DigiCanTrain

Digital Skills Training for Health Care Professionals in Oncology

Project Number: 101101253

Deliverable 2.1: Need assessment report

Executive Summary

The DigiCanTrain project aims at up-skilling and re-skilling the healthcare workforce in the cancer care setting. This, in return, supports the development of effective, person-centered health care, digital cancer care services, and the use of contemporary digital health technology by healthcare professionals (HCPs). The purpose of the DigiCanTrain project is to design, pilot, and evaluate DigiCanTrain education and training programme for trainers, and clinical and non-clinical HCPs. The goal is to improve access to continuing professional education, increase digital skills, and the use of digital health technology by clinical and non-clinical healthcare professionals working with people affected by cancer.

This deliverable report describes the need assessment process conducted in Work Package 2 (WP2) to guide the DigiCanTrain curriculum development in Work Package 3 (WP3). The purpose of the WP2 need assessment is to summarise the results of two literature reviews (1, 2) and mapping study (3) with the results of the workshop to identify the competences underlying the DigiCanTrain programme (Digital Competence Framework) and to be used in the planning of the DigiCanTrain programme.

The needs assessment consisted of two systematic reviews; one on the digital skills of HCPs in cancer care (1) and the second on interactive digital health tools and technology in use in oncology settings in care delivery and communication with people affected by cancer with specific view on empowering the person with cancer (2), and a mapping study on continuing education in digital skills for healthcare professionals across EU Member States (3). The two systematic reviews were further complemented as preparation for the workshop and identification of core competences by a narrative review of literature on existing digital competence standards or descriptions, instruments used to assess the competence (also to be used in WP4 and WP5, pilot and programme evaluation)

and to provide a broader overview on digital health in interprofessional practice and communication. A consensus workshop was organised according to the project plan to develop DigiCanTrain Competence Framework for the curriculum to be developed in WP3.

Thus, systematic reviews and mapping of public documents and the mapping survey do not provide opportunities to produce very detailed country and profession-based information on digital competencies or education needs. Furthermore, the second review produced information on digital health products, such as apps and websites, but the digital interventions (tools used to monitor and report symptoms, apps used for activation and as reminders, websites, self-management support, care navigation support) were included on the summary without specific product related information. Thus, a comprehensive approach has been taken to capture the current state for the next phase. Moreover, as part of DigiCanTrain curriculum development and module production, information on the current state for the trainers and trainees will be available as all the partners (beneficiaries) will be engaged in the development and production of the learning content, including some country specific information as background.

Contents

1. Need assessment process

The need assessment step in curriculum development systematically focuses on learning about the needs for education and training.

A need assessment, in this project consisting of systematic reviews (1, 2), mapping study on EU Member States (3) and narrative overview of relevant literature provides information to:

Determine learning outcomes (also called educational objectives) based on a factual foundation and learners' needs. For the educators, it provides common understanding of the focus and key concepts underlying the curriculum and its implementation. After the Bologna process, most of the degree programmes and continuing education courses are competence based, and therefore as part of the curriculum need assessment and planning process.

Defining a competence framework is an essential aspect for curriculum development. The DigiCanTrain Digital Competence Framework guides not only on designing learning outcomes but also planning of the content and informs assessment of learning outcomes.

The needs assessment process was conducted in the DigiCanTrain project in close collaboration among the University of Turku (UTU), Turku University of Applied Sciences (Turku UAS), Finnish Institute of Health and Welfare (THL) and University of Galway (GALW, lead of WP3).

The needs assessment aimed to:

- identify the current continuing education opportunities for health care professionals among EU Member States;

- identify existing digital competence standards/frameworks and assessment tools; and

- to summarise previous research on digital skills of health care professionals in oncology and provide an overview on the use of digital interventions in oncology settings used for care delivery and communication with people affected by cancer and within the interprofessional team.

The results were then used to inform the development of a digital competence framework that guides the development of DigiCanTrain programme curriculum learning outcomes in the WP3 (Chapter 3). During the need assessment process project lead of a project funded by the same call (TRANSiTION) was consulted to ensure that overlapping in the two projects could be avoided and results complement each other's as both projects had similar tasks and objectives due to call requirements.

The mapping study in DigiCanTrain was planned originally differently than in TRANSiTION and therefore no overlapping was identified (DigiCanTrain task 2.4: Document analysis on public documents of EU Member States on continuing professional education and training for health care professionals). Also, a meeting was organised on systematic reviews to ensure both projects will reach the objectives without significant overlapping. In January 2024, two projects had a collaborative seminar to present the results of the need assessments of the two projects for the two consortiums. Representatives from HaDEA and DG Sante also participated in the seminar.

