



Education and Culture DG

Lifelong Learning Programme

RENOVA

R9

REPORT ON THE PROJECT'S FRAMEWORK

English version

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1. INTRODUCTION

The main aim of RENOVA project is to develop specific new skills and competencies in health management for nurses, having different levels and qualification, by using an innovative framework of ideas in the field of professional training, namely the project-based training in real and virtual training environment.

As the project proposal underlines, a relevant education is more important today than ever because today's world demands a workforce that understands how to use technology as a crucial tool for productivity and creativity. These skills include “information reasoning”, a process in which reliable sources of information are identified, effectively accessed, understood, contextualized, and communicated to colleagues. Furthermore, employers require workers to have the skills necessary to collaborate, work in teams, and share information across global networks.

eTraining has become a key process in the actual world, where learning is a must for both individual and institutions, necessary to continuously adapt to the needs of organization and society. Companies, NGOs and governmental institutions use eTraining as a powerful strategy to better leverage their human resources capital and to create new skills, to increase performance, competitiveness, and efficiency.

To be successful in the emerging eTraining space, however, education programmes designers and practitioners should shift from designing relatively static distance training solutions (such as class-room extended, course-based experiences, and reconfiguring existing courses and content resources) to digital, interactive, reusable objects that can be used in different virtual spaces, in multiple scenarios and instructional sequences. The challenge calls for highly personalized training solutions that help learners respond to their defined needs and allows them to manage their own training experiences.

The first assumption in order to get improved training scenarios is that courses must be structured as a sequence of activities, where information and knowledge comes in support of these activities, rather than a sequence of contents with application.

The training scenarios of continuous education programmes for nurses would include sequences of digitized curriculum, properly designed for a full alignment with the conventional education situations, on one hand, and with the training programme goals, on the other hand. The “**Report on project framework**” (R9 – a result of WP 3.2 of the RENOVA project) is grounding the process of building digitized content for learning, taking into account the current pedagogical theories and practices, focusing on the curriculum design, the trainers' roles, and the need to have the target group of trainees as reference in building relevant learning.



2. FRAMEWORK OF THE PROJECT

2.1. Instructional strategy

Instructional transfer of innovation

The strategy behind the learning experience that is aimed for within RENOVA project is rooted in the training models provided by two projects considered as a basis for transfer of experience and innovation:

ELEKTRA - Enhanced Learning Experience and Knowledge TRAnsfer

ELU - Enhanced Learning Unlimited

Both projects tackle the learning process from an innovative, utility-related perspective, aiming at creating an efficient, results-oriented and behavior-transforming training experience through:

- **Game-based learning** in science as a procedure connecting games and education/pedagogy within a digital learning game in order to facilitate the transforming of pure information to knowledge through real acting in problem solving tasks, practical challenges, experimental learning.

- **Digital interactivity** as a procedure that enhances learning opportunities by creating a stimulative environment that enables natural learning and facilitates education through entertainment.

The learning strategy developed in RENOVA fundamentals a **Project-Based E-learning training model** by transferring game-based learning facilities and instructional strategies and tools, as well as interactive training procedures within a stimulative, reality connected environment.

The profile of an efficient training activity raises a series of challenges for both the institution – in terms of capacity and readiness – and for the staff involved – in terms of preparedness, knowledge, skills and specific competences to cope with wide range of issues from communication and technical type to pedagogical and managerial ones. Usually, the new technologies are seen as having a great potential to surmount a set of limitations which characterise conventional instruction; therefore, when we are talking about quality and efficiency in education, it is expected that the learning experience and outcomes to be higher in the education situation assisted by ICT, being they offline, online, self tutored, in fully integrated virtual campuses and so on. In this view, a complete elearning experience has several attributes which rely on a proper design and implementation:

- the learning sessions with digital support, especially the long ones, must be as interactive as possible and must emotionally involve the participants into learning;

