



Concept of the Updated Healthcare Curriculum

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Contributing partners	Consortium

1. Introduction and purpose of MS1

This document presents the **MS1 Concept of the Updated Healthcare Curriculum** developed within Work Package 1 of the Digi-CHange project.

The MS1 concept is not a stand-alone theoretical document. It is developed as a **needs-based and evidence-informed curriculum framework**. It links three key stages of WP1:

1. the diagnostic stage, represented by the **D1.1 Needs Assessment Report**;
2. the development stage, represented by the updated and newly developed partner syllabi/modules;
3. the quality-assurance stage, represented by external peer review and follow-up actions.

The purpose of this document is therefore to show how the needs identified across Georgian and Ukrainian beneficiary higher education institutions have been translated into a structured curriculum concept for medical and nursing education. The document also prepares the basis for further curriculum mapping, pilot implementation and quality assurance under the next stages of WP1.

The MS1 concept does not replace the later D1.2 curriculum map. Instead, it provides the agreed conceptual framework that connects the needs analysis with the updated curriculum materials and supports further implementation.

2. Evidence base: link with the D1.1 Needs Assessment Report

The Digi-CHange **D1.1 Needs Assessment Report** provides the analytical foundation for the updated healthcare curriculum concept. The report identifies the current state of digital health integration in the beneficiary institutions and clarifies why curriculum development is necessary.

The Needs Assessment shows that digital health integration in medical and nursing education is present, but remains uneven, fragmented and insufficiently systematic. It identifies several key gaps across the Georgian and Ukrainian beneficiary higher education institutions, including:

- fragmented and inconsistent integration of digital health within medical and nursing curricula;
- limited exposure to digital clinical workflows;
- limited use of simulation-based digital learning;

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- insufficient support for digitally enabled interprofessional education;
- lack of structured faculty preparation in digital-health pedagogy.

Based on these findings, the Needs Assessment defines priorities for the project: structured integration of digital-health competencies into medical and nursing curricula, systematic faculty development in digital pedagogy and digital simulation, and establishment of dedicated digital learning environments to support digitally enabled clinical education.

The Needs Assessment also identifies opportunities for sustainable reform. These include strong student motivation, faculty openness to innovation, existing digital infrastructure, and supportive national and institutional policy environments in Georgia and Ukraine.

This MS1 concept responds directly to these findings. It proposes a curriculum logic that moves digital health from isolated references within individual courses toward a coherent, progressive and competency-oriented learning pathway.

3. From needs assessment to curriculum response

The updated healthcare curriculum concept is structured around the gaps, priorities and opportunities identified in the Needs Assessment Report. The table below summarises how the main findings are translated into curriculum-development responses.

Needs Assessment finding	Curriculum response in the updated curriculum concept
Digital health is fragmented and inconsistently embedded in medical curricula.	Development of dedicated and updated courses/modules addressing digital health foundations, health data, clinical decision-making, digital tools, telemedicine, AI and digital diagnostics.
Digital health is minimally represented in nursing curricula.	Inclusion of digital-health learning outcomes and digital professionalism, privacy, ethics and patient-safety content in nursing-related curriculum materials.
There is no coherent digital-health learning pathway across study years.	Use of the Digi-CHange “knowledge chain” approach to organise learning progressively from foundational digital health literacy to applied clinical decision-making and responsible professional use.
Students have limited exposure to EHRs, telemedicine, CDSS, AI-supported care and digital workflows.	Integration of EHRs, telemedicine, digital documentation, AI-supported outputs, clinical decision support, remote monitoring and digital diagnostic tools into updated syllabi/modules.
Digital simulation and clinical digital workflows are insufficiently used in teaching.	Introduction of case-based, scenario-based, simulation-oriented and Digi-CHange Lab-supported learning activities.
Interprofessional medical–nursing digital learning is weak.	Identification of opportunities for shared cases, team-based digital-health activities and future pilot implementation linking medical and nursing learners.
Faculty need support in digital-health pedagogy and assessment.	Development of structured teaching formats, assessment rubrics, case-based learning tasks and future faculty-development links with Digi-CHange Labs and pilot implementation.
Digital learning depends on individual initiatives rather than coordinated institutional systems.	Development of a shared curriculum concept and common curriculum logic across partner institutions, while allowing institutional adaptation.
Institutional readiness is uneven across partner institutions.	Development of scalable and adaptable curriculum components that can be implemented according to national, institutional and programme contexts.



This needs-to-response logic is central to the MS1 concept. It demonstrates that the curriculum concept is not generic, but is directly grounded in the needs identified during the first stage of WP1.

