THE ROLE OF TECHNOLOGY IN DIFFERENT FRAMINGS OF SCENARIO-BASED SIMULATION IN NURSE EDUCATION AND THE IMPACT ON DESIGN FOR LEARNING

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Abstract

Scenarios for simulation in nurse education are often designed around specialized technological equipment such as full-sized programmable manikins in order to achieve a high level of fidelity and credibility. The scripted scenarios are performed or played out by students as part of their training in order to acquire proficiency in specific techniques, e.g. measuring blood pressure, catherization or administering CPR. In addition to the scenario the learning designs often include rounds of evaluation in order to integrate theory in what is conceived as simulation of praxis and to provide opportunities for reflection on action. In such designs technology withdraws into the background as part of an evaluation of how realistic the scenario is deemed. The emphasis is on evaluation of the performance. In this paper we would first like to offer an analysis of the above approach as evaluative as we have observed simulation unfold in a training facility in a Danish school for nurse education. We would like to suggest an alternative explorative approach to the design and execution of scenarios for simulation training. Unlike the evaluative approach an explorative approach places little emphasis on the fidelity of the simulation and much more on the simulations ability to support guided discovery for the student.

Secondly we would like to discuss the impact a change in design approach will have on the overall purpose of simulation training. Learning goals of scenarios remain embedded in the acquisition of technical proficiency however the purpose of the simulation shifts from emulation of real conditions to providing a secure environment for students to explore different courses of action and develop their skills. Rather than evaluating the fidelity of the scenario this learning design makes it a point - that the scenario is not real. Time-outs where the student steps out of character and back-stage communication in between performances are considered part of the design. These pauses are not only opportunities for reflection but can be used to discuss alternative courses of action with peers, recall information, and provide guidance in prioritizing and relevant criteria for professional judgment. In such a design technology plays an active role in the exploration and reflection on the students' skill progression. The emphasis is on an education of attention wherein the students' sensitivity and criteria of relevance are developed in tandem with her skill as reflection in action. Finally we consider concrete changes in the role technology plays in the two designs.

Keywords: Simulation-based learning, technology, nurse education, design for learning.

1 INTRODUCTION

Simulation-based learning can be defined as an approach to teaching and learning that consists of hands-on interactions with a patient substitute such as a manikin and it is supplied with a debriefing with an instructor [1]. In nurse education, the use of simulation has been gaining momentum since the 80's [2] and it continues to grow and develop. Simulation scenarios are designed to reflect real-life conditions but without the risk-taking consequences of an actual situation [3]. This reflection of real-life conditions is primarily sought established by the use of technology and manikins, but also depends on scenarios that are enacted as role-plays or games. In order to support learning in practice and due to its many learning advantages and evaluated success among the students [3,4], teachers seek to integrate simulation in their teaching in various ways and in many areas [2,5]. Consequently, in recent years, research has focused on trying to measure and discuss the effect and learning outcome on different parameters [6], and results show that there are great learning potentials in simulation-based learning in nurse education. Some even find that due to the positive skill learning effect, simulated learning environments can replace or supplement some of the clinical time [7,8] .

This paper attempts to analyse and discuss two different approaches to simulation-based learning in nurse education that we have named the 'evaluative' and 'explorative' approach, respectively, that

yield very different foci in terms of the parameters used for design and evaluation of simulation as a learning tool. The evaluative approach takes its point of departure in the aim of developing the students' skills and contribute to and evaluate learning goals in *realistic* scenarios. A major part of the reasoning behind this approach is that learning is better retained and reproduced when it occurs in an environment as close to the real life situation as possible. By that token, if simulation-based learning is to be successful, learners need to suspend reality and interact with the simulation as though it was a real patient [2].The value of the simulation is based on its fidelity to reality and students performances in the simulation are evaluated relative to pre-defined correct responses. The simulation is approached as a problem of how to maintain the illusion, and attention is given to parameters that make or break the illusion. For instance, some findings show that students sometimes find it difficult to talk to the manikin [4], while others find that students often continue to care for the plastic patient even after it has been turned off [9]. The major perceived benefit of using simulation is practicing essential skills in lieu of real situated action. Debriefing therefore becomes the crucial part of the simulation-based learning design that controls the learning experience and outcome. Debriefing can be defined as the reflective learning process that follows the simulation scenario. It is an intentional and vital process that is designed to synergize, strengthen, and transfer learning from an experiential learning exercise [12]. Debriefing has been reported to be where most of the learning occurs [11]. Moreover, it is found that video feedback supports learning assessment [13] and that it reinforces reflective thinking [8].

