SimuCarePro

Simulation in healthcare
to develop a partnership
between learners and professionals
in medical
and paramedical training

Erasmus+

www.simucarepro.eu

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Introduction

This brochure was created by partners from four European countries who have participated in the European project "SimuCarePro".
It aims to put into words the main outcomes of a common work and of mutual improvement carried out for over two years, and to give a concrete form to those outcomes. The project purpose was to, starting from problems identified together by students and field professionals, build with nursing, midwifery and/or medicine students, validated simulation scenarios that would produce recommendations to healthcare protocols based on EBP (Evidence-Based Practice), and to submit them to field professionals as continuing training.

Besides, this approach was meant to be part of a methodological reflection supporting the development of nursing competences, particularly professional communication and clinical judgement competences.

This leaflet proposes…

- A brief presentation of the project, its basis, objectives and main expected outputs
- A description of the tools developed during the project and their theoretical basis
- A list and brief presentation of the simulation scenarios developed by the partners
- The presentation of one example of educational instrument that led to the development of different scenarios
- A SWOT-based critical reflection about the different sides of the project
- The work prospects stemming from this project and its possible impact on future nursing training

In this leaflet you can…

- See the work achieved during the last two years without detailing the project methodology and complexity
- Discover the concrete outputs stemming from this project without dedicating too much time to its technical and educational basis underlining the different outputs. A synthesis sheet proposes different educational instruments and scenarios. These sheets are not meant to be exhaustive. However, they give transferability to the presented approaches.

Regarding those two aspects, if you are interested in the presented elements, do not hesitate to get in touch with your country's contact person. They will easily respond to your questions, requests, interests…

The SIMUCAREPRO project

1. Simulation in healthcare to develop a partnership between learners and professionals in medical and paramedical training

Simulation in healthcare has become common use in hospitals and training institutions. So far, it must be observed that its use is sometimes compartmentalised, each one working on their own training objectives.

The project proposes to work on two original approaches. On the one hand, it promotes collaboration between learners and healthcare professionals, leading them to develop together simulation scenarios that benefit both initial training objectives and the improvement of field professionals' practices. On the other hand, it investigates the development and validation of simulation scenarios that integrate EBP and the evaluation of achieved learning. These two aspects will be addressed successively in this booklet.

In concrete, the framework initially set by the partnership was the following: in a hospital service, learners, in collaboration with professionals of this service, identified a major problem in the service. Within varied educational approaches, learners and trainers have worked to translate this problems into simulation scenarios paying particular attention to three aspects: documenting the scenario and solutions proposed through convincing data (EBN, EBM…), developing clinical judgement competences, and finally, multidisciplinary communication. After the scenarios were validated, during simulation sessions, learners and professionals created together propositions of good practices leading, when possible, to the creation of healthcare protocols referenced by convincing data, which are directly useful for professional areas.

Through different experiments conducted by the partners, a certain number of tools have been created to support a common dynamics within the framework of the project:

A scenario validation grid (CONTENT)
A project common thread to present the scenarios (FORM)
An observation and evaluation grid of the learning achieved during simulation sessions.

Those different tools made possible the development of a common culture and made easier the exchange of different simulation scenarios (about twenty) developed all along the project.

Beyond those tools and scenarios, the project also inspired numerous thoughts and the implementation of different educational instruments by simulation centres and/or education institutions:

- The internship and production of a dissertation as a prerequisite to the creation of simulation scenarios.
- The internship and production of a dissertation as a prerequisites to propositions of EBP recommendations for healthcare premises professionals.
- Exploiting and extending simulation sessions with a view to validate protocols.
- A simulation session evaluation grid (satisfaction scale).

As previously mentioned, this booklet will tend to highlight as best as possible the key experiments and reflections that gave life to the partnership during the project.

2. Other objectives targeted in the project

Beyond what made the core of our work, it must be noted that this project was part of a larger dynamics with the following objectives:

- To create European synergy in paramedical training and a network of partners to develop a collective competence in the field of simulation.
- To improve the quality and innovation in nursing and/or medical and/or paramedical teaching practice and professional training through an educational simulation tool that let learners and professionals multiply learning opportunities in a meaningful context thanks to a simulation of professional reality.
- To adapt educational methods to meet expected professional competences, the evolution of healthcare needs in Europe and the evolutions of jobs.
- To adapt simulation scenarios fostering the optimisation of clinical judgement competences and interprofessional cooperation competences in classic and continuing training.
- To professionalise training stakeholders in the field of simulation and in the development of shared contents in this field.
- To optimise learners' and field professionals' clinical judgement, communication and cooperation competences so that they can meet tomorrow's professional requirements.

Method that supported the approach, in a few key words

Collaborative work

- Education and / or simulation institutions
- Hospitals
- Professional experts

Diversity of a transnational partnership

- European meetings to share and take decisions
- Cultural diversity and mutual improvement
- Diversity of expertise of educational practices in simulation

Gradual and adaptive collaborative construction

- Everyone's particular context taken into account

Concepts shared and worked during transnational meetings

- Simulation
- Simulation scenarios
- Scenario validation grids
- Learning indicator grid
- EBN-EBM
- …

Multiple validations

- Topics in simulation and educational tools related to the virtual hospital by teacher partners
- Simulation scenarios by professionals
- Simulation scenarios by learners during situation
- Simulation scenarios by external evaluators

Pervasive communication

Internally:

- Thanks to a remote access platform for exchanges between partners
- Thanks to many national and international meetings

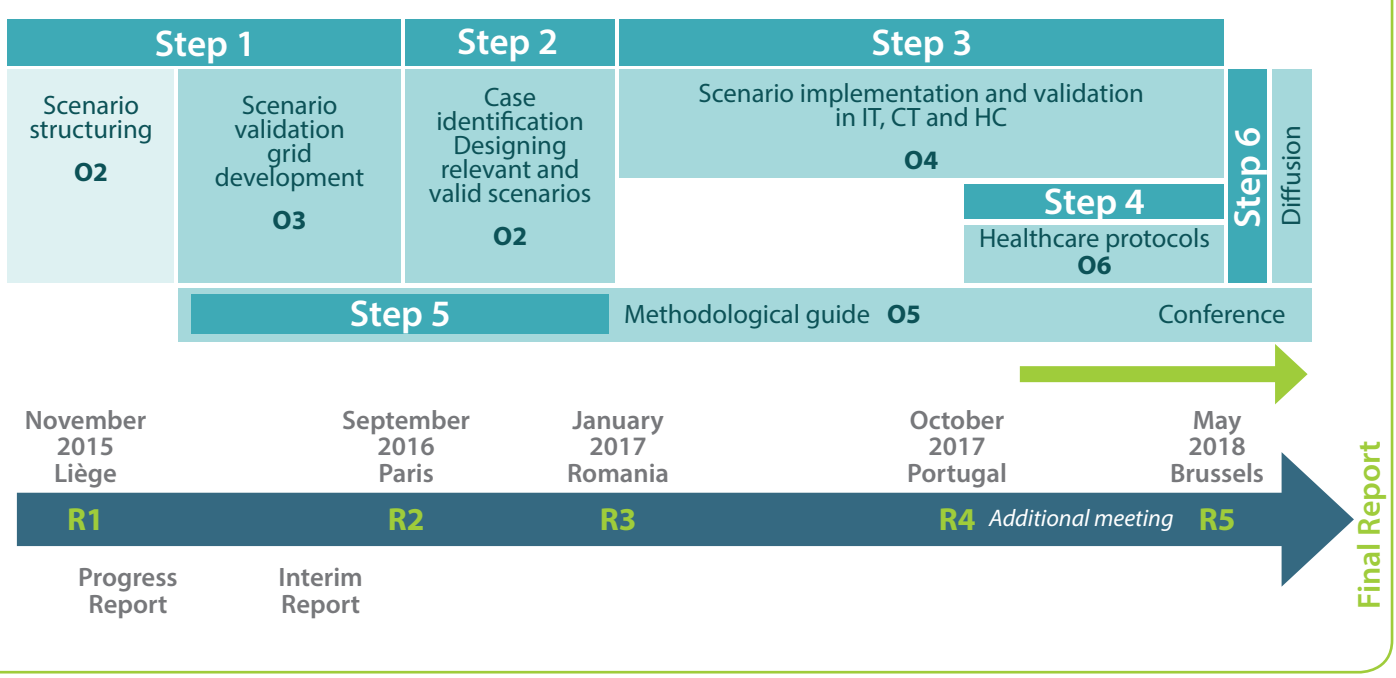
Externally:

