

Digital Educational programme involving hEalth pRofessionals (DELIVER)

**RESEARCH AND EVALUATION REPORT INTELLECTUAL OUTPUT 3:
Curriculum and e-learning material led by Health Innovation Centre of Southern Denmark, Denmark**

Report authors: DENMARK

Report authors: Randi Lehmann Boesen, Morten Sønderskov Frydensberg, Linda Justi

Project Lead: Health Innovation Centre of Southern Denmark, Region of Southern Denmark

Participating institutions:

Università degli Studi di Udine (University of Udine), Italy
Fakulteta za Zdravstvo Angele Boškin (Angela Boškin Faculty of Health Care), Slovenia

Fundació TICS Salut (TICS Salut Foundation), Catalonia, Spain
Syddansk Sundhedsinnovation (Health Innovation Centre of Southern Denmark), Denmark

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1. ABSTRACT

Background:

This research report is part of the DELIVER project (Digital Educational programme Involving hEalth pRofessionals), a project under the Erasmus+ programme.

DELIVER is a partnership between project partners from Italy, Slovenia and Spain and Denmark, who lead the project. The overall goal of DELIVER is to *enhance the digital skills of Health Care professionals (HCPs)*. The target groups are *multi-disciplinary healthcare professionals and healthcare managers working in the hospital and/or community care sectors*.

DELIVER will produce five intellectual outputs:

IO#1 – Need analysis

IO#2 – Organizational analysis

IO#3 – Curriculum and learning material

IO#4 – Healthcare professionals' e-learning platform (HELP) for digital skills

IO#5 – Policy and implementation recommendations

This is the research report for IO#3.

The term 'Digital Transformation' denotes a set of technological, cultural, organisational, social, creative and managerial changes associated with digital technologies in all aspects of human life. This transformation is cultural in nature and affects the elements of society in all countries.

Healthcare has also been involved in the digitization process, from hospital care to community services. At national and international level, numerous actions have been proposed to investigate digital health and how to implement it for citizens (patients or caregivers) and workers (professionals, managers, politicians). Among these projects the DELIVER (Digital Educational programme Involving hEalth pRofessionals) was developed to enhance the digital skills of healthcare professionals (HCPs).

Key words

Digital competencies, digital technology, digitization of health care, e-health, digital solutions, digital support, upskilling, recommendations, policies, digital transformation

2. BACKGROUND

Background

This report covering the development and testing of the curriculum and learning material is part of the DELIVER project (Digital Educational programme Involving hEalth pROfessionals), which was a project under the Erasmus+ programme (<https://project-deliver.eu/>), including partners from Italy, Slovenia, Spain and Denmark, who was lead on the project.

The digital transformation of health in European health care systems is dramatically calling for an increased use of digital technology. Healthcare professionals (HCPs) are the core in accelerating the digital transformation of health and digital skills now and in the future are essential for them.

Thus, the overall goal of DELIVER was to enhance the digital skills of HCPs. The target groups are multidisciplinary HCPs and healthcare managers working in the hospital and/or community care sectors.

DELIVER project achieved the goals through five intellectual outputs (IOs):

IO#1 – Need analysis

IO#2 – Organisational analysis

IO#3 – Curriculum and learning material

IO#4 – Healthcare professionals' e-learning platform for digital skills

IO#5 – Policy and implementation recommendations

3. AIM

The aim of Intellectual Output 3 is that all partners will actively contribute to the development and testing of the curriculum and learning material. The test phase will involve a minimum of 80 HCPs in total. All partners will provide and present a local evaluation of the test period and provide measures taken or potential suggestions of challenges experienced.

IO3 projects educational program and e-learning tools:

The curriculum and eLearning material was tailored upon the needs analysis and the digital and organizational analysis described in the reports for IO1 and IO2. The development process was initiated at the Transnational Meeting 3 set in Odense, Denmark at which a work shop took place. In addition, ongoing dialogue and discussions went on with all partners at monthly status meeting.

4. METHODS

Methods used in developing a generic transnational educational program were taken into account local contexts and presenting them for the DELIVER partnership, thus investigating and uncovering its transferability to other European countries and securing promotion of European added value.

The development of the material was highly influenced by the needs analysis and findings of IO1 and IO2.

The potential areas for improvement of digital competencies among HCPs and HCMs were defined in the IO1 report:

- Attitude and mind-set
- User skills
- Communication
- Technological understanding and ability to trouble-shoot

The above four potential areas of improvement were translated into five specific topics (and an additional topics for digital leadership, as was the task in the project description). This assured the learning material adhered to the needs and wishes of the HCPs and HCMs in the test group. Below is the topics list:

- The big why
- Mindset (stay curious)
- Telemedicine and teleconsultations
- The emphasis on the relationship between HCP and HCM
- Ethical dilemmas

The structure of the educational material contains a lot of use cases and examples followed up with questions for reflections is also based on IO1 and IO2 findings. The demand formulated was for material that would not be too academic and theoretical, but applicable and relatable in everyday use at the clinic.