4. Rationale for the updated healthcare curriculum

Healthcare education is changing because healthcare practice itself is changing. Digital technologies increasingly shape how clinicians communicate, document care, access information, monitor patients, interpret diagnostic data, collaborate across teams and make decisions.

Digital health is therefore not only an additional topic to be added to a curriculum. It changes the environment in which clinical competence is applied. Future physicians, nurses and healthcare professionals need to understand how digital tools influence clinical reasoning, patient communication, patient safety, professional responsibility, ethics, confidentiality, accountability and teamwork.

The Needs Assessment confirms that partner institutions already are motivated, existing infrastructure and examples of innovation. At the same time, it also shows that digital health education often remains dependent on individual initiatives, rather than being organised as a coherent learning pathway. This creates a gap between the digital realities of healthcare practice and the preparation offered within medical and nursing education.

The updated healthcare curriculum concept responds to this gap by proposing a structured approach to digital health integration. It aims to support partner institutions in moving from fragmented digital-health content toward a more systematic, competency-based and practice-oriented curriculum structure.

5. The Digi-CHange knowledge-chain approach

The **knowledge chain** is the organising principle of the updated healthcare curriculum concept. It responds directly to the Needs Assessment finding that digital-health learning is often fragmented, inconsistent or informally embedded. Within the Digi-CHange curriculum concept, the knowledge chain means that digital health competencies should develop progressively. Students and trainees should move from basic awareness and understanding toward applied, critical and responsible use of digital tools in healthcare practice.

The proposed knowledge chain includes the following progression:

5.1 Foundational understanding of digital health. Learners first need to understand the concept, scope and relevance of digital health. This includes awareness of how digitalisation influences healthcare systems, clinical workflows, documentation, patient engagement, communication and professional roles.

5.2 Digital systems and clinical workflows. Learners should then become familiar with digital systems used in healthcare, including electronic health records, registries, patient portals, telemedicine platforms, mobile health applications, remote monitoring tools and digital diagnostics.

5.3 Health data, ethics and professional responsibility. Digital health education must include the responsible use of health data. Learners should understand confidentiality, privacy, informed consent, data access, cybersecurity, patient rights, equity, trust and professional accountability.

5.4 Digital clinical reasoning and decision-making. At a more advanced level, learners should be able to interpret digital information critically. This includes clinical decision-support systems, AI-supported outputs, predictive models, digital diagnostics, risk scores and alert systems.

5.5 Critical and ethical use of AI-supported tools. Learners should recognise the strengths and limitations of AI-supported tools. They should understand uncertainty, algorithmic bias, explainability, overreliance, alert fatigue, accountability, human oversight and patient-safety risks.

5.6 Applied, case-based and simulation-oriented learning. Digital health competencies should be developed through applied learning. This includes clinical scenarios, case-based tasks, simulation, role-play, digital workflow analysis, critical appraisal of digital tools and supervised activities in Digi-CHange Labs.

5.7 Interprofessional and team-based digital care. Digital healthcare is rarely delivered by one professional alone. The curriculum concept therefore includes opportunities for interprofessional learning, especially linking medical and nursing perspectives through shared cases, team-based activities and digital patient-care scenarios.



5.8 Implementation, reflection and continuous improvement. The final stage of the knowledge chain links curriculum development with pilot implementation. Learners, teachers and institutions should reflect on feasibility, quality, relevance and patient-safety implications during implementation.

This knowledge chain approach allows each partner institution to contribute according to its own programme context while maintaining a shared Digi-CHange curriculum logic.

6. Updated curriculum structure based on partner syllabi and modules

The MS1 concept is operationalised through updated and newly developed curriculum materials prepared by Digi-CHange partner institutions. These materials reflect different educational contexts, including undergraduate medical education, nursing education and continuing professional development.

The external peer review covered curriculum-related materials from the four curriculum-developing partners: TMA, ILIAUNI, TNMU and UNPMMU. The reviewed materials included TMA's three linked digital-health elective courses, ILIAUNI's Biomedical Research I and Introduction to Digital Health, TNMU's AI/Telemedicine and Clinical Nursing-related digital health content, and UNPMMU's Digital Tools for Physicians and Digital Transformation of a Healthcare Institution.

The curriculum structure includes the following thematic components.

6.1 Foundational digital health and digital professionalism. This component introduces students to the concept, scope and relevance of digital health in contemporary healthcare. It covers digitalisation of healthcare systems, digital tools, electronic health records, telehealth, patient portals, mobile health applications, digital diagnostics, remote monitoring and basic AI-supported systems. It also addresses digital professionalism, digital identity, professional boundaries, appropriate online behaviour, digital communication, patient trust, digital health literacy, access and equity. This component responds to the Needs Assessment finding that digital-health concepts often appear irregularly and without a structured digital-competency sequence.

