Observing interprofessional simulation
David Boud

Students undoubtedly experience far more opportunities to observe a variety of interprofessional interactions in health care settings than they will ever have the chance to practice. This demands that the ability to learn from observation should be accorded a high priority in any course. It also implies that particular attention needs to be given to the role of simulations in promoting skills of observation as these are situations in which the role of observation can be directly influenced and acted upon, unlike the vicissitudes of opportunistic practice. However, developing skilled observation is not enough. Students need also to be able to respond to what they observe. At the very least they need to be able to formulate strategies to appropriately address the situations they identify, but they need also to be able to translate these plans into what is potentially actionable, and ultimately, act on them.

What are the circumstances that enable learning from observation in simulations? What kinds of observation practice can prompt students to develop the necessary capabilities? The major trap in simulation is to position observing students as passive and not engaged in the event. This is clearly not a desirable state of affairs as it is only through direct engagement and their own observations can they learn to discern what is important and identify what options they might have for dealing with expected and unexpected situations. While student observers may not, for example, be engaged in the hot action around the simulated patient, they can, if the overall event is set up appropriately, be just as actively engaged in noticing the action and recording what they see. They can practice their observation and be guided with respect to it through briefing and debriefing just as much as the players can be coached on their actions.

What then are the material conditions required and the set-up processes needed for observing practice to be fostered? The examples in this section show how easy it is to avoid observing the very phenomena that should be the focus of attention (interprofessional interactions) and for simulation processes to distract from the very learning that might be had. There is a predisposition in observing events of which one is not part, for following that which is most interesting and making premature judgements of what is occurring. While both seeing key actions and judging their appropriateness have a place, the challenge is to avoid them dominating initial exposure and for observers to miss out on noticing those things which might not be most exciting but which contribute most to what they should be considering and thus learning.

These examples challenge us to look at the practices of simulation that enable and inhibit a focus on noticing and the consequences that flow from this. Adapting the practices of briefing, action and debriefing to fully accommodate the fact that observers should be as

much part of the simulation as players is a necessary feature of the use of simulations for professional learning. After all, observers will inevitably become players and players will need to become sophisticated observers on many other occasions.

Learning through observation

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Organising simulation activities with large numbers of student brings on logistical challenges as well as consequences for what learning possibilities that become available, when some students are assigned to 'learning by doing' through participating actively in the scenario, and others to 'learning by observation' by watching the scenario being enacted by their peers. The fact that a large number of students become observers of (simulated) clinical practice, rather than learning from first-hand experience of the future professional situation, raises pedagogical challenges. However, a vast majority of research on simulation focus on the learning of the acting students (Rochester, Kelly, Disler, White, Forber & Matiuk, 2012). In this subsection, we will focus particularly on the conditions for learning from the simulation observers' point of view.

Previous research on learning from observation, or vicarious learning encompass learning contexts that include learning from observing someone else learn and learning from observing someone else act or perform (Chi, Roy & Hausman, 2008). Studies on the value of observation for professional learning have been reported in various work settings (e.g. Köpsén & Nyström, 2014). Focusing on education in healthcare, especially simulation-based education, some studies emphasise that not only physical and practical skills but also interprofessional and collaborative skills can be learned through vicarious learning (Chi, Roy & Hausmann, 2008; Grierson, Barry, Kapralos, Carnahan & Dubrowski, 2012; Stegmann, Pilz, Siebeck & Fischer, 2012). However, Eikland Husebø et al. (2012) found that observing the training of other teams did not increase subsequent performance. When learning skills through simulation, a study by LeFlore et al. (2007) shows the value of observing instructors modelling ideal performance prior to students' own simulation experience. Another study (Stegmann et al., 2012) indicates that observing students learned as much as their peers, in doctor-patient communication skills, by observing their peers interact with standardised patents.

The conclusion the previous research is that learning by observing others is a complex issue especially when it come to collaboration and team training. In this book, we apply an alternative approach to understand learning, where we ask how the practice of observation is arranged in simulation training and how? it relates to the social and material arrangement of the simulation. The contexts in our studies are two different sites of undergraduate education of health professionals. The empirical data is based on video recordings and observational field notes of nursing and medical students engaged in simulations as a compulsory part of their education in the last semester before graduation (Nyström et al., 2016b). Based on our findings, we will show how the ways the material set-up and organisation of the observation create different learning conditions for the observing students. These different learning

conditions are paramount for educators to understand in order to develop simulation activities that support the observing students learning.

Briefing - the invitation to participate as observer

One key aspect of learning is how a task is introduced and thereby what expectations the instructors have on observers participation. In line with previous research and as discussed in previous chapter, the briefing often focus on the task of acting students and the simulation as such. However, research stress the importance of engaging all students through a defined task justifying their role and give value to their participation (O'Regan et al. 2016, p.10). In the context of our study, attention was generally redirected toward observers at the end of the briefing session. We noted a variety of ways in how the observing students were invited to engage in the forthcoming simulation (Nyström et al., 2016b). In some some cases, the instructors justified the observer role and framed it as a learning situation.