4.1 Milestones for IO3



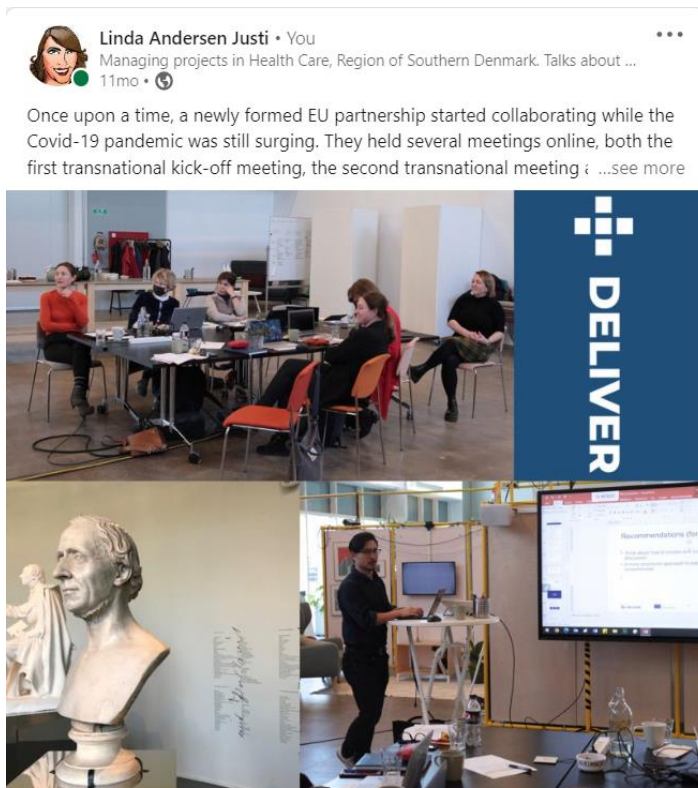
Reference group co-creation workshop, 15 March 2022

The Danish reference group met for a co-creation meeting in the roomy facilities of Health Innovation Centre of Southern Denmark. Top focus of the agenda was to execute a co-creation work shop to form the DELIVER education concept.

It was at this meeting a discussion of needs was initiated pointing to two top requirements: better training and opportunity to practice and focus on mind-set; leading to the following conclusion:

“The role of management and the organization is to facilitate WHY digitization makes sense and creates better conditions for getting to know the new technologies and reflecting on a targeted use of them.”

The advice given by this group was to have a high ranking leader explain the big WHY, subsequently leading to the creation of the big WHY films.



LinkedIn news: Partners visiting Region of Southern Denmark at Science Park, Odense. The visit also included a trip to the newly-opened museum of the Danish writer Hans Christian Andersen.

Transnational meeting 3 in Odense, 24 – 25 March 2022

First physical meeting with partners. TM3 agenda included first a presentation of results from IO1 and O2. Hereafter, discussions on goals for IO3 such as discussions on learning objectives, format, target groups and content, a workshop and presentations of insights and material from previous projects on digital competencies.

Conceptualization phase I and II, May thru October 2022



The PM team during a conceptualization session in “Pink Suite” at Videnbyen (situated in Odense), a community of modern offices and meeting facilities.

The first phase of conceptualization was executed during May thru September. A series of workshops and sprints constituted the conceptualization meetings held during this period.



The first draft and working concept with 7 themes, which eventually was scaled down to 6 using the so-called funnel method.

A second, follow-up meeting with three selected members of reference group was held with in order to qualify the conclusions of the analysis made from the initial workshops with the Reference Group and DELIVER partners. First sprint was held on 25 May with an agenda including points like: on-boarding of a colleague with didactics specialty, analysis results, framework for IO3, building blocks for the concept.

During this period, an ongoing and match of expectations with our partner, TIC Salut Social (responsible for IO4) was in progress in regarding interfaces and practicality in relation to the website. Additional agenda points treated at sprint meetings were: - Learning Objectives, learning tracks/elements, form/didactics and the task: Build a skeleton using the "learning blocks" from our inspiration catalogue.

The second conceptualization phase ran from September thru October 2022. Hereafter, a process of qualification by partners and select members of the Reference Group. The HR Management Academy in The Region of Southern Denmark joined in and provided us with freshly developed and qualified material from their education course "Management in Digital Transformation".

Design phase, production and design of educational concept, October thru December 2022

Knowing the importance of website user experience, the Danish PM team asked our in-house graphics designer to make a design manual in terms of colors, fonts, etc. and a responsive website lay-out.

Entry 1 December 2022: The skeleton for the concept is in place and lacks final qualification of partners and selected members of the reference group. An English guide to movies has been prepared with ping to explain "the big WHY". Dialogue

with TIC Salut Social (IO#4) has begun regarding interfaces and practicalities around the website.

March 2022: Design phase - Website, user interface (Dec.-Jan.) Mette Louise has made a presentation for the website with a focus on user-friendliness and accessibility (mobile/tablet), we are currently working with TIC Salut Social (ES) to develop a proto-type website for theme 1 , which can be tested from early 2023 in the partner group and reference group. There is a green light from digiS to use the films, the work with transcription and subtitles in all 4 languages on-going

Transnational Meeting 4 in Barcelona, 23-24 March 2023

Presentation of the current version of the e-learning concept¹. Also, the test protocol for the final pilot test was presented.

