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A closer look at learning in and around simulations: a perspective of experiential learning

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After a short exploration of the notion of experiential learning in training and education, we differentiate between the types of interventions that attend to, and facilitate, the ever-present process of experiential learning, and the interventions that leave it unattended. We then explore how this learning process unfolds in simulations and which conditions appear to stimulate it. Finally, we argue that the stimulation and facilitation of experiential learning in simulation contexts contribute to developing a culture of learning among practitioners.

In search of experiential learning in training and education

„Because we are, we learn" (Jarvis, 2001, p.46). Learning and living are inherently connected: life generates experiences and inevitably, we learn from these. Kolb defines learning as „the process whereby knowledge is created through the transformation of experience" (Kolb 1984 p.41; Kolb & Kolb, 2005). Learning arises from the continuous, ongoing exchange between acquired knowledge and new experiences; between expectations based on earlier experiences and new experiences that do, or do not, meet these expectations. This process happens all the time, consciously and unconsciously; inside and outside simulators.

If living implies learning and if there is no learning without experience, how can we understand experiential learning? Beard and Wilson (2002) start to define experiential learning by distinguishing it from classic 'school learning', which takes theory as a starting point. However, when we listen to a lecture, we can distinguish between two simultaneous learning tracks: the first track considers the theory presented, the second considers the presentation as a practice. The first track assumes that people acquire the presented content, process

it and eventually apply it. The second track focuses on the learning that results from experiencing the lecture; from participating in the event in whatever capacity. This is where experiential learning comes to the fore (see also Johnson, in this volume).

Kolb (1984) proposes that experiential learning includes two complementary processes: apprehension and comprehension (see Figure 1). *Apprehension* stands for the concrete and instantaneous grasping of experience. According to Kolb, this process does not involve explicit meaning cônstruction. Riding a bike or tying shoelaces are examples of activities that embody *apprehensive knowing*. As part of the audience of a lecture, we implicitly take away elements from that lecture that will influence the way we give or attend to presentations in the future. This knowledge is of a non-analytical, non-linguistic, intuitive, contextual kind. It is an affective way of knowing. Others cannot know our apprehensions unless we connect them to comprehensive knowing. *Comprehension* allows the learner to grasp experiences in an abstract, analytical way, by means of language, interpretations, conclusions, schemes, checklists, formulas, etc. These contain more explicit, discursive understandings of experience. Comprehensive 'knowing' is what William James refers to as „knowledge about" (in Kolb, 1984, p.44); for example knowing that it is important to pay attention to X and Y when giving presentations.

Kolb proposes that experiential learning generates, and combines apprehension and comprehension, in order to create a more complete type of knowing. It combines 'learning-in-experience' with 'learning-from-experience'. By learning to lecture, one can benefit from giving presentations; sensing what goes smoothly and what does not; receiving feedback and formulating guidelines for the future; and practicing again. Simulation learning can be considered 'experiential' to the extent that it fits this cyclical scenario of experiencing, reflecting, conceptualising and experimenting; commonly known as Kolb's learning cycle (1984). Translated to the simulation context this would mean that trainees participate in the simulation, reflect upon their experience, draw conclusions, try-out alternatives, engage in new experiences, etc.

Hovelynck (2001) distinguishes two prototypical approaches to learning: 'blueprint models' and 'experiential' approaches. In *blueprint models*, a teacher

Figure 1: *Experiential learning as an interplay between apprehension and comprehension*

or trainer defines the lesson to be learnt, based on his or her 'blueprint' of reality. On the contrary, in experiential training, the experience of the learners is the central reference point in the learning process. The following case may clarify this distinction.

> In a first aid class, trainees practice cardiopulmonary resuscitation (CPR) on a patient mannequin lying on its back. From the point of view of the trainer, the mannequin represents future patients with cardiac arrest. For one trainee, however, the mannequin generates far more concrete images of his terminally-ill mother, whom he took care of for several weeks until she recently passed away.

