DEVELOPING JUDGMENT IN AUTHENTIC SITUATIONS

EXPERIENCE-BASED LEARNING IN A SIMULATED SCENARIO FOR SAFE PROFESSIONAL PRACTICE

How do we promote development of judgment in our students? In a technical training context, how do we lead them to exercise sound judgment for safe professional practice? How do we promote experience-based learning that supports development of complex practical knowledge? By what teaching method can we enable students to draw direct links between action as well as professional reflection?

We strove to answer these many questions through experimental research (Deschênes *et al.*, 2015), in a project that emerged from a partnership among health and education resources in the Montreal region. This article presents the most interesting findings of this research,[1] which focused on the contribution of high-fidelity clinical simulation (HFCS) as a technological support for experience-based learning in nursing programs. Although the research was conducted in the healthcare field, many of the findings could also guide teaching practices in most technical programs where students must develop sound judgment.

JUDGMENT: AN INDISPENSABLE SKILL FOR PROFESSIONAL PRACTICE

In its report *To Err Is Human*, an American committee on quality of health care highlighted alarming statistics on patient safety: 45,000 to 90,000 deaths a year in the United States are linked to health care and attributable to avoidable errors (Kohn, Corrigan, and Donaldson, 2000). One of the report's recommendations stipulates that educational institutions training healthcare professionals should focus much more on learning from mistakes and on managing these incidents. Thus, developing the judgment of future professionals is an educational priority to ensure safe care for the public.

Judgment relies on knowledge, attitudes as well as reflective professional practice (Higgs *et al.*, 2008). Used as a conceptual framework for our research, clinical judgment in the nursing model developed by Tanner is defined by any "process for treating information, developing assumptions, subsequent clinical activities and reflection while in action" (p. 208, 2006) [translation].

This reflection usually includes:

- Feedback on experience
- Analysis and linking of data
- If necessary, regulation of thought methods (Nielsen, Stragnell, and Jester, 2007)

DEVELOPING JUDGMENT THROUGH LEARNING IN AUTHENTIC SITUATIONS

In a training situation, students develop their judgment in part through active teaching methods that foster their independence. Learning in authentic situations is based on assigning students a task that requires integration of their knowledge. To be authentic, this task must be meaningful and provide an understanding of, or solution to, a problem frequently encountered in professional practice (Herrington and Herrington, 2006). For example, clinical immersion through internships enables students to reorganize their knowledge based on the specifics of a given context. A teacher assessing the development of a student's judgment will then ask the following questions: Can students identify the relevant information for understanding a situation and anticipating a change in a patient's condition? Do they have the theoretical references to support advanced assumptions? Do they prioritize actions to be taken? Are they able to communicate effectively in a professional context to solve a problem?

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As part of nursing training, judgment develops primarily during internships in a real hospital care setting, but fostering attainment of this competency becomes difficult when internship opportunities are increasingly limited (Éducation Montréal, 2012; Smith, Corso, and Cobb, 2010). This challenge is compounded by the difficulty of standardizing students' clinical experiences in a context of over-specialization of care. It is proving ever harder to ensure that all students receive rich clinical experience during their training, which is essential to the development of professional skills such as judgment. Consequently, we are faced with new teaching challenges in the healthcare field: promoting judgment through teaching strategies that act as a complement to clinical internships and ensuring that students enter professional practice well prepared, through learning by error, while still preserving patient safety.

[During the briefing,] the "reflection while in action" and the "reflection following the action" capitalize on the experience gained in educational activities in learning contexts involving an authentic situation.

LEARNING IN AUTHENTIC SITUATIONS THROUGH HFCS

In order to foster the development of students' judgment, we recommend clinical simulation as a highly appropriate approach that forms part of an experience-based learning strategy that leverages an authentic situation (Jeffries, 2013; Norman, 2012). Already established in the aviation sector, it is now extending to other disciplines, such as police as well as ambulance work, medicine, respiratory therapy and nursing. In the healthcare field, teaching by HFCS provides an opportunity to recreate the reality of clinical situations by promoting contextualization and realism through the use of a computer-programmable patient simulator (Lapkin *et al.*, 2010). This simulator is life size, resembles a human being, and can talk and react based on realistic physiological manifestations. Through computer programming of this device, we can simulate diseases or behaviours rarely encountered in an internship, and thereby promote a measure of standardization in experience-based learning, deemed essential in training students (Baillie and Curzio, 2009; Moule *et al.*, 2008).