Final Pilot test, education concept, 80 HCPs, 8 May 2023

Testing of education concept among Healthcare Professionals.

Media development: films, PDFs, check lists

Preparatory work required an extensive amount of resources from the PM team. For instance, the films produced in Denmark necessitated adding of subtitles in all four languages: English, Slovenian, Italian, Spanish (Catalan).

Permissions were obtained from contacts in order to approve the use of films, actors and illustrations from fellow projects. Film produced by the Danish project digiS produced with Danish speak were firstly, transcribed and then translated by the Danish PM team and subtitles added in English, Slovenian, Italian and Spanish.

The big WHY films were produced in each country. PM team made a film and manual about the filming procedures and also shot the first film with a Danish Hospital CEO. Then followed Italy and Slovenia with their films. Spain did not produce a film due to changes of management in TIC Salut Social.

¹ The website was eventually modified and completed by the Project Management team and a professional web agency in Denmark.

4.4 Test phases

Relevant stakeholders were be highly involved in the test phase and three tests were conducted during the period 1 February thru 5 June 2023.

Name of test	Test design	Test subjects	Description
Prototype-test, selected modules	Didactics, form (less focus on content)	DELIVER partners, members of Reference Group (DK) and internal reference group	Mail link to test persons, informal questionnaire to fill out
Mini-test, all themes	<ul style="list-style-type: none"> • Primarily content • Usability & didactics • Form fit (different teaching scenarios) • Target group/potential users • Fit in relation to needs analysis 	DELIVER-partners, Appointed members of Danish Reference group, internal reference group	7-day test (described below)
Final test	<ul style="list-style-type: none"> • Content; Fit, validity, quality, applicability (learning outcomes), relevance • Usability & didactics • accessibility, duration and technical issues • Additional comments 	20 HCPs enrolled in the testing of the educational program in each respective country	4 weeks allocated for testing

4.4.1 Mini-test

A mini-test was conducted (7 days) with the purpose to see the teacher's perspective, concentrating on assessing content: form, usability & didactics, and to test the fit with target group. Test group were internal resources (Denmark) and reference group members. The methodology used was open ended questionnaire/matrix if testing on people outside the DELIVER-project. The findings were presented as an oral feedback at the TM4 in Barcelona. Below are the questions from the survey.

4.4.2 Questionnaire

Is the educational material's content accurate?

Is the educational material consistent and is there a clear common thread?

Are the themes' content consistent with the title?

Are the themes' coverage comprehensive in regard to the purpose of the educational material?

Is the educational material relevant?

- For students
- For healthcare professionals
- For healthcare managers

Is the educational material understandable and on an appropriate level considering the target group?

Is the educational material accessible and is it easy to get an overview of the material and navigate?

Is the material engaging and interesting?

Is the educational material suitable for

- Classroom teaching
- Individual studying
- Group based studying or work shops

Any areas for improvement?

Any issues with the material?



4.5 Target group and test scenarios for final test

There were 3 test scenarios to choose from in the final test of the e-learning concept. The scenarios were as follows:

Scenario 1

- **Class room setting (University/University College)**
- Test subjects: Students
- Method: Evaluation after course (questionnaire + qualitative feedback)
- Pros: Close to a real life setting, 20 respondent requirement, potential for good feedback
- Cons: Student sample, possible?



Scenario 2

- **Work shop setting/group setting**
- Test subjects: HCP and HCM
- Method: “think out loud meeting” (qualitative feedback)
- Pros: Includes the target group, appropriate setting, potential high quality feedback
- Cons: Time consuming (session + analysis), difficult to find 20 respondents



Scenario 3

- **Individual testing**
- Test subjects: HCP, HCM and students
- Method: Individual work with the educational material (questionnaire + focus group interview – 15/5 split)
- Pros: target group, easier work load
- Cons: difficult to recruit, no feedback on group work tools, potential for bad quality data



4.6 Test protocol

Partners were presented a proposed test protocol with 3 test scenarios to choose from. The first mini-test is by and for internal reference (not a part of the EU-report), its purpose being: to ensure we are on the right track before launching. Feed-back was given at the TM4 meeting. The test protocol was drawn up and shared with all

partners, describing the steps and requirements for the final pilot test of the educational material for the DELIVER project.

Test phase

- The test period is from 8 May 2023 – 5 June 2023.
- The feedback from the 20 respondents will be summarized in a feedback matrix. Each partner country is responsible for their own feedback matrix.
- The deadline for the summarized feedback matrix is the 12 June 2023.

Target group

Each country has to provide 20 respondents in the test phase. The test material will be in English, so a decent understanding of the English language is a requirement. A mixed population is highly recommended, covering both HCP and HCM

- Healthcare professionals (includes nurses, nurse assistants, midwives, physiotherapists, dietitians, general practitioners, hospital doctors and occupational therapists)
- Healthcare managers
- Healthcare students who has completed a substantial amount of their education like Post-graduate students.