1.1 Continuing education in digital skills for healthcare professionals across EU Member States

A mapping study was conducted to identify existing opportunities for continuing education for HCPs in EU countries on digital skills (1). Originally, we planned to conduct document analysis on public documents of EU Member States. However, after a pilot search, this approach was not feasible due to limitations in

access to public documents, lack of strategies and public documents on HCPs' digital skills in the EU Member States and lack of documents available in English. Therefore, a survey approach was chosen and questionnaires were sent to a group of international experts with knowledge of the topic across twenty-seven EU countries. The recruitment process is described on the article available at https://www.ijhpm.com/article_4608_32b2c789de1914812a28f0fe3b291b96.pdf

A 'Brief Survey on Continuing Education of Healthcare Professionals' Digital Skills in the EU Member States' was developed for the mapping consisting of few open-ended questions related to the organisation of continuing education in digital skills in the expert's country of residence, the stakeholders involved, and the accreditation or certification of the education. It is important to note that there were no public documents or country-based detailed evidence available on specific learning needs of individual profession level or of different medical specialties. The focus on EU Member State level is on general approach on continuing education of healthcare professionals' digital skills.

The experts were identified through the existing research groups networks, from the research literature on the topic, and by contacting ministries, educational institutions, and other relevant organisations. Contact details were searched from national ministries, educational institutions, European-level organisations, and also identified from research articles. The survey was disseminated via e-mail. Experts were professionals working in the fields of digital health, healthcare, education, or held national positions. The survey data was accompanied by public documents provided by the experts, and those available in English from the EU Member States, European organisations and published research papers. The final data covers information from all EU countries except for Bulgaria and Luxemburg. Bulgaria and Luxemburg are not partners in the DigiCanTrain consortium. From 20 of the countries the information was provided mainly by experts and in five countries derived solely from only online sources.

The results show variations between countries in policy strategies, training organisation, and funding mechanisms. Educational institutions, employers, third parties, and national/regional authorities were found to be the main organisers of the digital skills training. Comprehensive accreditation systems seemed to be scarce, and practices also varied between countries. The study highlighted the importance of adopting a systematic approach to enhancing continuous professional development in digital skills, which would better ensure that professionals have equitable access to education, resulting in consistent, quality patient care across countries.

The key findings are summarized below. The link to the published article has been added to the 'Publications' page on the project website.

A brief summary of conclusions of the mapping

- Among the EU member states, there is great variation in digital skills development from more well-defined national strategies and those lacking systematic coordination.

- Differences in national-level coordination of digital skills development also exist.

- Some countries have placed a stronger emphasis on HCPs' digital skills with comprehensive strategies, specialised training, workforce development, financial incentives, and mandatory continuing education in the field.

- Educational institutions seem to play the most central role in offering the training, while in some countries, it is primarily the responsibility of employers.

The results highlight the need for the DigiCanTrain Programme development to adopt a systematic approach to enhance continuous professional development

in digital skills. This will ensure equitable access to education, resulting in consistent, quality patient care across countries and regions.

1.2 Systematic Reviews

Two systematic reviews were planned to inform the DigiCanTrain Programme curriculum development and identification of core competences (2, 3). The systematic review processes and main results are reported in more detail on the Deliverable reports 2.2. and 2.3. A short summary is provided here.

A brief summary of conclusions:

- Digital skills of health care professionals in cancer care are multifaceted and fundamental for quality cancer care in digitalised care environments, however, HCPs have reported lack of education opportunities.

- The areas to be addresses are information technology, ethical practice, human oriented relationship and digital patient education and support. There is a variety of reliable digital tools that can be used on empowering the people affected by cancer. Thus, these tools have limitations on availability to be used across country boundaries. But increased awareness of the tools supports identifying tools to be used and developed in one's owns country and increases the intention to use such as tools in clinical practice.

The results were used to inform the identification of core competence and development of DigiCanTrain Competence Framework and results with more details were presented for the consortium members participating in the workshop in Sep 2023. The results of the two reviews are now available at: https://doi.org/10.1177/20552076241240907 and https://doi.org/10.1007/s00520-024-08545-9

1.3 Summary of previous literature used to inform the development of the Digital Competence Framework

The results of the two systematic reviews informed the identification of core competences and the development of the Digital Competence Framework and will support the development of the DigiCanTrain curriculum in the WP3. Furthermore, the reviews were accompanied by a narrative review of literature on existing digital competence frameworks, standards, existing instruments used in assessment of digital competence and further capture digital interventions in oncology used for interprofessional practice. The systematic review on the digital skills of HCPs (1, D2.2) explored digital skills, but any instrument to measure digital skills were not identified. However, after the systematic review data retrieval took place, we were able to discover a new validated instrument through the narrative review of literature, to be used in the pilot and programme evaluation (4). In November, information on a recent report by the WHO was added to the deliverable report and also provided to project partners on Teams in December.