However, although simulation-based learning environments are usually defined as secure, enjoyable and risk-free [10], it is not always easy to define and cross the line between reality and the simulation of it. Simulation-based learning can be stressful to students. For some students simulation exercises cause anxiety [4] and especially the fact that the simulation takes place under the scrutiny of peers and has the 'feel' of an exam is evaluated negatively among students [11] Some findings even suggest that students who had higher self-efficacy scores prior to a simulation scenario actually scored lower on the knowledge tests [1]. On the other hand, it should also be noted that learning may in fact be enhanced when the scenario is stress provoking [15]. These issues suggests to us a common oversight; that the simulation itself constitutes a reality in which the scenario is embedded. The very real teaching and learning situation taking place runs as an undercurrent throughout the performance of the simulation. When the scenario is 'paused' or communication occurs 'out of character,' it becomes obvious that the reality in which the scenario is embedded and temporarily suspends is the larger complex of simulation teaching. Hanna and Fins flags the possibility that the simulated relationship (here between nurse and patient) may be overwritten by a different power relation, namely the "silent, visual, surveillance power of the teacher/student relationship." [20]

For this reason we take an alternative explorative approach to simulation-based learning that includes the briefing before the scenario and that considers timeouts and debriefing sessions as integral parts of the simulation. Furthermore, rather than making realism the centerpiece of simulation, the explorative approach focuses on the potentials for innovation and creativity in simulations [10]. Not only by acknowledging the inherently artificial nature of a simulation but by designing the simulation experience to take full advantage of the possibilities for controlling restraints such as time and place, repeating or taking different courses of action and taking different levels of technological proficiency, experience and professional judgment into account. For example by using time-outs as part of the design, where a student steps out of character and engage in backstage communication. Such pauses are not only opportunities for reflection but can be used to discuss alternative courses of action with peers, recall information, provide expert guidance in prioritizing and using relevant criteria for professional judgment. Rather than perceiving the value of the simulation as a function of its fidelity, the simulation becomes a secure environment for students to explore different courses of action and develop their skills.

In such a design technology plays a pivotal and active role in creating and upholding the universe or playsphere that is explored. While the emphasis in the course of a simulation is on developing the students' sensitivity and criteria of relevance in tandem with her skill as reflection in action, the design of the simulation is directed at providing teachers with information about the students' skill progression and to dovetail with the teachers efforts to scaffold the education of the students attention in a blend of guided discovery of priorities, professional judgment and best practices. Thus the simulation has not as its aim a faithful reproduction of a 'correct' response, nor the mechanical training of rote skills, but the production of salient points or opportunities for exercising professional judgment and skill. Debriefing is still intended to play a vital role in the simulation, but no longer as an evaluation, but rather as an anchoring of professional foci and intervention points.

Simulation-based learning is developing. We believe this alternative approach accords with similar efforts to further develop simulation as a teaching tool. Not only are experiments and innovations made inside the simulated learning, educators also seem to experiment with simulation as genre. Simulations as games are found to help students develop skills concerning decision-making and problem-solving, and to encourage their critical thinking [14] and simulations as theatre are found to contribute to professional identity development: The students are not only learning to act like a nurse, rather they are learning to think and be like a nurse [15]

2 METHODS AND OBJECTIVES

This project is a subproject of the IMODUS project (http://imodus.dk/). The goal of IMODUS is to develop and test new didactical designs for teaching in higher educations in the Zealand region. It has a particular emphasis on mechanisms for recruiting, retaining and aiding men and boys complete their education. This particular subproject develops and examines the hypothesis that developing practical competencies have particular appeal for male students. The primary task has been to follow the construction of a pilot project that involved the design, execution and evaluation of a scenario based simulation course in what is known as module 10 of the nurse education 'the critically ill patient.' Changes made to this course relative from 'normal' classroom teaching to a simulation based teaching has been documented in writing, pictures, video recording. The pilot project was followed by several researchers and data was gathered using both qualitative and quantitative methods. The investigative design that forms the basis for this article consists in background research on simulation based teaching (primarily within the field of nurse studies), a mobile survey investigating the students attitude towards the simulation-based course, focus group interviews with students. During the simulation-based learning, observations were made and recorded and subsequent evaluation rounds with the teachers were done. The emphasis has been on gaining an insight into how the design was conceived and received by students and teachers alike.