In this case, experiential approaches will take the learner's mourning experience as reference point and facilitate learning about the process at hand. Blueprint models, in contrast, take the simulated cardiac arrest reality as their reference point and use it to teach CPR practice. In comparison to the dramatic gap between the teacher's blueprint and the learner's experience in the above example, the difference usually takes more subtle forms. For example, when a trainee makes a wrong move in the context of CPR training, the difference may lie between questioning the trainee about his or her understanding of that move and simply stopping the trainee and explaining again the right way to proceed. As the difference becomes less obvious, it becomes easier to make abstraction of the trainees' experience. Yet even then, Hovelynck (2001) argues, trainers are continuously confronted with the choice *whose construction of reality/experience* to use as a reference point for their programme.

The distinction between both approaches relates to expert versus participative stances of the trainer. In the first case, trainers communicate their expert-knowledge about the subject and teach an expert-response to that reality. The active involvement of the trainees has the status of skill acquisition: they practice until they perform to the expert's standard. Experiential approaches, on the other hand, are more participative. They take the trainees' experience as a starting point and facilitate their personal and joint learning processes from there. In such an approach, trainees are „regarded as active (..) participants in the process of defining and putting into practice educational agendas and methodologies" (Woolfe, 1992, p.1). As Woolfe points out, this implies that the 'locus of control' is shifted away from the teacher towards the learner, reducing the trainer's power and the asymmetry in the trainer-trainee relationship.

The distinction between blueprint and experiential approaches is also related to the distinction between positivist and constructionist epistemologies. In a positivist view, the mannequin represents the reality 'out there' based on certain similarities with cardiac arrest patients. The mannequin is not a human being. Indeed, when asked, people can list more differences than similarities

between them. Yet there is 'isomorphism': the simulation retains the essential features of the phenomenon and constructs a situation that captures its essence (Argyris, Putnam & McLain Smith, 1985, p.111). In a constructionist view, the focus shifts towards whose experience determines the so-called 'essence' of the phenomenon, and so generates a new reality. The CPR mannequin, from this perspective, is not a replication of reality, as much as a manifestation of a theory on cardiac activity that is taught in first aid courses worldwide: 'the heart is a pump' Whilst often understood as a straightforward description of reality, this metaphor selectively highlights features of the heart that facilitate a specific practice in a certain type of emergency, i.e. heart compressions. As such, this theory does not *reflect* as much as *generate* a manageable reality. This process is known as 'enactment'. Accident responders adopt a certain theory, discern specific features as facts based on this reference frame, and act upon the situation that they thus created. Weick (1979, p.130) refers to these respective subprocesses as 'selection', 'punctuation' and 'enactment'. Through the interplay of these sub-processes (explained further in Table 1), responders produce part of the environment they face. Their capacity to intervene effectively, in turn validates the theory that they enacted, e.g. the pump metaphor in cardiac emergencies. These sub-processes are connected circularly or even synchronically. Reference frames „enable activity while they change in the course of activity, backward and forward *in* time at the *same* time" (Lave, 1988, p.185).

We propose that simulations represent a meeting point between blueprint and experiential approaches, expert and participative stances, and positivist and constructionist epistemologies. Representing their designers' blueprint of reality, simulations offer trainees an opportunity to experience a specific situation. However, it is no coincidence that 'experiencing something' translates as 'Etwas mit-machen' in German. Experiencing involves co-constructing; co-designing the situation; and complementing the designer's isomorphs with one's own. Opening the curriculum to participants' experiences therefore implies questioning one-sided definitions of reality and recognising multiple expertises. Hence, trainers, using simulations, perform an ongoing balancing act, positioning themselves as expert teachers, imposing their blueprint of reality; and facilitators who acknowledge and explore the realities that participants co-construct.

