Observing of interprofessional collaboration in simulation: A socio-material approach

Sofia Nyström, Johanna Dahlberg, Håkan Hult & Madeleine Abrandt Dahlgren

To cite this article: Sofia Nyström, Johanna Dahlberg, Håkan Hult & Madeleine Abrandt Dahlgren (2016): Observing of interprofessional collaboration in simulation: A socio-material approach, Journal of Interprofessional Care, DOI: 10.1080/13561820.2016.1203297

To link to this article: http://dx.doi.org/10.1080/13561820.2016.1203297

Published online: 19 Jul 2016.
Observing of interprofessional collaboration in simulation: A socio-material approach

Sofia Nyström, Johanna Dahlberg, Håkan Hult, and Madeleine Abrandt Dahlgren

Department of Behavioural Sciences and Learning, Linköping University, Linköping, Sweden; Department of Clinical and Experimental Medicine, Linköping University, Linköping, Sweden; Department of Medicine and Health, Linköping University, Linköping, Sweden

ABSTRACT
Simulation exercises are becoming more common as an educational feature of the undergraduate training of health professionals. Not all students participate in these activities, but are assigned as observers of the actual simulation. This article presents a study that explored how social-material arrangements for observation of interprofessional collaboration in a simulated situation are enacted and how these observations are thematised and made relevant for learning. The empirical data consisted of 18 standardised video recordings of medical and nursing students observing their peers simulate. Practice theory is used to show how observation is embodied, relational, and situated in social-material relations. The findings show two emerging ways of enacting observation—proximate observation and distant observation. The enactments are characterised by different socio-material arrangements concerning the location where the simulation took place and its material set-up as well as embodied “doings” and “relatings” between the observing students and instructors. The observing students are participating in a passive, normative position as an audience and as judges of what is correct professional behaviour.

ARTICLE HISTORY
Received 17 December 2015
Revised 3 May 2016
Accepted 15 June 2016

KEYWORDS
Healthcare; interprofessional collaboration; observation; practice theory; qualitative video analysis; simulation education

Introduction
Simulation exercises are becoming more common as an educational feature of undergraduate training of health professionals (Cant & Cooper, 2010). The arguments put forward are that the safety of patients and the demands of future healthcare require that health professional collaborate (Frenk et al., 2010). Simulation is a way of exercising under safe conditions, and can be a way to reduce the risk of medical errors, hence to improve patient safety and to improve the capacity of collaboration among health professionals.

There is also a growing interest and awareness of simulation-based education as one way to prepare students for clinical practice (Kelly & Jeffries, 2012), or even replace some clinical experience due to shortage of clinical placements in times of high pressure on educators to provide clinical practice for healthcare students (Hayden, Smiley, Alexander, Kardong-Edgren, & Jeffries, 2014). However, due to the cost and logistic challenges of simulation-based education with a large number of students, all students cannot actively participate in the scenarios. Instead some will be assigned as observers (Rochester et al., 2012). The pedagogy of simulation typically follows three phases: briefing, simulation, and debriefing. The fact that a number of students become observers of (simulated) clinical practice, rather than learning from first-hand experience of the future professional situation, raises serious pedagogical challenges. Simulation is in itself an “as if”-reality, and one can question what the observers learn by observing this “as if”-activity. It has been argued that there is a need for more research with focus on how the observing students actually engage in the simulation exercise and the following debriefing (Dieckmann, Molin Friis, Lippert, & Østergaard, 2009; Husebø, Dieckmann, Rystedt, & Friberg, 2013). This study is a respond to this call and takes the starting point and focus specifically on one element of the phases of simulation, i.e., the observation.

There is a discrepancy in the literature on the benefits of learning from observation. The terms learning from observing, or learning vicariously, encompass learning contexts that include learning from observing someone else learn and learning from observing someone else act or behave (Chi, Roy, & Hausmann, 2008). Studies on the value of observation for professional learning have been studied in various work settings (e.g. Köpsén & Nyström, 2014). Focusing on studies in healthcare, and especially simulation-based education, two areas of research are discernable. The first area of research has focused on what can be learned by observing others performing their professional tasks. These studies emphasise that not only physical/practical skills but also interprofessional and collaborative skills can be learned (Chi, Roy & Hausmann, 2008; Grierson, Barry, Kapralos, Carnahan, & Dubrowski, 2012; Stegmann, Pilz, Siebeck, & Fischer, 2012). When learning skills through simulation, the study by LeFlore, Anderson, Michael, Engle, and Anderson (2007) shows the value of observing instructors modelling ideal performance prior to students’ own 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 second area of research on learning through observation focuses on how to support observational learning. This research...
suggests that vicarious learning through observation needs a process of active observation (Chi et al., 2008). Active observation can be supported in different ways: by the use of instructional support through individual observational scripts (Stegmann et al., 2012), by the use of collaborative scripts and peer feedback where different roles and tasks are distributed between the active and the observing students (Chi et al., 2008; Zottmann, Dieckmann, Rall, Fischer, & Tarasow, 2006). The use of observational scripts focused students’ attention towards critical aspects of the simulation and increased the accuracy of the feedback provided by the observers (Stegmann et al., 2012).