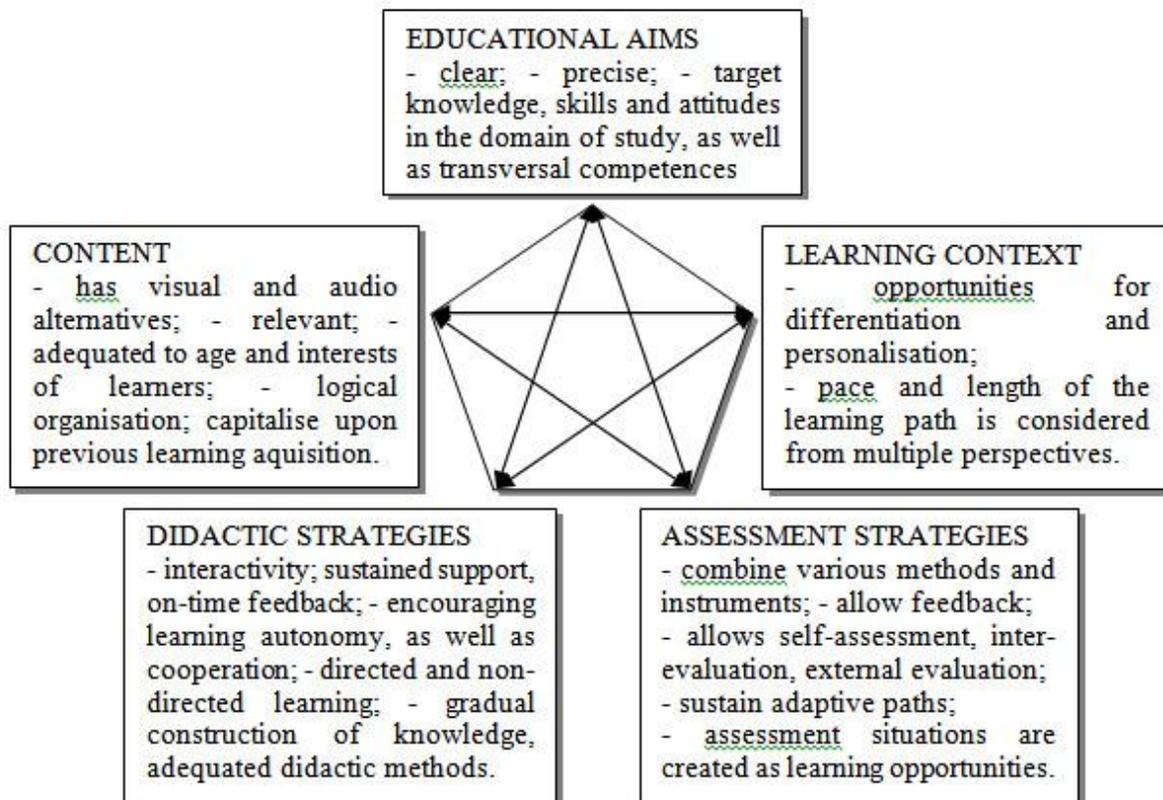
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- the new elements in the learning path, together with the innovative interaction ways have to be gradually introduced, and described based on the traditional, known experiences;
- the learning support and the feedback offered to participants must be in-time and on-topic; the tutor must monitor each learner' activity and to guide its learning towards achieving the education goals, as much as possible in the cognitive and socio-affective “zone of proximal development”;
- from the design phase, there must be specified some alternative specific ways to support participants with different learning rhythms and to include/encourage learners with different cognitive capacities;
- motivation of participants must be sustained through special methods and techniques;
- the learning rhythm must be constant, without long interruptions; accent should be put on varied, sufficient learning tasks, with clear deadlines;
- cooperation between participants (to collaboratively solve various tasks) must be encouraged and supported; equally, the autonomy in learning must be promoted.

Summarising, the following general scheme should be brought into attention of developers and instructional designers, but as well to the attention of course authors and support personnel involved in the elearning activities:

Figure 1. Added value of ICT in education and training: a view upon the curriculum components (Istrate & Velea, 2011)



2.2. Instructional design

At questions of whom?, which facts?, which moment, approach or instrument we owe the efficiency of teaching-learning process?, the education sciences literature reveals different factors which in certain conditions increase the quality and the efficiency of instruction. These studies reveal some elements, principles, stakes which has to be taken in account for an efficient instruction design. These principles represent a sort of conditions, attributes or instructional standards (of the largest generality) for the designing and evaluation of education& training activities from educational process viewpoint.

A consistent orientation toward learning objectives, a clear structure of content, a guided learning, clear working tasks which allow trainee to check his aknowledgements, pre- and post- thematic organizers, a varied difficulty background of exercises together with their solutions (complete, uncomplete or multiple), illustrations which contribute to content understatnding and text attributes which facility searching, organization and integration of knowledge are required, too.

