

VIDEO OBSERVATION FOR DESIGNERS: A CONTEXTUAL IMMERSION OF THE O&G MANNEQUIN IN CLINICAL TRAINING

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ABSTRACT

The use of mannequin is essential in the training of future Obstetrics and Gynaecology (O&G) doctors as it allows them to gain crucial practical experience in conducting medical procedures before performing these procedures on live patients. Despite of the beneficial technology and design emphasised on the existing mannequin used in the O&G domain, propositions have been made by the O&G experts for a new mannequin to be designed. This proposition was therefore addressed through a co-design project. The Contextual Immersion from Mocking-Up co-design approach was used in this project as it suits the designer-clinical expert co-creation circumstances, and it also enables designers to understand the specific user context. This paper reported the process of preparing video observation for designers as a tool in understanding the context in which the O&G mannequin is used in clinical training. Eight different sessions of clinical simulation were video recorded and analysed in this study. These videos used by designers to provide insights to the respective context such as understanding the usage of relevant mannequin in training medical student. Secondly, the video showed the interaction between the expert and novice users to the mannequin. These factors helps the designers to address the related design issues.

ception

Keywords: Co-design, mocking up, O&G Mannequin, Video Observation, Sustainable Product.

1. INTRODUCTION

1.1 Issue

The main objective of the project was to develop a mannequin as a teaching aid for clinical examinations and procedures of the female genitalia. As this project is specific and situated in a very specific domain, the designers need to be prepared with the context as a guideline in designing the mannequin. For this purpose, a group of O&G doctors collaborated to share their expertise in the project. However, there was a time constraint on these experts' side due to their clinical commitments and academic tasks. Therefore, a suitable method of understanding the context was essential for the project to be undertaken.

1.2 Mannequin for training in obstetrics and gynaecology

Mannequin has been used for a considerable period of time as a medical simulator in the training and research of the wide-ranging domain of medical and surgical (Cooper & Taqueti, 2004). In the O&G area, mannequin too has been extensively used (Gardner, 2008; Reynolds, 2008; Gordon, 2014). The current complex culture for obtaining experience with patients made the mannequin a significant alternative to vagina examination (VE) practice and other procedures. The mannequins used in the O&G area are various in types and purposes: birthing, suturing, vaginal examination and pelvic examination. This research explores the uses of these mannequins in training to understand the user context.

1.3 Designing a new mannequin

The project was initiated based on the propositions regarding the use of the current mannequin put forth by a group of O&G doctors. The initial issues

raised by these doctors were on the usability of the mannequin. To begin a design project, the designers need to have immense understanding on the context of mannequin usage in the O&G training. A reachable strategy for designers to gain this understanding is through observation (Koskinen, et al., 2011).

Mocking-Up is an example of a designing method involving a collaboration between designers and clinical experts (Ramli, 2014). Similar circumstances occurred in this project wherein a group of O&G academic doctors put forward a number of issues related to the mannequins that they had been using. Mocking-Up is based on a collaborative design concept of co-design and co-creation by Sanders and Steppers (2008) where creative activities are undertaken by both the designers and non-designers in a design project. Mocking-Up consists of three designing stages: (1) proposition made by users, (2) contextual immersion by designers, and (3) co-evolution of problems and solutions through the production of mock-ups (Fig. 1).

MOCKING-UP: A Collaboration Design (Co-Design) approach for Designers and Expert Users

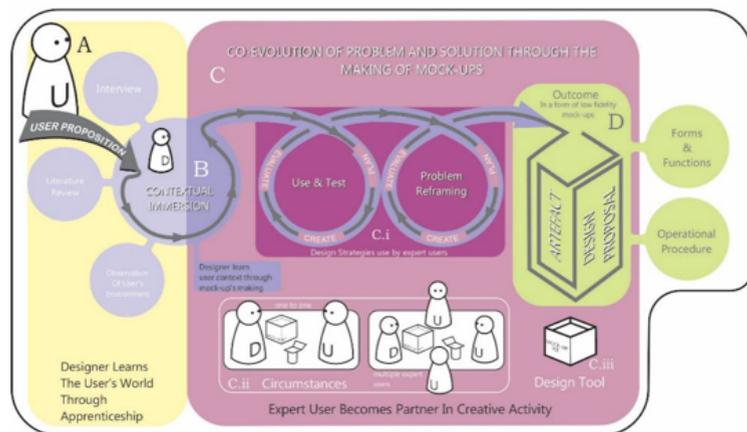


Figure 1: Mocking-Up process by Ramli (2014)

Contextual immersion is a method to understand and immerse with the user context. Techniques used in the original version of Mocking-Up are reviewing of scientific literature, familiarisation of the specific human anatomy and observation of simulated procedures. In this project, clinical simulation training was recorded as a tool of observation. This observation is important to allow the designers to have adequate information before undertaking another Contextual Immersion session with the doctors.