In this chapter, we mainly elaborate on experiential, participative, constructionist approaches to learning assuming that the blueprint, expert, positivist stance is widespread in the medical field and may benefit from exploring complementary perspectives. We advocate that the learners' experience is crucial to the learning process, because their experience, more than whatever theory they are taught, determines which reference frame trainees 'select', which facts they 'punctuate' and which reality they 'enact'.

Table 1: *Sub-processes of 'enactment' (based on Weick, 1979)*

Subprocess	Definition	Example
Selection:	Imposing a selected reference frame, "some finite set of assumptions" (Weick, 1979, p.45), to one's environment.	Adopting a pump metaphor to make sense of the heart
Punctuation:	Segmenting one's continuous flow of impressions into discrete events, "chopping the stream of experience into sensible, nameable and named units" (Weick, 1979, p.45)	Pinpointing the heart's activity in terms of compression and decompression, opening and closing of one-way valves etc.
Enactment	Acting, "doing something that produces an ecological change" (Weick, 1979, p.130) in an environment shaped by selective punctuation	'Pumping the heart': chest compressions

Spheres of learning in training and simulations

Brown and Duguid (1991) state that „the best way to support learning is from the demand side rather than the supply side" (p.13). They advocate giving priority to trainees' *learning agendas* over the trainers' *teaching agenda*. As suggested by the CPR case above, however, trainers have little means of knowing in advance, which features of a simulation will capture the trainee's attention. Even for the trainees, their experience remains to some extent unpredictable. People do not know for sure which of their reference frames may be evoked by future events and how they will respond to the situation at hand. Hence, learning agendas evolve moment by moment with ongoing experience. The learning agenda arises from two aspects of the experience that are related to Cooper's distinction (1998; in Beard & Wilson, 2002, p.190) between *concern* and *awareness*. Firstly, the learner needs to recognise the experience, i.e. he needs to construe congruence between experience in the learning environment and experiences elsewhere (Hovelynck, 2001; De Weerdt, Bouwen, Corthouts, &

Martens, 2006). This recognition originates from the learner's reference to earlier events. The clearer the learner's recognition, the stronger will be their concern and sense of relevance of the experience. Secondly, the learner needs to be aware of how events can be different from earlier experiences. The earlier event does not need to repeat itself. This awareness relates to the tension between the present and the aspired future. Both elements, concern and awareness, contribute to the readiness to learn something.

We propose that the appropriateness of blueprint and experiential approaches is, at least to some degree, related to the 'sphere' of learning. Klabbers (1996; in Dewulf, 2006, p.249) differentiates between three spheres, present to varying degrees in different simulations. In the *reproductive* learning sphere, problems are well defined and related to a specific body of disciplinary knowledge, which needs to be applied to the situation in order to attain a specific result. In the *heuristic* learning sphere, the specific context and its recent history (what already happened) has to be taken into account in order to interpret the situation appropriately and respond effectively. In the *self-organising* learning sphere, participants, in their interaction, (implicitly or explicitly) renegotiate meanings and rules in order to deal with the situation. Weick's (1979) notion of 'enactment', (explained in Table 1), may further clarify this distinction. In a *reproductive* learning sphere, both the 'selected' reference frame and the 'punctuated' events are set. Whereas in a *heuristic* learning sphere, the 'selected' reference frame is clear. Yet it remains unclear which events to 'punctuate' to understand the situation at hand. However in a *self-organising* sphere, neither the reference frame(s) to 'select', nor the events to 'punctuate' are yet agreed upon.

