



Intellectual Output 2

E-learning Content Development Process



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1.E-learning Content Development Process

The curriculum of the course of the VLE is based on the curriculum designed during Intellectual Output 1 and tested during the events of Intellectual Output 4.

Furthermore the VLE curriculum had to be adapted for the Virtual Learning Environment and designed in order to facilitate a strong social and learner-centred environment, meaning that learning is active and requires participation from all learners. The learners of the VLE platform need to be actively engaged in sharing, reading, reviewing, and communicate their learnings through the discussion forum incorporated in the platform. On a Virtual Learning Environment teaching is not something that can only be done by the instructor, the learner will also need to be involved and participate in the process.

In this introductory module the aim of the course is explained and the learners for whom this course is been designed are defined. Furthermore the introduction presents information about the approach followed and guidelines on how to use the VLE platform. Finally acknowledgments, to the funding of Vir2TEX project by Erasmus+ Program and the European Union are mentioned, together with the acknowledgments towards the support provided by all project team members for the development and the content of the VLE platform.

Learners are expected after the completion of the course to be able to:

- Understand the importance of the basic principles of textile production
- Improve the learning and skill of students by putting them in the middle of real situations in in immersive learning experiences.
- Enhance the learning and awareness of new employees, therefore, shorten the orientation time.
- Participate organizations in widening their organization network

Acknowledging the strength and effectiveness of peer learning, this course is designed to ultimately strengthen, improve and effectively textile production knowledge and



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engage learners in immersive learning experiences whether teaching in class or remotely.

The course includes content on textile production as well as training methodologies that enable effective facilitation, participatory and immersive learning and thus lead to sustainable knowledge and skills gain of and for the intended participants.

However, the modular structure also provides for alternative ways to use the VLE; following a needs-based analysis of learners, facilitators can select particular modules and facilitate a tailor-made training for particular learning needs. Moreover, against the background of facilitation of peer learning groups, the modular structure allows to spread out learning over several weeks or months, so that participants can learn at their convenience and relate the contents to their reality. Eventually, it is up to the user and facilitator to decide how best to use the approach and information presented in the VLE.

2. Modules and Content of the Virtual Learning Environment

There are two general approaches to e-learning: self-paced and facilitated/instructor-led. In this project, self-paced model is preferred where learners are alone and completely independent. VLE provides different levels of support from experts, tutors and instructors and collaboration among learners.

Learners are offered e-learning courseware which can be complemented by supplemental resources and assessments. Course content is housed on VLE and learners can access it from an online learning platform. Learners are free to learn at their own pace and to define personal learning paths based on their individual needs and interests.

As a provider we do not have to schedule, manage or track learners through a process. Content is developed according to a set of learning objectives and is delivered using different media elements, such as text, graphics, audio and video. We try to provide as



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much learning support as possible (through explanations, examples, interactivity, feedback, glossaries, etc.), in order to make learners self-sufficient. However, some kind of support, such as e-mail-based technical support and guidelines are offered to learners.

Simple learning resources which are non-interactive resources such as documents, PowerPoint presentations, immersive virtual reality experience are provided to learners. We also provide a set of interactive content for self-paced e-learning which include text, graphics, animations, audio, video and interactivity in the form of questions and feedback and recommend reading and links to online resources, as well as additional information on specific topics. Different instructional techniques are used, such as storytelling, case studies, examples, questions and practice with reinforcement feedback.

The content for the VLE curriculum is divided into 6 modules that are grouped into units. These modules are:

Module 1: Fiber Preparation

- Cotton Storage and Sampling Method from Cotton Bale
- Blow Room
- Tuft Feeding Unit and Carding Machine

Module 2: Spinning Preparation

- Draw Frame
- Combing Preparation and The Combing Machine
- Roving Frame

Module 3: Yarn Spinning

- Ring Spinning Machine
- Yarn Winding Machine and Yarn Conditioning



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Module 4: Fabric Production

- Flat Knitting Technology
- Circular Knitting Technology
- Weaving Preparatory Process
- Woven Fabric Production

Module 5: Textile Finishing

- Pre-Treatment Processes
- Dyeing Processes
- Finishing Treatments

Module 6: Textile Clothing

- Pattern Making-CAD Department
- Cutting department
- Sewing department

In each module, there are the module units, like objectives, key concept definitions, required reading, self- assessment tests, recommended presentations and an immersive virtual reality experience. Depending on the VLE Module, a module can consist of the appropriate units presented below:

- Introduction: The module introduction should provide a brief introduction to all the key issues being discussed in the module. It is written in a manner that will motivate the readers to read on.
- Learning Outcomes: These are general objectives of what the user is expected to achieve by the end of the module.
- Definition of Concepts: This section is meant to help users identify key issues that have been covered in the relevant module.