From the specificity of presented elements, some important conclusions can be drawn, regarding to efficient education characteristics: a) first, the instruction can be conceptualised in pedagogical reference frame, its attributes can be creatively promoted/ uptaken in education& training practice; b) second, an efficient instruction represents not only the result of trainer

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knowledge, but his art/ability to use a strategy, method, procedure in proper moment and in a given situation (Gage, 1978; Bîrzea, 1998); c) third, the instruction approach requests decision making from trainer, an objective situation analyse and turning to account the professional competence and available resources; d) fourth, the educator has to consider/see the trainee as an autonomous person, with individual features with makes him different.

Key elements of design and development of digital education software, on which special emphasis should be placed, consisting of pairs of characteristics in various curricular components:

interactivity	↔	formative assessment
differentiated learning	↔	adaptability (levels of difficulty)
alternatives for content delivery	↔	adaptability (learning styles)
personalisation of learning	↔	adaptability (rhythm and contents)
clear and precise aims	↔	authonomy –control of own learning
directed and undirected learning	↔	authonomy – motivation

Some suggestions to tackle the training situation embedded into the digital education software represent the general design principles:

- to follow simultaneously the capacity building and the knowledge transfer;
- to facilitate actions of independent structuring of the content through a synergistic effort of directed and undirected learning;
- to choose appropriate forms of formulating problems against the priority objectives, to facilitate the manifestation of creative, independent thinking;
- to anticipate and organize the training of effective thinking strategies;
- to organize structures of content so as to vary the levels of mental activity;
- to create conditions and elements for effective instruction and learning orientation;
- to create didactic situations that allow the self-control.

Scenario building digital education software for training should be developed by considering the following general sequences or phases:

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Fig. 2: Steps in designing a training scenario

1	establishing clear objectives (under the overall goals / benchmarks / competencies in the formal curriculum)
	↓
2	development of tools to measure the level of objectives achievement
	↓
3	the analysis of trainees' characteristics for which the training sequence is designed
	↓
4	establishing of the instructional content - the theme and sub-topics, as well as the level of complexity and depth to be addressed
	↓
5	determining training strategies, didactic methods and working procedures
	↓
6	choosing and developing the support materials and the training activity scenario
	↓
7	determining the value and impact of the training sequence developed
	↓

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(procedures for) improvement of the project based on the data obtained

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2.3. Establishing the training objectives

Considering that the objectives should precisely describe what we expect to form to the learners as a result of their participation in the training situation created, their operational definition must include:

- a.) identification (name of the) observable behavior;
- b) description of the conditions under which the behavior must be manifested;
- c) criteria for acceptable performance.

For the cognitive domain, the hierarchy of behavior classes expected at the end of the training session is aiming, in order: knowledge (acquisition of information), comprehension, application, analysis, synthesis and/or evaluation, plus (according to the latest taxonomies) creation.

Thus, according to the type of expected results of instruction (for the cognitive domain - L. Anderson), we can distinguish between:

- Sequences targeting behaviors of knowledge/ remembering
- Sequences targeting capabilities to understand
- Sequences for application
- Sequences targeting analysis capabilities
- Sequences targeting capabilities of synthesis / evaluation
- Sequences developing creativity.

There are therefore identified the types of trainees' observable and measurable behaviors that are acquired, developed or changed, by using a sequence of the application. Ideally, for a given content, a digitized education software must be designed to develop skills on as many levels as possible.

Precise identification of the types of operational objectives pursued in a digitized education software on each of its sequences helps trainers to design appropriate training strategy when using that software and to correctly develop assessment tools to measure the objectives attainment.

In addition, establishment of transversal skills/ key competencies is a necessary step to develop more accurate scenarios, open to varied expected learning results.

2.4. Multimedia objects and associated didactic strategies

The variety of types of information - terminology, particular facts, conventions, classifications, criteria, methods, principles, laws, theories - which may be the subject of learning

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and which can be requested/ measured/ assessed, determine the consideration of special dimensions referring the contents and their organization, ranked below.

