

Case study

Simulation in Nursing Education



Gjøvik University College

Gjøvik, Norway

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This case study is one, in a series of seven, describing various aspects of European simulation centers. The document was developed in collaboration with and approved by Gjøvik University College.

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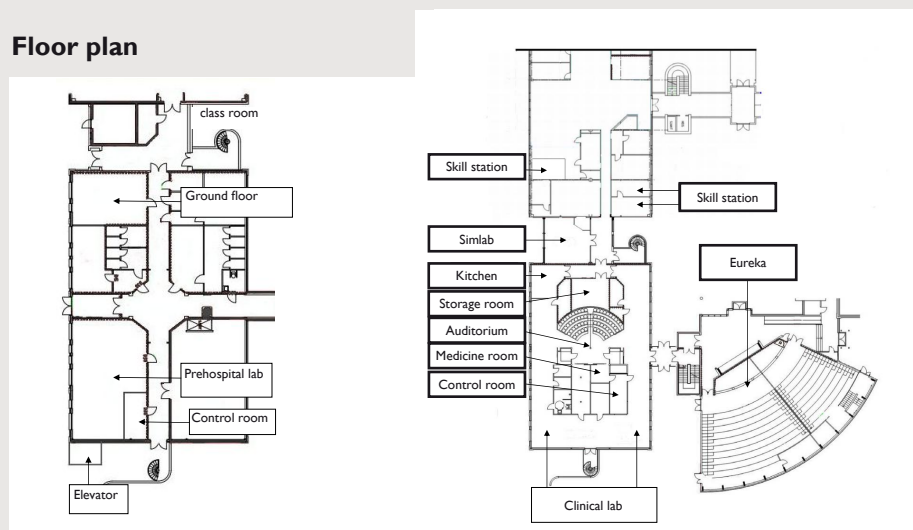
GJØVIK UNIVERSITY COLLEGE IN SHORT

Gjøvik University College (Høgskolen i Gjøvik - HiG) established simulation training in the facilities allocated to Section for Nursing when the Laerdal SimMan simulator became available in 2002. The initiators started out by developing and conducting simulation training courses for the pharmaceutical industry, and gained added, valuable experience from conducting free training for local hospital personnel. The external activity formed a sound financial basis to gradually establish a full-scale simulation center, which in turn could facilitate training for the school's own nursing students. Although nursing students are now the core clientele, HiG continues to provide simulation training for public hospitals, community organizations, and corporate industry. Part of the external activity takes place off premises (in-situ training). Gjøvik University College acts as a regional center, and trains approximately a 1000 students, physicians, nurses, EMS personnel, and simulation instructors every year.