3 THE EVALUATIVE APPROACH TO SIMULATION-BASED LEARNING

In scenario-based learning, the teaching takes place in a setting where the use of time, space and reality is different than when an ordinary lecture is given on campus. An approximate description of the setting we observed runs as follows:

The classroom looks like a hospital room with covered beds and manikin patients in some of them. A large flipchart is placed in the middle of the room, and about 25 chairs are set up in the back. The students enter the room, looking excited, all dressed in uniforms. They sit down and wait for the teachers' instructions and information about the 'patient's' condition, history, heart rate, blood pressure etc. On the basis of the students' skills and levels, the teachers have prepared a scenario for them, and on the flipchart, they have listed the learning goals, the hygiene rules to follow and the areas to focus on while treating the elderly woman with breathing problems in today's scenario. When prompted, the students hesitate to volunteer as acting nurses in front of their fellow students, but the ones who finally sign up consistently express excitement afterwards. As the scenario starts, the atmosphere is tense and the students are quiet but once the nurses start to talk to the patient, to measure and to treat her in the manner nurses are supposed to do, the classroom assumes the feel of a real hospital room. The teachers are not active themselves in the performance except when extra medicine or doctoral advice is needed: in the case at hand, one of them acts as physician in order to let the scenario continue to develop without interruptions.

The borders around this staged 'reality' are established by technology in the visceral shape of the patient manikin, by the teachers' behavior and the rules of a (theatre) play [15], The students can practice skills and competencies in this simulated reality, they can make mistakes and accidently kill patients without hurting anybody for real, but only because there is an agreement between the students and the teachers, can it function as a simulation or reflection of reality. Using Erving Goffman's famous distinction between frontstage and backstage [23] we can say that the enactment of the scenario serves as a front stage performance of a script. Actors are aware of being watched and that certain behavior is expected. Interactions prior to, in between and after the performance serve as a backstage area where performers can step out of character. This division affects how the entire simulation is structured as well as the objectives of the simulation.

In the evaluative approach, the objectives of the learning are defined, and the teachers set them with the declared goal of linking nursing theory and practice. The difference between the two is often

conceptualized as a gap that should be bridged in order for the students to learn and establish the transfer of skills and competencies into practice. This is found to take place for instance when the scenario integrates a recent learned theory such as drug calculation and only develops if the calculations are mastered correctly in practice. It is therefore considered very important that the scenario is as close to reality as possible, [2] and that the students experience the stress [15] and the, at times, urgent demand to act quickly, just as could be the case in an everyday situation at a hospital.

'*To read about what it's like to be with a patient who suffers from breathlessness and has chest pains, that is one thing. But to have a picture of such a patient: the sound, the smell, the sensation, the waiting and the context and so on; that is quite another thing*!' one of the teachers says during an interview.

'*During the scenario, you really get to see what the students actually can and cannot do. Drug calculation is even harder, when they're next to a patient, and if they're too unproficient, it shows in the scenario*,' another teacher says.

Thus, not only is the learning design concerned with offering the nursing student a quasi realistic opportunity to explore the margins of maneuver in a specific situation, it is also determined to provide ways for the teachers to evaluate students' understanding, competencies and reflection during the scenario play. Consequently the contrast between the staged performance and a 'normal' place of observation and evaluation, as well as crossing the border between them, becomes central for the simulation. This is clearly visible in the importance attached to debriefing in the simulation. The rationale is that in order for the acting students and the observers to learn from the experiences in a simulated reality, a debriefing that includes reflections on the actions is needed afterwards [1,12,17]. In the simulations that we observed, only three students are needed for the action in the simulation scenario, while the rest of the students are told to pay close attention to different areas of the acting students' performance and to learn from it [16]. In some cases they are given specific areas to observe and 'check' for correct performance. The non-acting students are particularly active in the debriefing phase that takes place after the scenario, in evaluating the performances, finding other solutions to problems, deliberating difficult issues or raising questions to the teachers. Once the debriefing phase has commenced, the roles of the teachers and that of the students have shifted back to normal: the teachers are asking most of the questions, evaluating the answers and subtly leading the discussion toward the learning goals.