6.2 Health data, ethics and professional responsibility. This component focuses on ethical, legal and professional principles related to the use of patient information and health data. It includes confidentiality, privacy, informed consent, documentation, data access, data sharing, anonymisation, pseudonymisation, cybersecurity, patient rights, trust, equity, accountability and professional responsibility. It also addresses responsible use of digital and AI-supported tools in clinical, educational and research-related contexts. This component responds to the need for learners to use health data responsibly and to understand how inappropriate data use may affect patient safety, patient rights and professional standards.

6.3 Digital health and clinical decision-making. This component addresses the role of digital health systems, electronic health records, digital diagnostics, clinical decision-support systems, AI-supported outputs and predictive models in clinical reasoning and patient care. Learners are expected to interpret digital recommendations critically and responsibly, considering clinical findings, patient history, patient context, evidence, uncertainty, bias, limitations, patient safety and professional accountability. This component responds to the identified need to align education with real clinical digital practice, including EHRs, telemedicine, CDSS and AI-supported care.

6.4 Biomedical research and responsible use of digital tools. This component connects digital health with research methodology, scientific communication and evidence-based practice. It may include AI-assisted literature searching, data analysis, scientific writing, critical appraisal, research ethics, academic integrity and responsible use of digital research tools. This component is important because digital transformation affects not only clinical practice, but also how healthcare knowledge is produced, evaluated and communicated.

6.5 Telemedicine, artificial intelligence and digital tools for physicians. This component supports practical understanding of telemedicine, digital clinical workflows, medical information systems, electronic documentation, digital assistants, AI-supported outputs, digital diagnostics and clinical decision support. It should include attention to clinical accountability, patient safety, limitations of automated outputs, human oversight, legal and ethical responsibility, and safe integration of digital tools into professional practice. This component responds to the Needs Assessment finding that students have limited exposure to digital tools that mirror real clinical practice.



6.6 Digital health in nursing education. This component addresses digital health from the nursing perspective. It includes electronic health records, telehealth, mobile health, digital diagnostics, remote monitoring, AI-supported tools, digital professionalism, data privacy, ethics and patient safety. This component is important because the Needs Assessment identifies limited digitally enabled interprofessional education and insufficient integration of digital health into nursing curricula. The curriculum concept therefore recognises nursing education not as an optional addition, but as a necessary part of a healthcare-team approach to digital transformation.

6.7 Digital transformation of healthcare institutions. This component addresses institutional and managerial dimensions of digital health. It may include medical information systems, dashboards, key performance indicators, digital maturity, quality assurance, governance, cybersecurity, personal data protection, digital transformation planning, AI-related institutional risks and sustainable implementation. This component is relevant for healthcare professionals and managers who will participate in or lead digital transformation processes within healthcare institutions.

7. Core competency areas of the updated curriculum

The updated healthcare curriculum concept covers a set of core digital-health competency areas. These competency areas are shared across the consortium, although each partner may implement them through different courses, modules, learning activities or programme structures.

The main competency areas are:

1. **Digital health literacy.** Understanding the concept, scope, terminology and relevance of digital health in healthcare systems and clinical practice.
2. **Digital systems and workflows.** Understanding electronic health records, digital documentation, patient portals, telemedicine platforms, registries, mobile health tools, remote monitoring and digital diagnostics.
3. **Health data use and data quality.** Understanding how health data are generated, stored, interpreted and used in clinical, educational and research contexts.
4. **Ethics, privacy and confidentiality.** Applying ethical and professional principles related to confidentiality, consent, privacy, patient rights, trust and responsible data use.
5. **Cybersecurity awareness.** Recognising cybersecurity risks, unsafe communication, unauthorised access, data breaches, phishing, password misuse and other risks in digital healthcare environments.
6. **Telemedicine and remote care.** Understanding how remote care is organised and how telemedicine affects access, communication, documentation, continuity of care and patient safety.
7. **Clinical decision support and AI-supported tools.** Understanding how digital recommendations, risk scores, predictive models and AI-supported outputs may support or mislead clinical reasoning.
8. **Critical interpretation and human oversight.** Recognising uncertainty, bias, explainability, data-quality limitations, overreliance, alert fatigue and the need for accountable professional judgement.
9. **Digital professionalism.** Demonstrating appropriate professional behaviour in digital environments, including respectful communication, boundaries, responsible social media use and protection of patient trust.
10. **Equity, access and the digital divide.** Recognising how digital health may improve or worsen access to care, especially for vulnerable groups with limited digital literacy, language barriers, disability, socioeconomic barriers or limited technology access.
11. **Patient safety in digital environments.** Understanding how digital tools may support safety, but also introduce risks related to incomplete data, poor documentation, communication errors, inappropriate alerts or misuse of systems.
12. **Interprofessional digital care.** Understanding how physicians, nurses and other professionals collaborate through digital workflows, shared documentation, telemedicine, digital monitoring and team-based decision-making.
13. **Sustainability and responsible digital transformation.** Recognising both the benefits and environmental costs of digital health, including telemedicine-related travel reduction, energy use, digital infrastructure and electronic waste.