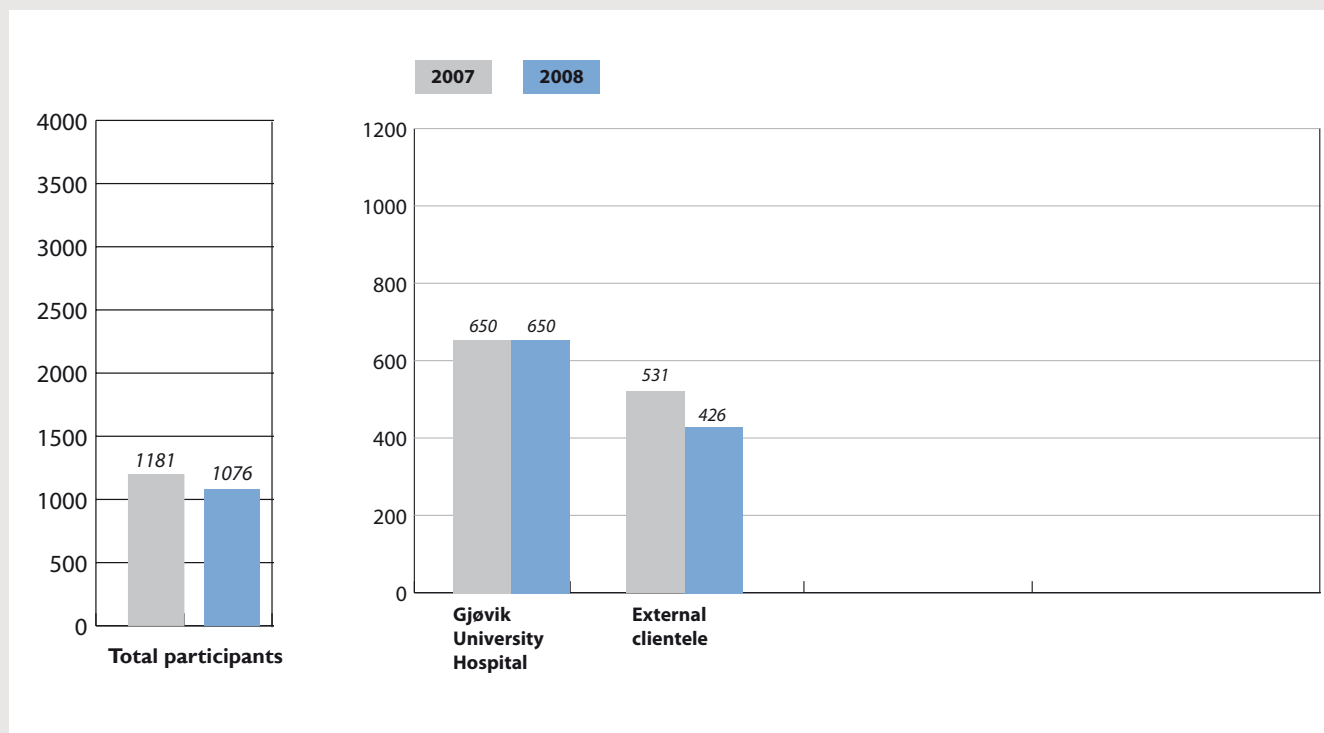
Profile

Simulation based Competency Management, Protocol Training, and Crisis Resource Management concepts are applied.

Floor plan



Activity



WHY SIMULATION WAS IMPLEMENTED

The main incentive to establish medical simulation training has been to improve the quality of instruction in nursing and medical education – as a step towards better quality of healthcare and increased patient safety.¹

ORGANIZATIONAL MODEL

The simulation center is an integral part of the Gjøvik University College. The simulation program is headed by a full-time employed intensive care and nurse anesthetist. The general manager divides his time between the simulation program – where he also acts as instructor – and a position with a local hospital. 12 part-time instructors facilitate training for the students at the University College, while an associated group of instructors perform training for the external clientele. The center provides in-situ training for clientele who request simulation training at their own workplace.

Staff competency levels

All instructors have a medical background and approximately 50% hold the formal three-day instructor course developed in collaboration by Barts, TüPASS, and DIMS European simulation centers. Debriefing is highly emphasized and is hence an essential part of this instructor course. Levels 2 & 3 of the Train-The-Trainer course are underway. Novice instructors at the University College conduct simulation training under supervision, pending their formal qualification.

For additional information: <http://www.EUsim.org/>

Staffing

General manager
1 technician

In-house instructors: 11 nurses (faculty members)
1 radiology technician

Associated Instructors: 3 MDs
1 intensive care nurse
1 nurse

Facilities

The University College administers 4 full-scale simulation rooms, 2 control rooms, 4 classrooms/debrief rooms, 2 auditoriums, various labs, and 24 hospital beds. Scenarios may be run independently in all rooms and in the open area surrounding an ambulance placed inside the simulation center. A pre-hospital lab – comprising an ambulance and a car wreck – is located outside the building and acts as an ambulance entrance. Here, the patients (patient simulators) are placed on stretchers before they are sent directly up to the simulation center in an elevator.

Curriculum

The University College develops and controls the curriculum. Scenarios for internal clientele – the nursing students – reflect the students' different educational levels, and scenarios for external clientele are designed to meet the various customers' educational needs.

FINANCIAL MODEL

The simulation center is owned and funded by the Gjøvik University College, Section for Nursing. The budget covers daily management and investments. Private funds and separate funds from the University College are allocated to research activity. Simulation training provided for the public sector is delivered at cost price, whereas training for corporate clientele is set at a higher price. Hence, clientele from the corporate industry generate some additional funding.

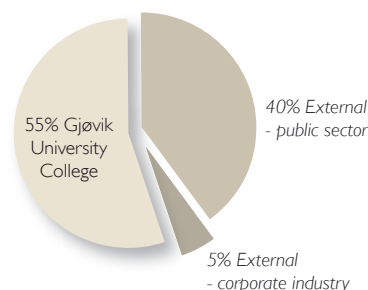


Figure 1. Funding.

BENEFITS OF MODEL

- **Facilities:** Four simulation rooms provide flexibility. The pre-hospital lab enables staff to conduct pre-hospital simulation scenarios with a high degree of realism/validity.
- **Meeting Educational Needs:** Instructors with limited opportunity to maintain clinical competence (nurse educators) are supplemented by full-time healthcare providers when conducting simulation training. This way the center safeguards an adequate level of clinical competence for all instructors.
- **External Clientele:** Simulation courses for external clientele generate supplemental funding.
- **Location:** Nursing students from the University College have easy access to the simulation facilities.
- **Financial Model:** Core clientele (University College nursing students) are ensured a minimum amount of simulation training.