Due to rapid development and complexity of cancer diagnostics and treatments, it is not possible to capture all technological advanced in this field. However, summary of common digital interventions was created based on results of the systematic and narrative reviews and shared with the partners responsible for the development of DigiCanTrain curriculum and content production. Furthermore, materials produced in EU-funded project DELIVER (Digital EducationaL programme invoIVing hEalth pRofessionals) are shared with the partners (https://project-deliver.eu/e-learning-tool). The narrative review was conducted by two Turku UAS project team members (Virpi Sulosaari and Heli Mikkonen). For specific module development of the programme, partners have conducted and will continue to conduct further literature searches.

It is important to note that in the literature, several concepts have been used to describe technology that is used in communication, interprofessional collaboration, diagnostics, treatment and follow up care of people with cancer. According to WHO (2020) *digital health* is the systematic application of information and communications technologies, computer science, and data to support informed decision-making by individuals, the health workforce, and health systems, to strengthen resilience to disease and improve health and wellness. Digital health also includes tools and services where health technologies such as mHealth, wearable devices, telemedicine and telehealth are used. *Digital intervention* refers to the application, software and adoption of digital technologies in cancer care delivery from diagnostics to treatment and follow up. (5)

In this project, we define "Digital health" as tools and services that use information and communication technologies (ICTs) to improve prevention, diagnosis, treatment, monitoring and management of health-related issues and to monitor and manage lifestyle-habits that impact health (EU Commission, Public Health).

In October 2023, the World Health Organisation (WHO) published the second edition of classification of digital interventions, services and applications in health (6). This document categorises the different ways in which digital health interventions are used to address individual and health sector needs and advance health goals. The WHO organises in digital interventions, services and application under three axes (Figure 1). Table 1 provides a brief summary on classification of digital health interventions and digital services along with examples.

Figure 1: *The classification of digital interventions, services and applications (original)*
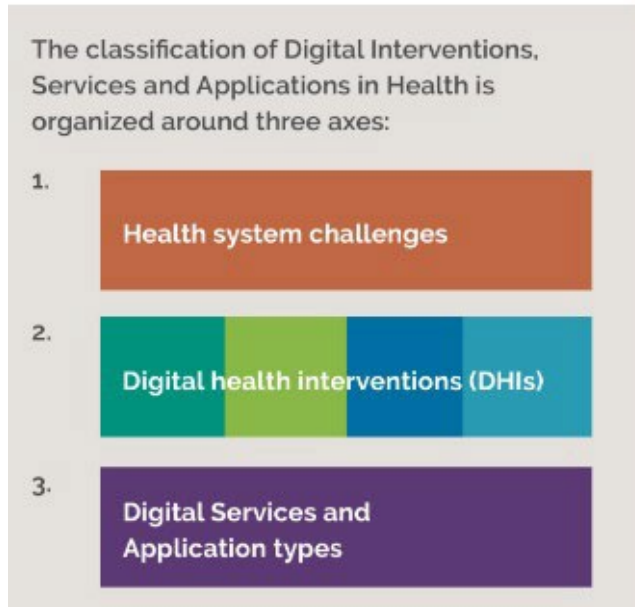

The classification of Digital Interventions, Services and Applications in Health is organized around three axes:

1. Health system challenges

2. Digital health interventions (DHIs)

3. Digital Services and Application types

TABLE 1. WHO (2023) CLASSIFICATION, EXAMPLES

Digital health interventions		
Interventions for Persons	Communication tools	Examples: targeted and untargeted communication, on demand communication
	Tools for tracking	Example: Access by the individual to own medical or summary health records
	Person based reporting	Example: Reporting of health system feedback by persons
	Financial transactions	Example: Transmit or manage out of-pocket payments
	Consent management	Example: provision and withdrawal of consent
Interventions for healthcare providers	Identification and registration of persons	Example: Verify identity
	Person-centred health records	Example: tracking of person's health status and services
	Health care provider decision support	Examples: prompts and alerts based according to protocol, check lists

	Telemedicine	Examples: consultation, remote monitoring, transmission of health data
	Health care provider communication	Example: Communication and performance feedback to healthcare provider(s)
	Referral coordination	Example: Manage referrals between points of service within health sector
	Scheduling and activity planning	Example: Identify persons in need of services
	Healthcare provider training	Example: Assess capacity of healthcare providers
	Prescription and medication management	Example: Track individual's medication consumption
	Laboratory and diagnostics imaging management	Example: Transmit person's diagnostic result to healthcare provide
	Healthcare provider financial transactions	Example: Verify individual's health coverage and financing scheme
	Human resource management	Example: Manage health workforce activities
	Supply chain management	Example: Manage inventory and distribution of health commodities

