



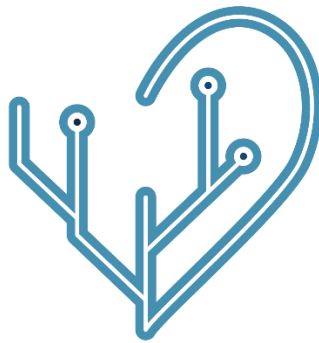
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Erasmus+ TECH2MATCH WP 3

JOINT SUMMARY REPORT

Austria, Denmark, Finland and Spain



TECH2MATCH

HEALTHCARE INSPIRED BY TECHNOLOGY



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Work package 3 – summary report

This final summarizing report of the work carried out in work package 3 (WP3) will describe the progress of WP3, the results from all tasks, and the conclusions based on each indicator (1-5) related to the work package. The report will also define how we will apply WP3 in the upcoming work package 4 (WP4). This report is also the final task (3.4) in WP3, and therefore, the report also concludes the work in each of the respective tasks in WP3.

WP3 has been ongoing from May 2023 until December 2023. UCN has been the lead partner on the work package, with tasks distributed between all four partners in TECH2MATCH. The overall purpose of WP3 has been to define and design frameworks for blended learning, real-life scenarios, teaching the lecturers, and creating an xMOOC. The purpose was approached through 3 separate WP3 tasks, each with a specific objective.



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The progress and results of each task are described separately in this report. UCN led task 3.1, SeAMK led task 3.2, and task 3.3 was co-led by FHV and UCLM. During WP3, stakeholders have been involved on several occasions to provide feedback, discuss questions related to the content of the frameworks, and influence the final frameworks from the point of view of students, lecturers, clinicians, patients, and relatives. Specifications related to the involvement of stakeholders concerning the respective task are described. The frequency of meetings between the project partners during WP3 has been high. Several ad hoc task-related meetings have been conducted, including planned monthly project management group meetings (PMG) and key online meetings (KOM). In mid-November, a transnational meeting (TM) took place in Finland, with SeAMK as the responsible partner.

Task 3.1

Progress

The objective of task 3.1, which was led by UCN, was to identify and report on existing models and cases of blended learning and real-life scenarios to provide background information for the development of the frameworks for both blended learning and real-life scenarios.

All partners agreed that a literature search would be the appropriate method to reach the objective of task 3.1. The responsibility for the literature searches conducted was allocated to each partner. To facilitate ease of applicability and to ensure the broadest possible search, all types of literature were considered eligible, and no limit on language was applied. When choosing examples of blended learning, the following definition was applied: "*Blended learning, also known as hybrid learning, is an approach to education that combines online education materials and opportunities for interaction online with traditional place-based classroom methods.*" Related to examples of real-life scenarios, it was agreed that the perspective could be broad, but they should preferably be from an educational context. The following definition was applied: "*A real-life scenario can be something that has occurred in reality or is inspired by real-life clinical practice. And it can have an outline for any proposed or planned series of events in the future.*"



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Results

All partners conducted a literature search using a variety of different sources. The sources accessed were internal university servers, schematic scholar.org, Google, PubMed, and Education Research Complete. The searches were conducted in multiple languages using multiple search terms, including "blended learning" or "real-life scenario." Based on these searches, each partner reported their results in a national report. From these four national reports, a final list of 40 examples (ten per partner) and a deeper description of eight examples were compiled in the task 3.1 final report. From the examples produced by each partner, it became clear that blended learning and real-life scenarios are very diverse teaching activities. Several areas of importance to the future development of the TECH2MATCH course was found. The results showed that when developing a course, it was important that the learning outcomes could also be applied outside the course. That a solid foundation for online learning was created by precise schedules, instructions for learning activities, exact deadlines, course objectives, and content presentation at the beginning of the course. Other things to be considered, when developing a course, were the clarity of the study material, the learning activity, the functional technical environment, the well-prepared and recorded lessons, and the availability of teachers. Often students would have the opportunity to design the participation structure and interactions within the learning process themselves, encouraging students to take on greater autonomy and responsibility for their learning. But, when tutored on a class level, it also made the students feel like a group, and recordings of the lessons were valued. However, recordings could not completely replace interaction with the teacher. Several teaching methods were applied in the examples: flipped classroom, creation of a WIKI, students dealing with different classifications (taxonomies) of digital technologies, and creation of role descriptions on an interactive whiteboard for job descriptions. In the examples, students were often organized into formal heterogeneous cooperative learning groups, with each group comprising approximately 5-6 individuals. These groups would serve as the basis for collaborative activities and discussions.

