Readymade design at an Intensive Care Unit

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ABSTRACT

Marcel Duchamp invented the idea of using existing artifacts as art objects by recreating their meaning. These artifacts he called readymades. This article uses his ideas about readymades and applies them on a design project at an intensive care unit. Through negotiation with the staff and among the staff themselves the meaning of already existing artifacts was co-constructed, transforming them into educational tools in their daily work. Self-produced videos accessible through barcodes out in the context and viewed on handheld computers support their ongoing oral learning culture and function as a common point of reference where their work practice is negotiated.

Keywords

Healthcare, work place learning, self-produced contextual video, handheld computers, readymade design.

INTRODUCTION

The story told is not the story of how a new artifact was designed. Instead it is the story of readymade design where new images of how established artifacts were reconstructed to create a new setting for learning at an Intensive Care Unit at the University Hospital in Malmö. We will tell how the staff at the Intensive Care Unit co-constructed images of their work practice through self-produced video and how this could support learning at their work. Kathryn Henderson has shown how engineer sketches facilitated individual thinking as well as collaborative communication. These drawings, that she terms conscriptions devices, function as network organizing devices letting different actors co-construct meaning when working toward a common goal [5]. Similarly the self-produced videos facilitated individual as well as a group thinking at the intensive care unit.

Working in the participatory design (PD) tradition, but with a background in Fine Art, for us the idea of co-

constructing has its roots in Marcel Duchamp. Already in 1914 Marcel Duchamp famously exhibited a bottle dryer introducing the concept of readymade or "found" object. Instead of creating a new art object he pointed out an existing artifact as an art object. One of the many implications of the work was that the object's meaning could be reconstructed through mental constructions, which further implied that meaning to a large degree was created mentally in the meeting with outer sensations. Meaning did not reside fully in outer sensation but in the meeting with them in a social context. One implication was that the viewers of the art object always reconstruct its meaning. Another implication was that the context, which an object is placed in, is significant to how the object is understood. Duchamp, however, did not mean that objects themselves were exempt from meaning. In fact Duchamp believed that the art object contained not only the artist's intentions but also contained meaning that she or he is unaware of putting into the object. The unintended content is hidden to the artist and is not revealed until the work enters into the social space and is read by viewers [3]. Similarly Hartswood et al. argue that use itself provides a significant source for design, but participatory design processes have seldom moved beyond the point of development and implementation where user expertise becomes most valuable [4]. According to Duchamp the creative act happens in the meeting with the object where the different intentions both conscious and unconscious are revealed. The gap between the intentions opens up and allows for a creative space to be established. This creative space is under constant configuration as posterity reconstructs its meaning [3].

THE INTENSIVE CARE UNIT

Our inquiries at the intensive care unit were on critical care nursing of the patients with a focus on the employees' work practice learning. After some time and through continuous analyses several strong images appeared. We saw that the intensive care unit had a dynamic workplace milieu with ongoing changes and vast variations in tempo. Most of the time the patient rooms were under constant configuration: patients entering and leaving, medical equipment being shuffled around, the staff going on or off

their five hour shifts, relatives visiting and experts from other units inspecting patients. However, in spite of all these activities the atmosphere was most often calm. Only once in a while the tempo would intensify or drop down to a low level of activity. The shifting nature of the work fascinated but also distressed the staff. The fascination was that they never knew what met them when arriving at work, i.e., what type of patients they would be treating and what skills that would require. What they found disturbing on the other hand were all the new routines, which they found difficult to be updated on. The new routines demanded that they had to continually rethink their work. Despite the information overload caused by constant new information the staff seemed content with their dynamic work.
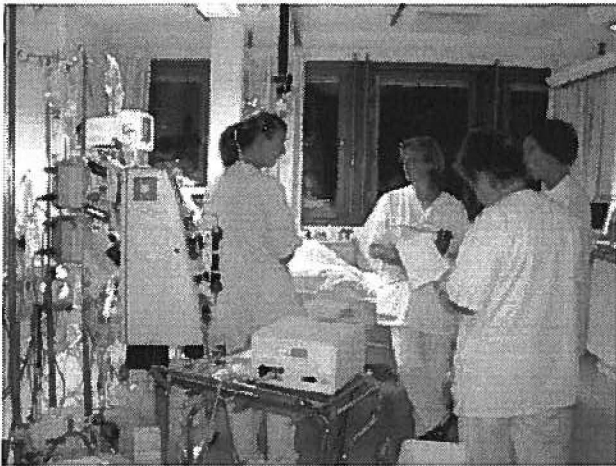
Fig. 1: The staff stated that they preferred learning that was closely connected to real cases in their daily work. The daily learning built strongly on an oral culture.