- During national and international meetings for feedbacks on achieved works and their validation

Well-defined tasks

- Responsibilities defined in function descriptions established with partners
- Careful and involved partners
- Discreet but present promoter
- Experts and an educational follow-up supported by multiple references

Timeline
Creation of relevant and validated scenarios



Internal quality monitoring

The quality monitoring was conducted internally by HELMo quality unit.
The promoter monitored the work progress using a quality frame of reference for regular monitoring and evaluation of the different work phases (for both process and outputs).

Thanks to this document, the initial methodology could be adapted in order to optimise everyone's work and take into account at best the specificities and resources of each partner.

External quality monitoring

After a call for proposals, an external evaluation of the output (in progress and at the project end) was conducted by a university pedagogy centre.
This evaluation was conducted using an evaluation grid for e-Learning products, adapted to the specificity of this project.

Thanks to the mid-term evaluation and the advice provided all along the project we have achieved quality results and will be able, at the end of the project, to further improve the existing instrument.

Simulation and tools developed during the project

Before addressing the various outputs produced during the project, it seems to us interesting to establish a few elements of the theoretical framework in which it has been developed. This framework will help better understand the meaning and legitimacy of the tools created in cooperation by the partnership.
Due to the length of the tools (often several pages), including them in this booklet is not easy nor relevant. Therefore, they will be briefly presented and commented in the guide and can be downloaded in full on the website (the download link is indicated in the guide under the related tool).

1. Simulation - definition

Simulation in healthcare consists in performing activities to address a professional situation in an environment that is meant to be as immersive and close as possible to the reality of health premises.

In the SIMUCAREPRO project, each partner identified professional situations in various ways depending on the educational processes implemented or their real-life situation.
Regardless of the selected method, the partnership between healthcare premises and training institutions offered an interesting synergy. With this cooperation, each one's expertise was put in common for the sake of instruments that fit real life at best.
On the one hand, healthcare operators provided real clinical situations and conducted interesting reflections about their feedback on current protocols in a real, ever-evolving environment. Thereby they guaranteed significant elements. On the other hand, training institutes guaranteed the implementation of the educational instruments and contents referenced in the research (EBN).

Despite this added value and an obvious link between stakeholders, this partnership is not as natural as it seems and a certain number of focal points need to be considered when such a dynamics is to be developed. We will go back to it later in the SWOT analysis conducted at the term of the project and presented at the end of this booklet.

Besides, clinical simulation is an educational process that directly aims for the development of competence through a clearly defined and prepared procedural management. It associates experiential learning and reflexivity starting from immersive scenarios followed by debriefings. Simulation in healthcare is part of active learning and relies on the techniques of experience-based learning, reflexivity, problem-based learning and collaborative learning.
Levett and Lapkin's studies (2014) have clearly demonstrated that key learning occurs during the simulation session debriefing phase.
Fostering constructive retroaction for learners is not easy and has to be learnt; simulation in general and debriefing in particular require from the teacher to develop expertise in learning processes (Deschênes, Fournier, St-Julien, 2016).

Behind the game – a precision timepiece.

As we can see through these first definitions, simulation activities cannot be improvised; the trainers' educational expertise is indispensable. It is expressed at three distinct moments: before the simulation exercise for the creation of the scenario, during the exercise at the moment of the scenario progress, and during the debriefing phase (an element inseparable from simulation that consists in a reflexive feedback on healthcare decisions and activities conducted by learners put in exercise situation (Policard, 2017))

- Before the simulation… Anticipation, preparation and definition of the exercise: creating a simulation scenario.

While there is an undeniable added value in simulation to develop and enhance professional competences, in initial and continuing training, simulation instruments require, to be efficient, a precise analytical anticipation of professional reality, scenarios and debriefings. Simulation cannot be improvised, it is a formal process that requires complex preparation, both in contents and the trainers' attitudes. For this reason the partners developed the two following tools within the framework of the project:

The first one is a common structure for the scenarios. Beyond a mere common form to share scenarios more easily between partners, the items that constitute it let the trainer correctly anticipate the different fundamental elements to create and structure the scenario.

Even more important, the second grid must ensure the validation of the simulation scenarios created. To do so, it aims to identify the different reflexive elements that will guide the scenario creator in their analysis of its quality.

- During the simulation… "Real-time" adaptation at the moment of the exercise and debriefing

Even if the scenario has been anticipated, tested and validated, the succession of interactions can still lead to events that had not be anticipated when the scenario was created. The trainer needs to quickly identify those events to refocus the proceedings and reach the predefined objectives or bounce back on opportunities and allow new learnings. The trainer will thus have to be constantly careful in order to lead the learner to the specific objectives defined in the scenario. The trainer's role and competences are therefore essential in making sure that the learner develop their own in an optimal way. In the SIMUCAREPRO project, we have not explored this point further because all the partners had previous training and experience in debriefing technique. The object of the project was therefore quite different.

We will limit ourselves here to emphasise that a debriefing is run consistently with the predefined objectives and the results of the scenario implementation. This consistency directly concerns the scenario validation grid developed by the partnership. Similarly, let's already note that the observation and evaluation grid for learning outcomes achieved during simulation sessions (cf. below) seems to us an important tool in the debriefing process because it will directly contribute to conducting the latter and to identify positive points and points to improve in learning different competences.

2. Educational instruments in healthcare simulation: theoretical elements to structure the created tools.

The simulation scenario is a tool built by and for trainers. It describes a specific exercise in a healthcare simulation instrument.

The scenario includes information about the context and role-playing, the type of simulation (dummy, standardised patient …), the learning objectives, the learners targeted by the scenario and the evaluation criteria and modalities.
Other data inform participants and make it possible to run the briefing session that always comes before the exercise.

The scenario also describes the progress of the healthcare situation. It includes a description of the initial situation and final state and a list of care material and accessories (decorum) to implement in the environment of the simulation game. The scenario also includes an "anticipated" description of the progress of the reactions and decisions expected from learners based on the progress of the clinical situation piloted by trainers. Finally, it lists the EBN references, the tools and resources to fuel learners reflections and (re)focus the debrief session when needed.

You will find those different elements in the "common simulation scenario grid" tool, available at the address:
http://simucarepro.eu/telechargements/documents/Structure_commune_des_scenarios.pdf

a. The importance of fostering internal attributions in the learner's reflexivity process.