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- **Immersive Virtual Reality Experience:** Each module consists of interactive Video 360 VR, an immersive virtual reality experience covered in the relevant module.
- **Recommended Readings/Videos:** Additional resources include links to online resources, recommended reading, web sites, articles, presentations and videos.
- **Self-Assessment:** These are the test questions which is very important to review the module and encourage users to think about further application of principles learnt in a specific module.

The content of each one of the Modules of the VLE was collectively collected by the partners using a proposed template. With the material collected from the partners, the technical team after developing the VLE and the necessary infrastructure of the VLE, delivered the educational training material, integrating the content to the eLearning course layout.

Instructional design is the systematic development of specifications using learning and instructional theory to ensure the quality of training. The aim of instructional design is to improve learner performance and to increase organizational efficiency and effectiveness. Trainers can easily adapt a set of provided resources to design and deliver classroom sessions using high-quality content which was developed and reviewed by international experts. Course lessons also can be integrated in facilitated courses on different e-learning platforms. The course adopts a facilitated and collaborative approach, using a combination of learning materials and asynchronous collaboration tools. The course is delivered through VLE, an open-source web-based learning platform.

Instructional designers (IDs) work with managers to understand the training goal, collaborate with subject matter experts (SMEs) to define which skills and knowledge need to be covered in the course. The appropriate instructional strategy is decided and the team is supported in defining delivery and evaluation strategies. IDs also are responsible for designing specific e-learning activities and materials that will be part of the course, including storyboard development. At this stage, content provided by SMEs



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from academies are pedagogically revised and integrated with instructional techniques and media elements which will facilitate and support the learning process. SMEs contribute the knowledge and information required for a particular course. They collaborate with IDs to design a course and define evaluation strategies.

3. Concept, Procedures and Guidelines of the VLE Development

In development stage, the e-learning content is actually produced, depending on the available resources. E-learning content may consist of only simpler materials (i.e. those with little or no interactivity or multimedia, such as structured PDF documents) which can be combined with other materials (e.g. audio or video files), assignments and tests. In that situation, storyboard development and the development of media and electronic interactions are conducted. The development of multimedia interactive content is comprised of three main steps: (1) content development: writing or collecting all the required knowledge and information from partners; (2) storyboard development: integrating instructional methods (all the pedagogical elements needed to support the learning process) and media elements and (3) courseware development: developing media and interactive components, producing the course in different formats for delivery and integrating the content elements into a learning platform that learners can access.

Web developers and media editors are responsible for developing self-paced courses; they assemble course elements, develop media and interactive components, create the courseware, adapt the interface of VLE and install the courseware on Web server. Servers/database programmers support us to install and configure systems. Technical support specialists are used to assist both producers and users of e-learning courses at every stage of this process.

Vir2TEX Virtual Learning Environment (<http://vir2tex.yasar.edu.tr/>) aims to provide a platform in delivering learning materials and developing collaboration skills,



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presentation skills, and academic skills to its target users. A framework for VLE design and delivery was developed in order to include relevant constituents which are required for the learning outcomes to be achieved.

This VLE-enabled learning activities are required to be differently devised in order to match the planned learning outcomes, yet being in accordance with the levels of learning of Bloom's taxonomy (Bloom, 1956), and motivate, engage, facilitate and support learners to go through the entire learning cycle (Kolb, 1984).

E-learning content is developed according to a set of learning objectives and is delivered using different media elements, such as text, graphics, audio and video. It must provide as much learning support as possible (through explanations, examples, interactivity, feedback, glossaries, etc.), in order to make learners self-sufficient.

Depending on the audience profile and the subject the ADDIE model approach is used. ADDIE is an acronym for Analysis, Design, Develop, Implement, and Evaluate (Branch, R. M., 2009). The model prescribes an audience and content analysis, then design the learning materials by deciding on the instructional, visual and auditory strategy, develop the materials with the appropriate authoring tools, implement the learning and finally evaluate it (Dick, W., & Carey, L., 1996; Leshin, C. B., Pollock, J., & Reigeluth, C. M., 1992). Kirkpatrick's model (2006) is used for evaluation of learning outcomes.

During analysis, the learning problem, the goals and objectives, the audience's needs, existing knowledge, and any other relevant characteristics were identified. In this stage, the learning environment, constraints, the delivery options, and the timeline for the project were also considered.

After a systematic process of specifying learning objectives, detailed storyboards and prototypes were done. The user-interface, content and learning materials determined based on the design phase was produced at the development phase.