Not only the role of the teachers and of the students but also that of technology shifts when the border between scenario and debriefing is crossed. During the scenario, technology plays the role of the patient in the center of the action in the form of the manikin. Moreover, by way of sounds, images and atmosphere, it frames the situation and retains the simulated reality – or rather an altered kind of reality. Thus, technology sets the stage and forms the background [19], but it is also the center around which everything revolves. The opposite takes place in the debriefing: in this setting, technology vanishes into the background, and it is now only present as history referred to as 'the patient' or 'the doll'. In the evaluative approach to the simulation-based learning, the borders between the two realities are clearly demarcated and therefore it becomes obvious whenever time, space and personalities crosses from simulation into 'normal': the center of the students' attention changes from the technology to the teacher.

However, it is possible to cross the borders inside the scenario too by integrating the opportunity of the *timeout*. This functionality lets the students pause the scenario either by pronouncing the word 'timeout' or by a hand sign, and when they do so, the scenario time and space pauses, problems can be discussed, difficult choices can be analyzed before they are made, and the nursing students can reflect before action. Thus, by the use of timeout, the borders between the two realities can be crossed continuously. When the students are unsure of the right decision, they can choose to pause and step out of the scenario, discuss the possible actions, and hereafter step back into the scenario and let it unfold further on. Moreover, the timeout gives the teachers an opportunity to intervene and correct mistakes or take the unfolding of the scenario in another direction. Our study shows that the students would like the scenarios developed even more in this direction regarding the use of pauses and the concept of another kind of reality: 'It was nice to put the nursing values on hold in this exercise and to focus on only a few thing. To integrate it all would have been just too messy', a student says. Another adds: 'You need to practice: When you are able to get on top of these tasks, you'll have the surplus energy to take real care of the patient.'

Because the simulation is conceptualized as a vehicle for enacting a set of learning goals, its primary purpose is to produce a student performance for evaluation. For that reason there are many things

that can go wrong. First of all, there is the condition that the audience (and in this case participants in the simulation) suspend disbelief. The dummy may be seen as unconvincing, the situation as artificial and the acting done as 'poor.' During performance we observed several cases where strict adherence to the fourth wall convention was maintained. Students were barred from asking their peers for help or communicating otherwise with the audience. Secondly the performance becomes contingent upon the enactment of a tightly scripted sequence of events prepared by the teachers in advance. As such the scenario can get stuck either because an action is not taken, performed wrong or a problem, that has been scripted by the teachers, is overlooked or misinterpreted by the students. Thirdly the experiences and the choices that the acting students make during the scenario are not always what the teachers hoped or planned for. The students may erroneously adopt errors they commit as learning points. Therefore it is seen as essential that thorough deliberations [18] and discussions take place during debriefing.

Furthermore, because of the stress, the acting students seem, at times, unable to make the right choices, and sometimes the need to act is so urgent, that they simply act randomly, regardless of the consequences: 'When I stood there, it was like I couldn't think!' one of the students said in a debriefing session, 'but in reality, I wouldn't act like that…' she added. During debriefing, such statements create an opportunity to discuss e.g. the need of pauses in real life too and the importance of an ability to reflect on actions while in action. Reacting to the above statement one teacher pointed out that, in fact, the student would most likely act like that in reality due to an explicit and implicit pressure to act. Thus, the purpose of the debriefing is to combine practice and the actions from the scenario with the theory concerning these issues in order to reach a higher level of abstraction and reflection. At the same time it is equally a priority for the teachers to give the students a 'good experience.' Although the scenario is simulated, the students' reactions are not. In some cases it might be necessary to repeat the scenario, especially if it did not evolve the way the students would have liked it to. 'Once we had to do a second take of the scenario with the same couple of students, because they were so discouraged by their performances in the first one', a teacher said during interview.

These problems could be engaged and attempted solved at face value. However, we believe that they should be approached differently because they are indicative of an oversight. Although the border between the front stage scenario and the back stage 'normality' is clearly established there is a second backstage area that is hidden. This is suggested by the quote from Hanna and Fins in the introduction [20], that the simulated relationship (between nurse and patient) is overwritten by the teacher/student relationship. When stepping 'out' of the performance, 'normal' teacher/student relations are assumed. Before, during and after simulation classes teachers engage in monitoring the execution of the scenario and discussing the usefulness of simulation as a tool. The back stage area formed when stepping back from *this* relation exclude the students. In other words, the simulation is firmly embedded in the performance of a regular teaching and learning situation. This is also evident in the structure of the border between scenario and debriefing where normal power relations are reproduced; i.e. the performance as praxis under scrutiny and debriefing as theoretical observation and reflection.