Clinical simulation requires an immersive environment that imitates professional reality, both in content (healthcare situation) and form (decorum). The learner's actions upon implementing the scenario are defined and conditioned by how realistic clinical situations encountered in healthcare environment are. Those actions are key because they are the object of reflections and learning for all learners (operator and observers) during debrief. If the operator learner does not believe in the situation, they will be able to evoke the lack of realism to justify their inappropriate actions and interventions. The more the learner will be immersed in the situation, the less they will be tempted to employ external attributions to justify lacks and imprecisions in their interventions.

b. The importance of targeting care decisions located in the learner's proximal development area.

Developing appropriate scenario is key in simulation training. The scenarios must be developed to meet specific learning objectives, without impeding the appearance of other learning points (Alinier, 2011). The scenario validation grid must make it possible to foresee debriefs regarding educational objectives. The scenario validation grid aims to inform the trainer about the general and specific educational objectives of the scenarios. The general objectives must match

the institution training programme/framework of competences, and the specific objectives are related to the learner's training competence level while respecting their proximal development area. For learners in initial training, theoretical knowledge acquired in class must come to use in simulation sessions. The scenario must target up to four specific objectives related to a "breaking point" and a "problem" situation. All those elements thus emphasise how important it is not to change the scenario during the situation and to stick as much as possible to what has been planned.

c. The importance of keeping the scenario climax in the crosshairs.

The simulation scenario not last too long (15 minutes), and the learner must be immersed straight away in the action. The initial situation must be described and the learner's entry into action must be an integral part of it. In order to keep the learning objectives in sight, interactions will have to be anticipated with rigour. Being able to anticipate possible interactions based on the scenario progress is primordial. This way the trainer will be more reactive. To do so, developing the scenario and testing it beforehand in team is indispensable. Those repetitions aim to identify meaningful responses to maintain or correct the direction until the final situation. The final situation (which is preferably a "happy ending" and should not put learners in the face of a fatal mistake that would completely unsettle them) is also described.
The scenario thus describes three phases: the initial situation, the progress and the final situation.

3. Contextualising learning outcomes in relation to EBN/EBM/EBP.

Basing practices on the best available convincing data is a key competence for healthcare professionals and for nurses in particular (Institute of Medicine, 2016). Numerous national laws state this willingness to build practice on convincing results when they implement the 2005/36/EU European directive (as modified by the 2013/55/EU directive). It concerns the competence of diagnosing in an independent way the required nursing cares based on theoretical and clinical knowledge, and planning, organising and delivering nursing cares to patients, based on acquired knowledge and skills in order to improve professional practice.

EBN /EBP teaching is often delivered and limited to research method courses. Learning is often mainly (or even exclusively) related to the achievement of a dissertation that we will be described as classic. Learning experiences should be multiplied with EBN /EBP and anchored in more contexts than just one theoretical analysis on the matter. In this regard, in the SIMUCAREPRO project, three partners thus chose to associate the process of achieving learners' dissertation with the creation of simulation scenarios based on real-life problems, which use convincing data.

The importance given by the project to scenario validation, based among other on convincing data that guide care decisions, deserves that we spend some time on the elements that justify such a choice, even though we will get back more extensively on this element when we address the educational instruments implemented in the different education institutes.

- In the SIMUCAREPRO project debriefed reflections are documented in an "informed" way.

Clinical decisions are not justified only with regard to the professional's clinical judgement, the healthcare context and the patient's resources, they must also be enlightened by knowledge of EBN (Ciliska, 2005). In most situations, learners comment and identify the most appropriate healthcare decisions for the situation, however, it is sometimes necessary that the trainer refocus the remarks accuracy. The necessity to reference healthcare decisions in the scenarios establishes itself de facto to guarantee the relevance of the justifications for healthcare decisions during debrief. Learners also have the possibility to leave the simulation session with supports from research.

- The SIMUCAREPRO project supports learners' commitment in their learning related to EBN/EBP.

In her review of the literature, Ryan (2016) highlights learners' positivity in nursing care in the face of learning and the use of EBN/EBP. However, teaching EBN/EBP is not without challenges and learners will sometimes meet difficulties.

The following elements are the most frequently cited:

The fear of dehumanising cares

Reconciling in learning both EBN /EBP and care personalisation is not easy. The authors highlight the teachers' responsibility in imparting to learners that EBN/EBP and humanist cares are not mutually exclusive. Indeed, there is a risk that learners lament the excessive amount of theory at school, and the oversight of care practices and of the patient's human dimension. (Halabi and Hamdan-Mansour, quoted in Ryan, 2016). The SIMUCAREPRO project guarantees, through the integration of EBP in the scenarios, that learners will make on their own the link between practices expected in a given simulation situation, and EBP guiding their care decisions.

The gap between teaching and professional environments

As previously mentioned, contextualising learning outcomes in relation with EBN/EBP is essential. However, during internships, this practice is not yet in force. Initial EBN/EBP training is recent, continuing training opportunities are scarce, and many nurses in healthcare contexts are not trained to support learners to integrate the results from research into their practice.

Contextualising learning and experience in relation with EBN, better levels of competence can be developed. The SIMUCAREPRO project, through the partnership between healthcare fields and training institutes, fully follows this logic.

EBN /EBP teaching methods

While learning achieved in initial training increases knowledge, some authors claim that learning must also be integrated in clinical internships and that training experiences must be increased, contextualising them in internship locations and simulation centres. (Finotto, Carpanoni, Turroni, Camellini & Mecugni, 2013).

In a traditional education scheme, learners spontaneously take on a position of "knowledge consumer" and expect the right answer will be provided by the graduated nurse, the teacher … Considering the idea of being a "knowledge producer" does not come naturally to learners. (Aglen, 2016)

Traditional education is ineffective and does not foster motivation. Millennial learners require interactive, focussed and experiential learning strategies (Schams and Kuennen (2012) Quoted by Aglen 2016).

Considering these elements, and knowing that pedagogies used to teach EBN/EBP research methods have more impact on learning if they are part of a practical (such as a simulation lab) clinical framework (work placement), the added-value of SIMUCAREPRO in this regard becomes obvious.

The simulation lab has an important advantage as researches in the best results can be actively performed by learners in real time and in immediate step with lived experience. (Brown et al., 2010)

Among others, those different points have been particularly useful for partners to design the scenario validation grid giving them relevance and suitability to the objectives supported by the project.

This validation grid is structured around different items focussed on the following dimensions:
- Problem, analysis of the situation
- Design of the simulation programme
- Scenario educational objective
- Documentary research methodology
- Targeted learner population
- Approach modalities and tools
- Evaluation elements
- Documents and supports

You will find the complete validation grid at the address:
http://simucarepro.eu/telechargements/documents/Grille_de_validation_des_scenarios.pdf

4. Observing and assessing learning outcomes

While the first tools are mainly useful in the first phase of the scenario conception, the teacher's work during simulation also needs tools. This is particularly true during the debrief and learning evaluation phase.

Therefore, it seemed important to us to create a learning indicators grid. It identifies observations during the progress of the simulation scenario. It is an essential tool in the learning process and a support to debrief.

In SIMUCAREPRO, we have listed the existing evaluation instruments and variables present in literature in order to create this tool.

In the end, the grid is made up of different aspects to evaluate, such as the clinical situation, information management, communication and team work, security and learner's reflexivity. The partners have formalised this grid with transversal indicators that can be easily completed with other indicators depending on the specific objectives of the performed scenarios.