Interventions for health management and support personnel (health system managers)	Public health event notification	Example: Notification of public health events from point of diagnosis
	Civil Registration and Vital Statistics (CRVS)	Example: Notify, register and certify death event
	Health system financial management	Example: Manage and plan budget allocations, revenue and expenditures
	Equipment and asset management	Example: status and maintenance of health equipment
	Facility management	Example: assess to health facilities
	Person-centred health certificate management	Example: current health certificate information

Interventions for data services	Data Management	Examples: Data storage and aggregation, automatic analytics
	Data coding	Examples: Classification of disease codes or cause of mortality
	Geo spatial information management	Example: Map health and health indicator data to geographic data
	Data exchange and Interoperability	Example: Point-to-point data integration
	Data governance compliance	Example: Data privacy protection
Digital services and application		
	Point of service	Examples: Electronic medical records, diagnostics systems, laboratory information systems, pharmacy systems, telehealth systems
	HealthSystem/Provider administration	Examples: human resource system, patient administration system
	Registries and Directories	Examples: Facility management information systems, health worker registry

	Data Management services	Examples: analytics, knowledge management system
	Surveillance and Response	Example: Public health and disease surveillance systems

Summarising digital health and digital interventions in oncology for curriculum development

Cancer care is influenced by the wider context of healthcare both nationally and globally, and this in turn influences the development and delivery of cancer care. Digital care has become an essential component of health care and cancer care (7) and is rapidly emerging as an important means of managing cancer and other chronic diseases (8). The Covid-19 pandemic has shown the need and the potential of digitalisation to transform the way that healthcare is delivered (9,10). There has been significant growth and development in the Digital health technologies, such as mobile health (mHealth) apps, electronic health and medical records (EMRs), wearable devices, telehealth, and telemedicine, as well as personalized medicine over the past decade with acceleration during the recent years. (11) For the multidisciplinary teams, telemedicine and health technologies offer opportunities to track and monitor the care across the cancer care continuum, timely reaction to care needs, and early detections of complications, but also channels for interprofessional communication, information sharing, and clinical decision support.

Telehealth aims to improve the patient experience of care, improve the health of populations, reduce the per capita cost of health care, and improve the experience of providing care (12). When used effectively, digital interventions can support patients' knowledge, improve shared understanding, increase patients' satisfaction, and enhance their ability to manage emotions, make decisions, and progress in their treatment. Furthermore, they can increase social support and building a stronger therapeutic alliance based on shared knowledge and transparency between clinicians and people with cancer. (13)

In oncology, telehealth can improve access to specialised cancer care services, the clinical outcomes, safety of the care and provision of the care, but also the experiences, and QoL and decrease symptom burden of the people affected by

cancer. People with cancer often require a close and continual connection to the multidisciplinary team responsible for their care as well as efficient communication channels. Telehealth can offer this time-sensitive connection without compromising the quality of care (14).

Telecommunication technology has also improved delivery of care among populations with limited access to care. (15) Advances in digital interventions, such as devices and wearable technology, make the person with cancer the consumer of health care and empowers them to be the driving force of management of their own health (16). Digital interventions, such as education and psychosocial support interventions, have also been seen as suitable to be used among the caregivers of people with cancer (17).

Technology in cancer care draws from a wide field, from research tools (e.g. sequencing machines) to the primary modalities of treatment (e.g. medicines, surgery, and radiotherapy) and domains of imaging and pathology. In addition, many generic technologies, such as mobile phones and the Internet, form a key component of the cancer pathway. (18) Opportunities for digital interventions in oncology also include technologies that improve patient experience, safety, and patient-clinician interactions; technologies that improve clinicians' ability to diagnose and predict adverse events; and quality of care and research infrastructure to improve clinical workflows, documentation, decision support, and clinical trial monitoring (19). Digital health and interventions, when correctly used, can be a very useful tool to facilitate dialogue among healthcare professionals and meet the health and care needs of people affected by cancer. Teleconsultations may take place in a synchronous, asynchronous, or blended format.

Digital interventions have been tested in multiple clinical settings, demonstrating at least equivalency to in-person care and high levels of patient and health professional satisfaction. Digital interventions in oncology have also demonstrated to improve access to care and decrease health care costs (15). Examples of successful applications include cancer telegenetics, bundling of

cancer-related tele applications, remote chemotherapy supervision, symptom management, survivorship care, palliative care, and approaches to increase access to cancer clinical trials. (15).

A summary of Digital health tools and digital interventions is provided in Table 2. Thus, it is important to note that the DigiCanTrain programme does not have focus on specific technology or tool such as a product developed for interprofessional communication. The aim is to increase skills and motivation to take into use different types of digital interventions such as communication tools available in the given country.