The examples of real-life scenarios were very heterogeneous, but despite that, overlapping areas of importance still became visible. Simulation case scenarios were often developed to align with students' prior coursework and could take many forms, such as student-involved demonstrations,



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role plays, videos, or audio recordings. The sessions involving scenarios were often facilitated by providing the patient's initial evaluation data, the context of the case and the required tasks to complete during the clinical encounter. Facilitation of reflection was an area that clearly was emphasized across the examples provided by the partners.

Concluding on indicator 3.1

Based on the work performed by all partners during task 3.1, UCN wrote a report. The report is 6110 words long and provides a short description of 40 examples of "scenarios" and "blended learning," and the eight most relevant examples are described in depth. By doing so, the TECH2MATCH consortium has fulfilled indicator 3.1 using the report as a quantitative indicator.

Task 3.2

Progress

The objective of Task 3.2, which was led by SeAMK, was to design and describe two frameworks. One for the development of blended learning and one for the development of real-life scenarios. The frameworks were developed in collaboration with stakeholder groups from all four partners. The involvement of all stakeholder groups in developing the frameworks has been pivotal to the quality and relevance of the frameworks' content. SeAMK developed guidelines for stakeholder focus group interviews. Each partner had the flexibility to determine how to involve the stakeholder group individually. Specific questions were formulated to guide or redirect the conversation toward the main goal/topic, and additional optional questions were created for further assistance, to be used at the moderator's discretion. The findings from the four focus group interviews have been compiled and processed in the final report for Task 3.2. The report encompasses two frameworks (blended learning and real-life scenarios).

Results

Task 3.2 resulted in the development of two frameworks, a blended learning framework (Table 1) and a Real-Life scenario framework (Table 2). The frameworks serve as planning and design



Table 1. The blended learning framework

Objectives	
1.	Define one or more objectives – this could relate to a course, module in a course or a specific teaching activity.
2.	Clarify learning outcomes – What should be learned to achieve the objective?
3.	Prepare content presentation
✓	Present objective
✓	Present learning outcomes – provide relevance to each learning outcome and specify evaluation criterias
✓	Present a schedule – including time/dates of activities, deadlines, access to course material and/or platforms/software
Learning environment	
✓	Up-to-date and well prepared material
✓	Prioritize accessibility to lecturers – real-time interaction or delayed feedback
✓	Provide recorded lessons – cannot totally replace interaction with lecturer
✓	Establish a "classroom" when tutoring – fosters social affiliation and retention
✓	Differentiate the learning environment – reduced numbers of spectators, collaboration in smaller groups, individualized approaches to feedback, and possible confidentiality
✓	Consider when to engage in face-to-face vs. Online teaching
Teaching methods	
✓	Decide what theory/evidence is the foundation for an activity.
✓	Consider various teaching methods (think visual learning, hearing, learning by doing)
✓	Engage different approaches in a single activity
•	Course participants develop, structure and prepare an activity – encourage responsibility and autonomy
•	Flipped classroom
•	Theory first followed by task assignments – Create a WIKI, develop a case study, create role descriptions for a job posting
•	Real-life scenarios
•	Discussion forums
•	Video and audio material
•	Students as mediators of knowledge
Collaboration	
✓	Consider social presence by providing students opportunities to share stories about their person
✓	Consider how collaboration can foster critical thinking and reflection
✓	Establish study groups for the duration of the course
•	Consider both face-to-face and online collaboration – specify platforms/medias for online collaboration
•	Collaborate in various ways – student-student, student-lecturer, student-group of students, lecturer-lecturer, lecturer-student, lecturer-group of students, group of students-student
Evaluation	
✓	Establish a foundation for continues self-evaluation
✓	Feedback from lecturers on evaluation criterias should be prioritized instead of peer-feedback – both written and verbal is applicable
✓	Both formal and in-formal evaluation should be applied, and is applicable in various ways
•	Quiz
•	Written assignments – knowledge test, case descriptions
•	Gamification

guides, aiming to support the overall development of the TECH2MATCH course and facilitate careful planning and design of each teaching module and activity within the course.