We detected that the dynamics of their work required an immense ongoing learning activity. A lot of the learning was closely related to their daily work, which built strongly on an oral culture. The oral culture was manifested in several ways. When confronted with a task they were unsure of how to perform the staff would rely upon each other for assistance to talk through the problem, solving it together. The solving of problems together were rich learning moments of negotiation through show and tell. The drawback of the oral culture was that routines could easily become distorted. The distortion can start out with one person doing a task slightly incorrectly. A colleague then picks up the inaccuracy and before long a routine has been altered. It was therefore important to have reliable sources of information so that routines are not distorted. Despite the drawbacks the oral culture was appreciated and considered important allowing the staff to socialize and exchange ideas.

Sustaining tradition through a common point of reference

For Duchamp the creative act happens when different intentions are revealed in the meeting with an object. The object becomes a common reference point for the artists and all those who enter into a dialogue with it. Playing metaphor games constructed by us for workshops revealed that the staff highly valued an artifact that functioned as a common point of reference. One example was a newspaper in one of those games considered an important artifact because it sustained tradition and motivated people to discuss. It seemed, however, to be unclear what the unit's common point of reference was.

A central issue in work place learning is the exchange of experience. Benner has observed how nurses learn through what she calls personal paradigm cases, which are situations that are both clinically and ethically demanding. These exceptional situations model the nurse's future work practice [1]. Similarly Orr has observed how technicians of copy machines exchange stories of complex repair cases. These war stories are central in developing the technicians work practice by becoming part of the community memory [9]. What Orr acknowledges is that learning is a social process and that experience and memory are spread among the community members. Lave and Wenger (1991) state that a work practice evolves more through the form of organizing the community than the rules of the practice. The form of collaboration is important because it affects the way the community can negotiate what competent practice is. Competent practice is not a stable solid core; instead competence has a relational character demanding ongoing negotiation of meaning [7]. These negotiations occur when the community members exchange experience through doing the practice together as well as exchanging stories. The staff felt that they had within their community in their daily work a lot of experience that could be better taken care of. The occasions for exchanging experience had diminished and the forms of exchange could function better.

SELF-PRODUCED VIDEO

After several design workshops the staff and designers decided that the most fruitful direction to further investigate was if video could be used to support the ongoing oral learning culture and to do that some video material was needed. The first movies made were short instructional movies about different medical equipment that were considered difficult to use. Making the movies was intriguing because it revealed that the staff effortlessly and without preparation made excellent movies. We basically just held up the camera and the staff with their prior knowledge could spontaneously be filmed instructing their colleagues. The strong tradition of orally informing each other became apparent. The film sessions

talked strongly back to us that the video medium could be a useful resource for their practice.

When the films were presented the staff was enthusiastic. It was much better to see a colleague show and tell than read a written instruction. They wanted, however, to be able to see the films out in the work context. This corresponded to what we had seen in previous design workshops were the ability to make information available on small displays out in the context through barcodes or other tag technology was considered interesting. Therefore we decided to bring together the two ideas. Passarge and Binder (1996) have experimented with video for learning on a laser disc out in the work context [10]. With today's handheld computer technology available maybe it would be even easier to make the video accessible out in the context. The collaboration resulted in a design proposal, where self-produced instruction videos were made accessible on handheld computers through barcodes out in the context.
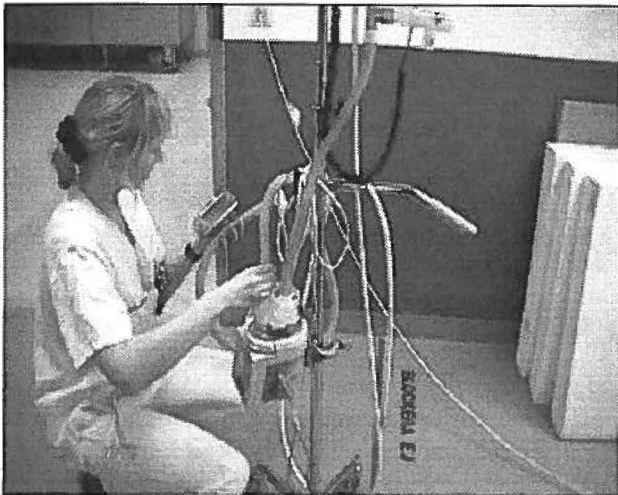

Fig.2: Self-produced videos were made accessible in the work context supporting their oral learning culture.