Teaching in such a simulation context relies on the theoretical precepts of collaborative learning, constructivism as well as social constructivism. In this regard, Rutherford-Hemming (2012) set out the sequential steps amenable to consolidation of learning during HFCS.

The BRIEFING prepares the student by activating prior knowledge and drawing out prior assumptions relevant to the simulation to be conducted.

The SIMULATION is the care event in which students are exposed to an authentic situation, which can be videotaped.

The DEBRIEFING addresses the emotions felt by the students, and above all, conducts a critical review of what occurred during the simulation. This step promotes meta-reflection in a prototypical situation from professional life.

EXPERIMENTAL RESEARCH

As part of the experimental research we conducted, we sought to determine the extent to which clinical simulation could play a role in developing the clinical judgment of nurses. We pursued the following objectives:

- **Experiment with sequences of three simulations per day that include briefing and debriefing activities for each simulation.**
- **Analyse the effectiveness of the simulation in developing nursing students' clinical judgment.**
- **Describe the benefits of this teaching method as a replacement for internship hours in a clinical setting.**

For this experiment, we formed a sample of 24 volunteer students from the Soins infirmiers [Nursing] 180.A0 program at Collège de Maisonneuve and Vanier College in Montreal, as well as the Santé, assistance et soins infirmiers [health, assistance and nursing] professional program of the Commission scolaire de Montréal.

In parallel with our research, the project *Environnements avec simulateurs patients pour l'apprentissage* (ESPA)–Montréal was launched. Under this project, 12 teachers from all the Cegeps and school boards on the Island of Montreal received training on clinical simulation at the Académie du Centre hospitalier universitaire de Montréal (CHUM), and then wrote teaching



scenarios that were validated by a disciplinary review process with nurses from clinical settings. This work was subsequently used to create a regional bank of 16 HFCS scenarios. The canvas for all the scenarios consisted of four sections. Presented in Table 1, this canvas could very easily be adapted to simulation activities in an authentic situation in various disciplines.

TABLE 1 CANVAS OF HFCS TEACHING SCENARIOS

TEACHING COMPONENT

- Summary of the situation
- Competency and competency components developed
- Learning outcomes
- References

OPERATIONAL AND LOGISTICAL COMPONENT

- Set up and materials
- Simulator programming
- Key components in the simulation and debriefing

PROFESSIONAL DOSSIER COMPONENT

- Nursing therapeutic plan
- Medical and nursing notes
- Prescriptions
- Medication administration sheets
- Diagnostic analyses and tests

STUDENT PREPARATION COMPONENT

- Summary of the situation
- Learning outcomes
- Suggested readings and preparatory activities

The experimental research days were planned with the method described by Simoneau, Ledoux, and Paquette (2012). Based on repetitive and collaborative learning strategies, this method involves dividing six students into three pairs. The first conducts the simulation with the simulator while, in another room, peers watch the simulation by videoconference and note what knowledge, skills and attitudes were mobilised during the activity. The peers then prepare for their own interventions. After 15 minutes, a second pair conducts the same simulated activity, keeping in mind the first team's successes and errors. The same procedure is repeated until all of the pairs have participated in the scenario.

Each simulation began with a 10-minute briefing period in which the situation was presented to the students. We asked them if they had established one or more potential hypotheses about the symptoms or complications the simulated patient might present. Each simulation ended with a 30-minute debriefing session in which the students were asked to answer a series of questions to promote metacognition. To achieve the research objectives, we used an observation grid for judgment behaviour indicators, developed from factors of the competency *Intervening with hospitalized adults and seniors requiring medical and surgical nursing care*,[2] in a context designed to develop comprehensive judgment based on the clinical judgment in nursing model developed by Tanner (2006). The grid, which is easily adaptable to different college programs focused on developing judgment, is presented in Table 2. The goal in using this grid was not to quantify the behaviours observed but rather to identify certain competency deployment indicators to support feedback from teachers and target critical learning in the debriefing sessions. During these periods, we also used a facilitation grid, presented in Table 3, to stimulate productive reflections. This structured feedback drove the explanation and verbalization of cognitive strategies used by the students in each simulation conducted.

Optimal articulation and structuring of knowledge in the minds of students ultimately translates into more effective professional communication. Engaging and maximizing activities that establish a "cognitive dialogue" is a teaching strategy to be promoted, a responsibility shared by students and teachers.