Table 2. Summary of digital interventions in oncology (3, 10, 18, 19, 20−33)

Digital interventions for people affected by cancer	Digital intervention for clinicians in oncology
Telephone contacts, SMS messages Mobile apps Digital appointments with clinician Website (internet, dedicated websites) Patient portals Electronic care pathways for patients Electronic health records Electronic Release of Medical / Care information, Pathology and Radiology Results for patients Health IT applications and mobile apps (interactive care navigation app, automatic messages, contacts to HCP via app, remote monitoring PROMS and Quality of Life, health status)	Diagnostics, for example digital biomarkers, cytological, morphological, and genotypic phenotyping, genomic applications, store-and-forward image transfers Electronic care pathways for clinicians Electronic medical record systems and integrated alerts/notifications (algorithms) Remote monitoring devices (wearables) and apps Tumour boards and other multidisciplinary meeting software (tele- and videoconferences) AI (computer programming) in cancer diagnosis, drug development, and precision medicine Clinician decision support software Automatic triage on referrals

Wearables (physical data) to monitor performance status or physical functioning and activity Online therapeutic and counselling services (such as speech therapy) Virtual reality applications Video games	Interactive robot-assisted therapy Immunotherapy (altering T cells) Digital therapeutic interventions, such as virtual reality products to guide rehabilitation exercises and AI devices to guide medication In clinical trials, nanotechnology-based cancer therapies Digital therapeutics and connectable implantable devices Gene editing tools Biomedical devices In-home chemotherapy devices Online education and training

2. Workshop in September 2023

The online workshop (task 2.4) was organized as planned on 25th September 12:00-15:00 CET hours to identify and agree on the core competences as planned in collaboration with the WP3 lead. The competence framework is used to guide the curriculum development in the WP3. The main aim and result of the workshop was to discuss and refine a digital competence framework draft developed prior to the workshop. The invited participants of the workshop included all consortium partner representatives.

2.1. Preparation of the workshop

The main responsibility of the organisation was with Turku UAS and UTU with the University of Galway (GALW). The task group was set up to plan the agenda and a script on execution of the workshop. In addition, we consulted experts from the OUC and ICO.

Members of the task group

Sulosaari Virpi, Turku UAS, Mikkonen Heli, Turku UAS Virtanen Heli, UTU, Tuominen Leena, UTU, Franck Teija, Turku UAS, Bergfors Tarja, Turku UAS, Dowling, Maura, GALW and Browne Patrick, GALW (HSE), Poraharju Jenna, UTU, and Leino-Kilpi Helena, UTU.

The process of the workshop implementation

DigiCanTrain Workshop
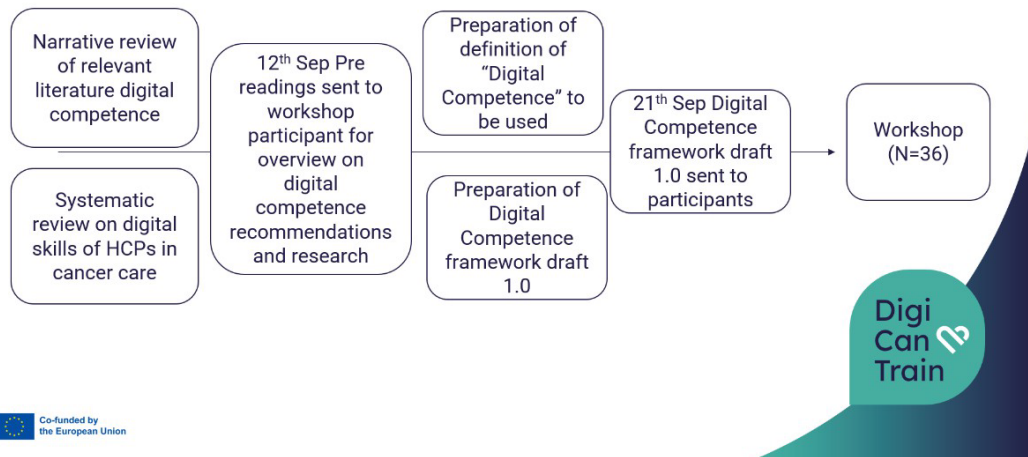
Pre-readings for the workshop participants

Pre-readings were sent to workshop participants to ensure the aims of the workshop were met and to enable efficient proceeding in the workshop.

Pre-reading materials:

EU Commission website: DigComp Framework (europa.eu)

The DigComp framework describes general digital competencies for all citizens, not specifically healthcare professionals (HCPs). However, all HCPs need to possess basic competencies and for that reason, we decided to have this website as one of the preparatory materials.

Konttila et al. (2018) is a systematic review published in a scientific nursing journal. Thus, the actual review is aimed at capturing HCPs competence in digitalisation in general. (34)

Longhini et al. (2022) is systematic review on Digital Health Competencies Among Health Care Professionals (35). This paper also discussed competencies in addition to tools used in assessing such competencies, and the effective interventions to improve them.