You will find the complete observation and evaluation grid at the address:
http://simucarepro.eu/telechargements/documents/Grille_d_observation.pdf

Simulation scenarios

After this description of the different methodological tools that guided us to create simulation cases, here are the partners' concrete productions.

During the project, each education institute committed to produce four scenarios.

As previously mentioned, these scenarios have been developed in direct relation with existing problems, sometimes identified together by learners and professionals during clinical internships, and therefore expressing experienced difficulties and/or concrete issues transmitted by professionals in their daily practice.

The table on the next page presents, for each activity in simulation:

- the partner who developed it
- the type of simulation
- the description of the person being cared for
- the main specificity/ies of the situation
- the existence of available variables

Abbreviation of the table

Partners :
See first page "partners

Type of simulation :

HF D.: High-Fidelity Dummy

S. Pat.: Simulated Patient
(standardised patient)

The scenarios will be available for download at the address: www.simucarepro.eu

Partner	*Simulation type*	*Description of the person taken care of*	*Specificities of the situation*
esenfc	HF D.	Patient with cardiopulmonary arrest due to hypoglycaemia related to extended fast.	One learner must take on leadership of the process, but will wear a blindfold. The different participants need orders from the leader to perform actions.
esenfc	HF D.	Refusal of care – Transfusion – Emergency situation.	Establish structured and efficient communication; take decisions based on available information, ethical code and legal documents.
esenfc	S. Pat.	Safety during drug administering.	Adopt preventive measures to avoid medication errors.
esenfc	HF D.	Communicating bad news to the patient.	Communicating a diagnosis in emergency service.
umfcluj	HF D.	Anaphylaxis with glottal oedema.	The participants should be able to work in team, assign roles and appoint a team leader to coordinate actions. Identify the seriousness of the situation and set priorities for actions to carry out.
umfcluj	HF D.	Polytrauma. Pneumothorax under pressure.	Application of ATLS protocol.
umfcluj	HF D.	Haemorrhagic shock after ruptured oesophageal varices.	Implement necessary reanimation actions and specific emergency actions in the framework of the scenario, implementation of a Sengstaken-Blakemore tube.
umfcluj	HF D.	Broken tibia. External haemorrhage.	Apply necessary immobilisation and haemostasis operations.
Ilumens	HF D.	Attending to pain in a patient with sickle-cell anaemia in vaso-occlusive crisis.	Recognise a vaso-occlusive crisis. Attend to the pain early, adapt therapies. Anxiety-inducing context.
Ilumens	HF D.	Anaphylactic reaction.	Attend to the grade 3 anaphylactic reaction. Recognise an anaphylactic reaction. Make links between the patient's condition and their medical file. Attitude to angioedema.
Ilumens	HF D.	Taking care of pulmonary oedema during a blood transfusion.	Recognise signs of the seriousness of pulmonary oedema. Implement nursing actions while waiting for the doctor to arrive.
Ilumens	HF D.	Heart arrhythmia following potassium IV.	Apply care proceeding algorithm. Identify IV potassium administration protocol.
Ilumens	HF D.	Transfusion accident.	Identify the transfusion accident and how to behave. Haemovigilance protocol during red blood cells transfusion.
Ilumens	HF D.	Attending to acute pain in a patient with chronic pain.	Attending to acute oncological pain in an emergency palliative care context.

HELMo	HF D.	Managing an infant's cardio-pulmonary arrest in a neuropediatric service.	Evaluation following a decisional algorithm in paediatric reanimation ERC 2015-2020 recommendations. SBAR transmission.
HELMo	HF D.	CPR with AED in a medical/surgery service	Make relevant gestures depending on the ABCDE analysis – CPR + ventilation. AEDE + anticipate intubation.
HELMo	HF D.	Emergency C-section on umbilical cord prolapse wide ARCF code red.	Identify and divide the different tasks, and communicate efficiently with other learners. Leadership – Transmission. SBAR.
HELMo	HF D.	Difficult intubation.	Manage a neurological degradation requiring intubation in a patient with cervical collar and skull fracture. Several possible variables.
ISSIG-HEG	S. Pat.	Taking care of an elderly in delirium with a risk of immobilisation.	Assess risk factors and factors predisposing delirium, using a decision tree. Implement different alternatives to immobilisation. Communicate with the team.
ISSIG-HEG	S. Pat.	Therapeutic education for a patient with lung transplant.	Identify the patient's cognitive abilities. Evaluate the patient's current knowledge. Identify past experiences and representations. Identify the patient's motivation to change their behaviour.
ISSIG-HEG	S. Pat.	Communication in the process of announcing bad news.	Develop one's emotional communication competences. Transition oncological/palliative /supportive cares. Guarantee care continuity/interprofessional communication.

Educational instruments
(theoretical aspects)

«The added value of technological tools
for education and learning largely depends on the methods
in which those tools are immersed »
(Lebrun, 2002)

While simulation is the educational tool at the heart of our project, and the elements presented above are an important focus for its development, it must be noted that the implemented simulation instruments were only one part of our project. Indeed, simulation is developed in a larger context within educational instruments that use a series of methods supporting the training opportunities offered to learners. Therefore, it seemed important to the partnership to define several markers to guide partners' reflections on the educational instruments to implement while make sure these would contribute to the project objectives. Apart from those previously developed, the objectives were:

- Learners' development of professional competences
- Working on clinical judgement and/or professional communication
- Exploiting, if needed, EBN and/or EBP and an important collaboration between practice premises and education institutes
- Achieving healthcare protocols validated by the services.

1. Development of professional competences by learners

Using several principals and theoretical frameworks, as well as a structuring reflection tool (DIPROS), we could make sure the processes implemented to develop learners' professional competences were relevant.

On the one hand, simulation in healthcare seemed a natural fit for the four principles of andragogy[1] and thereby particularly suitable in our training offers to help learners develop their competences.
The four principles are:

- **Involvement**: need to be actively involved in the process
- **Connection**: need to make analogies with what has already been learned
- **Adaptation:** not to stigmatise, and let one learn from their mistake
- **Usefulness**: need to respond to an activity that is clearly identified

Those elements are found, fully or partly, in the development model of socio-constructivist competences proposed by Lebrun (2011) as a tool to analyse educational instruments, which has guided many reflections on the implemented instruments.
This model let us emphasise the following elements, which are important for the project and a guarantee of quality work:

- The importance of putting in action and in interaction (between them and with professional areas) groups of learners responsible for producing, fully or partly, simulation instruments for the practice locations where they did their internship.
- The importance of making work motivating, structuring it with real needs felt and/or expressed in the units in which the learners were going to act, identifying with them continuing training needs or care problems on which they want to change their practices. Making work motivating also through the nature of the requested final product (simulation session for field professionals), which was going to bring a real added value, and improving the quality of healthcare providing units with an ideal tool to review their healthcare protocols when needed.

[1] *Adult learning*

- The importance of providing complex work that uses a series of resources from theoretical knowledge from professional literature (including EBN/EBP), as well as experiences from the field, and complex procedural knowledge regarding professional reality of which identified problems were part.