The blended learning framework, which is presented in Table 1, encompasses five main areas of importance: Objectives, Learning environment, Teaching methods, Collaboration and Evaluation.

The real-life scenario framework, which is presented in Table 2, aim to support the development of teaching activities focused on clinical transferable skill acquisition. Results related to the framework for real-life scenarios include four parts, headlined by defining competencies and needed skills for students to learn, which should be the first step when using the framework, before moving on to the working with planning; realistic depiction, professional dialogue, stimulating reflection and pedagogical preparation.



Table 2. The real-life scenarios framework

Define the competencies and skills needed for students to learn.

Realistic depiction:

- ✓ **Produce opportunity to transfer theory into practice – align to prior coursework.**
- Places RLS as an end goal of an activity.
- ✓ **Provide students a vivid representation of authentic situations – strengthens perceived relevance.**
- Places RLS as the entrance to an activity.
- ✓ **Produce opportunity to get hands-on experience – optimal for skills training.**
- ✓ **Many different approaches to a realistic depiction:**
 - simulation
 - student-involved demonstrations
 - role-play
 - video
 - real-life patient visit (on campus and/or off campus).

Professional dialogue:

- ✓ **Place students in both the receiving and providing end of the professional dialogue.**
 - communication related to technology.
 - communication related to the patient involving the technology.
 - communication related to interdisciplinarity involving either or both the technology and the patient.
- ✓ **Use various forms of dialogue.**
 - written material.
 - video.
 - online information material.
 - verbal.
 - virtual.
- ✓ **Structure the professional dialogue to support the competencies and skills of interest.**
 - pre-debriefing.
 - debriefing.
 - real-time.
 - feedback on self-evaluation.

Stimulating reflection:

- ✓ **Consider time as an aspect when stimulating reflection.**
- ✓ **Facilitate reflection – preferably both subjective and objective.**
- ✓ **Preparer appropriate point of departure of reflection.**
 - assignments.
 - video.
 - verbal feedback.
 - digital feedback
- ✓ **Produce opportunities to engage in reflection with various participants.**
 - one-self
 - lecturer
 - study group
 - group
 - HCP
 - Patient

Pedagogical preparation:

- ✓ **Consider preparation – what to prepare, when to prepare and with whom.**
- ✓ **Consider context – online vs. physical vs virtual.**
- ✓ **Consider flow of information – pre, post, real-time.**
- ✓ **Consider task assignment – unknown, known, guided.**
- ✓ **Consider time as an aspect – relates to preparation, flow of information, task assignment.**
- ✓ **Consider people engaged – students, lecturers, patients, pretend patients, HCP.**
- ✓ **Consider number of people – 1 on 1, 1 vs X observers, many on 1.**
- ✓ **Consider the implementation of observation – present, present but hidden, video, digital.**



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Concluding on indicator 3.2

Based on the work performed by all partners during task 3.2, the framework for blended learning has been developed and described in a hands-on document, and all four stakeholder groups have participated in the development. By doing so, the TECH2MATCH consortium has fulfilled indicator 3.2 using the framework for blended learning as a quantitative indicator.

Concluding on indicator 3.3

Based on the work performed by all partners during task 3.3, the framework for the real-life scenarios has been developed and described in a hands-on document, and all four stakeholder groups have participated in the development. By doing so, the TECH2MATCH consortium has fulfilled indicator 3.3 using the framework for real-life scenarios as a quantitative indicator.

Task 3.3

Progress

The objective of task 3.3 was to design and describe two frameworks. One framework is for teaching the lecturers, and one framework is for the xMOOC (Massive Open Online Course). UCLM was primarily responsible for developing the teaching the lecturer's framework, and FHV was primarily responsible for the xMOOC framework. Task 3.3 was built upon the results from task 3.1 and task 3.2 to develop the frameworks, meaning each of the frameworks in task 3.3 depended on the frameworks from task 3.2. Especially the framework for blended learning had content relevance and value to both the teaching the lecturer's framework and the xMOOC framework.

Stakeholder groups were involved in both the development of the teaching the lecturer's framework and the xMOOC framework. Based on the developed teaching the lecturers framework, UCLM provided the questions for the stakeholder interview. Only teachers from the stakeholder groups were invited to participate. Each partner could decide the format for the discussion of the framework. After finishing the stakeholder group involvement, each partner was asked to deliver a national report with the results.