Simulations can be understood as primarily engaging specific learning spheres. When participants in an advanced first aid class learn to administer injections by pricking an orange with a needle and syringe, there is little question about either selection or punctuation. The isomorphism is basic, the sequence of actions to be performed is clear: the trainees are expected to reproduce a well-established practice, explained and demonstrated by an expert, and later, 'real-life' application will require limited adjustment to varying conditions. In Klabbers' terms, this simulation creates a reproductive learning environment. The simulation gains in complexity, when the same class is confronted with a 'simulant', i.e. a person trained to make-up and role-play a variety of medical conditions as 'realistically' as possible, complaining of abdominal pain (Klabbers 1996; in Dewulf, 2006). In order to decide on appropriate actions, trainees need to establish indications of the nature and seriousness of the problem at hand. Through a process of fact-finding, they establish an understanding, which further guides their actions, including monitoring and reconsidering alternatives. In this case, the learning sphere is primarily heuristic. Finally, when

trainees are confronted with an accident scene that includes several victims, bystanders and co-responders, the complexity further increases. The fact-finding process now takes place in a context where multiple actors bring to the simulation (the accident scene) their conceptions of what is going on and what should be done about it. In such a self-organising learning sphere, any problem-definition and corresponding proposal for action implies a *de facto* decision on which reference frames to select and which, however temporary, not to. As such, it requires actors to develop a social meaning system.

We propose that the appropriateness of blueprint and experiential approaches to learning is related to the learning sphere(s) involved. When reproductive learning spheres prevail, blueprint models tend to be quite successful. The trainer teaches models, techniques and procedures, and the trainees adopt corresponding knowledge and skills. The more simulations involve self-organising, the more experiential approaches seem appropriate. What needs to be, and will be, learnt is less predictable as more personal and relational issues come into play.

While simulations tend to aim at specific learning spheres, they may actually evoke unintended learning spheres. This raises the question of which dimensions of the experience need to be attended to. If people learn to administer subcutaneous injections, a blueprint model will do to the extent that the trainees manage their emotions and anxieties on their own. (Also the CPR training case demonstrates this case in point.) As interdependency between the various actors increases, more idiosyncratic personal and relational issues have a larger impact on the events. In such situations, an experiential stance allows the learning agenda to remain connected to the trainees' experiences in the simulation.

For the trainer, this implies a continuous choice between a range of interventions that can be situated on a broad spectrum of possibilities between blueprint and experiential prototypes. For instance, after exploring and clarifying participants' learning agendas, the trainer can introduce a model that sets a teaching agenda. The sequencing of both types of interventions and their consequence for learning go beyond the scope of this chapter.

After this short exploration of the facilitation of learning from the trainer's perspective, the next paragraph focuses on the question of how the process of experiential learning unfolds.

Experiential learning through a relational lens

Shotter (1993) inspired our conceptualisation of the experiential learning process. He emphasised that the comprehensive and apprehensive way of knowing are interwoven and embedded into relational practice. In a similar

Figure 2: *Experiential learning as an interplay between participation and meaning construction*

manner to Kolb (1984, Kolb & Kolb, 2005), we describe two movements through which experience is transformed (see Figure 2); both complementary movements can be conceptually distinguished, but never separated from one another.

In the first movement, dialogue, reflection and meaning construction, transform experience into comprehensive knowledge. In the second movement, (inter)action and participation within the communities of practice, transform experience into apprehensive knowledge. Both transformational movements take place in a relational space within which interpretations and meanings can be construed and renegotiated in two complementary ways: explicitly through collective reflection and dialogue (first movement), and implicitly through action and participation (second movement). Let us take a closer look at both transformative movements.

Experience, dialogue, reflectivity and reflection

Experiential learning arises from sensitivity to our perceptions and impressions, i.e. „reflectivity". Jarvis (1987) proposes that reflection goes further. It is about giving meaning to, and making sense of, the experiences of which we have become aware. The higher the degree of reflectivity, the richer the experiential material we can reflect upon, and the more our interpretations can be multi-layered, which in its turn allows us to become more conscious of our experiences. Some kinds of reflectivity stay closer to the experience, whilst in others, reflection plays a more prominent role. Mezirow (1981, pp.12-13; in Jarvis, 1987) distinguishes seven forms of reflectivity. In Table 2, we illustrate, for each form, which kind of interventions facilitate this type of reflectivity in a dialogical context. The last four forms of reflectivity are characterised by Mezirow as being the 'critical consciousnesses'. This is because reflection plays a more important role in the last four forms than in the first three.