CHALLENGES WITH MODEL

- **Productive Capacity:** All nursing students perform hands-on, full-scale simulation for ACLS skills. Due to limited time and lab capacity, hands-on training is however not possible for all students when further full-scale simulation training is conducted. The majority of students will therefore observe, while smaller groups perform active hands-on simulation training.
- **Staff Competency:** Instructor competency levels vary as some instructors rarely conduct simulation training and hence lack sufficient practice.
- **Instructor Courses:** The 'Train-The-Trainer' courses are designed to facilitate instructor training for personnel with medical backgrounds from typically ER/OR/ICU/CCU

units. These healthcare professionals immediately recognize the value of simulation training when introduced to it. The benefits of simulation training may however not be equally apparent to faculty (nurse educators). The Train-The-Trainer courses have thus proved less successful as an introduction to simulation training for this group.

DEMOGRAPHICS OF CLIENTELE

Professionals

Physicians

Anesthesiologists
General practitioners
Interns
Pediatricians
Senior residents

EMS

Ambulance personnel
Casualty clinic personnel

Other

Firefighters
Instructor training
(Train-The-Trainer
courses)

Nurses

Anesthesia
Casualty clinic / Em. ward
Dispatchers
Emergency care
Intensive care
Operating room
Radiology
Ward nurses

Postgraduates

Nurses

Anesthesia
Anesthesia postgraduate
program
Intensive care

Operating Room

Nurses postgraduate
program

Undergraduates

Nurses

External Clientele

Local hospitals
Firefighters
Pharmaceutical industry

EDUCATIONAL ACTIVITIES

The Circle of Learning (fig. 2) reflects the continuing process of attaining, maintaining, and enhancing clinical competence. The University College facilitates knowledge acquisition, skills proficiency, and full-scale simulation in teams. Bachelor students and Postgraduate nurses specializing in anesthesia/intensive care/operating room utilize the Resusci Anne Skills Station for initial acquisition of BLS skills.

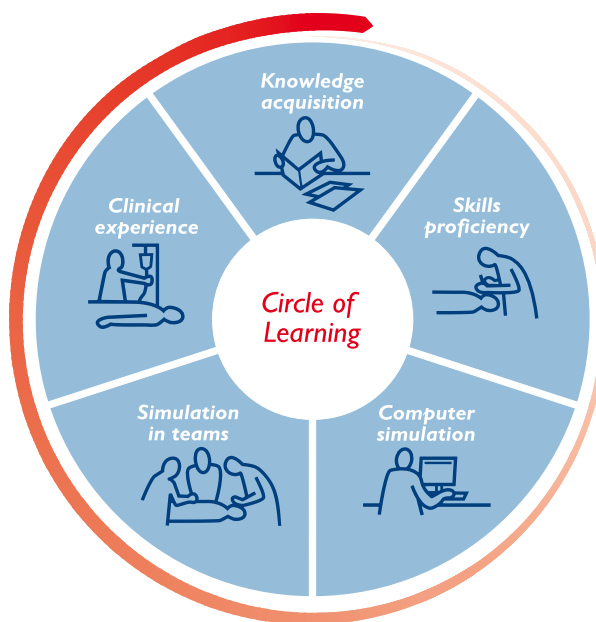


Figure 2. The Circle of Learning reflects the continuing process of attaining, enhancing, and maintaining clinical competencies.

TRAINING SOLUTION

The training equipment currently includes:

- 1 SimMan 3G
- 2 SimMan
- 1 SimBaby
- 1 Resusci Anne Skills Station
- 1 ALS simulator
- Laerdal skill trainers and manikins

METHODOLOGY

Simulation Training in Teams

Preparation: Participants prepare for the simulation training by attending subject related lectures and by studying relevant literature. 2-7 days prior to upcoming simulation sessions, the selected scenarios are published on the website along with other relevant information. It varies however to what extent the participants utilize this available information.

Brief: All instructors provide a 30-minute brief inside the theater. Here the participants are introduced to medical simulation as a learning method, and are shown the various features of the human patient simulator. Two instructors run a short scenario for demonstration purposes.

Validity: Gjøvik University College emphasizes validity to a high degree. This is eg done by dressing the manikins up in clothes that suit the ongoing scenarios.

Interactive approach: The instructors will stop a scenario in case something needs to be pointed out, or the group needs help to get back on track. The same scenarios are run 2-3 times, both during individual training and during team training sessions.