> *Then, what about those of you that won't be simulating? Well, you will stay here in the observation room with the operator and me. What I say now is not my own words, but the students before you said that being an observer, watching what goes on and having a conversation with Theo and me, is not a waste of time. It is just another learning situation. You learn a lot from being observers, but it is different from being in there [points to the simulation room]. (Site 1- briefing 3)*

The observing students were also given specific tasks by the instructors, such as looking at communication and leadership. One instructor said "You will sit here and look for what the team performs well. It would also be good if you found one positive thing for each of your fellow students, and maybe one thing that could have been done differently.".

We will now continue to discuss how these observations are thematised and made relevant for learning

Observing simulation

Our study had two different arrangements for the observing students. In one site, the students observed the simulation through a one-way screen, sitting together with the instructor and the operator in the control room (Nyström et al., 2016b). In the other site, the students were sitting in separate room, round at a table where they could watch the simulation on a screen. These two different socio-material arrangements had in common that the observing students had no possibility to change or interact with the simulation training that took place in front of them. This implies that the students' attunement was restricted and somewhat passive in relation to the material surrounding them, i.e. more like students in a classroom then active participant in a professional practice. In the following, we will now discuss the two ways in which the observation was arranged, proximate observation and distant observation.

Proximate observation

When students were localised to the control room, observation emerged in a complex material set-up where the students were participating as a backstage audience, watching the scene from the coulisse. Here students were seeing different practices, i.e. the simulation exercise representing the professional practice of a hospital, the extension of the manikins' mind and bodily reactions via a voice through a loudspeaker, and how these bodily reactions were manipulated in the control room. This complexity was made possible due to the students' presence in the same room as the instructor and the operator running the scenario, but also their access and closeness to how the manikin was enacted by their fellow students, visualised via how the patient/manikin was operated via computer screens and different monitors.

The observing students could see how the patients' voice was enacted through the instructor, speaking into the microphone, and how this information was perceived by the students in the simulation room, influencing what was said and done on the other side of the one-way screen (Nyström et al., 2016b).

Interestingly, the observing students also heard and witnessed how the instructor or operator answered the phone call from the simulation room, acting "as if" they were other professional actors in the hospital setting.

> *The operator answers the phone call from the simulation room saying "The switch board". The medical student from the simulation room "I'm looking for the anaesthesia on call.". The operator continues, "Yes one moment.". He looks at the instructor, who laughs and states, "The anaesthetist is occupied". The operator talks into the phone again "Hi, it is Karen, mid-wife. You are paging the anaesthetist on call, they are here but they are occupied in the delivery department. Is it something you want me to pass on?" (Site 1 – observation 1)* (Nyström et al., 2016b)

The study show that the presence of the observing students located in the control room, close to the instructor shaped as a teaching practice. The teaching practice that emerged in this context, show how the students became passive while the instructor were taking on a didactic teacher's role, using the simulation as an educational example of correct and incorrect professional behaviour or doings, but also used the location to inquire about students' medical knowledge or their knowledge of protocol.

> *The students, instructor and operator hear the simulating students looking for a pulse on the screen in the simulation room. The instructor points to her screen and says "No, that is not the pulse, what is it?" She turns and looks at the observing students. One of the medical student answers, "It is Mean Arterial Pressure." Instructor says enthusiastic "Exactly! There are so many, here you have the heart rate. You have to know what the numbers stands for". (Site 1 – observing 4)*

We also observed how the instructor redirected students' attention to certain events helping the students to distinguish critical instances in the simulation (Nyström et al., 2016b).

> *Through the one-way window, the students, the instructor, and the operator watch the students examining the patient, who starts to vomit. The instructor points out "Did you see how they took their time to position themselves in order turn the patient? It is not uncommon that someone just pulls [the instructor shows a pulling manoeuvre with the arm] the patient to one side [the students turn their attention towards the instructor]. Now look, let's see how they reposition the patient." All of them turn their attention towards the one-way window again. (Site 1- observing 3)*

Line line with previous research, we emphasise that the presence of the instructor need to be supportive in this respect, since research has shown that they have an important role in directing students' attention toward critical issues and ideal professional performances (see also Gierson et al., 2012; LeFlore et al., 2007). In this example, with proximate observation, the complexity of the socio-material arrangements in the control room where different practices coalise call for the importance of directing and supporting the observing students' attention towards the overarching aim of the simulation.

Distant observation

In the case of distant observation, it was enacted in another socio-material set-up, characterized by a disconnection to embodied doings and relatings of the actual simulation practice (Nyström et al., 2016b). At this location, the observation was distant to where the simulation took place, leaving students with no first-hand contact with the enactment of healthcare work by their peers. To guide their observations, they only had the short instruction from the instructor in the briefing saying that they should observe what their peers did well and what could have been done differently. We argue that this location and its material set-up form another type of pedagogical activity compared to proximate observation. The simulation was presented to the observing students as a projection of an activity on a screen, taking place somewhere else and therefore distant in space. The need of focus on the screen in order to hear and see what was played out made communication between the students sparse. Instead the observing students were sitting quietly around the table.