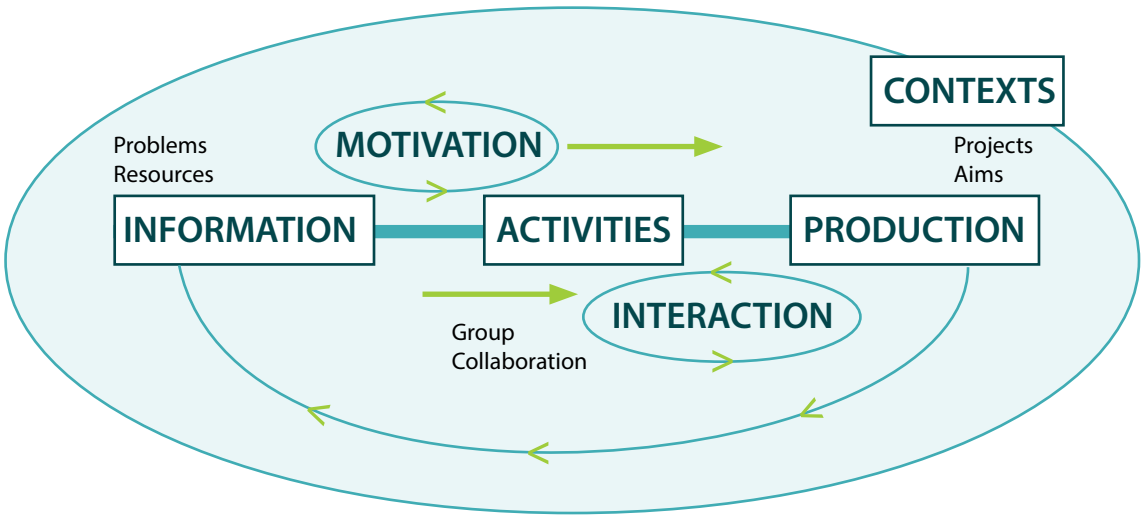


Figure 1: A pragmatic model to analyse the effects of instruments (with or without ICT) on learning (Lebrun, 2011).

While the first elements seem to guarantee de facto efficient work on developing new competences, we still had to make sure that the developed competences were part of learners' professionalising process. To do so, the partners were required to use DIPROS in order to describe the instruments and to make sure they were professionalising.

In this framework and transversally, after reviewing and implementing the project, it emerged that the directions taken in the beginning of the project already partially guaranteed the quality of the final instrument and its professionalising aspect. Indeed, it now seems important to us to point out that the work carried out in simulation within educational instruments possesses a certain number of intrinsic features that turn out to be particularly interesting to develop professional competences. Let us note on this subject that:

- The work in simulation within medical and paramedical professional teams foster learning in a meaningful context of action (higher information memory rate).
- Simulation scenarios as they were defined in the project give the possibility to work from authentic problem situations from professional reality.
- Production, communication and interaction activities encourage learners to use their varied knowledge, resources and experiences from various professional areas (disciplinary and interdisciplinary) and to confront them to the teacher and to field professionals.

2. Work on clinical judgement and professional communication

Another reflection topic for the partnership was about making sure that the implemented instruments were going to work on the competences targeted at the beginning of the project.

Currently, for the learners in our partner institutions, clinical judgement is mostly developed during internships. However, specialisation and shortened internships cause, in many countries, a structural restriction in internship attribution.

Due to the significant diversity of clinical situations, all learners cannot always develop their learning with meaningful clinical experiences. It is therefore necessary to implement, in parallel with professional internships, learning situations that would let them develop clinical judgement and would better prepare all learners. This state of affairs also applies to the development of communication skills, even though we insist more in this guide on the elements that have underpinned our reflections about developing clinical judgement.

In this regard, while simulation is sometimes erroneously associated mainly with the development of technical gestures, it seems important to show here how it participates almost naturally in the development of the clinical judgement competence, and to explain a few frameworks of references for anyone who wishes to practice those competences through simulation.

In the article "INACSL Standard of best practice: Simulation" (2016) are defined many concepts related to simulation. The following diagram is presented and make a link between the different elements that influence and enable the development of a high level of competence in the cognitive field, and particularly to take safety decisions that are relevant for practice. Clarifying the different elements of this diagram was an interesting preliminary for the partnership and anyone who wants to implement an instrument to develop clinical judgement competences.

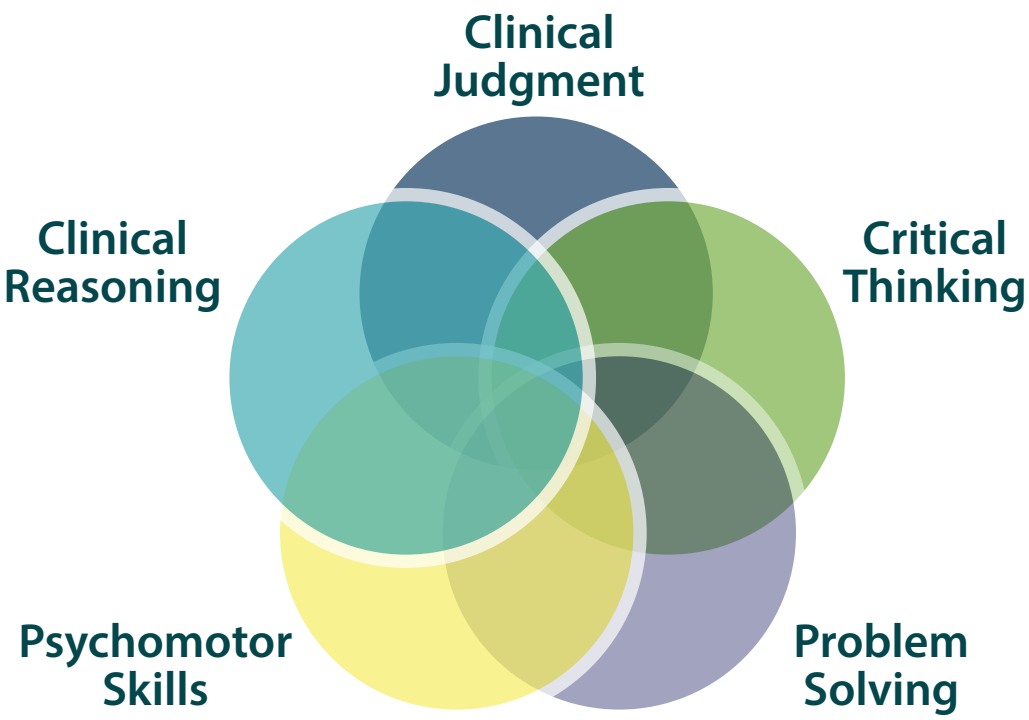


Figure 2 : Skill Development and Clinical Judgment©. INACSL 2016

Besides, we have also observed that Tanner's model of nursing clinical judgement (2016) is frequently used by researchers to develop the reflexive approach to debrief in simulation and thus associate the development of learners' clinical judgement and the debrief phase of simulation sessions (Deschênes, Fournier, St-Julien (2016), AL Sabei, Lasater (2016)).

In this regard, Patrick Lavoie and his colleagues have recently published on this subject an article about supporting reflections on healthcare situations that can be perfectly implemented in different active learning strategies; including simulation.