In order to learn by reflection, using new disjunctive experiences that challenge what we already understand, we need to feed our 'meaning system' (Jarvis, 2001). If our frame of reference no longer fits our experiences, then we

Table 2: *Seven kinds of reflectivity (based on Mezirow, 1981)*

Kinds of reflectivity	**Definition**	**Examples of facilitative interventions**
(Basic) reflectivity	Awareness of one's own perceptions, thoughts and behaviours	"What have you done subsequently and what were your motives to do so?" "What took place prior to your intervention? And what happened afterwards?"
Affective reflectivity	Awareness of the feelings and emotions that go along with these perceptions, thought and behaviours	"What did you feel at this particular moment in the exercise? "Which moments where exciting/tense/scary for you?" "When did you become frustrated/angry?"
Discriminative reflectivity	Assessment of the pragmatic validity and effectiveness of one's own perceptions, thoughts and behaviours	"Which of your interventions where effective, and which were not?"
Judgemental reflectivity	Awareness of ones own value judgements	"When did things go right/wrong according to you?" "When did the situation become dangerous in your experience?"
Conceptual reflectivity	Assessment of the extent in which used concepts are adequate to understand and judge	"Was [phenomon A] solely due to [cause X]?" "What else had an influence on A?"
Psychical reflectivity	Awareness of the habit to make interpretations based on limited information	"Given the observation that this decision was the wrong one, on what kind of information did you jump to conclusions?"
Theoretical reflectivity	Awareness of the adequacy of our perspectives to frame personal experiences	"Which assumptions did you base your decision on?"

become aware of its inadequacy. So reflective learning comes from an 'honest' examination of our interpretations, assumptions, values, preconceptions etc... through reflection, and of the experience itself (through reflectivity, awareness, mindfulness). According to Schwandt (2005), this allows the learner to break through the closed circle of the self-referential process of enactment through which people continuously find what they make, i.e. construe a reality based on their frame of references.

In blueprint approaches, 'closed' exercises strongly model the new experiences. The trainer offers interpretations and instructions that lead the trainees to the 'right' conclusions through a process of guided discovery. Closed questions, such as: „at which point in time did things go wrong?", may support this process. From an experiential perspective, the trainer does not (need to) know in advance what the trainees' experiences will be. The validity of interpretations is established in two-sided communication, supported by open questions, such as „how did you experience this (particular moment of the) exercise?"

Experience, practice, (inter)action and participation

Actions can be strongly based on, or deductively derived from, the learner's comprehensions. For instance, on the one hand a doctor can follow an explicit procedure when he examines a patient, and on the other hand, he enacts an implicit theory-in-use of how to deal with the patient's reactions. He or she has developed this theory-of-action over the years and is, therefore, only partially aware of it. Practice is putting explicit and implicit knowledge into use, which in turn simultaneously and spontaneously generates new understandings. Simulations obviously give learners the opportunity to practice these understandings.

However, every patient, and situation, is to some extent unique and so the doctor's actions are more than mere applications of implicit or explicit theories. Action to some extent arises from the improvisational negotiation process, between what he or she knows, and the specific context involved. The more uncertain, complex and ambiguous the professional context, the more 'improvisation' becomes a substantial part of the activity (Brown & Duguid, 1991; see also Schön, 1983). In the act of improvisation, knowledge and activity coincide, and competent (professional) behaviour stems from responsiveness to the situation (Holman, Pavlica, & Thorpe, 1997). This means that every context is a learning situation in which the learner needs to be sensitive to the available contextual *cues* (Harley, 1993). In this regard, simulations can contribute to the development of such responsiveness towards the new and the unexpected.