We did not know if the suggested design solution would work. With Duchamp's ideas in our mind that an artifact resists and reveals parts of its meaning first after it's placed in a situation we confronted the staff with a handheld computer containing video made at the unit. We asked a nurse that had never used a particular machine if she, with only the support of a video played in a handheld computer, could assemble it. One of the questions was if the small display of the handheld computer would suffice supporting the task? It turned out that it worked well. However, what was most interesting with the experiment was how much she valued listening to her colleague's voice which made her feel secure when carrying out the task.

NEGOTIATING PRACTICE BY MAKING AND WATCHING FILM

The challenges in front of us at this stage were to domesticate the process of making films and using films as part of the daily learning rather than technically implement the concept. The staff among themselves needed to explore in what way self-made video films could be meaningful for them.

Julian Orr has pointed out that technology does not explicitly have inherent meaning. Technology needs to be socialized in a way where relationship is honored [8]. Williams et al. (2000) say that to domesticate an artifact is to negotiate its meaning and practice [11]. For an artifact to be domesticated it needs a facilitator, i.e., someone that can show how it can be used in a meaningful way. Its usefulness is shown through use and repertoires of good examples where its use and meaning are negotiated. In terms of Duchamp the creative act happens when an artifact enters the public arena and its meaning is continuously negotiated rather than when the artifact is being "produced."
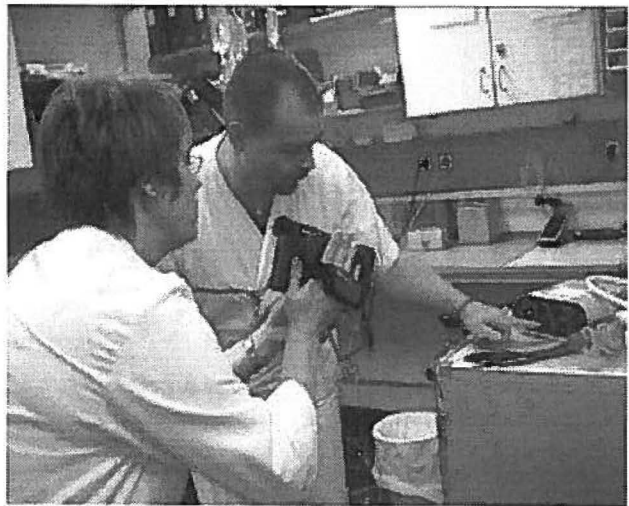
Fig.3: The production of movies was an opportunity for learning in itself. The learning occasions were along the whole process of making the movies as well as when they were made available to all staff members.

A rich setting for learning was established from the very beginning of the film production process but this became apparent first when we stopped acting as cameramen. The filming of the movies became a lot more interesting when two colleagues worked together. The making of the films became a rich learning occasion allowing the staff members to discuss and reflect on their practice as well as check how certain unusual procedures are done. This observation is similar to what Binder noticed when making educational movies in collaboration with coil setters [2]. The staff at the intensive care unit reflected on a whole

range of issues such as what they had trouble with at work and why that was the case, what was important to include in the films, what kind of language was practiced at the unit, as well as how they should communicate and teach. Often the process of making movies started out with two individuals making a "rough draft" movie with the intention of adjusting it through group participation. The movies functioned, it could be argued, as conscription devices in a collaborative visual thinking process establishing a space for negotiation [5].

The reflection and negotiation of work practice with the films as reference point continued after the initial filming was done. The making of the movies was typically a collective process not only involving the instructor and the cameraman but also involving a large number of staff members watching the movies and commenting upon them. To get feedback on the movies frequent film presentations were established in the intensive care library. The film presentations involved five to ten staff members that were asked to comment upon the movies. Did the movies include all that was needed, was anything incorrectly stated, was there any aspect that needed to be stated more clearly?

Generally the movies were considered to be of good quality and they appreciated that it was a colleague's story that they heard in them. They were surprised that their colleagues were able to make such good movies. The movies were judged to be much better than corresponding movies from manufacturers of medical equipment. This was partly due to the fact that the films were judged by their community to be a known successful reading of how a certain task was accomplished. Seeing several good examples of film helped to them establish the picture that they are capable, without too much difficulty, to make quality movies.

The film presentations functioned also as positive feedback recognizing good practice. But more importantly the presentations were an opportunity to reflect and gain insight into how their colleagues practiced their work and how that differed from their own practice as well as how it differed in some cases from the prescribed method. The difference that was revealed by watching the films collectively spurred discussion on how certain procedures should be done. Why should I do it this way when another way in my opinion is just as good? The movies function as mirrors of the practice and often had the character of an investigative film. These qualities of video are similar to the way video has been used as a research tool in ethnography and PD revealing tacit knowledge and creating a distance to the everyday work. Karasti (2001) has seen that video makes "taken for granted" aspects of work visible and therefore easier to reflect on when she

has used video as a shared object in her work with Radiologists [6]. Even if the main purpose for the intensive care staff, when producing videos, was not to us as an ethnographic tool or to elucidate tacit knowledge, the videos nevertheless had qualities that allowed for this to take place. It also became clear that the learning not only would happen mainly on the receiving end of the peer-to-peer communication. The production of movies was an opportunity for learning in itself. The learning occasions were along the whole process of making the movies as well as when they were made available to all staff members.