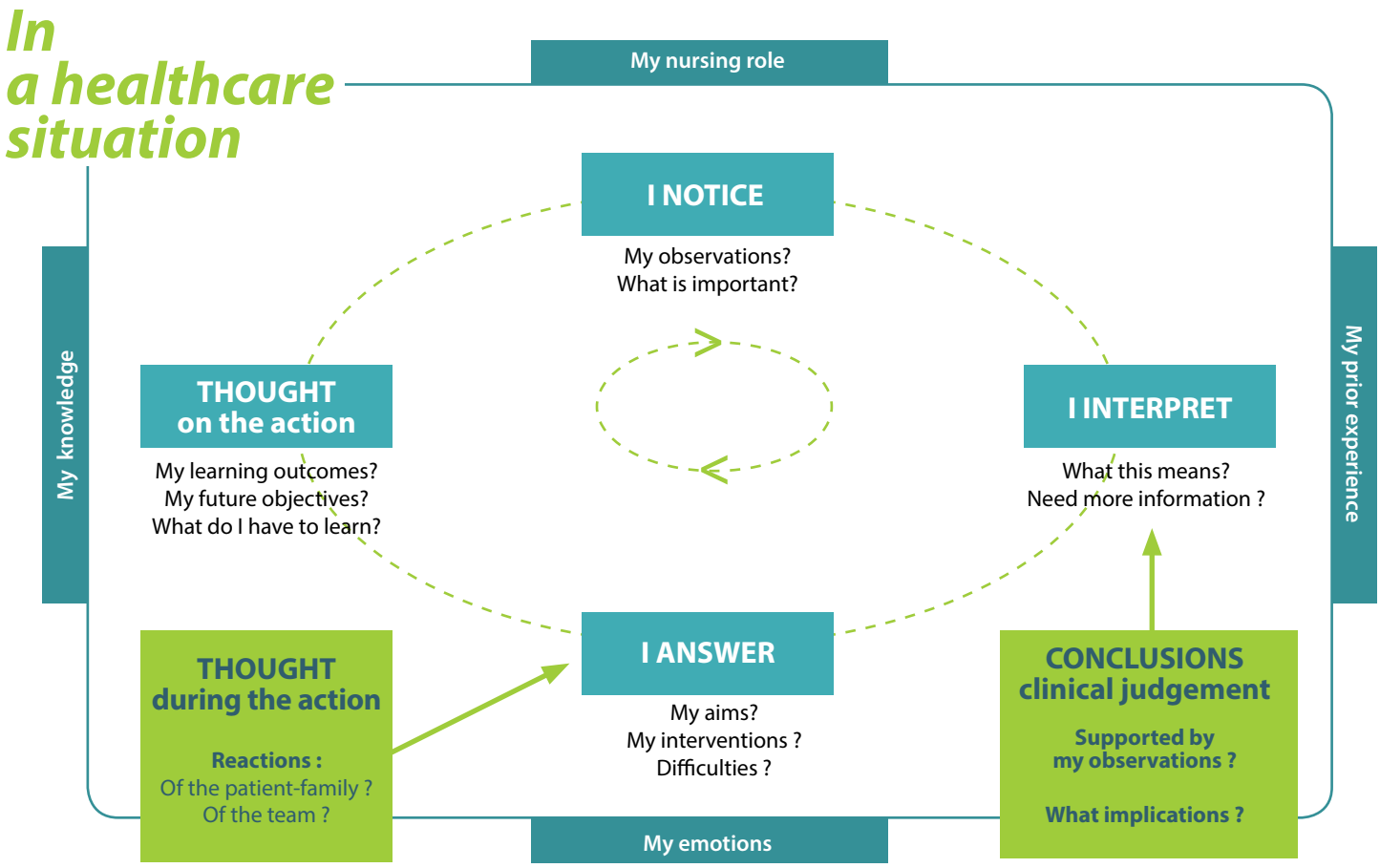


Figure 3: Reflection model for clinical judgement. Lavoie & al. 2017

In clinical judgement, the person recognises the prominent aspects in a clinical situation, interprets their meaning, identifies possible decisions and thinks about their efficiency. Thinking about actions during debrief is related to the competences practiced during the implementation of the scenario.
Encouraging feedback on experience is crucial. In this context, thanks to theory on **experiential learning** pedagogical reflections can be integrated in healthcare simulation.

Poore, Cullen and Schaar (2014) explain that Kolb and Fry defined adults' learning process through the experiential learning cycle. Knowledge, competences and attitudes are acquired within a four-step cycle: concrete experience, reflexive observation, abstract conceptualisation and active experimentation.

- **Concrete experience.** The learner participates in an experiment such as simulation or uses past experience.
- **Reflexive observation.** During the clarification, the learner thinks about the experiment to describe facts and thoughts. They put data into words and assess decisions and consequences.
- **Abstract conceptualisation** During the explanation, the learner identifies the significant principles and rules of the experience that can be generalised. They identify from specific experience what can be transferred and what is invariant. This process is finalised with a feedback on theory.
- **Active experimentation.** It involves the use of what has been learnt to guide and improve future practice. This step is formalised with the implementation of theory, with a link to practical implications. OR Implementation of theory – practical implications.

New knowledge, competences and attitudes are achieved by the learner through personal experience. Through transformation of the experience, learning occurs. The learner must first experiment though personal experience (such as the simulation scenario). Then comes the clarification of facts and thoughts, which is the reflexive observation step, continued with a conceptualisation phase during which links with theory and concepts are made through questioning. Finally, the learner designs future experiments.

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Kolb D.A. (1984) «Experimental Learning experience as a source of learning and development», New Jersey : Prentice Hall

Figure 4 : Kolb's Experiential Learning Cycle. 2016

Kolb's theory indicates that learning processes are not constant and cannot be identical for all learners because they are influenced by the learner's knowledge and experience. Learning is a continuing cycle, knowledge is built from a basis of prior knowledge and therefore cannot be transmitted if the learner does not understand it according to their prior conceptions. Therefore, learning is fostered when learners can build a personal, understanding based on the experience of things and reflection on those experiences (Barry Hill, 2017).

The latter element is also cited by Deschênes, Fournier and St-Julien (2016), who emphasise that judgement development is fostered through the learner's verbalisation of data processing. They also highlight the importance of using reflection in a context of pedagogy in an authentic situation.

All those frameworks of reference have been informative for the partners and seemed useful to share at this level to support any person's approach to develop significant educational instruments within the framework of simulation and aiming for the development of clinical judgement.

3. Exploiting, where needed, EBN/EBP, a work on learners' confidence in their ability to use them and important collaboration between practice locations and educational institutions

While we have already mentioned the obvious interest and relevance of basing simulation practices and the development of simulation situations on scientific literature and valid results, it is also useful to extend reflections on this matter in order to see which important elements must be taken into account in order to develop educational instruments that integrate this dimension more globally.

Indeed, a practice informed by research results requires learners to develop competences in research method and critical reading, which are not easy. To this must be added the need of a passive understanding of English, an obstacle for too many learners in numerous non-English-speaking countries. Learners need to develop in parallel knowledge to understand the use of EBN/EBP and trust this use to increase their efficiency in practice.

The main challenge in teaching practice based on convincing data is that learners do not perceive how the research results will contribute to nursing practice (Aglen, 2016).

Fiset, Graham and Davies (2017) identified in a review of the literature the obstacles and facilitators, as well as the strategies that support nursing care learners' engagement in in the active use of EBN/ EBP data. The obstacles identified most frequently are poor knowledge and competences, negative attitudes, and lack of support in care units. Therefore it was important for all partners to pay particular attention to this aspect while developing instruments. Without offering an exhaustive list of those aspects, we are going to take here one of them as an example to show how it could guide some partnership stakeholders while developing their educational instruments.