> *Four students sit around the table watching intensively a screen showing four images, one close-up of the manikin's upper body, two images from two different angles showing the hospital bed with the patient and two nurse student acting, and finally the screen with all the patient data. On the screen, they see one nurse student interacting with the patient and the other is trying to get hold of a doctor, without any success. The observing students fidget and laugh shortly. One of the observing nurse students says: What happened to the doctor? Why isn't anyone coming? Another one answer: I do not think the doctor is supposed to come yet. The group laugh nervously and continue to watch the screen. (Site 2 – observation 4)*

The noticeable that the observing students sayings and bodily doings appeared as single comments as a reaction of what was being projected from the simulation or as bodily expressions of unease or dissatisfaction, indicating that the observation was a rather passive and individual activity compared to proximate observation. In this setting, the students had no instructor who could assist and guide their observation and the communication between the students were sparse, making these students more of an passive audience.

Support for active observation and interprofessional learning?

This chapter have discussed how the the ways the material set-up and organisation of the observation create different learning conditions for the observing students. Previous research has emphasised that observation is an activity that needs to be supported (Chi, Roy & Hausmann, 2008; Stegmann et al., 2012) in order to achieve professional learning (e.g. Grierson et al., 2012; LeFlore et al., 2007). The findings show that the observation room/operator room is a pedagogical site of learning with its own material set-up, making certain activities more likely to happen (Schatzki, 2002). We have show two emerging ways of observation, proximate observation and distant observation. Proximate observation emerged in a complex material set-up where the students were participating as a backstage audience, watching the scene from the coulisse, seeing different practices, i.e. the professional practice of a hospital, the simulation exercise, and the extension of the manikin's mind and bodily reactions through the operator. The complexity of the sociomaterial arrangements the observers find themselves in, call for the importance of directing the students' attention towards what overarching aim of the simulation is. Here the presence of the instructor need to be supportive in this respect, and in line with previous research the findings show that they are directing students' attention towards critical issues and professional performances (see also Gierson et al., 2012; LeFlore et al., 2007).

The findings also showed distant observation enacted in a different sociomaterial setup, characterised by a disconnection to embodied doings and relatings. Here, the actual location was distant to the location where the simulation took place, leaving students with no first-hand contact with the enactment of healthcare work by their peers. Instead, the observing students are left to watch simulated healthcare work projected on a screen almost as an audience. In this setting, the relatings between the students are also passive, but in this setting, students have no instructor who can assist them in directing their observation.

The aim of the simulation-based exercises were to practice interprofessional collaboration. However, our findings show that the observing students and the instructor have focus on professional behaviour and medical procedures more than articulating interprofessional collaboration. This could be seen as conflicting with the given task in the briefing, i.e. to observe communication, leadership and good/less good professional performance of the team. Based on the findings presented in this chapter, it is possible to question what conditions are

created for learning interprofessional collaboration through the organisation and arrangements of the simulation-based training, especially when some are appointed to do simulation and others are to be observers.

The learning conditions for the observers could have benefited from being supported by observational script, in order to get a more active learning experience (i.e. Chi, Roy & Hausmann, 2008). Such a observational script could also direct students gaze toward interprofessional aspects of the simulation. Reeves et al. (2011) emphasise that interaction between the learners are recommended for achieving interprofessional competencies. If students are given a specific task, could this direct student's observations to interprofessional behavior? If so, how should this task be designed? One aspect is how to design a script that directs the observations towards the overarching aim of the simulation exercise, to develop interprofessional competencies. In the two enactments we have described, the students were passively watching the scenation unfold. In one case, the activities were sometimes complemented with remarks from the instructor, or, as in the second case, distant observation were enacted in a sociomaterial set-up characterized by a disconnection to embodied doings and relatings. By this we mean that the observing students were left to watch simulated healthcare work projected on a screen, and the relatings between the students were passive, not having an instructor who assisted in directing their attention. Others have shown how the use of observational scripts could contribute to focus students' attention towards critical aspects of the simulation and increased the accuracy of the feedback provided by the observers (Stegmann et al., 2012), both individually and collaboratively (Zottmann et al., 2006).

Concluding bullet-points

- The findings contribute with knowledge on the complexity of arranging an observational practice within a simulation-based exercise.
- The two emerging ways of observation, enacting proximate observation and distant observation, have different material arrangements creating different conditions for learning, as well as differences in knowings that were emphasised and expressed.
- The results emphasise the importance of further understanding of how to use the observation room as a learning environment and a pedagogical site.

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Developing professional noticing: shifting the logic of observer guides from evaluating to noticing
Donna Rooney & Michelle Kelly

Students might understand the principles of 'closed loop communication' and/or 'holistic care'. They might understand, in principle, the significance of any number of symptoms that patients may manifest. But noticing these sorts of activities and/or other phenomena unfolding in an episode of professional practice requires practise. Most would agree, nursing and other health professions students need to become skilled in noticing in a range of complex clinical situations. This is both an issue for professional practice as much as it an issue for educators.