The first draft of the DigiCanTrain Competence Framework (version 1.0) was built upon the findings of the systematic reviews on digital skills of health care professionals in oncology and on digital tools in oncology, on the grounds of preparatory materials mentioned above, the digital capability framework of NHS, a qualitative study regarding aspects associated with health care professionals' digital health competence development (Jarva et al., 2022, 36), and digital health competence instrument validation study (Jarva et al. 2023, 4).

2.2. Delivery and results of the workshop

The workshop was held in the Teams platform with 36 participants (Appendix 1). The participants represented multidisciplinary expertise in cancer care, digital health education, and health care education. Therefore, they were able to share informed opinions on the context of digital competences in cancer care. The group work function of Teams was used to provide the opportunity to have more in-depth discussion and together add comments and revision proposals on the competence framework.

Preliminary results of systematic review (tasks 2.1, 2.2) were presented for the participants to support the collaborative work in the workshop and to inform the curriculum development.

Agenda of the workshop:

Picture 1: *Agenda of the meeting*

After the 10 minutes discussion was held and changes to be made on the definition of "Digital Competence" were agreed upon with voting.

Picture 2: *Revising the DigiCanTrain Competence Framework 1.0*

After 45 minutes a discussion took place with all participants and key areas to revise were recorded.

Results and feedback

Overall, the workshop was successful; all the partners had sent their representatives to the workshop, preparatory work was seen as meaningful and overall implementation of the workshop as effective and inclusive. All participants were able to share their opinions and participate. One conclusion of the workshop was that the framework needs some minor refinements during the next steps of the project. However, with the proposed revisions made, the framework can be used to guide the curriculum development and be published as version 2.0 on the project website.

The results of the workshop were shared with the partners on the project's internal platform.

For future use, it was seen as needed to include the perspectives of patient advocates. This will be possible with the project advisory board including patient advocates. We decided to ask for comments from the advisory board. After that, the final framework (3.0) will be updated on the project website.
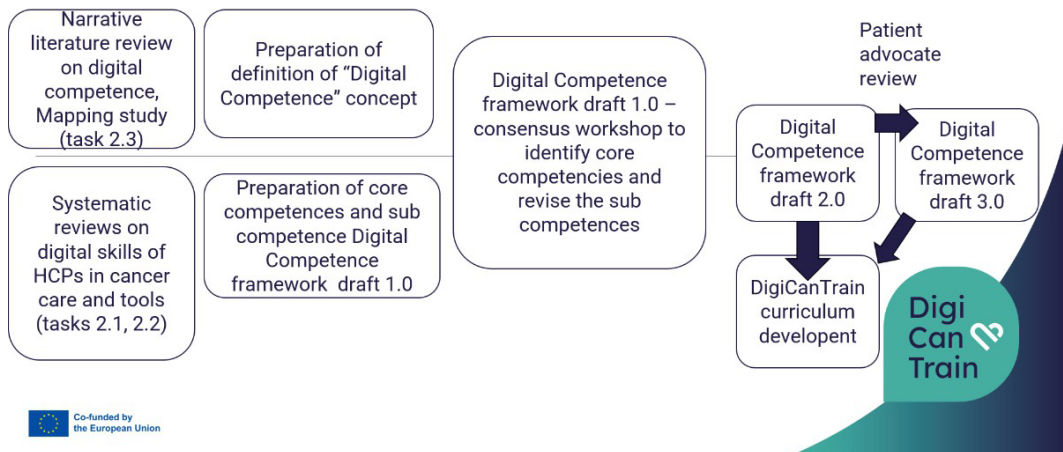
3. Development of the DigiCanTrain Digital Competence Framework

The development of the framework's first draft consists of four phases: I) extraction of competence descriptions and core competencies from results of a narrative review of the literature (EU commission publications/websites,

European or national guidelines/standards, published research on digital competence) and the two systematic reviews, II) extraction of knowledge, skills, attitudes, and values from the competence descriptions, III) drafting the core competencies of Digital competence in DigiCanTrain and IV) final draft of sub competencies divided into knowledge, skills and attitudes/values. The draft 1.0 was then reviewed by project partners, and revision proposals were provided.

The framework version 2.0 to be used in the curriculum development was subsequently prepared (Appendix 2) and will be used in the WP3 as part of the curriculum. However, a decision was made that later when the project advisory board meets, a review by the patient advocates will be conducted, and if needed version 3.0 will be finalized and updated for future use of the framework and shared with partners and on the website.

Picture 3: *Digital Competence Framework development*

Definition of Digital Competence in the DigiCanTrain project

Digital competence is defined as a combination of knowledge, skills, attitudes, and values in confident, critical, ethical and responsible use of digital health in cancer care to communicate, provide high-quality patient care and caregiver support, manage information, collaborate, create, share and implement evidence-based care in effective, appropriate and secure manner in all phases of the cancer care continuum.