Pilot test methodology

Considering the project partners' access to potential pilot testers, an adaptable approach to the pilot test methodology has been adopted. Below, two ideal test scenarios are described. However, qualitative feedback and the convenience of pilot testers are of higher priority. The educational material is extensive and with busy clinicians, the data collection process has to be flexible and on HCP/HCMs' terms.

Individual testing

1. Week1: Briefing meeting (Optional). If possible, it is suggested to arrange a briefing meeting with the pilot testers. The purpose is to reconcile the expectations for the pilot test, go through the instructions and feedback matrix. It is also a good opportunity to collect the declaration of consent form.
2. Week 1: After the meeting, send the material, feedback matrix, and instruction letter. Set the deadline to 3 week to go through the material.
3. Week 2: After two weeks send a reminder, ask for a status and if there are any questions.
4. Week 4: Collect the material. We suggest, that in this instance, it would relevant to do at least 5 follow up interviews, where you let them expand on some of their comments.

5. Week 5: Summarize the feedback and translate it to English. After completion, the matrix is send to DK.

Group based testing

1. Briefing meeting (Optional). If possible, it is suggested to arrange a briefing meeting with the pilot testers. The purpose is to reconcile the expectations for the pilot test, go through the instructions and feedback matrix. It is also a good opportunity to collect the declaration of consent form.
 - a. Send the material, feedback matrix, and instruction letter in advance. Give the pilot testers some time to go through the material. The feedback matrix can be used for taking notes.
 - b. Arrange a meeting with the pilot testers, where you go through each theme and overall evaluation of the educational material following the feedback matrix.
 - c. Summarize the feedback and translate it to English. After completion, the matrix is send to DK.

2. Arrange a meeting with the pilot testers. Individual, focus group or an entire classroom.
 - a. Give a brief intro to the DELIVER project and the purpose of the pilot test.
 - b. Go through each theme, maybe do some of the group based exercises, and then evaluate on the theme following the feedback matrix. Remember to collect to declaration of consent form. It is suggested to have a dedicated rapporteur and record the meeting. It is not necessary to do a transcript; however, quotes can be valuable feedback. If it is a classroom of students, the meetings can be spread out through several days.
 - c. Summarize the feedback and translate it to English. After completion, the matrix is send to DK.

The target group was discussed with all partners and specified ahead of the final pilot test. The specifications shown in the following diagram. The test was conducted over a period of 6 weeks, testing the purpose and ecological validity of the transnational educational program. Test groups included 20 respondents/test persons (requirement), 75%/25% split for HCP and HCM and position must be reported. Its aim was to test perspective of the target group and during the test create, as close as possible, a real life setting/class room setting.

5. Results

All test sites results were analyzed and used to fine-tune the educational program prior to its full deployment within the European partner's countries. The educational program consists of traditional teacher-student sessions, supervision and online teaching sessions. In the following is described the division of work, the tasks leading to the production of the intellectual output and the applied methodology.

5.1 Spanish (Catalan) pilot test: Outlines of the methodology employed

By Marc de San Pedro, PhD, TIC Salut Social

The objectives of the DELIVER pilot included the review of the contents of the 'E-learning Tool - Deliver' platform and the assessment of its usability. To conduct the pilot, we reached out to the Official College of Nursing of Barcelona, which successfully enrolled 11 professionals with the following profiles: Nurses, Nurse-Midwives, and Nurses in management positions.

On May 2, 2023, TICSalut hosted an initial online meeting with the participants to outline the objectives of the DELIVER pilot. Since the 'E-learning Tool - Deliver' website still required some usability improvements, we provided instructions for accessing all the training content on the website, along with the questions for the participants to answer. The nurses were given a month to review and analyze the website and to respond to the project's questions individually.

Following the submission of their responses, a closing online meeting was scheduled for June 1, 2023, to collect final remarks.

5.2 Slovenian pilot test

By Dr. Mirna Macur, Associate Professor, Angele Boskin Faculty of Health Care

In Slovenia two types of assessment of educational material were conducted: individual assessments and focus group. Individual assessments were provided by 11 high school teachers of Angela Boškin Faculty of Healthcare. Most of them were registered nurses by profession, the rest were physiotherapists and other healthcare professionals. We had a meeting on May 16th where DELIVER educational material were presented to them; intention of the educational material, its structure and content, as well as feedback matrix. On the meeting all questions were answered to them and issues clarified so they were able to fill feedback matrix on their own by the end of May 2023.

Focus group were organized with partners of the Angela Boškin Faculty of Healthcare: 4 from clinical environments (3 nurses in 1 physiotherapist) and 2 high-school teachers. 2 online meetings were organized: on May, 11, 2023 educational material was presented to them. They were asked to carefully read the material. On-line focus group was conducted on May 25, where feedback on educational material was collected in a group discussion.

From material gathered one feedback matrix was formed and sent to leading partners to Denmark in the beginning of June 2023.