CO	Categories of content
CO01	facts, data, information, representations, images
CO02	life experiences
CO03	phenomena, processes, relationships
CO04	components, classification, structure, types, systems
CO05	features, meanings, properties, similarities, differences
CO06	arguments, demonstrations, functional principles, strategies for knowledge
CO07	concepts, categories, fundamental principles
CO08	hypotheses, theses, laws, models, concepts, theories
CO09	genesis, evolution, historical perspectives
CO10	epistemology and logic of knowledge and activity areas
CO11	operations and practical actions, methods, specific techniques, models and operational strategies
CO12	methods and techniques of intellectual work
CO13	motivations, attitudes, personal values

A step further in identifying composite elements of a digital education software in terms of content is the way in which content can be organized within the proposed learning unit. Alternative paths, determined by the learning style and cognitive characteristics of trainees (esp. adult ones), but also by the specific of the theme, can be set within the digital education software.

Structuring of the learning content is done by following a few directions and specific strategies, according to practical conditions in which the learning is occurring. We reproduce below the main possible approaches, indicative for an education software design and implementation.

OC	Organization of the learning content
OC01	Conjectural organization or organization by assumptions
OC02	Personalized organization of information
OC03	Sequential organization
OC04	Progressive organization
OC05	Taxonomic organization
OC06	Individual organization or by level
OC07	Organization as conceptual maps/ for information

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OC08	Focused organization
OC09	Organization by the phases of the teaching model
OC10	Organization upon the model of units of significance
OC11	Organization upon the model of differentiating information
OC12	Organization through models, drawings and other coded elements
OC13	Organization based on relevance tree
OC14	Thematic organization

By the type of the strategy employed, various distinctions could be made between the education software, applications currently used in education& training combining two or more strategies or aspects thereof:

- Software that favors inductive strategies/ approaches
- Software in which the predominant strategy/ approach is deductive type
- Software that fosters collaborative activities
- Software that allows independent learning
- Software in which learning is driven/ mediated by trainer etc.

Regardless of type, an efficient strategy is a optimal combination, within the logical sequences of learning, of specific didactic methods and procedures, aiming to reach certain learning objectives, organized by the type of contents, with the support of assessment methods, and related to the temporal axis.

The main methods that can be used in an digital education software are presented below in a manner that ensures the possibility of transferring conventional training projects to didactic scenarios for the development of digital education applications.

ME	Didactic methods
ME01	Exposure / static presentation (of theory)
ME02	Modeling and simulation
ME03	Conversation / dialogue between the user and application
ME04	Problem-solving
ME05	Demonstration
ME06	Practical work
ME07	Exploration/ discovery
ME08	Case study
ME09	Individual study
ME10	Conducted/ supervised experiments
ME11	Systematic observation

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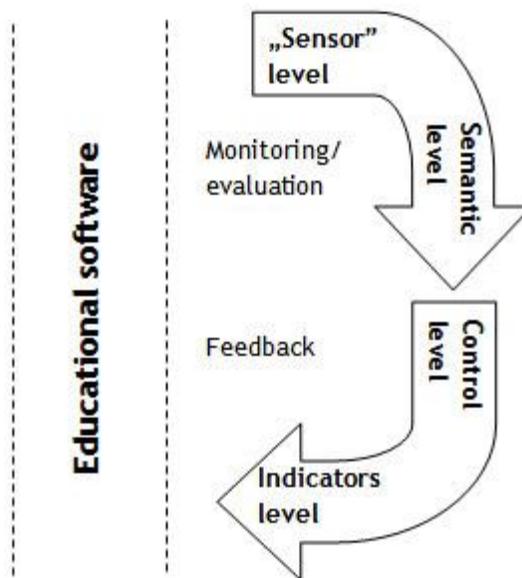
ME12	Debate
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The extent to which different methods of training and learning satisfy the requirements of didactic principles is an indicator to be used to create each sequence of „digitized” instruction, provided that such an approach should be geared towards ensuring a high degree of accuracy and performance of the final product related to the proposed educational objectives, having primarily in mind that it is more difficult to make further improvements and interventions.

PI	Instructional principles
PI01	Intrinsic motivation principle
PI02	The principle of active participation
PI03	The principle of personal approach
PI04	The principle of structuring
PI05	The principle of feedback
PI06	The principle of horizontal transfer
PI07	The principle of progress/ success
PI08	The principle of applicability
PI09	The principle of learning depth/ duration in time
PI10	The principle of effort per time unit

In the education process plan, a significant learning experience is designed to ensure continuity in the process of assimilation, through continuous feedback, taking into account the characteristics of the context in which learning takes place. A significant model for sequences of computer-assisted instruction (after Glahn 2007) consists of four layers of analysis and aims to capture information processing interaction of the learner in a context of training, on four levels: "sensor" level, semantic level, indicators and control levels.