Ahn, Rimpiläinen, Theodorsson, Fenwick, & Abrandt Dahlgren (2015) show, in their study of simulation of interprofessional collaboration between medical and nursing students, that the separation of participants into performers and observers produced different knowings. Their findings showed that the different locations, i.e., simulation room, the operator room where the observers sat, and the debriefing room were characterised by medical knowing, affective knowing, and communication knowing, respectively. Hopwood, Rooney, Boud & Kelly (2014) also emphasise the lack of acknowledging observation as an embodied experience in itself and how this is brought to fore in briefing and debriefing.

Interprofessional education (IPE), in which students learn from, with, and about each other, for health professionals and competency-based curricula has been promoted globally as a necessity to meet the demands of future healthcare (WHO, 2010). Reviews of research on interprofessional simulation-based training show that studies focusing on the practice of simulation in undergraduate programs are still less common (Palaganas, Epps, & Reamer, 2014). However, the recent research on interprofessional simulation indicates that simulation improves role clarification and facilitates use of problem-solving skills (Titzer, Swenty, & Hoehn, 2012).

Recently, a new challenge has emerged due to the large number of students that need to be assigned as observers and not active participants in the simulation per se. Therefore, educators need to question what conditions are created for learning interprofessional collaboration through the organisation and arrangements of the simulation-based training, when some are appointed to observe and some are appointed to simulate. Reeves et al. (2011) argue that pedagogical approaches that emphasise interaction between the learners are recommended for achieving interprofessional competencies.

There is a need for more theory-based, process-oriented analyses of current simulation practice (Dieckmann, Molin Friis, Lippert, & Østergaard, 2012). This need is also emphasised by Ahn et al. (2015) and by Hopwood et al. (2014) who highlight the need to consider how different socio-material arrangements for simulation-based education produce different conditions for learning. The present article draws on recent research and theory that describe how professional learning is embodied, relational, and situated in social-material relations (Fenwick, 2010). The study explores how social-material arrangements for observation of interprofessional collaboration in a simulated situation are enacted and how these observations are thematised and made relevant for learning.

**Theoretical framework**

In this article, observation is viewed as an organised set of actions embedded in a practice, in which both human and non-human actors are taken into account, in order to explain and understand how a nexus of actions unfolds through the relationship with the material set-ups of the situation. Such a view could be described as a socio-material perspective on practice (Reckwitz, 2002; Schatzki, 2002). Socio-material views on practice share some common features such as the view on the material set-up as dynamic and integrated with human activities in ways that act on practice. Further, the emphasis is not on singular things or technologies but on relationships between material arrangements and human actions and what these produce (Fenwick & Abrandt Dahlgren, 2015).

Such perspectives are increasingly being used in order to understand professional practice and learning in new ways (Fenwick & Abrandt Dahlgren, 2015; Kemmis, 2009). A focus on the social and material arrangements as relational can shed light on how and why certain activities become practically intelligible, i.e., more or less likely to happen in the unfolding practice (Schatzki, 2002). A practice presupposes a certain arrangement of human actions expressed through language, actions, and relations between individuals—“sayings”, “doings”, (Schatzki, 2002) and “relatings” (Kemmis, 2009). The sayings concern different ways of thinking and discussing what a professional practice is and means. The doings concern the different types of activities and work performed by the professionals and the way these doings influence others in the same practice. In addition, every practice has its own relat- ings, certain arrangements of people, roles, and relations (Kemmis & Grootenboer, 2008).

**Methods**

This study is part of a comprehensive multiple exploratory case study consisting of three empirical settings that allow for an analysis within each setting and across settings (Yin, 2003).