Core competence domains

Competence domains
1. Communication, collaboration and participation,
2. Information technology and digital health systems,
3. Person-centred digital cancer care,
4. Digital interventions in cancer care,
5. Safety and ethics related to digital interventions and data management.

The sub competences consist of 17 knowledge items, 24 skills items and 12 attitude/value items (Appendix 2).

Next step is to build learning outcomes for the DigiCanTrain Programme based on digital competence domains.

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Appendix 1 Participant list of the DigiCanTrain workshop

Anita Narbro, Turku UAS

Virpi Sulosaari, Turku UAS

Terry Hanan, HSE (NCCP)

Jassi Aho, Turku UAS

Heli Mikkonen, Turku UAS

Maijastiina Rekunen, TUH, Fican West

Clara Madrid Alejos, ICO

Kadri Kööp, TTK

Stylianos Katsaragakis, NKUA

Tarja Heponiemi, THL

Daniela Cabutto, UOC

Katja Tähkä, CSF

Marta Gonzalez Morcillo, ICO

Anu Kaihlanen, THL

Silvia Romeo, ECO

Lotta Virtanen, THL

Johan De Munter, EONS

Leena Salminen, UTU

Franck Teija, Turku UAS

Maria Carme Carrion Ribas, UOC

Mervi Siekkinen, VARHA

Tarja Bergfors, Turku UAS

Pia Vihinen, TUH, Fican West

Sebastian Curcean, IOCN

Marika Skyttä, CSF

Richard Kelly, EONS

Helena Leino-Kilpi, UTU

Olga Romero Clara, ICO

Antoni Baena García, OUC

Lisa Marry, HSE (NCCP)

Leena Tuominen, UTU

Jenna Poraharju, UTU

Alvaro Jimber, ECO

Dowling, Maura, GAL

Patrick Browne, GAL

Deborah Moreno Alonso, ICO

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Digi Can Train

Digital competence is defined as a combination of knowledge, skills, attitudes, and values in confident, critical, ethical and responsible use of digital health in cancer care to communicate, provide high-quality patient care and caregiver support, manage information, collaborate, create, share and implement evidence-based care in an effective, appropriate and secure manner in all phases of the cancer care continuum.

Competence domains

1. Communication, collaboration and participation,
2. Information technology and digital health systems,
3. Person-centred digital cancer care,
4. Digital interventions in cancer care,
5. Safety and ethics related to digital interventions and data management.

Digital health and care refers to tools and services that use information and communication technologies (ICTs) to improve prevention, diagnosis, treatment, monitoring and management of health-related issues and to monitor and manage lifestyle-habits that impact health (EU Commission, Public Health); **Digital intervention** refers to application, software and adoption of digital technologies on cancer care delivery from diagnostics to treatment and follow up. **People *affected* by cancer** also includes family members, significant others and caregivers.

Competence domain	Knowledge	Skills	Attitudes and Values
Communication, collaboration and participation	understands the different nature, purpose, and function of digital communication, collaboration and participation. knows different types of digital communication, collaboration and participation strategies, forms, and channels for health care professionals (HCP) and used in HCP and patient communication.	uses digital technologies to communicate respectfully and professionally. adapts communication strategies to specific audience or to specific target group / context. uses digital tools and technologies for professional and interprofessional collaborative processes, and for co-construction and co-creation of resources and knowledge. participates actively in and across digital networks locally, nationally and internationally. provides sufficient and relevant information, and addresses concerns according to the needs of all people affected by cancer within digital health. tailors' information according to patients' and caregivers' situation and needs. uses a range of digital technologies and tools in empowerment, teaching, coaching, mentoring, and supporting patients', caregivers and other health care professionals.	demonstrates positive, sensitive, and professional attitudes and behaviours in communicating, collaborating, and participating in digital health. possesses awareness of digital divide in the community and society on digital environments and tools. demonstrates willingness to participate in society through the use of public and private digital health.

Digital health and care refers to tools and services that use information and communication technologies (ICTs) to improve prevention, diagnosis, treatment, monitoring and management of health-related issues and to monitor and manage lifestyle-habits that impact health (EU Commission, Public Health); **Digital intervention** refers to application, software and adoption of digital technologies on cancer care delivery from diagnostics to treatment and follow up. **People *affected* by cancer** also includes family members, significant others and caregivers.

Competence domain	Knowledge	Skills	Attitudes and Values
Information technology and digital health systems	knows relevant evidence-based online information sources in oncology and in own specialty (for example radiation oncology).	interprets and critically evaluates health data, information, and digital content.	intends and is motivated to use and promote to use health information technology and digital interventions in provision of cancer care services.
	knows how to articulate information needs and devise a plan for searching information and content from digital environments	evaluates trustworthiness, credibility, and applicability of digital health information.	demonstrates willingness to learn and explore opportunities of and for digital health.
	understands how copyright and licenses apply to use of data and information, digital content and knows of required legislation.	operates in various digital platforms and environments.	
	knows common benefits and barriers on the use of digital health and interventions.		
	is aware of the environmental impact of digital technologies and their use.		