1.3 Learning the context of use of O&G mannequin

Clinical experts are eventful professionals (Ramesh, 2011). This is especially true for those who are involved in the academic world (Leuthardt, 2006). The nature of their job has prohibited them from engaging themselves in innovation activities. A similar situation was encountered in this project. The doctors had tight schedules and limited time to involve in research and innovation activities. Due to this, the research processes had to be tailored according to their availability.

Observation of clinical simulation training was suggested by the doctors as it encompasses the context of use of the mannequin. These video-recorded scheduled classes were participated by 25 students who were divided into several groups, and were held in four rooms with different training types. This differs from the original Contextual Immersion where the designer engaged in self-learning through scientific literature and review on anatomy (Ramli, 2014).

2. METHOD

2.1 Research circumstances

In the original Mocking-Up approach, the researchers plays the same role as the designers. However, in this study, the researchers only facilitated the design process environment to be used by the designers and the doctors. Similar to other design projects in the medical domain (ref), the users would put forth a proposition, and the researchers would choose a co-design approach to address the proposition. Seven O&G doctors involved in this project had immersed themselves with the user context grounded on observation during undergraduate medical training to understand the usage of mannequin in the O&G training.

2.2 Setting

Eight sessions of simulation training were held at the Clinical Skill Lab, Universiti Putra Malaysia in two distant days. This training was part of the standard academic training arranged by the O&G department, and this presented the researchers with the opportunity to understand the user's context as several types of mannequins were used in this training as the simulators. The eight simulation training sessions were video-recorded with small portable cameras. Planning on the setting was undertaken a day before the sessions were held. This was to determine the number of cameras needed, the placement of the cameras and also the best recording angles. The research

team followed one of the student groups to every session. Such a set up was undertaken as all of the students groups attended the simulation training sessions in the four rooms on a rotational basis.

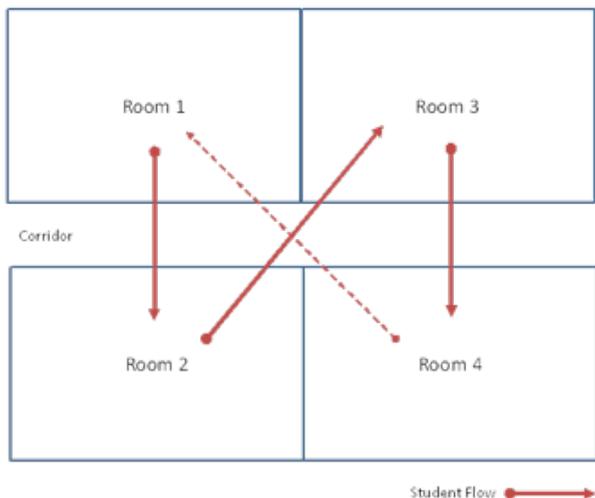


Figure 2: Flow of student transition between rooms

2.3 Video recording

Two action cameras were used for all of the sessions; one was set to capture the overall situation while the other one was installed on a volunteered student to capture the user view angle (Fig. 3 and 4). Action cameras were chosen are small in size and are easy to be set up. Furthermore, they have eclectic-type accessories which are suitable to use for most situations. Wood (2012) reported that a small camera is beneficial as it will result in the participants to act more naturally as they are not aware that they are being video-recorded.



Figure 3: View from the static spot action camera with the overall view of



Figure 4: View from the action camera strapped on the volunteer's head

All the four rooms share the same layout; hence, the static action camera was set up at the exact same location in each of the rooms. The location of the static action cameras were determined beforehand to comply with the rapid transition from one simulation to another in different rooms. One action camera was set up using a head strap on a volunteered student, and controlled and viewed from smartphone (Fig. 6).



Figure 6: A volunteer was equipped with a head-strapped camera during the clinical simulation training

As mentioned above, the researchers followed the selected student group to all of the four simulation training sessions. However, it was ensured that certain distance was maintained from the student group as to not interfere

with the authentic conditions. In other words, the researchers were genuine observers rather than participant observers as in the original Mocking-Up (Dewalt & Dewalt, 2002).

2.4 Preparing videos for the designers

The recorded videos captured all of the clinical simulation training sessions. To ensure effective video observation for the designers, these videos were analysed to identify the most crucial scenes for the designers to understand. The videos were segregated into several sections and coded according to the actions of the subjects as below (Table 1).