**Data collection**

The empirical data for this article is based on 18 hours of 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. The contexts in this study are two sites (site 1 and site 2) of undergraduate education of health professionals, which are relevant for the study since they include simulation as part of their curricula. The sample comprised students participating in a full day of simulation exercises conducted at two university simulation centres in Sweden connected to teaching hospitals. As part of the activity, students were grouped into interprofessional teams that were kept together during the simulation day. The stated aim of the simulation-based exercise was to provide opportunities for the students to engage in teamwork and interprofessional collaboration. All scenarios included in the simulation were variations on the themes of
acute emergency or deteriorating condition of the patient. The simulations as well as the observations were recorded in their naturalistic setting (i.e., as part of the ordinary curriculum and not designed by the researchers). These settings varied in their layout as well as the time allocated.

Altogether 106 students – 71 females and 35 males – participated in the simulation session, either as active participants (2 medical students and 2 to 4 nursing student per scenario) or as observers (4 to 6 students per scenario) in the simulation scenario. Sixty-six were nursing students and 40 were medical students. Some of the students had prior experience of simulation. Altogether, seven experienced instructors participated – two males and five females – with varying health professional backgrounds. The instructors have training from Dansk Institut for Medicinsk Simulation.

Two video cameras were used in order to capture the whole room where the observing students were positioned and where the observations took place. There were also separate audio recordings. The usage of video creates a unique opportunity for conducting an analysis of the students’ interaction and actions in the observation (Heath, Hindmarsh, & Luff, 2010). The usage of recordings from different rooms allowed showing how activities and what seems to be unrelated tasks or actions were intertwined (Fele, 2012). Furthermore, it enabled the researchers to trace and discuss the practice of observation in embodied and material terms (Hopwood, 2013).

**Data analysis**

Data were analysed collaboratively by the four authors, each contributing a different background in healthcare work (such as physiotherapy, biomedical laboratory scientist), and in medical education as well as in education generally. A layered, purposeful constant comparative analysis (Boeije, 2002) comprising three phases of collaborative activities was applied (Table 1). First, individual field notes were taken while observing the video. Field notes were guided by the theoretical perspective on how the intentions and expectation are enacted in the relation to social and material arrangements. Second, the individual field notes were cross-checked, compared, and finally merged into a joint, preliminary description. Third, comparisons were made between different video recordings with the purpose of cross-checking and refining the provisional interpretation against all data. For a more elaborated description of the analysis see Nyström, Dahlberg, Hult, and Abrandt Dahlgren (2016). The findings in this article are drawn from video recordings from two different sites, hereafter called site 1 and site 2. Field notes supporting our findings are provided in the "Findings" section.

**Ethical considerations**

In accordance with ethical research practices, the participants, i.e. the students, instructors, and operators, provided their consent to participate after they had been informed of the aim of the study and of how the research material would be used. The research project was ethically approved by Linköping University (Dnr 2012/439–31).

**Findings**

The simulation session started with a briefing where all students were introduced to the material arrangements. The instructor demonstrated the technical features of the manikin, and the students were familiarised with what the SimMAN could or could not do. The students also explored the material set-up of the room to see where everything was located. The briefing also included a description of the scenario by the instructor and a distribution of roles to enact by the participants. In site 1, the location and scenario was an emergency room where the patient has a head injury from a car accident and in site 2, a health centre with patients that have a deteriorating condition. The briefing was also directed towards the observing students. One instructor explains to the students the value of observing their peers simulating:

> 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)

<table>
<thead>
<tr>
<th>Phases of analysis</th>
<th>Purpose</th>
<th>Analysis activities</th>
<th>Questions</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Identifying multiple perspectives within a single video recording</td>
<td>Developing collectively enriched and shared understanding of the sequence of activities</td>
<td>Step 1. Individual field notes of the video recording</td>
<td>How are students’ ways of observing of interprofessional simulation enacted?</td>
<td>Focus and process for phase 2 determined Aspects for comparisons between video recordings formulated</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Step 2. Merging individual field notes, reaching consensus on interpretations of fragments</td>
<td>How are interprofessional and professional knowings made themedatised and made relevant for learning?</td>
<td></td>
</tr>
<tr>
<td>2. Comparison between different video recordings of the same scenario</td>
<td>Develop a shared understanding of the patterns across the data of each phase of the sequence</td>
<td>Comparing interconnections between human and non-human actors.</td>
<td>How are socio-material arrangements related to sayings and doings in the observation?</td>
<td>Transcripts of selected segments Provisional interpretations of the enacted observations as a focus for phase 3 Patterns of enacting observation of interprofessional collaboration identified</td>
</tr>
<tr>
<td>3. Comparison between video recordings of different scenarios</td>
<td>Enlarging and enriching the basis for interpretation Identifying variation</td>
<td>Refining provisional interpretations against wider data</td>
<td>What common features can be identified across all scenarios?</td>
<td></td>
</tr>
</tbody>
</table>
The observing students were 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”. (Site 2—briefing 2).