As part of the experimentation, a descriptive interpretive analysis of the data (Creswell, 2014), supported by observing the behavioural indicators of judgement that were deployed during the simulations and debriefing sessions, revealed three findings involving the specifics of judgment development in a simulation context:

1. **The teaching method in the context of authentic simulation promotes consolidation of learning and student autonomy.**
2. **Repetition and collaborative learning in an authentic simulation context help improve the development of professional practice.**
3. **The development of judgment is promoted by students verbalizing the data treatment process.**

[2] Nursing Program 180.A0, MELS, 2007.

TABLE 2 OBSERVATION GRID FOR BEHAVIOURAL INDICATORS OF CLINICAL JUDGMENT

COMPETENCY 01QE: *INTERVENE WITH HOSPITALIZED ADULTS AND SENIORS REQUIRING MEDICAL AND SURGICAL NURSING CARE*

	ATTAINED	PARTIALLY ATTAINED	NOT ATTAINED
Element of competency no. 2 – *Perform an initial assessment of the person or a progress assessment.*			
The participant gathers biophysiological and psychosocial data through:			
• Consideration of the tools available (e.g. medical chart, laboratory analyses);			
• Verbal gathering of data on the simulated patient's condition;			
• Appropriate physical examination of the system affected;			
• Taking vital signs;			
• Assessment of the presence of pain.			
Explanatory comments:			
Element of competency no. 4 – *Determine care needs.*			
The participant analyses and interprets all the information through:			
• Identification of one or more potential hypotheses for the simulated patient after considering the information available (preparatory readings) before the simulation;			
• Recognition of indicators of one or more problems in the simulated patient during the simulation;			
• Identification of one or more problems detected in the simulated patient after the simulation.			
Explanatory comments:			
Element of competency no. 8 – *Perform procedures.*			
The participant:			
• Determines the nursing procedures required immediately by the patient's condition;			
• Informs the professionals involved of the simulated patient's condition;			
• Issues nursing instructions to the appropriate people;			
• Delivers nursing and medical care.			
Explanatory comments:			
Element of competency no. 10 – *Assess the procedures and care outcomes.*			
The participant:			
• Assesses the simulated patient's condition using the tools available.			
Explanatory comments:			

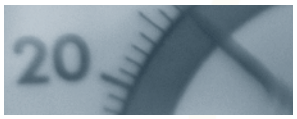

TABLE 3 DEBRIEFING FACILITATION GRID

1.	**BREAKDOWN OF EMOTIONS**
	• What emotions did you feel while executing the scenario?
2.	**PRIOR KNOWLEDGE**
	• Did you have the required prior knowledge to handle the care situation effectively? • What clinical data drew your attention? How did you obtain this information? • What care hypothesis (or problem) did you consider a priority in this context? • What gathered data enabled you to validate this hypothesis? • What clinical procedures did you perform? Were these consistent with your care hypothesis? How would you subsequently judge the effectiveness of the procedures you performed? • What other knowledge or procedures would you have found useful?
3.	**LEARNING ACHIEVED**
	• What did you learn from this situation? • Of the things you learned, what do you consider most relevant to incorporate into your future professional practice? • How could you improve your clinical nursing judgment in a future simulation of care situation that might be similar to this one?

1 The pedagogical method in the context of authentic simulation promotes the consolidation of learning and student autonomy.

Although the students had acquired knowledge during their training that was essential to participate effectively in the research activities, they still found the clinical immersion experience in a simulated context unsettling. The clinical simulation provided this opportunity to test the knowledge the students had acquired by confronting them with clinical representations provided by the patient simulator and the actions to be taken. It exposed them to the need to reorganize their clinical knowledge more effectively for a transfer of learning in a specific context (Tardif, 1999; Tardif, 2006). This reorganization is a difficult but very necessary intellectual activity for further development of judgment. One participant voiced this perspective in a debriefing session.

> *We were forced to stretch beyond our limits. We had no choice. During the simulation, I said to myself: reflect, think, act. This plunges us into reality and increases the integration of the learned subject matter. It encourages us to engage in better self-criticism of our strengths and weaknesses. It helps us connect the dots. We learn to prioritize care, while factoring in the overall situation. We learn to integrate all our knowledge.*

In fact, regardless of whether simulations had a positive or negative outcome, students were able to assess whether their interpretations of the situation and their actions were appropriate. The experience-based learning method encountered in a clinical simulation provides a bridge between theoretical knowledge and practice.

