be found.

The assessment technology assures that the using of the Digital Fashion on line Platform and the content of the modules are well aquired. The assessment methodology is based on the learning outcomes of each learning module and the specific of the Digital Fashion Erasmus project.

The assessment method agreed by all the partners is factual, to show that the learner knows and comprehend the content of the learning design and can follow the necessary steps of fashion design.

For each module there were elaborated quizzes consisting in ten questions with four possible answers, one correct answer.

The quizzes are accessible from www.digitalfashionproject.eu, Project Results, PR4, or on the E-learning section /Simulation Platform/Quizz.

**Exemple of quiz for module 1 Fashion Design**

**1)** The fabric colour description in the database is realized:
   a. According to the international colour coding system Natural Colour System (NCS)
   b. Fabric color is not an input for the database
   c. According to both international standardized colour coding systems: Pantone Color System or Berger Whiteness Index
   d. The user fills his own colour description in the database

**2)** Why the comprehending of the textile materials properties is so important for the designer?
   a. To learn how to provide solutions to the pollution generated by the textile industry
   b. to align the intended design concept with the functionality of the garment
   c. To be able to realize the technical sketch of the desired garment
   d. Because the designer must complete a quiz to receive access on the e-learning platform

**3)** What is the drapability of a fabric?
   a. The fabric ability to hang gracefully and fluidly
   b. The ability of the fabric to return to the initial shape after bending
   c. The fabric resistance to repeated bending
   d. Is a fabric property obtained through a finishing process

**4)** What the density of a knit (courses/cm) represents:
   a. The total number of horizontal rows measured per centimeter
   b. The total number of horizontal rows and of vertical columns, measured per 1 $cm^2$
   c. The distance between the two faces of the fabric, measured under a certain pressure
   d. The ratio between weight and volume of the knitwear

**5)** How is realized the pairing process of the physical fabric with its digital correspondent:
   a. Lectra fabric database provide the best "digital match" based on the input parameters of the real fabric
   b. The user manually searches a similar digital fabric in the Lectra fabric database
   c. The pairing process is just an e-learning tool, without practical field application

d. The material composition is the only necessary input data for the pairing process

**6)** The fabric composition in the database is described:
a. According to the raw material with the highest percent from the fiber composition
b. With exact percentages of each raw material component
c. According to the general fibers classification: *natural* and *synthetic (man-made)*
d. The fiber composition is not an input for the database

**7)** The weaving process is defined as:
a. The evolution of one or more threads along the transverse direction of the weave
b. The interlacing in adequate angles of at least two systems of threads - longitudinal and transversal systems
c. The evolution of one or more thread systems along the longitudinal direction of the weave
d. The process of interlacing fibers or yarns, no matter the technique used

**8)** The warp knitting process is characterized by:
a. The evolution of one or more threads along the transverse direction of the knit
b. The interlacing in a 90° angle of at least two systems of threads - longitudinal and transversal systems
c. The evolution of one or more thread systems along the longitudinal direction of the knit
d. interloping one thread or a system of threads, along the longitudinal or transversal direction of the knit

**9)** The texture of a fabric refers to:
a. Fiber composition of the fabric
b. The tactile quality of the fabric's surface
c. The thickness of the fabric
d. The luster degree of the fabric's surface

**10)** What a swatch book represents:
a. An inspirational online collection of fabrics with various colours, patterns, textures and materials composition
b. A tangible and visual guide to a wide range of fabrics
c. An instrument to acces the Lectra fabric database
d. An online guide about how to use Lectra fabric database

# 3 PR4/A4.3 Design examples and online design exercises

The design example has the role of showing to the learner how to use the information from the teaching module for creating a new model. It consolidates the knowledge from the module and guide the learner to the path of applying the specific details from the module.

For a better understanding of the teaching modules, in the end of some of the modules, when this was appropriate, design examples were elaborated.

Design example from module 1 Fashion Design

Design example of analogous colour combinations can be found in **Figure 1**, where a shade of blue according to the **RGB colour scale** (**87; 192; 255**) and **Hex (# 57C0FF)** is used for the blouse and skirt.