> Students need help recognizing the practical manifestations of textbook signs and symptoms, seeing and recognizing qualitative changes in particular patient conditions, and learning qualitative distinctions among a range of possible manifestations, common meanings, and experiences (Tanner 2006 p.209)

According to Tanner's (2006) well-cited clinical judgement model (CJM), *noticing* is an essential step for nurses before they can interpret and respond to clinical situations - and a "function of nurses' expectations of the situation" (p. 208). But, if noticing is as "integral to the everyday practice of nurses" as Tanner and others suggest it is (Watson and Rebair 2014 p.154), then questions arise about how student nurses develop a capacity for noticing, in addition to questions about the sorts of pedagogical interventions which might promote it. Notwithstanding clinical placements and despite the limits of manikins (seen in chapter 4), some may suggest that simulation-based education (SBE) provides a tentative answer to both questions. Promoting noticing behaviors, that is, helping novices to look and think beyond the obvious cues as they approach a patient or come across a 'situation', can be afforded in SBE.

But what about students who observe simulation? Simulation based education (SBE) is fast becoming a 'signature pedagogy' (Shulman, 2005) of contemporary nursing education (and health education more broadly) that is informed by a mature research foundation including well-cited models of simulation in health education (e.g. Cook et al, 2011; Dieckmann et al., 2012). However, there is comparatively less available research that focuses attention on the large number of students taking observing roles (e.g. Grierson et al., 2012). Given increased enrollments, larger and diverse cohorts, limited practicum places, and diminishing resources among other things (Rochester et al., 2012), it seems timely to foreground the role of student observers in simulation classes.

This section begins with an overview of the observer role in simulation before turning specifically to noticing. Drawing on seminal ideas within health education literature (e.g. Tanner, Lasater), we introduce the concept of noticing, the first of four aspects in Tanner's research based model, as central to making clinical judgements. Next we briefly outline a two-phased Australian study where the observer role first captured our attention. We illustrate how the observers were prompted to *evaluate* the performance of their peers and consider this in terms of noticing. After offering an understanding of noticing that extends that found in the simulation literature, we move to the second phase of our study where we carried out a small pilot involving a series of interventions in an effort to make the observer experience a more active one. These interventions included the redevelopment of observer guides, that purposefully shift the logic of prompts from *evaluating* to *noticing* various aspects of the simulation and we illustrate how these generated more nuanced responses from observing students. We conclude by proposing multiple benefits of shifting the logic of observer guides, benefits in, and beyond, the simulation classroom.

The observer role

There are mixed views among students concerning being delegated an observer role. While some students prefer an observer role because it is perceived to be 'less stressful' (Hober and Bonnel 2014; Kelly et al 2016), others associate being an observer with 'being bored' (Harder et al. 2013) and would prefer an acting role. Then there are roles like the documentation nurse, where the acting students come in and out of the action: in essence offering a pseudo-observer experience, *with* opportunity to observe (closer to the action). Some students in Harder et al.'s study (2013) reported these betwixt roles as preferential. Regardless of students' perceptions and preferences for various roles in the simulation, studies concerned with learning highlight benefits of being an observer (O'Regan et al. 2016). These include: opening up thinking and analysis, engaging in the action via peer review, seeing the 'bigger picture', validating one's own and others' practices and decisions, and, having a connection with the acting students in the simulation (Hober & Bonnel 2014).

An active/passive binary is often used to distinguish the acting role (active) from the observer role (passive) in simulation: with the former generally being more prized. The use of observation guides (sometimes called scripts or rubrics) by observers exemplifies a pedagogic intervention that seeks to make the observer role a more active one (Bethards 2014; Zottmann et al. 2018; Stegmann et al., 2012; Chi et al. 2006). These provide direction about *what* is to be observed (Bethards 2014). For instance, an observer guide may direct attention to various features of the simulation like clinical skills, teamwork or communication with an associated expectation that these will be learned, critiqued and promoted. There is much agreement that observer guides provide focus and structure to the observer role, and help observers contribute to more meaningful debriefings discussions (Bethards 2014; Stegmann et al., 2012; Zottmann et al. 2006; Chi et al. 2006). These sorts of findings led Stegmann et al., (2012) and others (e.g. Jefferies and Rizzolo 2006, in Scherer 2016, p.350) to conclude that learning experiences in simulation are equitable irrespective of learner role (*cf* Zottmann et al. 2018). Leaving the idea of 'equitable experiences' aside for the moment,

given the importance of Tanner's CJM in nursing education, guides that focus observers' efforts on noticing, interpreting and reflecting are well regarded (e.g. Hober & Bonnel 2014).

Noticing in clinical judgement

Noticing is critical in all professional domains (Stürmer, Könings and Seidel, 2015; Mason 2002). Teachers notice students' behaviour in their classrooms (Borich 2016), managers notice risks that need averting (Kutsch and Hall, 2014), business leaders notice salient features of the market (Bazermakarsn 2014) and nurses notice the clinical situations they are faced with. Tanner (2006) describes noticing as " [a] perceptual grasp of the situation at hand" (p. 208) and a first important step in making the clinical judgements which are central to the practice of nursing. Despite Tanner's (2006) CJM being over a decade old, it continues to inform research accounts of nursing and nurse education.