4. The gap between education and professional areas

Contextualising learnings in relation with EBN/EBP is essential. Indeed, pedagogies used to teach EBN/EBP research methods have more impact on learners' learning if they are part of a practical framework (such as a simulation lab) or a clinical one (work placement).

However, nursing students' internship do not naturally propose these types of learning. Initial EBN/EBP training is recent, continuing training opportunities are rare and many nurses in healthcare institutions are not trained to support learners in the integration of research results in their practice. In their learnings related to the internship, learners have little contact with nurses who actively and explicitly use research in their clinical practice (Irlande, quoted in Aglen 2016). Therefore, there is currently a transition phase; voluntarist strategies such as the SIMUCAREPRO project can influence this transition phase in a positive way.

Moreover, during their internships learners are mostly directed by professionals towards healthcare activities; their research skills are little or not used. This dissymmetrical support between academic/theoretical and professional areas can increase learners' discomfort and decrease their trust in EBP. (Henderson and al., 2012).

Education institutions and clinical areas must imperatively cooperate to improve a practice informed by the best research results for graduate nurses and students (Ryan E., 2016).

Contextualising learnings and experiences in relation with EBN, one can develop better levels of competence. The SIMUCAREPRO project and its partnership initiated between healthcare institutions and training institutes follows this logic; reason for which the partners made sure the majority of educational instruments were developed paying attention to the following:

- Close cooperation between learners, teachers and professional areas all along the educational process;
- Encouragement to base EBN/EBP researches in a problematic situation identified by both learners and nurses;
- Education team's support to learners who search EBN/EBP data, particularly helpful and significant within the framework of the identified problems. Implementation of educational instruments for improvement in this regard;
- Development of simulation scenario based on EBP/EBN data and exploitation of these by learners to help professional nurses improve their practice around identified problems;
- During debriefs, exchanges between learners and professionals about EBN/EBP in order to fuel the reflection about healthcare protocols and make an explicit link with clinical practice to demonstrate how using EBP/EBN within it is interesting.

Thanks to the experience acquired during the project and considering the various satisfying evaluations conducted with learners and professionals about the training processes, it currently seems to us that paying attention to those various points helped us help learners overcome this obstacle.

Other authors (Zelenikova R. and coll., 2014) push the reflection on this subject further and propose that schools also participate in the support to graduate professionals in order to develop their EBN/EBP competences. While this is not clearly the project objective, it is however useful to note that in several situations, the partnerships informed teams about the added value of using research results in their practice. This use is undeniably a motivation element worth exploiting in order to encourage a collaboration aiming more explicitly to further develop those competences.

5. Implemented instruments resulting in healthcare protocols validated by the services

One of the last objectives was to achieve healthcare protocols based on convincing data and validated by professional areas around questions raised in cooperation by the learners.

In this regard, given the experience achieved, it now seems important to specify what the partnership meant by healthcare protocols. While there were numerous national definitions, we could agree on the following elements.
A healthcare protocols:

- Presents a template for optimal care addressed to a nursing and/or pluriprofessional team;
- Is built around a problem that interests a group of professionals in a specific context and proposes solutions to it;
- Is part of a local environment and practices and must take the proposed solutions into account;
- Must be documented and respond to good practices on the subject; where needed by EBN/EBP data;
- Must gain consensus so as to foster the harmonisation of practices.

Yet, clarifying those elements we came to address more humbly the project objectives in this regard. Indeed, achieving real healthcare protocols turned out to be more complex than expected. The following challenges were met:

- Difficulty for the teams to use directly, within the post-simulation deadline, all the new competences they achieved to develop protocols that should, by definition, often integrate the view of other professionals (such as taking care of acute oncological pain in a context of palliative care in emergency services.)
- Difficulty for the teams to use directly, within the post-simulation deadline, all the new competences they achieved to develop protocols that should, by definition, often integrate a certain number of hard to define or anticipate elements related to institutional/organisational constraints (such as code red emergency caesarean during umbilical cord prolapse with foetal arrhythmia.)
- Difficulty, considering the chosen topics and problems (sometimes nursing-focussed and based on psycho-social problems: refusal of care, communication of bad news), to clearly identify in the literature indisputable evidences with all partners' direct consensus.
- Difficulty, finally, to review scientific texts and to fully or partly transfer identified results considering the competences of the various stakeholders (learners and professionals) in terms of critical reading of scientific articles, and to understand the very notion of transferability and its impacts.

Thus, while in some cases where situations were strongly focussed on a well-documented medical practice, it was possible to reach an identified result in the framework of the project, other situations brought us to target intermediate results that consisted in:

- Either distributing memos after simulation session debriefs;
- Or sharing resources and distributing a reading portfolio to help teams sustain their future reflections in the framework of protocols implementation or review.

In these two cases, extra time and a specific project dynamic would have been needed to carry out a genuine review of protocols directly supervised by the project partners. We then questioned the legitimacy of our action in this regard as a training partner. While it clearly seemed part of our missions to provide tools to professionals, with all the necessary content to develop and/or review protocols, going further seemed beyond our missions of continuing training. A real work in tandem with healthcare managers or middle managers to manage the teams would have been necessary. While the benefit of such approaches is obvious, they are rather part of consultancy missions than continuing training missions. The document "HEALTHCARE PROTOCOL MEMO" is available at the address: http://simucarepro.eu/telechargements/documents/Protocole_de_soins.pdf

6. Integration of various elements in educational instruments aiming to enhance the school/hospital partnership

Given the different conceptual elements presented above, within the framework of the project, the partners developed educational processes around the use of simulation and a cooperation process between training organisations and professional areas.

Some partners based the project development on the meeting between learners in initial training and professionals directly during simulation sessions.

Other partners paired learners' dissertations with an internship to identify a healthcare problem and propose good practices from research results. In this system, the learners liked that they had to identify with professionals the choice of problems to study. They also enjoyed researching databases of concrete problem situations. Validating simulation scenarios based on this dissertation was an interesting opportunity to develop practices informed by the best results, for both learners and healthcare professionals.

Let us note that in order to implement such instruments, it was necessary to implement organisation and communication tools between the learners/professionals and teachers concerned.

Every implemented instrument was evaluated by the concerned professional partner. In the evaluations, the learners spontaneously mentioned they had developed clinical leadership competence indicators. (Healthcare quality evaluation – Arguments based on convincing data – Autonomy development and awareness of professional responsibilities – Communication and coordination with professionals in a common project)

Regardless of the process developed by the partners, putting learning outcomes into context and referencing them to EBP is recognised as a support to learning by both learners and professionals.

Those few elements are only the tip of the iceberg. Each partner's description of the process implemented through the DIPROS tool (Parmentier, Paquay & al, 2002) is available on the project website (http://simucarepro.eu), and so is the evaluation of simulation sessions via a scale to measure satisfaction and learners' confidence in their learnings.

Beyond these specific and contextualised evaluations, the final transnational meeting gave the opportunity to analyse more broadly the whole work carried out by the partners. This will be presented in the next part.

Feedback on experiences with implemented instruments

Transversal SWOT analysis

The project objectives for the different partners were to:

- Foster and increase exchanges between professional areas and training institutions to build in cooperation practical knowledge directly useful to clinics on firm conceptual bases.
- Let learners work on healthcare problems as relevant and motivating learning objects.
- Let practitioner update their knowledge and fuel their reflections with the addition of EBM and EBN to enhance their daily practice.
- Optimise simulation practices in terms of content and methodologies.