5.3 Italian pilot test

By Alessandro Galazzi, PhD, RN, University of Udine, Udine, Italy

To conduct the pilot test the Italian team involved the students of the Master Degree in Nursing and Midwifery Science at the University of Udine. This group was chosen for its heterogeneity, in fact it was composed by nurses and midwives, working at clinical, educational and managerial levels. They also had different ages (from 28 to 54 years). On the 8th of May 2023, during a face-to-face meeting, the DELIVER project was presented to the students and asked them the consent to participate in the pilot test. Written informed consents were collected and how to evaluate the contents was explained.

During the pilot period, from the 8th May to the 5th June 2023, 30 (100% of master students) professionals were enrolled. In case of further information, the UNIUD co-investigators were available (they could be contacted via email, telephone or face-to-face appointment). Participants checked the website contents and filled individually the evaluation grid (Excel file). The individual evaluations were collected in a single file by one of the co-investigators, checked by a second one and sent to the lead partner for curriculum and learning material developing (Denmark). Once the pilot period was over, the participants were thanked and informed about future developments of the DELIVER project.

5.4 Danish Pilot Test

By Morten S. Frydensberg, cand.scient.pol, Region of Southern Denmark

The Danish pilot test was split into several phases related to Health Innovation Centre of Southern Denmark being the primary developer of the educational material. In the beginning of April and start of May Health Innovation Centre of Southern Denmark reached out through the reference group and other networks for the recruitment of potential pilot testers.

Internal design sprints were conducted in preparation for an internal Danish mini test conducted parallel with the DELIVER project partners. This mini test was conducted with five selected members of our reference group with extensive experience in teaching or the development of educational material and didactics. This was done from the 12th April to the 19th of April. The mini testers were included in the final test.

Based on the feedback small adjustment were made in preparation for the final pilot test. The final pilot test was conducted from the 9th of May to the 5th of June. The pilot testers were invited to two voluntary online briefing meetings which were conducted the 9th and 10th of May. Testers who were not able to participate in those two meetings were offered personal briefings. 23 pilot testers participated and included healthcare professionals, learning consultants, educators and health managers. Despite being asked to fill out the predefined feedback matrix, some of the participants from the organization chose to write a summarized and combined

feedback based on the material. All of the feedback were gathered and summarized in the combined feedback matrix in a collective effort from the working group in Health Innovation Centre of Southern Denmark. The participants were thanked and informed about future developments of the DELIVER project.

6. Curriculum

The transnational educational program was developed in close collaboration with all project partners and relevant stakeholders from what is referred to as *the quadruple helix*: educational institutions, the first and second healthcare sectors, and a regional entity.

This educational program consists of components on how to maintain a professional relationship with citizens via digital technologies, provide care via digital technology, support citizens in their use of digital health technology, adapt to new digital workflows, cross-sectorial digital communication, ethical issues, and benefits of digital health. The transferability of the educational program learning outcomes comply with the competency levels and taxonomy of the European Qualification Framework (EQF).

On completion of the educational program, HCPs will be able to:

- a. Perform telemedicine health care delivery
- b. Support and guide citizens in the use of healthcare technology and apps
- c. Assess the citizen's digital capabilities/literacy
- d. Utilize ICT for cross-sectorial collaboration
- e. Effectively implement digital solutions in health care systems
- f. Give peer-to-peer support and education

The education concept amounts to approx. 60 individual micro-modules under 6 themes; some are newly developed for the purpose, others are upcycled – i.e. a reuse of previously developed and qualified educational material which has been adjusted to the DELIVER e-learning format.

All material is free and available in 6 languages (English, Italian, Slovenian, Spanish and Catalan, and Danish) at the webaddress: <https://project-deliver.eu/e-learning-tool>

Target users of the material are professors, educators and trainers in healthcare. Material is applicable in education and learning courses for large or small groups or as a possible self-study. Please be aware that DELIVER consists of individual modules and NOT in a so-called CMS (Content Management System). Instead of the content being a chronologically structured learning process, it is to be perceived as an inspirational catalogue of themes and modules matching the needs uncovered by the analyses in DELIVER Intellectual Outputs 1 and 2.

For educational and training purposes, please note that each individual URL can serve as a direct bookmark to use for accurate reference (i.e. in a syllabus).

6.1 Content and Learning Objectives

Based on the analysis conducted in IO1 and IO2, the potential areas for improvement of digital competencies among HCPs and HCMs were the following:

- **Attitude and mind-set:** Open-mindedness, interest, curiosity, patience, courage – change of ways of thinking (across countries)
- **Reflection** on value of technology, awareness of ones shortcomings
- **Skills to use existing digital tools** and further training in communicating digitally and training colleagues and patients in using digital solutions.
- **Technological understanding** and trouble shooting.