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During implementation phase, the material collected was delivered to the target group. After delivery, the effectiveness of the VLE and training materials is evaluated. A quality framework for the evaluation of Vir2TEX Virtual Learning Environment is based on five dimensions defined by Gunawardena and Zittle (1997) that are seen as central to effective online learning. These dimensions are Social presence, Interaction, Cognitive strategies, Collaborative learning and Learner centeredness;

- The social dimension of online interaction provides the basis of establishing an environment of trust and motivation for effective learning. According to constructivist theory (e.g. Jonasson, 1998), learning is a social, dialogic process, which includes social negotiation of meaning as a central part of knowledge construction.
- Through interaction with content, peers, experts/instructors, and the technical interface, new information is acquired, interpreted and made meaningful.
- In the process of knowledge construction, cognitive strategies are complimented by the results of social negotiation of knowledge through articulation and dialog with peers, mentors and experts.
- Collaborative learning is the process of learners working together in order to generate deeper levels of understanding and to achieve a common learning goal that fosters sharing and exchanging knowledge and understanding. This collaboration aids in developing, testing, and evaluating different beliefs and hypotheses within learning contexts.
- Engaging the learner in interaction and collaboration as described above and thus facilitating individual and social knowledge construction, with a focus on learner-initiated inquiry and exploration. Synchronous and asynchronous online discussions are designed to facilitate communication and knowledge-sharing among learners. Learners can comment and exchange ideas about course activities or contribute to group learning by sharing their knowledge.

The principles described above were used as the theoretical framework for the teaching and learning strategies used in the Virtual Learning Environment, which are



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varied and aim to involve the users and make them responsible for their own learning, attempting to cater for the needs of a variety of learners.

The Vir2TEX Virtual Learning Environment encourages learners to participate in a variety of interactions with their peers and experts. This VLE has been designed to facilitate a strong social and learner-centered environment, meaning that learning is active and requires participation from all learners. Users need to be actively engaged in sharing, reading, reviewing, and commenting on others through VLE.

Learning materials are designed and developed for target groups of learners. Course difficulty is pitched to the group's educational level, and examples or exercises are selected from the learner's environment. Materials obtained through collaboration with other institutions. Although the basic content of shared teaching and learning materials stays the same, the examples, arguments or explanations is adapted to reflect the culture of the partner institutions. All shared resources are reviewed to determine what changes are needed and supervise adapting the resources to the needs of local learner groups.

To measure the effectiveness and efficiency of VLE the phase evaluation occurs throughout the entire instructional design process - within phases, between phases, and after implementation. Evaluation phase consists of (1) formative and (2) summative evaluation. Formative evaluation is present in each stage of the ADDIE process. Summative evaluation consists of tests designed for criterion-related referenced items and providing opportunities for feedback from the users. Revisions are made as necessary.



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4. References

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Annex I: VLE Content Template

(Introduction)

Training Description:

Learning Objective of the Training

After the completion of this training learners will be able to:

-
-
-

Instruction to learners:

-
-
-
-
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Training Content:

Module/ Topics Sections of the module	Learning Outcomes	Types of activity needed to achieve each outcome	Any self-assessment needed for that unit	Additional Materials (Reading Materials, Web Links, Videos...)
<p>Module 1: Title</p> <p>Units:</p> <p>Title 1</p> <ul style="list-style-type: none"> • • • <p>Title 2</p> <ul style="list-style-type: none"> • • • • 	<p>Learning Objectives:</p> <p>By the end of this module, learners will:</p> <ul style="list-style-type: none"> • • • • 	<p>Video 1:</p> <p>Summary video of key concepts</p> <ul style="list-style-type: none"> • • • • <p>Activity 1:</p> <p>Explanation....</p> <p>Objective of activity:</p> <p>Explanation....</p> <p>Materials needed:</p> <p>Source of the material...</p> <p>Reflection questions: (Forum Discussion)</p> <p>Discussion Topic and Topic Question(s)</p>	<p>Self-assessment 1:</p> <p>Entrepreneurial Qualities</p> <p>Explain...</p>	<p>Required Reading:</p> <ul style="list-style-type: none"> • • • • <p>Recommended Reading:</p> <ul style="list-style-type: none"> • • <p>Recommended Web Sources: (Video)</p> <p>(Web Pages)</p>
<p>Module 2: Title</p> <p>Units:</p> <p>Title 1</p> <ul style="list-style-type: none"> • • • <p>Title 2</p> <ul style="list-style-type: none"> • • • • 	<p>Learning Objectives:</p> <p>By the end of this module, learners will:</p> <ul style="list-style-type: none"> • • • 	<p>Video 1:</p> <p>Summary video of key concepts</p> <ul style="list-style-type: none"> • • • <p>Activity 1:</p> <p>Explanation....</p> <p>Objective of activity:</p> <p>Explanation....</p> <p>Materials needed:</p> <p>Source of the material...</p>		



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