At the end of the project, each partner reviewed the strengths, weaknesses, opportunities and threats related to the project and the processes implemented in its framework. Sharing their work, the partners were able to point out the omnipresent strengths and weaknesses and to learn lessons that seem relevant to share here. The opportunities, threats and strategic plans developed to guarantee the sustainability of the approaches adopted during the project are specific to the context of each partner, they will not be addressed here.

Some of the strengths identified by the partners:

- The implementation and success of the educational instruments developed during the project were fostered by support from school managements and professional areas. Such instruments are strongly related to the quality of the partnership. The latter was enhanced during the project (which often happens in innovative projects) but several partners highlighted that the organisational complexity of the instruments could be difficult in initial training (threat more present in the country where the school-hospital partnership is less established).
- In all the partner countries, a real dynamic was established around the project between academic and professional areas. This dynamic has brought numerous positive elements for both learners (meaning given to learning, awareness of difficulties on the field and need to work in team, meaning given to use of EBN, increased confidence, development of leadership abilities,…) and professionals (revised appreciation of the learners and what they can bring, reception of learners' questioning and personal questioning of one's practices,…).
- The prior existence of a trustful professional relationship between the healthcare team and the teacher leading simulation sessions has also been cited as an essential to improve work and make such a project a success. The teacher's role is crucial to support the project dynamics, strengthen links, regularly remind the objectives, support learners in their assigned role, …
- Having real experience in simulation seems indispensable to implement new instruments with the purpose of turning simulation into an educational tool among others in larger instruments. Indeed, thanks to their experience in simulation, the different partners could fully focus on the whole instrument without just dedicating to the development of simulation scenarios or having to acquire debrief competences, for example. In our experiences, it does not seem possible to be simultaneously learning a new pedagogical technique (simulation) and supporting the type of instrument implemented in this project.

- Another element cited as an obvious strength in the project is the partnership and the meetings that drove us. Having a place to share practices and discuss was an undeniable benefit for the quality of the instruments. Realising that we sometimes meet difficulties similar to other partners' (implementing the EBN in educational teams and teachers' current competences in this regard). We could rely on the expertise developed by the others in specific areas necessary to the development of educational processes (link between clinical judgement and simulation, knowledge of certain databases or expertise in evaluation…). Those conclusions were helpful and supported the quality of everyone's final productions.

- Using simulation and the interest currently raised by this technique among teachers, learners and professionals is an important motivation lever. It fosters work, in parallel, on other more complex topics, which are difficult to address and to establish in training in a way that makes sense for all participants. Thus, using simulation to emphasise the importance of EBN and the clinical judgement that integrates it is an obvious strength of the project.

- Likewise, motivation to implement research in simulation practices and motivation to put the "EBN/EBM research method" course into context as it has been done by several partners are obvious and important strengths in the framework of our project.

- Last but not least, as all the partners could observe, learners, professionals and teachers had fruitful exchanges about evidence-based practice to support reflections on professional practices in simulation centres. The satisfaction to have taken part in simulation sessions was often important. This is particularly stimulating and motivating for the purpose of sustaining the process and will be a driving force for the future.

- More specifically to some partners, having tied the dissertation to a six-week internship, identifying a field problems, developing a project around the design of simulation scenarios addressed to professionals through the implementation of co-development groups... Those elements were undeniable riches for participating learners, their motivation, and the quality of the work carried out.

Some of the weaknesses identified by the partners:

Due to the diversity of national and institutional contexts, the weaknesses listed below did not necessarily concern all partners. However, it seemed important to mention as weaknesses the following elements:

- The recent introduction of EBN practices in institutions (professional area and training) often leads to work with learners (or even teachers) without experience in EBN research and reading. Therefore they received particular support during the process. Teachers' and learners' complete autonomy sometimes seemed difficult, or even impossible.

- The passive command of English for many learners is not up-to-date, not always sufficient to fully exploit texts.

- The necessity to base pedagogical practices on texts or researches about similar topics made partners' work more complex. Indeed, research literature has few examples of the best ways to integrate researches into the bases of EBN in pedagogical instruments.

- Professional nurses who graduate over five years ago are relatively little trained and informed about EBN. Working from EBN data is therefore not easy or meaningful for them. Beyond the obvious interest for literature and the articles found by learners, for those professionals, to see how to exploit them in their practice was not always simple (transferability difficulty, i.e. tendency to dismiss what is theoretically documented in a context as not applicable to their situation).

- One weakness of the implemented processes was related to the workload required by the European partnership, whose calendar did not always match the reality of education institutions. Besides, the different rhythms inherent to a type of training, which requires time for learners to integrate, and a professional area that wants quick results to get an answer to questions previously identified by learners were sometimes little compatible. The length of time between the identification of a problem situation in a unit, the formulation of the scenario topic, the validation of the scenario, and its implementation with professionals was considered too long and therefore a weakness of the instrument.

- Another major difficulty considered as a weakness was to integrate the simulation sessions in a continuing training process for professional areas. Making workers available to participate in simulation sessions organised for them raised many questions (cost, recognition of the training sessions as continuing training, how the team worked during the training, etc.). Besides, it was necessary to anticipate many purely organisational questions, which, with many stakeholders from different areas, is not always simple (agenda to gather professionals in the simulation centre, necessary number of sessions, common availability of learners and professionals, etc.)

- One final weakness was related to the difficulty to really achieve validated protocols based on EBN good practices at the end of the processes. Indeed, often we could not meet this objective and ended up with memos or reading portfolios addressed to professional areas. Achieving protocols would have required more time, more common post-simulation reflections and more involvement of healthcare managements in the projects. This was not possible due to the project duration.

Conclusion and prospects

In this guide, we have summed up and structured the diversity of the reflections that gave life to the project.

The partnership initiated a double dynamics, the first one within the simulation teams of each partner, the second one among the partners.

The tools built by the partnership will benefit the development of simulation centres. Moreover, the project was an opportunity to put scenarios in common among partners.

The different collaboration practices activated between training institutions and professional areas should be possibly extended due to the highlight on the benefits of this partnership and the quality of interprofessional contacts that occurred.

Regardless of the country, the partners emphasise that simulation in initial training is more easily implemented than simulation dedicated to professional continuing training. Different types of obstacles can explain this difference: organisational resources, teams' schedule, lack of a formal framework … but it is mainly the "pedagogical engineering" necessary to provide efficient simulations sessions that would explain this gap.

Healthcare sectors have expertise and knowledge of professional reality. Based on an analysis of practices, it is possible to identify sensitive healthcare decisions in real contexts. School simulation centres have experience in simulation sessions and command pedagogical processes related to experiential learning and documentary research.
A voluntarist and deliberate collaboration should not only help develop students' competences to better meet professional challenges, but also increase graduate professionals' competences.

The project clearly identified that simulation in healthcare could contribute to quickly implement and develop a professional culture of evidence-based practice. To this end, students' internship at the end of their studies should be based on a reflexive approach to healthcare quality. This approach would also contribute to initiate a clinical leadership attitude. Voluntarist coordination between initial training institutions and professional institution quality managers could lead to identify good practices and update healthcare protocols.

Project achievements:

- Dynamics initiated between professional areas and training institutions for learning in healthcare simulation and for the development of a practice based on the use of EBN/EBP
- Development of synergy between training institutions and professional areas
- Development of simulation centres
- Development of a EBN/EBP professional culture
- Development of clinical leadership
- Development of continuing training processes in training centres
- Development of contextualised initial training processes

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