This teaching method also promotes independence by making students fully responsible for the simulation episode, during which the teacher is not in the room, to confirm the approach taken. This makes students responsible for the intellectual efforts required of them to develop their professional practice. One student said:

> *This simulation experience will help me become more independent. Tomorrow, I will go back to my internship. I feel I am going to stop waiting and will start thinking for myself. During a simulation, I can make decisions while risking mistakes, and this allows me to learn. We have carte blanche, I am in the driver's seat. I must act now. In an internship, I wait for approval from the teacher or nurse. During that time, it's as if I'm not always thinking it through to the end by myself.*

With the patient simulator, students are free to think and act to the best of their ability without running risks or causing harm to a live patient. On the other hand, "freedom" also implies "responsibility." Freedom to think makes students responsible for the consequences of their clinical analyses and acts.

2 Repetition and collaborative learning in an authentic simulation context help improve the development of professional practice.

We have found that repeating simulations generates improved behaviour that reflects judgment, even with different content in the scenarios and even if the order of the pairs varies over the course of the activity. At the start of the day, some students were unable to start the necessary care or properly assess the condition of the patient simulator. The simulation brought students face to face with their developing professional practice, helping them improve their acuity in the information to be gathered and care to be provided. In other instances, their

interventions did meet the standards of practice. Through repetition of the scenarios, students learned to focus more effectively on the components of a situation, interpret the results, act faster and reflect upon the best approaches. This improvement has been reflected in the greater quality of performance in the behavioural indicators observed for clinical judgment in nursing.

We subsequently noticed that some behavioural indicators improved through observation of peers. This social constructivist learning was achieved through observation and analysis of the behaviour of colleagues participating in the simulation by videoconference. The following comment by a student on recognizing key points of a situation reflects this.

> *At first, I was gathering information more mechanically. But when I saw the others' success, I adjusted to avoid tunnel vision and develop a comprehensive vision of the patient and the situation.*

Consequently, the difficulties or ease experienced by student pairs guided successive teams. The contribution of peers' performances facilitated adjustment in the students' thought processes through direct observation of effective and ineffective strategies. Through feedback, the debriefing sessions in turn reinforced behaviours deemed effective and compliant with standards of practice. These periods highlighted factors contributing to the development of judgment. They confronted the students with certain cognitive biases that caused mistakes arising from inappropriate beliefs, perceptions or practices. For example, several students thought they had to resolve everything on their own during simulation; the debriefing sessions made them realize that it was perfectly alright to seek necessary assistance and that this constituted a sound strategy and was not a sign of weakness or failure.

3 The development of judgment is promoted by students verbalizing their data handling process.

Verbal articulation of information deemed essential to the professional problem-solving process is one of the main cognitive strategies that students said they developed to support their learning during simulations. Although the students communicated within their partner and with the patient simulator, they also had to provide relevant information by telephone or verbally to other people involved in the scenario (e.g. physician, orderly). This cognitive verbalization strategy for facilitating learning in a simulation context (including the debriefing period) also becomes a professional skill to develop. Many students, however, encountered difficulty with the thoroughness and accuracy of information that had to be relayed to various members of the medical team, which implies that this strategy should be developed further. Since the information was incomplete, this made the task much harder for anyone coming into the situation and trying to understand what was happening. One student explained:

> *During the call with the physician, I had a memory lapse! I had assessed the factors but could not make them comprehensible to others. I have to be more coherent in my ideas. I think I will have to write down my impressions and adopt a more structured thought process.*

Lack of coherent organization of thought appeared to affect students' ability to convey clinical impressions on the fly. The improvement noted during the course of the day in the accuracy of verbalization of the diversified information and consistent linking of this information had a direct impact on students' skill in professional communication. Optimized verbal articulation of information improved the quality of simulator-patient management when the students became aware of its crucial importance to the development of their judgment, and to the care process.

TWO RECOMMENDATIONS TO FOSTER THE DEVELOPMENT OF JUDGMENT IN AUTHENTIC SITUATIONS IN COLLEGE COURSES

Our experimental research generated two recommendations for teaching teams wanting to use authentic situations in a technical program:

1. **To promote the development of the students' judgement in an authentic situation, it is important to focus on "reflection while in action" and on "reflection following the action," to foster consolidation of learning;**
2. **For the development of HFCS situation activities, it is wise to consider regional collaboration and concerted action, to pool resources.**