The CJM forms the basis of the Lasater Clinical Judgment Rubric (LCJR) (Lasater 2007). While the LCJR was designed to be used by educators to assess students' capacity for clinical judgement, it is telling to read how noticing is understood. First, the LCJR outlines examples of 3 dimensions of noticing: (1) focused observation; (2) recognizing deviations from expected patterns; and, (3) information seeking. Then, for each dimension, it provides criterion along a 'beginning' through to 'exemplary' continuum.
Beginning noticing involves:
1. Focused observation: important data [being] missed
2. Recognising deviation from expected patterns: focus[ing] on one thing at a time and miss[ing] most patterns and deviations
3. Information seeking: rely[ing] mostly on objective data (Lasater 2007 p.500)

Whereas, *exemplary* noticing involves:
1. Focused observation: monitor[ing] a wide range of objective and subjective data
2. Recognising deviation from expected patterns: recogniz[ing] subtle patterns and deviations from expected patterns in data
3. Information seeking: carefully collect[ing] useful subjective data (Lasater 2007 p.500)

Our research and subsequent research developments

Our interest in noticing is informed by insights into the observing role that emerged as part of a research study. Our initial aim was to conceptualize simulation in higher education. As our research progressed, a number of issues emerged in regard to observers of simulation (see Rooney et al. 2015; Kelly et al. 2016: Hopwood et al. 2014) and these became increasingly difficult to ignore. Each class consisted of around 25-30 students of which 5-7 were delegated an active role in each simulation, and the remaining (and majority) of the students were delegated observer roles. During the actual simulation, it was common to see observers engaged in personal grooming or playing with their mobile phones, and (in one instance) we even saw a student sleeping while the simulation was being performed. Despite all students

having electronic access to observer guides prior to the class, only once was an observer guide actually seen (and this was left untouched on the student desk). When it came to the debriefing, it was typical for only 1-3 observers to contribute to discussions. In all, despite Stegmann et al's (2012) assertion that acting and observers roles were equitable, our general 'hunch' was that the observers' experiences of simulation we saw during data collection were being overshadowed by the simulation action. We began to consider how the observer role and guides were introduced (or not) and what influence this might have on what observers did during the simulation.

Toward the end of our initial research an unanticipated opportunity arose to extend our study through a small internal 'teaching and learning' grant. We used this as an opportunity to turn our attention to simulation observers and to pilot a number of interventions. We tried some changes to how student observers were organised including arranging them into small groups that each focused on a different aspect of the simulation. The results of this are described more fully elsewhere (Kelly et al 2016). We made changes to facilitators' guides that included emphasising the value of observing (with a view to help students form intent for learning). We also identified how some facilitators were already prompting students to notice through "noticing out aloud" during the simulation (Rooney and Boud forthcoming).

But of particular interest here, is our redevelopment of the observer guides. With our focus on noticing, we rewrote observer guides and piloted them with 4 simulation cycles in the same subject as we had studied in the first phase of our research (e.g. Rooney et al. 2015; Kelly et al. 2016: Hopwood et al. 2014). Identical data collection processes to those used in the original research enabled us to comment on the outcomes of our developments. With an amendment to our original ethics approval, we also collected completed observer guides. The overall effect of these interventions resulted in major differences in observers' behaviour during the simulation and, as one observer attests, the students thought there were differences too:

> It was so good to actually have … normally the observers observe and you'll talk about it at the end…but you might not really observe – having a focus area – you sit and you think I actually have to work (laughs) it's really good to have the focus (class agree).

Evaluating simulation

So, how was noticing (so critical to clinical judgement) reflected in the original (and generally unused) observer guides before our interventions? Well, the original observer guides prompted observers to notice *accomplished* simulated practice with questions like, "What elements of patient care did the team perform well?" An ideal response to this question involves observers noticing an isolated activity performed by their acting peers that they perceive as being performed in an *accomplished* manner. To evaluate it as such, they would need to compare their peers' performance with what they have learned about in class or from their textbooks.

It is not just our own institution that ask these sorts of questions. Zottmann et al.'s (2018) observation guide also prompts pairs of observers to find an "example of *successful implementation* of [effective communication]" (p.4, *italics* in original). The directions are clear - not any example will do. Like our own prompts it must be an *accomplished* one and, like our own example, this form of questioning illustrates a logic of evaluation. Observers must focus on (notice) an activity and consider it in normative terms: i.e. how well the practice meets a shared understanding of normalised practice (Hopwood 2017 p. 70). Importantly, because it is an isolated activity that observers are prompted to notice/evaluate, it aligns with the LCJR beginning criterion of 'focusing on one thing at a time' in doing so the students' efforts could be assessed at a 'beginning ' level of noticing (Lasater 2007 p.500). To be assessed more toward an 'exemplary' level of noticing the prompts would need to guide observers to notice multiple activities; see/recognise patterns; and make judgements about subjective activities.

A similar framing is evident with another common prompt used in observer guides (or spoken during briefing sessions (see example in Nyström, Abrandt Dahlgren and Dahlberg's above)). This is where observers are asked to look for examples of their peers' acting performances that *do not* meet the shared understanding of accomplished practice. This sort of question also requires an understanding of what accomplished practice is, in order to consider why what their peers' did was not. Again, this invites evaluative comments of an isolated activity that observers have noticed - again, according to Lasater's continuum, observers may be assessed at a 'beginning level' of noticing (Lasater 2007 p.500).