As an alternative, our study points to several tendencies already present in simulation teaching as we observed it, that can be developed in order to dissolve the above problems. We believe that the purpose of the simulation can be given a different focus; that the role technology plays and the way the simulation is structured can be made into even better instruments for teachers when they design scenarios and finally that involving students in designing scenarios could provide an added value to simulation teaching.

4 THE EXPLORATIVE APPROACH

In his discussion of the nature of art and aesthetic experience, the philosopher Hans-Georg Gadamer distinguishes between 'erlebnis' and 'erfahrung.' Where erlebnis is an experience someone has of, say, a thing, erfahrung is something that happens to us and something we undergo [21]. In this sense there is no substitute for experience (erfahrung). It is transformative, and once we have gained experience (erfahrung), our outlook and way of engaging the world is changed. Needless to say any simulation pales in comparison. At best it is an erlebnis that we live through. As such we agree that true experience gained in the field cannot be replicated. This is also the position assumed when simulations strive to be 'as real as possible.' Although the perceived value of the simulation is its fidelity to reality, it cannot ever become as real as reality.

The explorative approach acknowledges this inherently artificial nature of a simulation and rather than fight, it attempts to make a virtue out of necessity. The idea is to recognize that a simulation is artificial. Instead of making the crossing of the border between front stage and back stage a breach of illusion, the crossing back and forth becomes the point and strength of the simulation. The point, because it trains the alteration between the pressure to act in situ - exercising professional judgment - and taking long, qualifying pauses to reflect on those choices; and the strength of simulation, because it it offers something that a real life situation seldom offers: the possibility to have second thoughts and act on them by repeating the scenario, taking different courses of action and reaching different outcomes. No situation repeats itself and so no realism is to be obtained. Therefore, in the explorative approach to simulation-based learning, realism should be abandoned as a goal for simulations. The best one can hope for is a measure of relevant similarity.

Shifting the focus of simulations from learning points to the students' experience (erfahrung) is a way of orchestrating and investing the scenario with insights that are present and available in perhaps the most potent resource available in a simulation: the teachers' erfahrung. By creating the mechanisms of the simulation around the teachers experience and building the scenarios accordingly, the simulation becomes what Tim Ingold, using a term from J.J. Gibson, calls an 'Education of attention' [22]. This idea cuts across any mechanical mapping of skills or generic set of learning goals. The idea is that professional expertise cannot be adequately described in a list of skills, because it is precisely defined by navigating an open horizon where the application of skills happens as "a continual adjustment or tuning of movement in response to an ongoing perceptual monitoring of the emergent task." [22, p. 21] Currently scenarios are built by crafting a script around a series of predefined learning points. These learning points are usually theoretical points that needs to be learned and anchored in praxis, and this makes the progression of the scenario linear

Image 1. A linear progression of the scenario

We suggest that the scenario continues to be built around learning points, however, instead of defining a 'correct' response in a given situation, the teachers apply their experience base (erfahrung) in an attempt to identify several likely states that the situation might start out in, different courses of action and the possible outcomes of these.

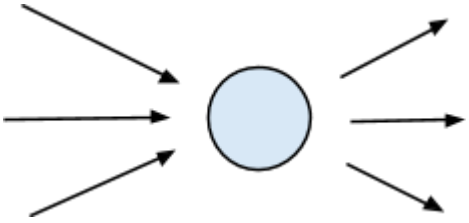

Image 2. A 'salient point' with different possible beginnings, actions and results

The learning point is construed as an opportunity for exercising professional judgment and skill. Since several different starting conditions, courses of action and outcomes have been identified, the learning points need not be executed in a particular pre-arranged order. Connecting the learning points will require some improvisation, and the main challenge will be to keep track of values and variables changing. In order to do so, we suggest constructing a 'map' of the scenario that specifies all of these relevant values, for example focusing on patient vitals such as heart rate, temperature, etc. Relative to this map, beginnings should be understood as different configuration of values, each with an impact on the relevance of possible actions; 'actions' should be understood as influencing these values (nurse administers medicine, nurse measure heartrate, etc.); while 'outcomes' then specify concrete shifts in the values (for instance one outcome specifies: heart rate goes X up, temperature goes Y down, etc.).