The content and learning objectives of the educational program for Healthcare Professionals was layed out as the following:

- WHY – for clinicians
 - Digital technologies good for both clinicians and citizens.
 - See responses in qualitative data
- Video consultation w/ citizen
- Communicate through digital tools
 - Relationship building through a screen.
- GDPR and how to implement
- Technology understanding
 - Awareness of landscape of digital technologies (AI, VR, etc.)
 - Reflection on use of digital technology (TEKU-model)
- Awereness of digital competencies (definition)
 - Explain each competency
 - The competence wheel

The content and learning objectives of the educational program for Healthcare Managers:

- WHY: Why do we want to strengthen digital competencies? Also why we implement a specific technology.
 - why from directors, authorities and/or ministries, clinicians and patients (show that there is broad international focus on the area)
- How to communicate the WHY to clinicians (and patients)
- WHAT: Awareness of what digital competencies are?
- HOW:
 - The process of how to implement as in deep implementation/digitization - a concept or a pathway?
 - Clear roles and responsibility (monitoring and supervision)
 - Recommendations to join networks of HCM' s (how to integrate digitization in relation to other strategies)

This is a curriculum for professionals (from bachelor to PhD), conforming to the EQF levels 6, 7 and 8. The learning objectives have been qualified by Università degli Studi di Udine (University of Udine), Italy and Fakulteta za Zdravstvo Angele Boškin (Angela Boškin Faculty of Health Care), Slovenias.

At the end of the modules **Healthcare Professionals** will be able to:

- describe the importance of digital health for citizen and clinicians;
- organize and manage video consultation with citizens/patients;
- communicate effectively through digital tools;
- know regulation of GDPR;
- be aware of landscape of digital technologies (e.g., AI, VR);
- reflect on the use of digital technology (TEKU-model);
- know the ethical implication using digital technology;
- evaluate their personal level of digital competence (competence wheel).

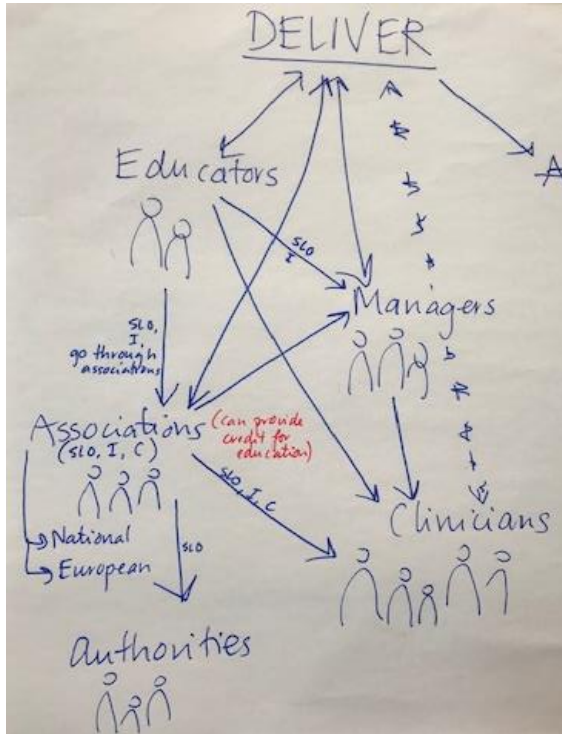
At the end of the modules **Healthcare Managers** will be able to:

- describe why is important the digital transformation from different points of view (citizen/patients, healthcare professionals, manager);
- explain the importance of digital health transformation to clinicians and patients/citizens;
- be aware of what are the digital competences;
- have a strategy (theoretical and practical) to implement digitization;
- identify roles and responsibility of managers and clinicians in the digitization process;
- integrate digitization with the other hospital strategies.

6.2 Target Group(s)

The following points were made in pointing to the target users of the material:

- Educators - provide lifelong learning for active clinicians and teach students
- Slovenia: Through Nurses' Associations and faculties, they provide training for clinical mentors 2 times per year
- Italy: similar to Slovenia
- Cataluña (Spain): provide training in data protection
- The managers – on various levels
- Suggestion: Focus on first movers and young managers
- Associations on both national and EU-level – an access point to address authorities, clinicians and managers.
- Considered the primary target group by Slovenia and Italy.
- Educate managers and clinicians directly (Slovenia and Italy)
- The clinicians – not direct target group, but they will have access to material on website



An original mapping from the TM3 work shop with partners which illustrates target groups for the DELIVER educational concept.

6.3 A generic transnational digital skills educational program

The curriculum is based on analyses of the current scientific literature, an analysis of the findings of the different DELIVER intellectual outputs, and finally on the opinions of experts in digital health partners who participated in the creation of the DELIVER project's outcomes.

A curriculum for teaching digital competencies based on DELIVER e-learning addresses all the challenging issues **in today's society: experts'** acceptance of new "digital" solutions; learning their new attitude towards novelty; knowing the social standpoint towards the "digital" solutions; knowing pro and cons of "digital" solutions; knowing traps of "digital" solutions; knowing available resources and good practices. All these important issues would be encompassed in the crated curriculum. Goal of such teachings would be to develop creative skills, expert knowledge, competences, as well as professional behavior and responsibilities with the use of digital technologies.

The tools prepared in DELIVER project and e-learning material would be interesting and relevant to students. The theoretical foundation for teaching digital competences are suitable and adequate, whereas the teaching of apps available in a given healthcare system is unique and must be connected with the apps applied in this particular country.

Overall speaking, being that this curriculum covers a generic transnational digital skills program, specific technology such as virtual meeting platforms (e.g. Teams,

Zoom, Webex, Google, etc.) and various apps among others and uses thereof are deliberately not included. The curriculum's focus is on educating digital literacy to prepare for lifelong learning of digital skills.