Further, simulations allow participants to engage in the professional community's shared practices. Through this process of participation, people implicitly, and explicitly, negotiate meanings. They engage in an 'authentic discourse' (Brown & Duguid, 1991), in the sense that their conversation is about acting-in-the-world rather than merely talking about the world. People learn, although it is not their intended activity. Here, learning is an interwoven, secondary process that facilitates the process of participation.

These ideas of improvisation and participation suggest that simulations at some point benefit from reflecting the 'fullness', complexity and unpredictability of professional practice. Here, the distinction between closed blueprint exercises and open experiential training appears to be relevant. The blueprint model leads to the dissection of the full practice into subtasks, which trainees learn separately at first. Authors such as Lave and Wenger (1991) and Brown & Duguid (1991), however, emphasise that the whole is more than the sum of its parts. Whilst learning 'elsewhere', i.e. in a situation that is not the professional context itself, will inevitably remain incomplete in this regard; experiential approaches allow, to some extent, integration of the complexity of the professional practice in a training context. Further, learning experientially will need to be an integral part of work life itself.

Simulations closely relate to the dynamics between these two movements, i.e. between challenging participation and reflective dialogue about one's professional behaviour. Participation is most prevalent during the simulation itself. However, the reflective process, during the debriefing with the trainer, simulators and other trainees has a participatory character also. And reflection occurs explicitly before or after, but also implicitly during the exercise. Both movements are ongoing and interwoven, yet we propose that the experiential learning process benefits from timely explicit attention. The facilitation of explicit self-reflection, and reflective conversations embedded in the professional practice, in simulations as well as in the workplace itself, contribute to the development of a culture of learning amongst professionals.

Conditions of experiential learning in and around simulations

We propose three conditions of experiential learning in simulations and elsewhere:

1. the degree to which the simulation is experienced as a transitional space that combines psychological safety and challenge, playfulness and seriousness;

2. the extent to which the learning process is facilitated by interventions of 'scaffolding' and 'guided discovery' within the learner's 'zone of proximal development'; and
3. the degree to which the learner has the opportunity to explicitly address and explore new, emerging learning questions.

1. To some extent, we learn from all experiences. Most of the time this learning occurs in subtle ways that remain unnoticed. The question arises how people can learn more, and more deeply, from their experiences. We have already explored the twofold dynamic of the active exploration of new ways of participating and the process of reflecting upon it. The centre and the 'drive shaft' of the process lies in the quality of the engagement in the experience (Merriam, Mott, & Lee, 1996). This allows the learner to examine the experience carefully, to reflect upon it, construct new interpretations and then to explore new practices. Psychodynamic perspectives on experiential learning pay attention to the way in which this process is hampered. Anxiety and ego defences, for reasons of identity preservation and the maintenance of self-esteem, may inhibit the learning process (Brown & Starkey, 2000; Kayes, 2002). These dynamics make people deny experience or its disjunctive elements. Consequently, they are unable to acknowledge inadequacies in their existing frames of reference. In contrast with these inhibiting dynamics, learning environments that serve as a 'transitional space' facilitate experiential learning (Winnicott, 1971). Transitional spaces are „intermediate worlds" (Grolnick, 1990; Bouwen & Hosking, 2000); or „intermediate areas of experience" (Winnicott, 1971) between the past and the future, fantasy and reality. Simulations are real and fake at the same time. Because there are no 'real' consequences of wrong interventions, the simulation remains to some extent a play or a game. Heap (1993; in Beard & Wilson, 2002) states that children at play, do not distinguish between learning, playing, working and recreation. „Play creates transitional objects which help us to resolve the anxieties of learning" (Brown & Starkey, 2000, p.112). „Play [...] helps to relieve the tension of living, helps to prepare for the serious and sometimes deadly [...]. Play provides a trying on ground for proceeding onward" (Grolnick, 1990, p.35). When playing a game, challenge and psychological safety come together. „People learn best where they continuously experience an ingenious blend of challenge and support (Kegan, 1994, p.42; cited in Kolb & Kolb, 2005). In the context of reframing, Bouwen and Hosking (2000) state that „frame-breaking thinking [occurs] as a consequence of close interaction with significant others who provide the necessary challenge and safety to pose a new framework" (p.362). Concerning safety, Williams and Irving (1996) introduce the notion of „conductive environments"; anxiety puts a brake on learning (see Daloz, 1986; Merriam & Heuer, 1996), consequently people learn