Fig. 3. Digital support for computer-assisted instruction (Glahn, 2007)



The "sensor" level consists in all input elements that highlight the actions of the learner, monitoring his every move made within the education software. It is assigned to it a set of data that can give, at the most concrete level, the measure of participation to the proposed activities: the time spent in learning activities, the number of inputs, the number of learning tasks solved etc.

The semantic level collects data from the "sensor" level and integrates the into higher level information system, giving them a meaning. The aggregation sets of rules are called „aggregators”. Aggregators capture elements such as "work", "effort".

Interpretation of the information at semantic level is made depending on the learning context, personalized, at the control level.

The indicators level consists in providing information to the learner by translating it into representations appropriate and useful for improving the process of acquisition of information and skills development.

2.5. Roles and tasks of today's education practitioners

As many studies are indicating, the performance of the staff involved in elearning activities is highly correlated with the level of support received from the management, including the extent to which the procedures are regulated in specific documents and institutional policy papers. It is desirable that within the institution would exist a collaborative, stimulative environment, in which the personnel cooperate towards a better understanding of the nature of the tasks implied by the new technologies, as well as towards a more efficient practice using ICT and/or within virtual educational platform. Motivation, implication, involvement – these are the

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dimensions supporting a high quality work, which are occurring in time, in a both constant and dynamic socio-professional medium, online or offline.

Main categories of competences necessary for dealing with the elearning situations are four:

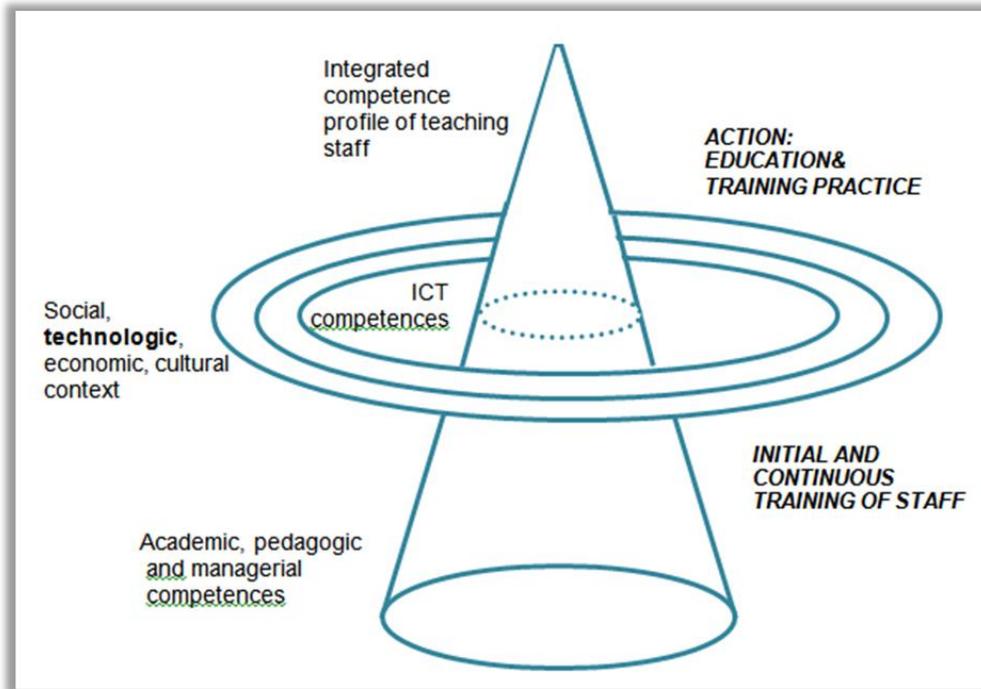
- academic – knowledge, abilities and attitudes specific to the study domain;
- pedagogical – knowledge and capacities to design, develop and evaluate a learning situation;
- managerial – skills necessary to organise learners, resources, time and tasks;
- technical – ICT/ digital skills.