Another noteworthy point in regard to questions framed in this way is their purpose: i.e. to provide feedback to the acting students during debriefing sessions (Zottmann et al. 2018). In our institution's existing facilitator guides , instructors were prompted to invite observers to provide feedback to their peers about their performances. While there is merit in peer feedback (Tai et al. 2017), and noticing/evaluating isolated examples of accomplished performances, these sorts of questions commonly found in observation guides may not be promoting a capacity for noticing as well as they could be. We suggest there are other forms of noticing that might complement and extend noticing - *and* to multiple ends. We stress, however, that we are not suggesting a replacement of the well researched models of clinical judgement (if ever we could), but are suggesting a different perspective that encompases and extends *what* and *how* observers of simulation might notice.

Expanding noticing

By using the term noticing we mean more than simply seeing or 'becoming aware of' something (Dictionary.com). Indeed, elsewhere we propose three interrelated forms of noticing of relevance to SBE (Rooney and Boud, forthcoming). The first form is *noticing in context.* Obviously pre-service nurse education must involve students learning the various activities that constitute nursing practice (e.g. taking blood pressure, performing CPR, patient handovers etc.). However, noticing in context refers to students understanding how the scope of activities that they are learning about unfold in a professional setting: not isolated

enactments of a single activity. While well-rehearsed protocols (e.g. ABCDs etc) do some work to illustrate how various activities hang together (e.g. airway, then breathing, then …), they do not account for episodes of professional practice when other activities (e.g. panicked family members, misplaced equipment, poor communication etc.) disrupt linear and non-situated sequences. To notice in this sense, is to be attuned to the spatial-temporal. Importantly, noticing in context requires noticing 'more than one thing at a time' as well as the 'subjective data' of a professional practice setting. In this way, noticing in context can foster 'exemplary noticing' (Lasater, 2007, p. 500).

Building on the first form of noticing, but also extending it, is *noticing of significance* (Rooney and Boud forthcoming). This second form of noticing refers to 'disciplined perception' (Rose, 2014, p.73) or 'marking' (Mason, 2002). For instance, within the professional setting, a nurse must not only notice when a patient's blood pressure has dropped but also recognise the significance of this. This is what Watson and Rebair (2014) refer to when they write of 'the art of noticing'. We understand noticing of significance in alignment to what Tanner (2006) advocates for in the CJM: i.e. being able to zoom in on, and discern the salient features of clinical situations based on an understanding of what is likely to occur next - and what, if any, response is necessary. Noticing of significance also aligns with the concept of exemplary noticing through its invitation to recognize 'deviations from expected patterns' (Lasater, 2007, p. 500). Importantly, a capacity for noticing significance or 'marking' is dependent on the capacity to *notice in context*: This signals the interdenednacy of both forms of noticing presented hitherto.

Finally, as educators, we suggest that *noticing learning* itself constitutes a third, and necessary, form of noticing for simulation observers in pre-service professional education (Rooney and Boud forthcoming). As Bateson (1994) foreshadowed, the "essence of noticing is being awake to situations, being mindful rather than mindless" (in Mason, 2002 p.38). This means students forming an intent to learn prior to observing (Boud & Walker 1990) if they are to learn from it. While talking about experienced professionals ongoing professional learning, Billett (2016) also concurs that understanding one can learn by observing others, opens up the observing experience to learning. With an intent to learn from observing episodes of professional practice, students are able to notice (and reflect on) what was learned afterward as well. Like the other forms of noticing, we see *noticing learning* as important in pre-service education.

These three forms of noticing offer a different lens to consider the purposes and possibilities of observer guides used in simulation classes. For pre-service health professionals we see potential in working toward the exemplary levels of noticing that health practitioners require when making clinical judgements. However, we also see potential for developing skilled observers/noticers that may use their capacity for noticing to continue to learn as they enter their careers. Below we illustrate how we used these ideas to redevelop the observer guides used in a nursing subject in the second phase of our study.

From evaluating to noticing

In redeveloping the observer guides we expanded the evaluative logic of the original questions (described above) to include developing a capacity for noticing (see Table X). The observers were divided into small groups that each had a different focus. Each group was given an observer guide with questions relating to their focus area. Some groups shadowed particular roles (e.g. team leader, nurse 1, patient etc.) and some groups focus was a particular phenomena (e.g. communication, clinical actions etc.). In all the newly developed guides groups of observers were asked to notice specific actions or phenomena, and then expand on what they noticed in terms of impact/effect beyond quality. An ideal answer would not only indicate noticing a particular phenomena but situating the activity in unfolding practice. For instance, observers shadowing the team leader were asked: "When does the TL step back from the action? What effect does this have?" To which, the observer group wrote: "The TL steps back when the TL calls the RMO for a drug order. When the TL steps back there was a bit of confusion". What we see here are students noticing in context: where 'confusion' and the 'team leader withdrawing' are temporarily linked in the unfolding practice being observed.