6.4 E-learning education concept (platform content)

Theme 1: Digital Technology in Healthcare

1. Facing the Digital Transformation
 - a. Explaining the big WHY
 - b. Better patient experience
 - c. Trends and expectations from citizens
2. Definitions
 - a. Digital transformation
 - b. What are digital competencies for healthcare professionals?
 - c. Potentials and challenges for the digital healthcare professional
3. Reflections before choosing a digital technology
 - a. What to consider before implementing a telemedicine solution?
 - b. Guide for reflecting on digital technology and healthcare practices
 - c. How does technology affect my work?
4. Tools and materials

Theme 2: Technology and Ethical Dilemmas

1. Approaching technology with ease
 - a. How to avoid the pitfalls of technology
 - i. Introduction to the module
 - ii. Ethics and healthcare technology
 - iii. Source / References
2. Dilemma cases
 - a. Home Measurement
 - b. Night surveillance
 - c. Breast screening
 - d. Netdoctor
3. Understanding data in a healthcare setting
 - g. The Role of Data in Healthcare
4. How to assess technology in an ethical way
 - a. Two tools for reflection and ethical assessment
5. Tools and materials
 - a. The quick and proper ethical technology assessment model

Theme 3: Match between Citizen and Technology

1. What is a good match?

- a. Definitions: eHealth and digital literacy, Usability, Health Literacy and Accessibility, Personal Health Literacy, Organizational Health Literacy
- 2. 5 central elements of the match
 - a. 1: The knowledge, resources and limitations of the citizen
 - b. 2: What are the physical settings in which the technology must operate?
 - c. 3: The options and limitations of technology
 - d. 4: The professional purpose of the technology
 - e. 5: How technology changes daily workflows and tasks
 - f. Case-examples: Emily and John
- 3. Tools for match-making
 - a. Tool: Life-oriented Technology assessment
 - b. Tool: Meeting Guide for Reflection Meeting
 - c. Tool: What is important to you?
 - d. Tool: The user journey game
 - e. Tool: Ask the citizen – and their relatives
 - f. Dilemma film: How do I assess whether home monitoring is the best solution?
 - g. Dilemma film: The balance between technology and people
- 4. Quiz
- 5. Tools and materials

Theme 4: Telemedicine and Video Consultations

- 1. Why remote health care services? titel er denne
 - a. What is telemedicine?
 - b. What is telemonitoring?
 - c. Clinical examples of telemonitoring
 - i. Case: Telemonitoring during pregnancy
 - ii. Case: The Tele-COPD program in Denmark
 - d. Telemedicine: Clinical and communication challenges
- 2. Video consultations – a guide for the healthcare professional
 - a. Physical environment and appearance
 - b. Planning the video consultation
 - c. During the consultation
 - d. Ending the consultation
- 3. Video consultations – a guide for healthcare managers
 - a. Building a framework for Video Consultations
 - b. Suitable for whom?
 - c. Questions for reflection
 - d. Tools and materials

Theme 5: The Digital Healthcare Professional

- 1. Are you ready for the digital age?

- a. What are the needs of the healthcare professionals in relation to digital technology?
 - i. Better training and abilities to practice
 - ii. Focus on mind-set
 - iii. Source / References
 - b. New roles and responsibilities as healthcare professional
 - i. Communicator
 - ii. Cooperator and coordinator
 - iii. Health coach
 - iv. Leader
 - v. Health expert and Academic
 - vi. Innovator
 - vii. Source / References
 - viii. NY: Questions f. reflections
2. The Digital Competence Wheel
- a. The Digital Competence Wheel: An interactive online tool
 - b. Four main areas of competency
 - c. Test yourself: The Digital Competence Wheel
3. Reflections on technology use
- a. A model for employees' reflections on use of technology
 - b. Reflections on technology use
 - c. Dialogue cards for reflections on technology and its effect in practice
 - d. Process tools
 - e. Case-example: The digital healthcare professional
 - f. User-centered approach to the technological development
4. Tools and materials

Theme 6: Digital Leadership

1. The role of a digital leader
 - a. Need for leadership in the digital transformation
 - b. Supporting the digital healthcare professional – as a manager
 - i. Case: The struggles of a healthcare manager striving to promote digitization
 - c. How to support healthcare professionals in using digital solutions
2. Motivation of the healthcare professional
 - a. 1. Autonomy
 - b. 2. Meaning
 - c. 3. Relatedness
 - d. 4. Coping
3. Supporting changes
 - a. Make it easy for the healthcare professionals to do the right thing
4. Skepticism & resistance