The comments that came up during the film viewing lead in some cases to redoing the films completely and in some cases to appending sequences at the end of the movies with missing information. In one case an enrolled nurse redid her film since she had heard that her parts of her film had been questioned during a film presentation. Before the re-take she wanted those that had found parts of her movie unconvincing to clarify what they meant. A spontaneous viewing of her film in a video camera was arranged in an empty patient room. Two colleagues saw the movie with her commenting upon what they thought needed to be clarified. She in turn explained why a certain tape should be used and not another resulting in that they accepted her argument. After negotiating the content of the movie they directly filmed a new version of it.

Fig.4: Video as a reference point for discussion.

These instructional movies were not purely instructions movies and as stated earlier functioned well as a reference point for discussion. Some of the instruction movies had in fact more the character of a war story with an instructive message. A good example of such a war story is a movie that an enrolled nurse created. When she talked to us she told us that she wanted to make a movie about how a piece of board is removed from the patient bed that is

difficult to remove. When the movie was made the point of the movie became clear. It was not simply an instruction to her colleagues about how to detach the board. The message was: "I think we should clean the beds more often. To do that the board has to be unfastened and this is how you do it!" Another example is how an instruction movie unintentionally became a war story used for negotiating the possibility to buy new equipment. Preceding a film presentation one of the unit's physiotherapists had voiced the need to buy a new model of certain medical equipment without getting much response from the senior physician. She had voiced the need because the new model was less complicated to use. Once the senior physician had seen how complicated the current equipment was at the film presentation he recognized the need to take the physiotherapists' wish into consideration. In this case the film not only functioned as an instruction movie but also as a negotiation film.

CONCLUSION

If we look back at the process and ask ourselves what we have designed it turns out that it's not the handheld computer of course, and it's not the barcode reader, or the idea of using contextual information; nor has any software been designed. All the artifacts and software are off the shelf and already exist and yet something has been designed. What we have done together with the staff at the intensive care unit is to use off the shelf products as ready-mades reconstructing their meaning.

Letting the design process continue into use has broadened the suggested design solution. Instead of being about contextual video instructions it has evolved into a learning process using video as reference point. The process starts when two colleagues discuss and negotiate how the film should be made. It continues by involving additional colleagues in watching, reflecting and discussing their work practice. The objective of producing films to be viewed in a handheld computer is nevertheless intact, but has been reduced to being just one component in a larger process.

ACKNOWLEDGMENTS

REFERENCES

1. Benner, Patricia (1984). *From Novice to Expert: Excellence and Power in Clinical Nursing Practice.* Addison-Wesley.

2 Binder, Thomas (1995). Design for Workplace Learning, *AI & Society*, 9, 218-243.

3. Duchamp, Marcel (1957). The Creative Act, *Art News, 26*, 4.

4. Hartswood et al. (2000). Being there and doing IT in the work place: A case study of a co-development approach in healthcare. In *PDC 2000 Proceedings of the Participatory Design Conference.*

5. Henderson, Kathryn (1999). *On Line and on Paper Visual Representation, Visual Culture, and Computer Graphics in Design Engineering.* The MIT Press.

6 Karasti, Helena (2001). *Increasing Sensitivity Towards Everyday Work Practice In System Design.* Oulu University Press.

7. Lave, J. and Wenger, E. (1991). *Situated learning: legitimate peripheral participation.* Cambridge University Press.

8. Orr, Julian (2000). Lessons from Frankenstein on Technology and Society. In *PDC 2000 Proceedings of the Participatory Design Conference.*

9. Orr, Julian (1996). *Talking about machines: an ethnography of a modern job.* Ithaca, NY: ILR Press.

10. Passarge, L. and Binder, T. (1996). Supporting Reflection and Dialogue in a Community of Machine Setters: Lessons Learned from Design and Use of a Hypermedia Type Training Material, *AI & Society, 10*, 79-88.

11. Williams, R., Slack, R. and Stewart, J. (2000). *Social Learning in Multimedia.* Edinburgh: Research Centre for Social Sciences, The University of Edinburgh. http://www.rcss.ed.ac.uk/research/slim.html (accessed May 15, 2002).