8. Teaching and learning approach

The updated healthcare curriculum concept promotes active, applied and learner-centred teaching methods. Digital health cannot be taught effectively only through theoretical lectures. Learners need opportunities to analyse realistic cases, interpret digital information, discuss ethical and professional dilemmas, and apply digital-health concepts in practice-oriented tasks. The proposed teaching and learning methods include:

8.1 Case-based learning. Case-based learning allows students to explore how digital tools influence patient care, documentation, diagnosis, communication, follow-up and clinical decision-making. Cases may address electronic health records, telemedicine consultations, digital diagnostic results, AI-supported recommendations, confidentiality problems, cybersecurity risks, digital inequity or professional accountability.

8.2 Scenario-based seminars. Scenario-based seminars support discussion of ethical, legal, professional and patient-safety issues. They help learners develop reasoning rather than simply memorising digital-health concepts.

8.3 Simulation-oriented learning. Simulation can support learning about digital workflows, telemedicine, decision support, AI-supported outputs, handovers, remote monitoring and digitally mediated teamwork. Simulation-based learning is especially relevant for Digi-CHange Labs, which are intended to support practical exposure to digital health tools.

8.4 Small-group work and collaborative learning. Small-group activities allow students to discuss complex digital-health situations, compare professional perspectives and develop communication skills.

8.5 Critical appraisal of digital tools. Students should learn to appraise digital health technologies critically. This includes evaluating evidence, usability, limitations, risks, bias, equity, privacy, patient-safety implications and professional responsibilities.

8.6 Reflective and written assignments. Written assignments help students analyse digital-health issues in more depth. They can focus on health data ethics, responsible AI use, digital professionalism, patient rights, cybersecurity, digital equity or clinical decision-making.

8.7 Interprofessional activities. Where feasible, learning activities should bring together medical and nursing perspectives. This may include shared cases, joint seminars, team-based digital care scenarios or simulation activities during pilot implementation.

8.8 Digi-CHange Lab-supported learning. Digi-CHange Labs will provide opportunities for practical exposure to digital-health tools, simulation-based learning, digital clinical workflows and collaborative activities between academia and practice.

9. Assessment approach

Assessment in the updated curriculum should be aligned with learning outcomes and should evaluate not only knowledge, but also critical reasoning, professional responsibility and safe use of digital health tools. The assessment approach may include:

9.1 Written assignments. Written assignments can assess students' ability to analyse digital-health tools, ethical challenges, data-use scenarios, privacy issues, digital inequity or responsible use of AI-supported tools.

9.2 Case-based presentations. Case-based presentations allow students to demonstrate how they interpret digital information, identify risks, consider patient context and formulate responsible conclusions.

9.3 Critical appraisal tasks. Critical appraisal tasks can assess students' ability to evaluate digital-health technologies, AI-supported tools, telemedicine applications or digital clinical workflows using evidence-informed criteria.

9.4 Scenario analysis. Scenario analysis can assess ethical, legal, professional and patient-safety reasoning in digital healthcare contexts.

9.5 Simulation-based assessment. Where resources allow, simulation-based assessment can evaluate the application of digital-health competencies in realistic or semi-realistic settings.

9.6 Rubric-based assessment. Assessment should use transparent rubrics. Rubrics should clearly show how points are allocated and should assess relevant dimensions, such as:



- understanding of the digital-health issue;
- interpretation of data or digital outputs;
- recognition of uncertainty, bias and limitations;
- patient-safety reasoning;
- ethical and legal reasoning;
- professional accountability;
- communication and justification of decisions;
- appropriate referencing and declaration of AI-supported work, where relevant.