when they let go. Psychological safety makes this possible, because people know that if they fail, they will receive care and support (see Brookfield, 1987; Kolb & Kolb, 2005; Rogers, 1961; Rogers 1995; Tennant & Pogson, 1995). Psychological safety also invites people to trust their own learning process, by which an optimal, dynamic balance arises between letting, and making, things happen (Beard & Wilson, 2002). So people learn from an alert relaxation. This can be created in simulation settings in which there is a climate of both seriousness and playfulness. The seriousness derives from the experienced similarity between the simulation and the 'real practice'. This seriousness invites people to exercise rather than to play (Beard & Wilson, 2002). People *play* to the extent that the simulation's 'as if' character is prevalent. Children play with baby dolls because dolls are not real babies. Dolls don't mind when you drop them on the floor. However, dolls allow children to practice certain aspects of parenthood. Similarly, simulations can invite people to either play or exercise or both.

2. Further, it seems to be important that trainees get access to, possibly new or unfamiliar, lifelike practices. Rich simulation games can to some extent offer such a 'full context' within which every action has its meaning (Brown & Duguid, 1991). During this process, full practice gradually leads to full understanding. Trainers can correct and support the course that the simulation exercise takes. The trainer is sensitive to the particular situation in which the learner finds themself and to „the moment-by-moment contingencies of the learning enterprise" (Harley, 1993, p.49). Therefore, the trainer attempts to meet the instantaneous, possibly implicit, learning needs of the trainee at every moment in the learning process. This supportive, interactive quality is called 'scaffolding' (Bruner & Haste, 1987). For example, hints and additional cues can be given; the speed and complexity of the exercise can be altered; the weight of the consequences of failing can be changed; the trainer can decide that certain actions can be undone, etcetera. These elements can be used as levers to increase or decrease the degree of difficulty, in order to challenge the trainees within their zone of proximal development (Vygotsky, 1978; Kolb, 1984; Pelissier, 1991). The trainer guides the learning process by keeping a close eye on what the trainee already knows and on what they still needs to learn (see also Mehl, this volume). Notice that this idea of scaffolding relates to:
1. the idea of experiential learning in the sense that the trainer's intervention connects with the position, experience and frame of the learner; and
2. the blueprint model of learning in the sense that the trainer directs the learning process towards what needs to be learnt from an expert's point of view.

The trainer and trainee can also be sensitive to unexpected hindrances and difficulties of a more personal, emotional or relational kind. Trainees and trainers

can address and explore these issues from an experiential training mode. Therefore, guidance of the trainee's practice in a simulated 'full' context, possibly meets both models.

Sufficient time and relational space are important for the trainee to become reflectively aware of all relevant aspects of the experience. Kolb and Kolb (2005) speak of the process of grasping, owning and valuing experience, in which the recursive experiential dimension is not 'overruled' by the discursive. This awareness invites the learner to interpret the past in a way that creates an outlook on possibilities in the future. This reflective space can be organised or spontaneously created during, or after, the simulation exercise. Here, it appears to be important that trainees themselves come to insightful understandings, that the trainer connects to these, and that he offers possibly new perspectives (by proposing an alternative definition of the situation or a first step towards a solution) in a way that keeps the perspective of the trainee in sight. Karpov and Haywood (1998) call this practice 'guided discovery', which is the reflective counterpart of the more participative process of 'scaffolding'. The more the experiential training model prevails, the more this reflective process will be of an explorative and dialogical kind whereby the conversation is facilitated rather than guided by the trainer.