**Observing simulations**

The observations took place in two different kinds of sites as a part of the compulsory simulation session. In site 1, the students sat together with the instructor and the operator in a room where they could observe the simulation through a one-way screen. In site 2, the students sat in a separate room at a table, where they could watch the simulation live on a screen. These observation sites were two different socio-material arrangements, but had in common that the observing students had no possibility to change or interact with the situation played out before them. This implies that the students’ attunement was restricted and passive in that they were not engaging with or touching the material surrounding them. The findings show two ways of enacting observation—proximate and distant.

**Enacting proximate observation**

The findings show how observation is enacted in proximity to the location where the simulation took place, embodied doings and relatings. Here the control room was the location for the observations. This location had a complex material set-up that positioned the observing students as a close up audience on a “stage within a stage”. The metaphor refers to the students’ presence in the same room as the instructor and the operator running the scenario. The observing students were participating in a stage where they had access and closeness to how the manikin was enacted by their fellow students. This was visualised via how the patient/manikin was operated via computer screens and different monitors. Second, the observing students also became participants in the broader professional practice, in that they heard and witnessed how the instructor/operator answered the phone, and acted “as if” they were other professional actors in the hospital setting, e.g. a switchboard operator, a midwife:

The operator answers the phone call from the simulation room saying “The switchboard”. 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, midwife. 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)

In their sayings and doings, the instructor and the operator enacted the observational room as located within the professional practice. The “stage in a stage” metaphor also refers to how the observing students can see the patient being enacted as the patients’ voice through the instructor answers, as well as the doings and sayings of their fellow students on the other side of the one-way screen. Finally, the closeness to the instructor, compared with the first site, also made this arrangement into a teaching practice characterised by certain relatings between the instructor and the students. In the observation room, the activities in the simulation room were often commented on in terms of “correct or incorrect” medical knowings, clinical issues, or professional behaviour. Below follows two examples of the instructor taking on a didactic teacher’s role:

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)

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 lots of information [blood pressure, pulse, O₂-saturation etc.], here you have the heart rate. You have to know what the numbers stands for”. (Site 1—observing 4)

In these examples, the instructor took on a traditional didactic teacher’s role, i.e. where student is passive and learning is teacher-directed, using the simulation as an educational example of correct and incorrect professional behaviour or doings but also as a way to test students’ medical knowledge as well as knowledge of protocol. The instructor points out to some students “Think out loud, remember the structure A, T, L, S, it is the framework [the framework of acute trauma life support] to [he points to his head as if to show that it should be remembered], that’s it. If you get a black out and cannot think anything at all, then you think A, B, C, D, E”.

(Site 1—observation 8)

The instructor also redirected students’ attention to certain events, e.g. when to call the medical doctor “on call”, or the instance when the students realised that the patient’s condition was deteriorating. The instructor’s sayings and doings helped the observing students to distinguish critical instances in the simulation. The role of a teacher is characterised by certain sayings, doings, and relatings that are enacted and entangled with the material set-up. The students had the task to observe their fellow students, focusing on leadership and communication, but these issues were not addressed, instead the medical procedures were.

**Enacting distant observation**

The analysis also showed enacted distant observation characterised by a disconnection to the location in site 2 where the observation took place. This material set-up formed another type of pedagogical activity compared to site 1. 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 both space and time. There is also a distance between the students involved in the observation since this enactment need a focus on the screen in order to hear and notice what is played out on the screen. Hence, the doings and the sayings are at the minimum since the observing students were quietly sitting
around the table or small talk about what happens on the screen. The field note below exemplifies observation as distance:

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 students 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 sayings and bodily doings were single comments as a reaction of what they see being projected or bodily expressions of unease or dissatisfaction, indicating that observing simulating students was a somewhat passive and individual activity. The students were given the task of observing what the teams were doing well by the instructor, but what that might mean in terms of attunement to interprofessional enactments was not explicitly articulated to the students.