Trends

- Lectures are getting shorter
- Self-study is increasingly applied as a means for preparation
- Range of difficulty level (progression) will be incorporated into the simulation training
- External clientele are increasingly requesting in-situ training
- Many prefer to perform initial training at the simulation center; and have additional, follow-up training conducted at their own workplace
- Mobile audio-visual systems (AVS) will be applied in connection with in-situ training

Scenarios: All scenarios are self-made.

Most frequently used scenarios

- Acute, critical illness
- Cardiac arrest
- Chest pain
- Coma
- Difficult airway / Intubation
- Hemorrhaging – post op
- Pulmonary disease
- Trauma

Debriefing

Emphasis: High.

Debriefing fosters awareness and provides participants with key answers and hence a better understanding of what they need to reinforce and improve. Time allocated to debriefing depends on the learning objective (e.g. communication skills). The intended learning objectives also determine whether the focus is on the individual versus the team.

Applied tools

- Video clips recorded during ongoing simulation
- Notes taken by instructor during ongoing simulation

The priority program at Gjøvik University College is to improve quality of instruction in medical education. In order to accommodate the different needs of the wide range of clientele, the center provides both skills training and full-scale simulation training - individually and in teams.

Examples of training courses

- Qualifying examinations for ambulance personnel (3-day course organized partly at the simulation center/ partly outside – external examiner performs assessments)
- Skills testing for interns (10 hour hands-on skills training course with SimMan)
- Skills training for casualty clinic/emergency ward physicians (scenarios include laryngeal, CPR, pneumothorax, fractures, psychiatry)
- Commissioned course for critical care nurses (with purpose to increase awareness and general competence level at anesthesiology- and critical care units).

Focus

- Team performance during full-scale simulation (CRM)
- Individual performance (Competency Management)
- Protocol training

WHAT MAKES GOOD SIMULATION PROGRAMS

Issenberg et al² reviewed and synthesized existing evidence in educational science that addressed the following question: What are the features and uses of high-fidelity medical simulations that lead to most effective learning?

Issenberg argued, that the weight of the best available evidence suggests that high-fidelity medical simulations facilitate learning, when training is conducted under the "right conditions."

The right conditions include:

- Feedback is provided during the learning experience
- Learners engage in repetitive practice
- Simulation is integrated into the normal training schedule
- Learners practice with increasing levels of difficulty
- Adaptable to multiple learning strategies
- A wide variety of clinical conditions are provided
- Learning on the simulator occurs in a controlled environment
- Individualized learning and team learning are provided
- Learning outcomes are clearly defined
- Ensures the simulator is a valid learning tool

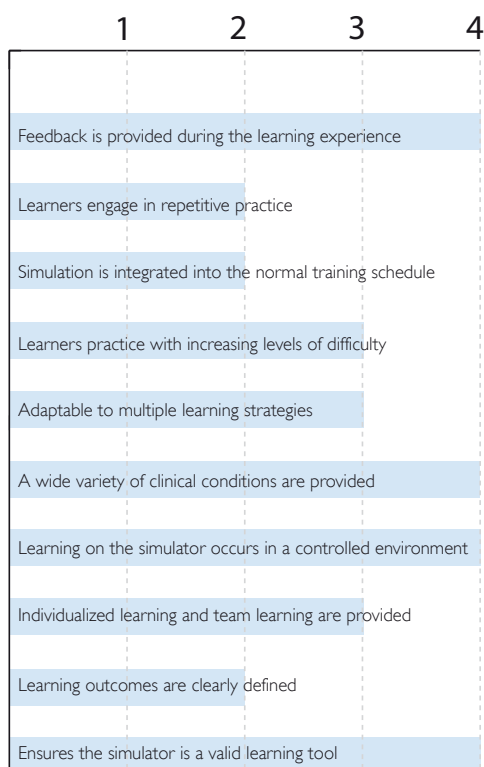


Figure 3. The bars indicate to which degree the University College delivers on each of the listed right conditions, as assessed by the simulation center on a 4 - point Likert scale (4 = highest).

RESEARCH ACTIVITY

Topics for ongoing projects:

- Assessment of which modality is more effective in learning airway management: paper/pencil versus lower- end simulation versus full-scale simulation
- Simulation as a didactic method related to patient safety in critical care nursing (PhD project).
- Simulation as a learning method for intensive care nursing, with emphasis on CRM (project is conducted in collaboration with three local hospitals).

REFERENCES

1. Gjøvik University College website: <http://www.hig.no/academics/simsenter>
2. S. Barry Issenberg, William C. McGaghie, Emil R. Petrusa, David Lee Gordon, Ross J. Scalese (2005) Features and uses of high-fidelity medical simulations that lead to effective learning: a BEME systematic review, *Medical Teacher*, Vol.27, No.1, pp. 10-28

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