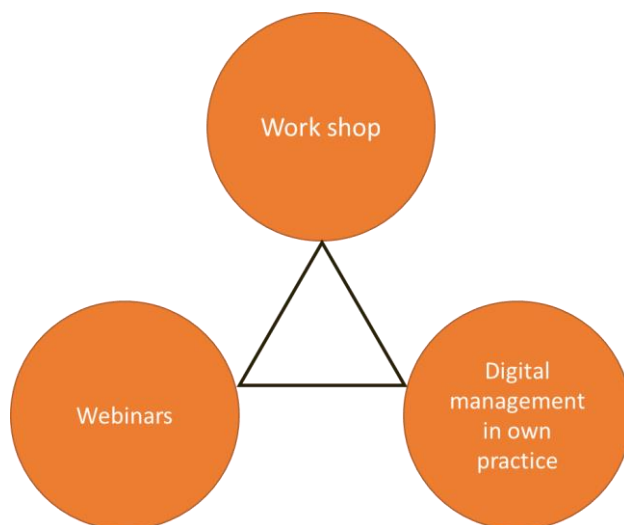
- a. Users and non-users
 - b. The power of non-users
 - c. How to learn from non-users
 - d. What have we learned on managing the digital transformation?
5. Tools and materials

The above content is available on the following web address: <https://project-deliver.eu/e-learning-tool> and adheres to the content description of IO4: the DELIVER e-learning platform.

6.5 Digital Leadership educational program

To illustrate the practical use of the DELIVER e-learning, an education concept was drawn up, by request, for the sixth theme, “Digital Leadership”. The concept is made to match the needs cited by members of the DELIVER Reference group along with a broader circle of municipalities.

The concept consists of three main parts:



Two physical workshops (one at the beginning of the course and one at the end), where the managers meet to exchange knowledge and experience based on the selected cases from their everyday life and selected themes. Four webinars, theory and the latest knowledge in the field are reviewed and practical learning in participants' own organization based on different practical actions throughout the course

Specifically, over 12 months the project aims to deliver:

- Design of education concept
- Presentation and material for two workshops, 4 webinars and support for practical learning
- Evaluation of the concept for further development and scaling
- Report with recommendations for setting up a program under UCL auspices
- Report with learning and knowledge gained in the project
- 30 municipal managers complete the training course and have acquired skills for digital leadership

Providers of the course will jointly develop and implement the content for the training course and the municipalities will participate actively, including feedback on content and form for evaluation and further development of the concept.

The competence course will strengthen managers' competences to drive the digital transformation for the benefit of both their organizations, the citizens and the healthcare system in general. Managers will gain a deeper understanding of the value of digital solutions, which will strengthen their prerequisites for making decisions about use in their organizations. The training course will equip managers to create meaning and strengthen employees' commitment to the digital transformation, which promotes successful implementation. Participation in the course provides an additional opportunity to establish networks with other managers, so that their access to sparring and knowledge sharing in this area increases. The project will also provide knowledge and recommendations for the creation of similar programs in the future.

7. Intellectual Output 3

The educational program learning outcomes comply with the competency levels and taxonomy of the European Qualification Framework. That said, we are aware that levels of complexity vary and that there are material with levels pertained as *introductory*. The explanation for this is that digital literacy among the users of the educational program will inevitably vary and the fact that the e-learning platform suggests “inspiration clicking” as opposed to a chronological use presupposes the user to apply a certain amount of curiosity in navigating on the website.

For professors and educators, the micro-modules are deep-linked on the website www.project-deliver.eu thus allowing them to add links to the syllabus.

7.1 Deviation from original scope

PM initiated an open dialogue with partner, TIC Salut Social in mid September 2022 to match expectations and have a talk about the interphases between our work. However, it became evident that circumstances had changed by the time the actual e-learning platform development commenced. The manning of the web developer had changed, for one and development processes dragging on resulted in deadlines being postponed.

During the Pilot Test, the eLearning platform had deficiencies which impacted the website user experience and thus, made navigation on the website difficult if not inaccessible. Consequently, users missed out on a large quantity of the e-learning modules.

Feed-back from the Pilot Test prompted the PM team to make a critical decision and take over the development of the DELIVER e-Learning website (IO4) from TIC Salut Social. The following e-mail was sent to partners 3 July 2023: “Based on the current structure of the DELIVER eLearning website and the feedback from the Pilot test, we concluded that a change was necessary in order to finalize Intellectual Output 4 successfully. The change has been determined in agreement with the Danish EU Office and in accordance with the rules of ERASMUS+ projects. TIC Salut Social have been informed of the change. To keep the record straight, TIC Salut Social is still a partner in the DELIVER project.”

The website was modified and completed by the Project Management team and a professional web agency in Denmark.

8. Conclusion

The DELIVER project has successfully developed and tested a transnational educational program and e-learning tools to enhance the digital competencies of Healthcare Professionals and Managers across European countries. The iterative development process, collaboration with partners, and feedback from pilot tests have contributed to the refinement of the educational material. The curriculum's alignment with EQF levels ensures its relevance and applicability for a diverse audience. Despite challenges in the web development phase, the project management team's proactive approach ensured the successful completion of the overall project goals. The report highlights the importance of adaptability and collaboration in addressing challenges and achieving the project's objectives.

The material is targeted at educators, healthcare managers, and clinicians. The report suggests focusing on first movers and young managers, as well as engaging associations at national and EU levels. The generic transnational digital skills educational material is now available on the www.project-deliver.eu webpage.

9. Sources

- IO1 DELIVER Report
- IO2 DELIVER Report
- Various DELIVER documents produced during the IO3 development and testing phases.