3. Finally, Reflection not only leads to interpretations that allow the learners to find solutions. It also raises new questions and learning opportunities. Inherently and explicitly, this will be the case when the trainer and trainees work with an experiential training model. In experiential trainings, the trainer broadly defines in advance the learning goals. This 'open curriculum' allow the learners to explore and develop their own learning agenda (De Weerdt, Corthouts, Martens, & Bouwen, 2002). The trainer or trainee himself cannot totally predict the difficulties trainees will experience when they participate in a simulation exercise. Therefore, learning elicits new learning questions. Kolb (1984) describes this dynamic nature of experiential learning as: „The tendency to define learning in terms of outcomes can become a definition of non-learning" (p. 26).

Conclusion

Simulations, along with training in general, are contexts for teaching and learning. On the teaching side, the supply side of learning, trainers organise the simulation based on a construed isomorphism with a professional reality. On the learning, or the demand, side, trainees organise the simulation through their moment-by-moment sensemaking and experiencing in the sense of „mitmachen". In the simulation, both sides meet. In blueprint approaches, trainers

set the stage and the agenda. In experiential approaches, the learning needs and concerns of the learner direct the process.

We propose that trainers in simulations choose, on an ongoing basis, between both approaches. Blueprint teaching, as well as experiential facilitation, is potentially relevant at any given point in time. Competent trainers are aware of the kind of interventions they make in this regard. They continuously search for an appropriate balance, understanding that the experiential learning process is ever-present, whether or not trainers or trainees, or both, attend to it. We argue that blueprint approaches are essential in the reproductive learning spheres commonly evoked in relatively simple simulations with a technical emphasis, yet experiential approaches are more appropriate in complex multi-actor simulations, in which personal and relational issues become more prominent.

From the point where the complexity of professional practice cannot be translated into a set of procedures, experiential learning needs to be an integral part of professional life. As professional contexts have a more heuristic and self-organising character, learning (knowledge creation) and practice (knowledge use) can no longer be separated (Eraut, 1994). As Tennant and Pogson (1995) pointed out, reflection in such contexts occurs 'in' rather than 'after' the experience. To the extent that reflection is embedded in the interaction at work, communities of practice establish a culture of learning. Simulations can play an important role in developing such a culture. They provide an opportunity to learn while participating in a context of practice. This process brings about 'inside-out' knowledge that originates from the living experience of being in-action. Simulations also provide an opportunity to learn reflectively from the experience. Sharing and reflecting on experiences by means of language results in 'outside-in' knowledge (Bouwen & Hosking, 2000; Shotter, 1993; Nonaka, 1994). To the extent that professionals integrate these two learning movements, apprehensive 'inside-out knowledge' and comprehensive 'outside-in knowledge' become interwoven, which leads to a fuller understanding of past experiences (retrospective learning) and of future possibilities (prospective learning).

Addison (1992) points out that physicians, in their internships, experience conflict between the ideal and everyday practice because of contradictory medical practices and the absence of unambiguous role models. Those interns bounce back and forth between 'Covering Over' these conflicts in the pressure of everyday medical business and 'Over-Reflecting' (ibid p.123). Based on this research, Addison concludes that newcomers in this professional domain need to learn to balance action and reflection. In our opinion, an experiential approach to medical simulations may provide an answer to this educational challenge. Simulations that are embedded into a broader reflective and conversational space (Baker, Jensen & Kolb, 2002), can contribute to developing com-

munities of practice that reflect „on their performance and the relationships that they are creating at the same time" (Bouwen, 2001, p.367). Practitioners, such as physicians, appear to be confronted primarily with blueprint approaches to learning which do little to support the development of such learning cultures. Therefore, we suggest that experiential, more participative approaches to learning and corresponding constructionist epistemologies deserve special attention in the set-up and facilitation of simulations in this domain.

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