An example from another observation guide (with delegated focus on clinical actions) included asking: "What are the key clinical actions? How do these actions come about, and who instigates them?" A group responsible for this focus answered by stating: "Delivered Neb[ulizer].; Measurement shows patient has low Sat[uration]; RN1 decides to deliver nebulizer". In responding this way the observers are *noticing* [the delivering a nebulizer] *in context* as well as *noticing* [the] *significance* of low oxygen saturation. Again a temporal element links the occurrence of 'low oxygen' with the 'delivering nebulizer' in an unfolding sequence. The students were not only *noticing in context* but, according to Lasater (2007), demonstrating something more akin to exemplary noticing. Further questioning in the guide prompts observers to notice and comment on the unfolding events *and* the timeliness of the action. To which another group responded: *"Patient was SOB* [short of breath] *and cough*[ing]. *Patient's symptoms were not resolved (intervention delivered not rapid enough)'* Here, students have not only noticed a temporal sequence (more than one thing), patterns and deviations (short breath, coughing, intervention), noticed the significance of symptoms (coughing short of breath), but also evaluated the temporality of what they had noticed. These rich examples of observers' noticing, via asking different sorts of questions, illustrates a shift toward exemplary noticing - consistent with the LCJR definitions (Lasater 2007 p.500).

Redeveloped guides were purposefully presented in a tabular format to illustrate the deliberate relationship between the questions. Below (Table 6.1), for example, it is not just an isolated action (column A) that is to be noticed, but the guide prompts observers to notice its impact (column B) and timeliness (column C) as well. In addition, the fourth column (D) prompts students to think about (notice) what they are learning: this further extends the temporality of the simulation into their future practice.

TABLE 6.1: *Observer guide including questions and student responses*

A. What are the clinical actions?	B. How do these actions come about, and who instigates them?	C. Does the action happen at the most appropriate time? Would it have been better at a different time?	D. What does this tell you about key ideas or concepts you already know about? What does this matter? What are the implications for your practice?
Clinical assessment	*As soon as patient was admitted to the ED [emergency department], RN1 delegated roles (assessment)*	*Time management was well-managed. Patient seemed satisfied with the treatment he was receiving*	*Communicating with the patient is the essential factor in finding out patient's clinical problem.*
Change of NP [nasal prongs] *- Hudson Mask*	*RN1 delegated the task to RN2 after the patient complains about SOB and chest tightness*	*Right time*	*Give immediate response to patients complaints. Sharing nurses are here to care for you and building a good relationship between patient and nurses.*
The team gives/ administers pain relief	*Asked how the patient was feeling - assessed their pain*	*Yes, it was appropriate because pain assessment was their first priority and they acted on it straight away*	*Listening to the patient - making sure they are comfortable*

Overall, these observation guides prompted students to engage with ideas and content that they already knew about, but in ways that extended what the earlier guides logic of evaluating practice had invited. These redeveloped guides include prompts for *noticing in context, noticing significance* and *noticing learning.* In terms of the continuum of noticing (Lasater 2007), they also shift the form of noticing from a beginning level through to developing, and towards accomplished and/or exemplary levels. In combination with other pedagogical strategies, like facilitator's briefing of observers and folding observers into debriefing sessions (Nyström, Abrandt Dahlgren and Dahlberg discuss this in more detail above), we mark this as a fruitful direction for further development and comments from observers' in our small trial provide additional encouragement:

> I think the questions …the observations questions thing … is really good …. It.. so like X and I can sit here and say "do you think this is X" so we can discuss and you can focus on the main points and then afterwards everyone can talk about it

Noticing beyond simulation

Our small project of developing a pedagogy of noticing (in relation to observers of simulation) has potential to develop some capacity toward exemplary noticing as novice practitioners become involved in clinical judgement and actual clinical situations. However, here we point out additional benefits to developing a pedagogy of noticing. Supporting students to become more skilled observers (noticers) in the simulation classroom may

develop a capacity for noticing that has other advantages as well. Throughout their careers our graduates will transition from novice to experienced practitioners and ongoing learning will be central to this. The combination of multiple opportunities to observe practice *and* being a skilled observer/noticer also presents ideal conditions for ongoing professional learning.

It is not only pre-service students in simulation classes that are observers. In professional settings it is common for novices and those on clinical placements to observe clinical situations. Billett (2016) goes further to explain how professionals engage in *mimetic* learning and how observing others in professional settings is central to this. Borrowing the Japanese term *minarai* (meaning apprentice) to make his point, he describes how learning through observation of professional practice is partially reliant on the learners' *intentionality* (Billett 2016 p.129). Observing, in this sense is an active process with an agentic element. In this sense, Billett aligns with early ideas about experiential learning: where, in order to learn from an experience, the learner must form some *intent* for learning (Boud and Walker, 1996) – aligning with the broader intent of the activity itself (Hopwood 2017; Mahon, et al. 2017). While we see helping observing students form learning intent as critical for educators in the simulation classroom, we also see value in helping students to independently recognise the potential for learning in practice situations long after they graduate. Perhaps what is needed is a reimagined fidelity that is pertinent to those who observe simulation as well as those who participate in acting roles - albeit in different ways?