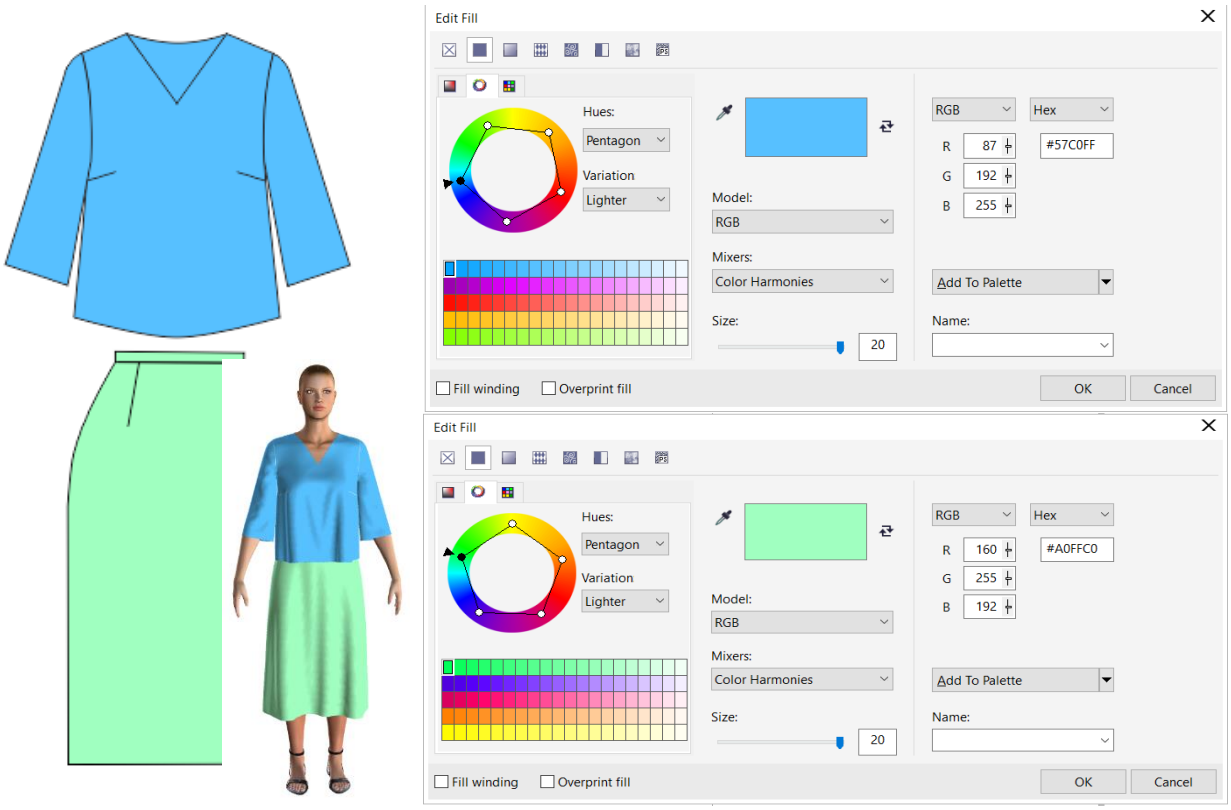


**Figure 1.** Analogous color combinations.

**The online design exercises** from the user manual are utilized for guiding the learner through the Digital Fashion on-line platform, linking the teaching modules with the platform.

The student is first instructed how to register and log in.

Then, according with the main parts of the platform the students are instructed, using design exercise, how to select the model, the human body type and the avatar, the fabric, than how to made the pattern selection and the virtual try-on.

For facilitating the use of the platform, especially for the people with some disabilities, a video ***Digital Fashion Platform Operation Demo*** can be accessed from the platform.

# 4 PR4/A4.4 Define the evaluation criteria for the training programme of fashion design

Evaluation is the activity that determines the level and quality of students' training during the study programs, as well as the competences that learner have at the end of their studies.

The competences for each learning modules are presented in tables 7÷12.

**Tabel 7**

| LEARNING MODULE | *FASHION DATABASE* |
|---|---|
| **COMPETENCES** | • To understand and know the basic steps of fashion design, the requirements of fashion and the role of design elements in the design of fashion clothing<br>• To use the basic design elements in virtual 3D prototyping of clothing |

**Table 8**

| LEARNING MODULE | *FABRIC DATABASE* |
|---|---|
| **COMPETENCES** | • To understand the role of the fabric properties when selecting a specific textile material for a garment model |

| | |
|---|---|
| | • To understand the correlation between real fabrics and digital twin fabrics for selecting the proper material for a specific garment model |

**Table 9.**

| LEARNING MODULE | *DESIGN CASES* |
|---|---|
| **COMPETENCES** | • To understand the importance and adopt the content of a technical sheet according to its purpose<br>• To be able to identify the type and specific of garments' elements in order to characterise a model from the garments database |

**Table 10.**

| LEARNING MODULE | *2D GARMENT DESIGN* |
|---|---|
| **COMPETENCES** | • To select a body type from the database according to the measuremens<br>• To understand and know the steps of 2D garments design |

**Table 11.**

| LEARNING MODULE | *3D GARMENT DESIGN* |
|---|---|
| **COMPETENCES** | • Understand and know the steps of 3D Garments design<br>• Understand and know to read and make adjustments of the final virtual fitting |

**Table 12**

| LEARNING MODULE | *GARMENT E-SHOPPING* |
|---|---|
| **COMPETENCES** | • To understand the mechanisms behind the garment e-shopping platforms<br>• To understand and know the correlation between the three steps of e-shopping: choosing the avatar, the fabric, the model and appreciate the results of the virtual fitting process. |

In the learning process a set of methods, forms, types and criteria of evaluation and grading can be used for evaluating the learners' professional-scientific performance.

The forms of assessment provided for in the platform are the quizzes and the on-line exercises.
For each learning module there are allocated 10 questions, four possible answers, only one is correct.
For considering that all the competences are reached, the learner must respond at minimum 5 questions.

# 5 Conclusions

This interim report presents the results of the PR4 of DigitalFashion. The results of PR4 are strongly correlated with all the previous results of the project, being developed with the help of all partners. The elaboration of the results of PR4 started with establishing the content of the educational materials, the learning outcomes, training materials suited also for people with fewer disabilities, developing of design examples and quizzes are inserted in the on-line Digital Fashion platform. A user manual was developed for guideing the learners through the goals of the on-line Digital Fashion Platform. All the training materials are translated in partners' languages.

Considering the content of all the educational materials developed for PR4 it can be said that the main goals of the Digital Fashion project are fulfilled.

**ERASMUS +**

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