The big challenge for the education practitioners acting in virtual environments is to surpass the novelty not only through adequately use of the technologies, but also through knowledge and use of adapted virtual education practices. The technical aspects consist in appropriate use of some instruments such as forum, blog, wiki, bookmarking tools, collaborative documents – which suppose some hours of hands-on training. The pedagogical dimension is much more complicated, regarding development of some specific competences towards: a learner-centred approach, collaborative learning, continuous support and counseling, online assessment, motivational techniques and so on. Here is a list of tasks and roles associated with education staff in the virtual environments:

- design of educational activities
- organisation of the instructional process and context
- analysis of resources and instruments available
- choose of didactic strategies and methods
- design of instructional alternatives
- prevention of interruption and distractions
- facilitation of learning
- ensuring good conditions for learning and communicating
- provoking thinking, challenging previous knowledge/ prerequisites
- formulating answers
- stimulating debates
- encouraging learners, motivating them to keep going
- suggestion of new paths for deep learning and alternative solution searching
- assistance, monitoring, assessment
- animating discussions, giving hints
- guidance, counseling
- prevention, management and capitalising upon education crisis situations
- decision and asking for opinion, proposal of themes and tasks
- coordination, organising groups and learning teams
- learning support
- moderation, communication.

Figure 3. Categories of competences for the teaching/ training staff

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A detailed list of roles and tasks of a trainer is difficult to build. Anyway, when looking at the most activities in the training space, it is quite clear that these roles and tasks are not linear, and therefore the skills and competences that a trainer should possess are almost impossible to be developed without continuous practice and without solid grounding into nowadays technological and pedagogical frameworks.

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Figure 4. Some roles and tasks of the education/ training practitioner



The characteristics of an efficient training situation in the 21st Century are highly correlated with a proper set of skills and competences that the education practitioners/ trainers should be acquainted with. A complete vision of the transformation in the set of skills necessary to education staff working on the virtual environments would include pedagogical and academic competences, filtered and refined through the present technological context, projected in a “savoir faire” which makes today the difference between good educators and the others.

The responsibility for continuous development firstly belongs to the training/ education practitioner, and this perspective raises a series of questions at individual level: what expectations have the trainees/ learners and the community from an educator?, what competences do I have to develop in order to successfully manage training situations and to correctly design, develop and evaluate adequate training situations?, what support do I need and who could offer it? Today, the professional of the education & training system is proactive, open to innovation, anchored in the technological, pedagogical/ andragogical and academic actualities, available to collaborating and sharing with colleagues.

2.6. Assumptions about the learner

The context in which the digital application would run has two dimensions: (1) psycho-cognitive characteristics of those the digital education software it is intended for and (2) learning time.

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(1) With regard to audience, the more precise prior knowledge, skills, motivation, skills and interests can be estimated, the more accurate and efficient the digital educational situations can be designed, with the most appropriate contents, methods and assessment tools.

Alternatively, sequences of initial assessment can be integrated to make a diagnosis of interests and level of knowledge of those who would use the software, in order to determine the possible learning paths tailored to the characteristics of the target group.

Digital education software remains a powerful tool for learning in conditions of use determined by psychological and pedagogical profile of the user (age, motivation, level of education, mental capacity).

(2) The temporal dimension of the themes/ units proposed learning is one of the possible axes structuring the content and the training methodology training.

Project based training is a “training by doing” environment where learners make things collectively, tackling real problems under the guidance of experienced practitioners, where they can share ideas with others hence working in teams, where tutoring help learners to reflect on their objectives and assumptions, where lecturing felicitously complete training by doing giving learners the knowledge they need to perform the activities that are the core of their work or interests.

Project-based training provides complex tasks based on challenging questions or problems that involve the learners' problem solving, decision making, investigative skills, and reflection that include trainer facilitation, the tutor no longer offers information but mediates the knowledge construction. Project Based Training is focused on questions that drive learners to encounter the central concepts and principles of a subject hands-on.

A key criterion that essentially contributes to the quality of the instructional process is the extent to which it addresses and meets the identified training objectives for the identified target learner groups. Learner information strongly impacts the development of instructional software. Factors that we explore in assessing learners include:

1. Demographical. What are the general characteristics of the learners? Is there (or not) uniformity to gender, age, instructional or cultural background?
2. Psychological. What is the cognitive structure, the level of cognitive development, intellectual ability, the cognitive style? What type of delivery is most appropriate for different (group of) learners?



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Annex 1. Description model for projects & project scenarios

The digitized scenarios will be designed upon the following scheme:

Project Title/ Theme:	
Authority (Institution):	
Audience:	
Project short description:	
Scope:	
Learning objectives (outcomes, at trainees' level):	
Key (instructional) strategies:	
Methods:	
Assessment:	
Description of activity:	
Effective practices/ processes:	
Integration/ sustainability:	
Evaluation and amelioration:	

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