Concluding remarks

Simulation provides opportunities for developing capacity to *noticing context* as well as *noticing significance*. Observers of simulation can be assisted to 'read' the simulation action unfolding before them (*noticing in context*), notice significant features of it and predict what actions might be required (*noticing significance*). Pedagogical interventions, like carefully considered observer guides and framing observing as a learning experience, starting in the pre-briefing phase, can help students form learning intent (*noticing learning*). These are not alternatives to well-established research-based models currently used in nursing and health related pre-service education, but complement and expand on the overall project of clinical judgement. Developing a 'pedagogy of noticing' in relation to patient cues, how teams communicate and respond to changing situations, may be a first step in guiding novice professionals to become skilled observers/noticers in other situations. The small intervention illustrated in this chapter shows that shifting the logic of observer guides has potential to also shift *what* and *how* observers of simulation are noticing and potentially moving them more toward the sorts of noticing required for patient care in professional practice. We mark this as a fruitful direction for further research.

Bullet points
- The logic of the prompts or questions in observer guides evoke different sorts of thinking and responses.

- Noticing in context, noticing significance and noticing learning build on and extend the forms of noticing that are prevalent in the health education literature (e.g. noticing in clinical judgement)
- Questions in observation guides that promote various forms of noticing can contribute to development of skilled observers/noticers
- Helping students develop a capacity for noticing may benefit them in, and beyond, the simulation classroom.

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Commentary: Dara O´Keeffe

This chapter has discussed the role of the observers of simulation from two contexts. Firstly, how the setup of the observation environment affects learning; and secondly how the learners observation skills can be enhanced.

The structure or setup of the observation environment is a fascinating issue. The authors here describe two potential environments: proximate and distant. Proximate observation is defined here as observing from the control room with running commentary from the instructor. In this setup there is proximate feedback from the instructor however, the observers being in the

control room breaks the high fidelity of the simulation, bringing their frame of mind away from a believable clinical context and showing the activity from a very different viewpoint. It may be hard for observers in this situation to project themselves into the frame of mind of someone immersed in the scenario and they may therefore not be able to understand why the performing learners have carried out certain actions.

Distant observation is described here as locating the learners in an observation room without a facilitator present and it has been shown that this leads to a more 'passive' learning environment. This kind of environment will undoubtedly be less effective unless it is actively setup by introducing tasks to the learner in advance via what is described here as an 'Observation script' (Bethards 2014; Stegmann et al., 2012; Zottmann et al. 2006; Chi et al. 2006). However, this alone may not produce the desired effect in learning. Giving defined observation tasks in advance should also include a clear outline of the learning objectives for the learners, as without this they may focus on the wrong outcomes, for example, assessing the individuals' performance instead of the inter-professional interactions.

We pose the question as to whether the difference between these two environments is really the location, but actually more about the presence or absence of a facilitator to give proximate feedback? We would suggest that there is a third observation setup environment that will compensate for the disadvantages of both these previously described situations. That setup involves proximate feedback being given by a facilitator from a remote or adjacent observation room without the distraction of the control room environment. This setup requires additional faculty but probably yields the best observational learning experience for the observers.

In the second part, learners' observation skills are discussed in the context of shifting focus from 'Evaluating' to 'Noticing' behaviours and performance. Traditional observation guides tend to focus on objective evaluation of tasks performed but the authors here discuss how framing these guides to encourage more advanced 'noticing' encourages pattern recognition and other higher level observation skills. In our institution, we promote this in the observers by asking them in advance what they hope to observe (after they have heard the case presentation) and how they will 'notice' if this has been achieved. This concept of advanced noticing is then reinforced during our instructor debriefing which uses the Advocacy Inquiry approach (Rudolph et al, 2018) in which the facilitator will repeatedly model the 'I noticed' framework and language, thereby reinforcing the noticing behaviours from the learners. The 'noticing of significance' described above is also reinforced by this framework by indicating why the behaviour caused concern for the instructor. This is just one example of how advanced noticing can be promoted both before and after the simulation is observed. The authors make the important point that teaching higher level noticing and evaluating skills in simulation may well translate to improvement of these skills in the clinical environment.

Logistical issues can sometimes impact negatively on instructors attempts to provide equity of experience between participants and observers. Very large class groups where only a small number of learners will participate in the simulation and the majority remain as observers provides a huge challenge to equity of learning. High fidelity simulation was not originally

conceived to be used in large groups. However, enthusiasm for simulation as a mode of teaching implementation has lead to increased pressure on educators to use simulation in learning contexts that are not ideally suited to this modality. How much time do we realistically have as instructors to teach the observers to observe? Sometimes we must accept that this learning will happen longitudinally over years as they advance through their training experiencing repeated simulation sessions.

Being mindful of supporting the correct pedagogy and providing the correct structure to the observation environment should lead to an equitable learning experience for participants and observers alike as discussed above (Jefferies and Rizzolo 2006; Zottmann et al. 2018). However, to ensure optimum equity in learning we need to consider the structure of the simulation session as a whole and plan to allow all learners to be both participant and observer during multiple simulations wherever possible. This will ensure the most holistic learning experience for all participants in the simulated environment.

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