4.1 Advantages of the new model

In this model the focus is no longer a 'correct' response but giving the student, his/her peers and teachers alike an insight into the students level of proficiency and thereby provide clues to where a particular student needs scaffolding. The shift in focus is motivated by the rationale that a trained

professional is able to handle not only routine situations but also any novel situation relative to their professional judgment and sensitivity. A professional has developed a 'professional eye' with which to see and evaluate relevance criteria and tell-tale signs; to develop a best practice; as well as learn how to make priorities and trade-offs in their work. This is what Kilbourn and Isaksson, in an article about the skillful development in perception over time, terms a move from exploratory movement to performatory movement [24]. Using the aforementioned concept of 'education of attention' the authors emphasize the point that the perception of a situation changes relative to an actors proficiency. When initially introduced to a skill an actor cannot, in a sense, see what she is doing. Movements are slow and exploratory in an attempt to figure out what to do. Once an understanding of 'what to do' (intervention points) or 'what to look for' (a focus) has been established, movement shifts into attempting to perform the requisite movements and to deepen and strengthen ones skill. Debriefing is still intended to play a vital role in the simulation, but not as an evaluation tool that anchors the performance in reflections, but rather as a way of highlighting the professional foci and intervention points used in the scenario.

The value of a simulation setting is of course the ability to scaffold intervention points and professional focal points that would otherwise be physically or ethically problematic. Interventions such as administering CPR or injections are examples. It could also simply be scenarios that are unlikely to occur simultaneously with opportunities for training. We contend a simulation actualises its potential as a sandbox, when it becomes a secure environment for students to act, get stuck, make errors, explore different courses of action and thereby develop their skills. Technology plays a pivotal role in establishing such an environment. A simulation provides possibilities for controlling key restraints of the scenario such as time and simulating symptoms. Using time-outs as part of the design is a concrete example. When a simulation embodies salient points of a scenario and also enables the skillful movements and actions taken, providing the opportunity to take a time-out is a way of slowing down an exploratory process where the student is looking for relevant properties or signs that allows a way of grasping the situation, i.e. of sifting the relevant from the irrelevant. A teacher or fellow student monitoring the student is at the same time able to scale the support relative to the students needs. During time-outs alternative courses of action can be discussed with peers, information can be reviewed, and teachers may provide clues or expert guidance in how to prioritize and apply relevant criteria for professional judgment. Crossing and re-crossing in and out the scenario becomes a sort of staggered approach to learning a skill akin to learning to bike with training wheels.

Hand in hand with this line of thinking a different way of utilizing simulations suggests itself. Prestopnik and Foley writes in their article about the development of a World War II prototype visualization tool (TEMPO) that they "learned more about World War II history from the act of developing TEMPO than we ever would have from its use alone." [26, p.59] Similarly we believe that involving students in designing and facilitating scenarios to be used in class holds a lot of potential for anchoring knowledge. The design problem of attempting to work through relevant values, different stimuli, symptoms and responses and their likely outcome is a reflexive process and an opportunity to communicate about all of the above.

The design presented here is in line with Jarvis' learning theory based on states of disjuncture [25]. Learning happens according to Jarvis in disjunction between what is taken for granted and what is being sensed or experienced. The disjunction can either be rejected (no learning occurs), reflected upon, emotionally dealt with, or acted upon in any combination leading to a permanent change similar to experience as erfahrung. The latter three can in this particular context relate to the different strengths of simulation-based learning; the stressfulness of being exposed to simulated sensations of a hospital (emotion), the demand to act in a given simulated situation (action), and the possibility to reflect before, during (as time-out), and after the scenario. From this learning perspective, it becomes less relevant to discuss whether or not a simulation is close to being real but more important to discuss the way a scenario produces situations that causes states of disjuncture between what the students take for granted and what they experience so that they act and reflect upon it or deal with it emotionally. It seems fair to argue that the evaluative design puts more emphasis on the emotional part of learning whereas the explorative design utilising time-outs and student designed scenarios creates more opportunities for reflection.

5 CONCLUSION

In conclusion we reiterate our conviction that a different approach to scenario based simulation teaching holds a great potential for providing much needed training for students. Further research will

have to develop particular didactical designs to be tested that include designs of specific mechanisms such as time-outs, designs that allow fluent transitions between learning points, maps of scenarios, and work sessions where scenarios are built and facilitated by students.

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