THE DEVELOPMENT OF JUDGMENT

Targeting reflection in a teaching context using an authentic situation

The learning in an authentic situation we assessed required the students to draw on their knowledge, act promptly, and assess the effectiveness of their actions. Indeed, drawing on



knowledge reinforces the development of competency (Tardif, 1999; Tardif, 2006). These results are consistent with those of Simoneau, Ledoux and Paquette (2012) as well as Simoneau and Paquette (2014) on the effectiveness of HFCS for better preparation of college students prior to the clinical internship experiences. The systematic combination of action (simulation) and reflection (debriefing) creates a "space-time" favourable to the integration and transfer of learning (Fanning and Gaba, 2007; Levett-Jones and Lapkin, 2014). The debriefing periods after each simulation promoted reflection following the action, an essential intellectual process that gives students the opportunity to use certain cognitive strategies for better theoretical support of their professional interventions. Thus, the "reflection while in action" and the "reflection following the action" (Schön, 1983) capitalize on the experience gained in educational activities in learning contexts involving an authentic situation. Mistakes form part of a student's learning process during the simulation. They become a problem to be solved rather than a mistake to be reprimanded (Simon, Raemer, and Rudolph, 2010), which is pedagogically interesting, because it presents the opportunity to cultivate the honing of standards of practice in a setting that is risk-free (Berragan, 2011; Murray *et al.*, 2008), yet similar enough to real life to actively engage students in their learning.

Simulation makes use of a wide range of learning situations while offsetting the problem of random exposure to experiences in internships in a real setting.

Optimal articulation and structuring of knowledge in the minds of students ultimately translates into more effective professional communication. Engaging and maximizing activities that establish a "cognitive dialogue" is a teaching strategy to be promoted, a responsibility shared by students and teachers. The quality of pedagogical coaching in authentic situations forms part of cognitive companionship (Collins, Brown, and Holum, 1991), a social cognitivist perspective in which support from the teacher focuses on the student's cognitive process to foster development of progressively critical and independent thought (Bédard, *et al.*, 2000; Frenay and Bédard, 2004). In this perspective, the teacher observes, guides, provides feedback, explores and questions the student's approach, while explaining aloud his problem-solving strategies (Collins, Brown, and Holum, 1991; Vanpee *et al.*, 2009). In HFCS pedagogy, debriefing represents a decisive stage in which clarification and consolidation of learning is achieved through verbal articulation of information and the reasoning associated with a problematic situation in professional practice (Fanning and Gaba, 2007; Levett-Jones and Lapkin, 2014; Rudolph *et al.*, 2006; Simon, Raemer and Rudolph, 2010).

THE DEVELOPMENT OF HFCS ACTIVITIES

Focusing on regional collaboration and concerted action

This research entailed many steps to make the experiment viable in light of the available time and resources. To ensure the effective roll-out of any simulation project, we recommend the following:

- Optimal training of teaching staff in simulation pedagogy
- Pooling of human and material resources
- Establishment of a community of practice
- Pursuit of a partnership with teaching resources and practice settings
- Pursuit of the research to document the benefits of simulation to training

Simulation places teachers in a new situation in which they will be asked, in part, to facilitate debriefing sessions. This shift from the role of content expert to that of process expert is built and refined through experience and reflection on the teaching act. For example, giving students constructive feedback is not an easy exercise; it is learned and cultivated in a constructive and collaborative spirit (Kolbe, Grande, and Spahn, 2015; O'Brien, Marks, and Charlin, 2003). Thus, the receipt of instruction, support from a community of practice, and the various partnerships involved in the project are vital resources to ensure effective delivery of HFCS activities (or any teaching activity that takes place in an authentic situation).

In order to narrow the gap between training and practice, collaboration and partnership are also recommended aspects to ensure that learning activities accurately reflect the clinical context. Finally, given the importance of properly targeting the contribution offered by and limitations of each pedagogical method used, research is essential to document the outcomes of simulation as a complement to or replacement for internships. (Larue, Pepin, and Allard, 2015.)

CONCLUSION

HFCS, and any simulation activity in general, provide an opportunity to experiment with learning situations that are sometimes atypical, used infrequently or never in clinical

internships, and involve high risk for the public (Moule *et al.*, 2008). For considerations of ethics and public safety, patients cannot be treated as "learning objects." Thus, simulation can draw on a wide range of learning situations while offsetting the problem of random exposure to experiences in internships in a real setting. This teaching method also promotes experience-based and authentic learning (Baillie and Curzio, 2009). It optimizes the challenging of knowledge acquired by students by confronting them with real representations and clinical actions. It also engages them in a process of reflection on professional action. In this spirit, simulation activities or those in an authentic situation foster significant educational experiences, adapted to various labour market contingencies, and should be used more extensively in the college system.

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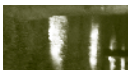

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