The socio-material arrangements in the two sites revealed different practices in which these students were participating. The findings in this article raise questions of what students learn from observing other students engaged in simulation.

Discussion

The paper explored how social-material arrangements for observation of interprofessional collaboration in a simulated situation are enacted and how these observations are thematised and made relevant for learning. The findings in this article contribute with knowledge on the complexity of arranging an observational practice within a simulation-based exercise. Previous research has emphasised that this 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). The observation rooms had a socio-material set-up with similarities to a classroom; students were watching while instructors were teaching, which produced different enactments, doings, sayings, and relatings. Typically, the students in the observation location were passively watching, and/or listening to instructions or remarks from the instructor. The observing students do not have a first-hand experience; instead they observed others learn and act (e.g. Chi, Roy & Hausmann, 2008).

The aim of the simulation-based exercise was to practice interprofessional collaboration, based on the core competencies for interprofessional practice, as defined by Interprofessional Education Collaborative Expert Panel (IPEC, 2011). However, the findings show that the observation room was a location for normative professional judgements, more than for articulating interprofessional collaboration among the students. The students were participating in a passive, normative way as an audience and judges of what was or should be correct professional behaviour, and were “tested” of medical knowings (Ahn et al., 2015) and clinical issues. This conflicted with the task given to the observing students during the briefing, i.e. to observe communication, leadership, and good/less good professional performance of the team, as a focus of attention. These findings emphasise the need for educators of medical education and instructors of simulation-based education to reflect upon the briefing for the observing students. What could direct student’s observations and, if they were given a task, how can it be designed in order to support learning, both for the observing students and those who act.

The findings show two emerging ways of observation, enacting proximate observation and distant observation. Proximate observation emerged in a complex material set-up where the students were participants in a “stage within a stage”, seeing different practices, i.e. the professional practice of a hospital, the simulation exercise, and the extension of the SimMan’s mind and bodily reactions. The complexity of the socio-material arrangements the observers find themselves in, call for the importance of directing the students’ attention towards what overarching aim of the simulation is. The presence of the instructor need to be supportive in this respect, and research has shown that they have an important role in directing students’ attention towards critical issues and ideal professional performances (see also Gierson et al., 2012; LeFlore et al., 2007).

The findings also showed distant observation enacted in another socio-material set-up, characterised by a disconnection to embodied doings and relatings. The enactment is also 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. Also in this setting, the relatings between the students are passive, but in this setting, students have no instructor who can assist them in directing their observation.

In relation to study limitations, the two observation enactments described in the findings might have benefited from being supported by observational script, in order to get a more active observation (Chi, Roy & Hausmann, 2008) and as a support for individual and collaborative feedback (Zottmann et al., 2006). One aspect to consider is how to design a script that directs the observation tasks towards the overarching aim of the simulation exercise and the same time stimulates an active observation.

The practice theory perspective and the usage of video for data collection chosen in the research project provided tools that brought about new understandings of observations of interprofessional collaboration in a simulated situation. Data were generated from two different universities and a common pool of data was created for the analysis, which can contribute to increase the transferability across learning settings. A critical reflection is that the methodology was delimited to what could be captured through observations and documents. Additional interviews with participants after observation might have enriched the understanding even further. However, the process of collective data analysis enriched the interpretations made. The iteration and balance between empirical data and theory required a constant critical reflection as well as a negotiated consensus on identified themes in the analysis.
Concluding comments

The use of a practice theory perspective and articulation of two emerging ways of observation, enacting proximate observation and distant observation, contribute with knowledge about observation for professional learning in healthcare. Furthermore, these findings show that different material arrangements create different conditions for learning, as well as differences in knowings that were emphasised and expressed. With the increasing number of students observing simulated clinical practices, these findings emphasise the importance of further understanding of how to use the observation room as a learning environment and a pedagogical site. Especially, if simulation-based education is to prepare students for clinical practice when not all students is permitted to participate in simulation exercises.

Acknowledgements

The authors wish to thank the partners at Göteborg University and the Karolinska Institutet for collecting and sharing the data analysed in this article. We would also like to acknowledge Dr. Nick Hopwood, University of Technology, Sydney, for acting as a critical friend, particularly for his input to the analysis of our findings.

Declaration of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of this article.

Funding

The authors wish to thank the Swedish Research Council for funding of the SIMIPL project.

References