The preliminary development of the framework for the xMOOC was done by FHV. The consortium discussed the preliminary framework, and all partners commented on drafts. The involvement of the stakeholder groups was done through an online survey. This qualification of the framework was handled individually by each partner.

Results

Task 3.3 resulted in the development of a framework for teaching the lecturers (Table 3) and a xMOOC framework (Table 4). The framework for teaching the lecturers, which is presented in Table 3, is divided into five main sections: Training Design, Training Preparation, Training Delivery, Post-Training Activities, and Training Evaluation. The sections in the framework mirror the stages of the ADDIE model (Analysis, Design, Development, Implementation, Evaluation), particularly in terms of design (Training Design), development (Training Preparation), implementation (Training Delivery), and evaluation (Training Evaluation). The "Post-Training Activities" section aligns with Continuing Professional Development (CPD) principles, focusing on ongoing learning and support after formal training. The way to follow this framework is sequential; to move on to the next phase, one must have completed the previous one. A detailed description with specific elements, offering a detailed description and key considerations for decision-making in WP4, is attached to the framework.

Component	Description	Decision-Making Considerations
1. Training Design	<ul style="list-style-type: none"> Establish clear and measurable learning objectives. Construct a detailed training outline with primary topics, sub-topics, and their sequence. (Consider including a timeline) Decide upon the training format (hybrid, self-guided or face-to-face). Emphasize practical over theoretical content. Implement ongoing evaluation and feedback mechanisms. 	<ul style="list-style-type: none"> How will learning objectives be quantitatively and qualitatively assessed? What structure and sequence will optimize comprehension and retention? Which training format best suits the needs and available resources? How to balance theory with hands-on experience?
2. Training Preparation	<ul style="list-style-type: none"> Develop training content derived from the course, inclusive of key points and real-life scenario explanations. Plan for interactive elements to foster engagement, such as hands-on activities, role-plays, or group discussions. 	<ul style="list-style-type: none"> What specific content and examples will resonate with the lecturers? How will interactive elements be integrated to enhance engagement and facilitate active learning?
3. Training Delivery	<ul style="list-style-type: none"> Begin with an introduction that sets out the session's scope. Deliver content in a coherent and structured manner, utilizing examples and scenarios. Encourage lecturer interaction through questions, discussions, or activities. 	<ul style="list-style-type: none"> How will the introduction set the stage for learning? What methods will be employed to ensure clear and organized content delivery? How will practical activities be designed to ensure effective learning? What feedback mechanisms will be in place?



	<ul style="list-style-type: none"> • Provide opportunities for practical application of methodologies. • Offer detailed guidance on necessary materials and provide user guides or tutorials if needed. • Consider the possibility to narrow the perspective of a teaching activity towards their own profession. • Consider providing constructive feedback during practice sessions. 	
4. Post-Training Activities	<ul style="list-style-type: none"> • Provide improved/extended teaching materials to teachers, based on feedback and experience during the training. • Provide ongoing support for teachers implementing new methodologies, which may include coaching or peer support networks. • Consider including a "hotline" where the participants could contact someone who is part of the development group by mail. 	<ul style="list-style-type: none"> • What type of review materials will reinforce learning? • What form of support will be most beneficial for teachers post-training?
5. Training Evaluation and Redesign	<ul style="list-style-type: none"> • Gather feedback from teachers regarding their training experience through surveys or informal methods. • Engage in self-reflection on training delivery and identify areas for improvement. • Utilized feedback and self-reflection to enhance future training sessions. 	<ul style="list-style-type: none"> • How will teacher feedback be collected and analyzed? • What reflective practices will be employed to evaluate the trainer's performance? • How will the insights gained inform future training improvements?

The framework for the xMOOC, which is presented in Table 4, was designed, and developed on experience from a previously Erasmus+ project (IENE 10), previous work package results such as WP 3.2, additional research, internal discussions, and stakeholder group feedback. The framework include considerations regarding the learning environment, teaching methods, collaboration, and evaluation.