9.7 Entrustment-oriented assessment. Where appropriate, the consortium may further explore entrustment-oriented or EPA-based assessment for selected digital-health competencies. This may be especially relevant for competencies such as:

- interpreting AI-supported clinical decision-support outputs;
- conducting telemedicine consultations;
- using electronic health records responsibly;
- recognising digital patient-safety risks;
- applying privacy and confidentiality principles in digital workflows.

This approach can be further developed during pilot implementation.

10. Quality assurance and independent verification

The MS1 concept is supported by a quality-assurance process linking three sources of evidence. First, the **Needs Assessment Report** provides the diagnostic basis for curriculum development by identifying gaps, priorities and opportunities across the beneficiary institutions. Second, the **updated and newly developed syllabi/modules** demonstrate how partner institutions translated these needs into concrete curriculum materials, learning outcomes, teaching formats and assessment approaches. Third, the **external peer review** provides independent academic feedback on the quality, relevance, coherence, feasibility and practical applicability of the curriculum-related materials. The external peer review is used as a formative quality-assurance tool. Its recommendations are addressed through partner corrections, a response-to-review matrix and preparation for pilot implementation. This process ensures that the MS1 concept is not only formally produced, but also critically examined, improved and verified before further use in Task 1.3. The independent academic panel / external reviewer verification confirms whether the concept is coherent, needs-based, aligned with the Digi-CHange knowledge-chain approach and suitable as a basis for further curriculum mapping and pilot implementation.

11. Relationship with partner materials

The MS1 concept is connected to the partner-developed and updated syllabi/modules. These materials demonstrate how the concept can be adapted across different institutional and programme contexts. The partner materials together cover:

- digital health foundations;
- digital professionalism and digital literacy;
- health data, ethics and professional responsibility;
- electronic health records and digital documentation;
- telemedicine and remote care;
- clinical decision support;
- AI-supported tools and digital diagnostics;
- biomedical research and responsible use of digital tools;
- digital health in nursing education;
- institutional digital transformation and healthcare management.

The concept recognises that partner institutions are not identical. They differ in national context, programme structure, institutional readiness, available infrastructure and target learners. Therefore, the updated curriculum concept does not impose one uniform course model. Instead, it provides a shared curriculum logic that can be implemented through different courses, modules, learning activities and pilot



formats. This flexible structure is important for sustainability. It allows digital-health integration to be adapted to each institutional context while maintaining alignment with the overall Digi-CHange objectives.

12. Link with Task 1.3 pilot implementation

The MS1 concept provides the foundation for the next stage of WP1: **Task 1.3 – Pilot Implementation of the Updated Healthcare Curriculum**. During pilot implementation, selected courses, modules or learning activities will be implemented and evaluated. The pilot phase will assess:

- relevance of the updated curriculum content;
- feasibility of implementation;
- student engagement;
- faculty experience;
- alignment with learning outcomes;
- usefulness of case-based and simulation-oriented methods;
- potential for Digi-CHange Lab-supported learning;
- opportunities for interprofessional medical–nursing learning;
- quality and clarity of assessment methods.

The pilot will also provide feedback for further refinement of the curriculum materials and for preparation of the later D1.2 curriculum map. The MS1 concept therefore serves as a bridge between curriculum design and implementation. It defines the logic of the updated curriculum before full-scale piloting and mapping.



Annex 1. Needs-to-curriculum alignment matrix

Identified need / gap	Curriculum concept response	Related curriculum direction
Fragmented digital health integration in medical curricula	Structured integration of digital health topics into updated and new courses/modules	Digital health foundations; clinical decision-making; AI; telemedicine; digital tools
Minimal digital health in nursing curricula	Inclusion of nursing-relevant digital-health content and patient-safety topics	Clinical Nursing digital health component; interprofessional cases
No coherent pathway across study years	Knowledge-chain structure from basic understanding to applied decision-making	Progressive sequencing of competencies
Limited exposure to EHRs, telemedicine, CDSS and AI-supported care	Integration of real digital clinical workflows and tools into learning activities	EHRs, telemedicine, AI-supported tools, CDSS, digital diagnostics
Limited simulation and digital workflows	Case-based, scenario-based and simulation-oriented learning	Digi-CHange Labs; digital clinical scenarios
Weak interprofessional medicine–nursing digital learning	Future shared cases, seminars or pilot activities linking medical and nursing learners	Task 1.3 pilot implementation
Faculty need support in digital pedagogy	Structured teaching formats, rubrics and future faculty-development links	Digi-CHange Labs; faculty training
Digital learning depends on individual initiatives	Shared curriculum concept and common logic across partner institutions	Consortium-level curriculum framework
Uneven readiness across institutions	Flexible and adaptable implementation model	Institutional adaptation with shared principles