Table 1: Coding for subject's actions

| No | Description of action | Code |
|----|---|------|
| 1 | Oral explanation by trainer/ doctor | OE |
| 2 | Mannequin engagement by doctor | MED |
| 3 | Mannequin engagement by student | MES |
| 4 | Pause (everyone stopped communicating and moving) | P |

Eight simulation session videos were analysed and tabled (Table 2). Four of the sessions were conducted for 30 minutes each, and the other four sessions were conducted for 25 minutes each. These videos will be edited by removing the OE and P as they do not contain any physical action towards the mannequins used. The total duration for the OE section was approximately 12 minutes. The P section, on the other hand, was recorded for 8 minutes in total, and it only occurred in one recording. The table also shows that the physical MED and MES actions were each recorded for 81 minutes. Therefore, the total duration of the video observation that will be shown to the designers is 162 minutes or 2 hours and 40 minutes.

3. DISCUSSION AND CONCLUSION

Observation is an effective method in designing in order to understand user context and propositions (Blomberg et al., 1993). This ethnographical approach which was originally more holistic and undertaken in an intense period of time was adopted in the designing process and has been more focused and compact (Wood, 2012; Crabtree, 1998; Millen, 2000).

Table 2: Segregation of actions in the video recording

| Vid. No | Description | Facilitator | Day | Duration | OE | MED | MES | P |
|--------------|-----------------------------------|---------------------------------------|-----|----------|-----|-----|-----|-----|
| | | | | | min | min | Min | Min |
| 1 | Gynaecology abdominal examination | Academic doctor | 1 | 30 min | 7 | 15 | 8 | - |
| 2 | Examination for pregnancy | Academic doctor | 1 | | 3 | 19 | 8 | - |
| 3 | PAP smear | Academic doctor | 1 | | 1 | 7 | 14 | 8 |
| 4 | Normal delivery | Staff Nurse | 1 | | 4 | 17 | 9 | - |
| 5 | Eclampsia – Pelvic examination | Academic doctor | 2 | 25 min | 8 | - | 17 | - |
| 6 | Postpartum haemorrhage (PPH) | Academic doctor | 2 | | 12 | - | 13 | - |
| 7 | Cord prolapse | Academic doctor | 2 | | 4 | 13 | 8 | - |
| 8 | Shoulder dystocia | Academic doctor (Associate professor) | 2 | | 11 | 10 | 4 | - |
| Total | | | | 220 min | 50 | 81 | 81 | 8 |

Rapid ethnography is a good example and has become the model for contextual immersion method in understanding the users (Millen, 2000). In this project, the designers need to understand how the mannequin is used in the training and also the users' propositions. The edited videos could directly show the usage of the mannequin without the need to understand the scientific context such as the terms and jargons used during the training. This will be the preparation for the designers before they undertook co-design workshop with the doctors. This includes understanding the context of the usage and the interaction between the mannequin and the users hence the considerable collaborative proposition with the doctors.

However, some explanation may be needed during the video observation as this could help the designers to attain deeper understanding of what is being observed. More generic terms may need to be used for the benefits of the designers as previously done in rectal clamp and fistula project, the clinical experts had to substitute the medical jargon for more general words when working with the designers (Ramli, 2014). This may be different to this project as the designers are not required to have face-to-face sessions with the clinical experts. Nevertheless, this recording could supply preliminary understanding of how the mannequins are used.

Two cameras were used to record the training; one camera was strapped on a volunteer, and another one was placed at the corner of the rooms. This was to ensure that the data collected could provide the designers with the context of mannequin usage in clinical training. Although both cameras produced good recording, only the recording from the camera strapped on the volunteer was used. During the reviewing process, it was decided that the recording from this camera could provide more valuable input; for example, it captured the hand movements of the participants during the training. Hence, all the eight recording from the strapped camera were edited and compiled for the purpose of designer's video observation.

In Wood's (2012) recording approach, a hardly visible camera was used in the recording of research data. This is to enable the subjects to act naturally as they were less conscious that they were being recorded. This approach was adopted in this research in which relatively small action cameras were used. However, some of the subjects, for example the staff nurse and students, were caught looking at the strapped camera for a few times during the recording, especially during the transition of the training sessions. This may be due to the fact that the head gear was alien to the training environment and therefore had caused a distraction to the subjects. Nevertheless, it did not affect the important part of the recording which was the engagement with the mannequin. This process will be continued with video observation with the designers. The edited videos will be used to introduce the context of the product which is related to the clinical environment.

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