Table 4. MOOC Guide
LEARNING ENVIRONMENT
COSTS <ul style="list-style-type: none"> • Consider the costs of the platform for participants as well as for hosts and what will happen if it is no longer provided free of cost • Compare usability and planned content with platforms that are free and those that incur costs.
DATA PROTECTION <ul style="list-style-type: none"> • Identify who is responsible for keeping data handling aligned with GDPR • Communicate data protection plan regarding all implemented learning tools (Which data is collected/sent to the provider/developer, etc)
MULTI-LANGUAGE <ul style="list-style-type: none"> • Decide in which language the content and learning activities are provided • Assess the possibility to change the language of the platform navigation (e.g., menus, ..)
ACCESSIBILITY/USABILITY <ul style="list-style-type: none"> • Assess mobile support, options to improve accessibility such as changing font size, color schemes, icons, etc. • Assess possibility to include externally created (Rise 360, Livresq) content via HP5 or SCORM



- Organize technical support in different languages (communication options like chat, mail, forum; allocate staff resources, videos/FAQs on how to use the platform)

USER ACCESS

- Assess login options (single sign-on using institutional credentials, etc.)
- Determine options for course promotion and direct access to the course
- Define when and how the course materials are made available to participants (beginning and end date for facilitated course and self-organized learning course, availability of content, assigning different content to different student groups e.g. experts/beginners or students from different institutions)
- Test ease of conversion of the course content to different learning management systems
- Decide upon workload distribution and course structure as well as individual and/or pre-defined learning paths

COMMUNICATION FROM TEACHERS TO STUDENTS

- Assess the possibility and modality of (automated) notifications regarding news/announcements, feedback from teachers, learning progress etc.
- Consider the possibility to contact specific students (e.g. who are not progressing) and how e.g. via direct mails
- Explore possibilities of feedback for learning activities and student collaboration.
- Allocate resources for teachers, define roles of teachers (facilitation, moderation, assessment, etc.)

TEACHING METHODS

INTERACTIVE CONTENT

- Ensure a wide variety of learning activities such as quizzes, games, challenges, etc.
- Consider gamification options like badges, score, levels, etc.

INTEGRATION OF LIVE CONTENT

- Think about if and how to integrate live content (webinars)
- Consider an appointment management system (application form, attendance sheet, also for in-person teaching)

LEARNING PROGRESS

- Define conditions for progressing through the course (minimum success rate in activities/assignments and how many resubmissions are acceptable.)
- Identify the technical requirements and possibilities for different forms of self-assessment, progress assessments etc.

COLLABORATION

COMMUNICATION BETWEEN STUDENTS

- Explore methods of facilitating collaborative e.g. Forums, blogs, Wikis.
- Consider how asynchronous collaboration can be supported.
- Create opportunities for knowledge exchange e.g. learning diaries, survey.

EVALUATION

CERTIFICATION

- Consider whether certificates should be provided automatically by the platform, how this would be achieved and if there would be any acknowledgement of different learning pathways (e.g. facilitated course and self-organized learning course).
- Decide on the minimum requirement (e.g. amount of ECTS/content completion) for certification.

STATISTICS

- Explore the possibilities to gather data such as time taken for (sub)sections and activities, drop-out rate, etc.
- Consider (automatic) methods of analysing and visualising data.

FEEDBACK

- Consider tools like surveys, etc. to get feedback on the course content, structure, activities
- Find a good balance regarding the amount of time participants spend for feedback
- Plan how to use the feedback to improve the course (time and costs)



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Concluding on indicator 3.4.

Based on the work performed by all partners during task 3.3, FHV and UCLM wrote a report with a hands-on description of the framework for teaching the teachers. By doing so, the TECH2MATCH consortium has fulfilled indicator 3.4 using the report as a quantitative indicator.

Concluding on indicator 3.5

Based on the work performed by all partners during task 3.3, FHV and UCLM wrote a report with a hands-on description of the framework for the xMOOC. By doing so, the TECH2MATCH consortium has fulfilled indicator 3.5 using the report as a quantitative indicator.

Moving on from WP3 to WP4

As stated in the application all four frameworks developed in WP3, will be used in the development of the TECH2MATCH course during WP4. The primary objective during WP4 will be to develop the blended learning course using the framework from task 3.2, and include 4 real-life scenarios focused on VR/AR, monitoring, mobile apps and telehealth, respectively. The real-life scenario framework, will be used in the development of each real-life scenario, using results from WP2, to define which skills and competencies to focus on. Secondly, the teaching the lecturers framework, will be used to develop the content and teaching material for the lecturers involved in the blended learning course, to ensure they can manage and teach the TECH2MATCH course. Thirdly, the content from the blended learning course and the real-life scenarios, together with the xMOOC framework, will be used to develop the content for creating the xMOOC.