Digital health and care refers to tools and services that use information and communication technologies (ICTs) to improve prevention, diagnosis, treatment, monitoring and management of health-related issues and to monitor and manage lifestyle-habits that impact health (EU Commission, Public Health); **Digital intervention** refers to application, software and adoption of digital technologies on cancer care delivery from diagnostics to treatment and follow up. **People *affected* by cancer** also includes family members, significant others and caregivers.

Competence domain	Knowledge	Skills	Attitudes and Values
Person-centred digital cancer care	understands the basics of digital information and services used to inform health and care related decisions and actions for and with the patient and caregivers/family members. knows digital health technology of own specialty used in direct patient care and caregivers' support. understands the principles of person-centred care in digital cancer care.	evaluates the patient's and caregiver's/family members digital capabilities, resources and willingness to use digital health services. promotes the patient's and caregivers' / family members capabilities, resources and willingness to use digital health services, for example by empowerment, encouraging, improving knowledge, and addressing their concerns. uses a range of technical devices and software in a professional context relevant for own specialty and multidisciplinary cancer care and choose the best interventions and tools for the situation. evaluates the patient's situation through digital means; obtains relevant patient information during digital symptom assessments, ensures the accuracy of patient medical history and medication details. incorporates the patient's and his/her caregivers/family members empowerment and needs on delivering digital care. creates and edits digital content targeted for patients and caregivers/family members in different formats with participation of patients through co-creation.	promotes equality and effectiveness of digital cancer care services and communication for people affected by cancer. values person-centred care regardless of the environment.

Digital health and care refers to tools and services that use information and communication technologies (ICTs) to improve prevention, diagnosis, treatment, monitoring and management of health-related issues and to monitor and manage lifestyle-habits that impact health (EU Commission, Public Health); **Digital intervention** refers to application, software and adoption of digital technologies on cancer care delivery from diagnostics to treatment and follow up. **People *affected* by cancer** also includes family members, significant others and caregivers.

Competence domain	Knowledge	Skills	Attitudes and Values
Digital interventions in cancer care	knows digital interventions and tools relevant for own practice and patient care. updates own knowledge regularly on developments of digital interventions relevant for own practice. knows fundamentals of AI, its latest developments and possibilities for clinical application in own specialty (for example oncology surgery).	demonstrate technical skills in efficient and correct use of digital health interventions and tools. critically evaluates the feasibility of digital tools in cancer care. identifies and resolves technical problems in the digital environment with IT and/or technical support.	sees digital solutions as important part of one's work. demonstrates a positive attitude in seeking out appropriate and innovative digital interventions. demonstrates willingness to learn new digital interventions.

Digital health and care refers to tools and services that use information and communication technologies (ICTs) to improve prevention, diagnosis, treatment, monitoring and management of health-related issues and to monitor and manage lifestyle-habits that impact health (EU Commission, Public Health); **Digital intervention** refers to application, software and adoption of digital technologies on cancer care delivery from diagnostics to treatment and follow up. **People *affected* by cancer** also includes family members, significant others and caregivers.

Competence domain	Knowledge	Skills	Attitudes and Values
Safety and ethics related to digital interventions and data management	understands existing and potential risks and threats in digital health environment. knows the safety and security measures of own organization on digital interventions, data ownership and data management. understands and acts upon appropriate guidelines, protocols, regulations, and safeguards in the use of digital health data and content to meet legal, ethical, cultural and security rules, requirements, and expectations. understands the guidelines, regulations and best practices when working with personal, public, professional and/or confidential digital information, data, and content.	ensures privacy, conducts technology checks needed and creates technology back-up plan. protects privacy and personal data of patient and caregiver/family member in the digital environments. recognises and acts upon situations and events that might compromise personal, professional, or organisational security in digital work environment. organises, stores, and retrieves data, information, and content in and from digital environments according to required legislation. shares data, information, and digital content through appropriate digital technologies with the appropriate safety and ethical precautions.	provides collegial and organisational support for building positive experiences on digital cancer care. demonstrates ethical, positive and appropriate attitudes and behaviours in relation to digital identity, wellbeing and safety of self and others.

Digital health and care refers to tools and services that use information and communication technologies (ICTs) to improve prevention, diagnosis, treatment, monitoring and management of health-related issues and to monitor and manage lifestyle-habits that impact health (EU Commission, Public Health); **Digital intervention** refers to application, software and adoption of digital technologies on cancer care delivery from diagnostics to treatment and follow up. **People *affected* by cancer** also includes family members, significant others and caregivers.

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