

This is a self-archived version of the original publication.

The self-archived version is a publisher's pdf of the original publication.

To cite this please use the original publication:

Nurmela, T., Leinonen, T., Franck, T., Saarinen, J., Laivuori N. and Aho, J. (2023). Postoperative nursing care in recovery room using 360° video learning game and users experiences. INTED proceedings. doi:<https://doi.org/10.21125/inted.2023.0609>.

URL: <https://doi.org/10.21125/inted.2023.0609>

All material supplied via Turku UAS self-archived publications collection in Theseus repository is protected by copyright laws.

More information on self-archiving contact julkaisutiedonkeruu@turkuamk.fi

POSTOPERATIVE NURSING CARE IN RECOVERY ROOM USING 360° VIDEO LEARNING GAME AND USERS EXPERIENCES

T. Nurmela, T. Leinonen, T. Franck, J. Saarinen, N. Laivuori, J. Aho

Turku University of Applied Sciences (FINLAND)

Abstract

Simulations have been used in nursing education for decades, and simulation teaching with special environments has increased significantly in many universities. Today, technology enables new implementation methods, especially for promoting students' independent study and by bringing the "real world" in front of the student's eyes, e.g. with the help of 360° video technology. However, 360° video simulation technology has not been very familiar to nursing lecturers in the universities providing nursing education, and the tools to manage the technique challenging. In this project, the aim was to make this technique available and as easy as possible for nursing academics to create their own materials for learning purposes.

Keywords: 360ViSi, 360 Video Simulation, postoperative nursing, Design Thinking.

1 INTRODUCTION

In Turku area, Finland, there is limited number of practice placements for the students in the area of perioperative nursing. If the students cannot practice essential nursing skills in authentic circumstances, the opportunity, for this should be arranged in some other way. According to a survey directed to nursing academics at Turku University of Applied Sciences (Turku UAS), patients' post-operative observation was selected to be the area of nursing to be developed with 360° video simulation technology.

360° videos can help to get accustomed to unknown environments and even capture complex human interaction situations. The videos make it possible to practice for example managing violent client interactions safely. Furthermore, 360° videos can help students to analyse and understand the context, and reconstruct the situation to broaden their understanding of the whole situation.

In the 360°ViSi project Turku UAS aimed to create 360° video simulation case to learn postoperative nursing and the tools for teachers to create 360° simulation training content by themselves. The aim was also to assess the experiences students and lecturers of using the developed case. Furthermore, feedback of the created tools, the editor and the player for 360° videos was important part of the evaluation. The developing process of the project in Turku UAS follows the Design Thinking protocol.

The development phases of the post-operative scenario and the tools:

- **Clarification of 360° video simulation needs:** Survey to the teachers to find out the needs for 360 videos in nursing (August 2020)
- **Idea and decision** of the target area (Autumn 2020)
- **Preliminary** manuscript of the scenario and the first version of the editor and player. First 360° simulation: record and test of the manuscript, creation with the editor and use with the player. First evaluation data collection. (Spring 2022)
- **Further development** of the manuscript. Development of the editor's and player's features to better meet the needs of the case. Data collection from students and lecturers. (Autumn 2022)
- **Final version** of the manuscript and final videos. Improving integration between Editor and Player and cleaning code for possible future development. Player working in local system without webserver. Final data collection will take place in winter 2023.

2 METHODOLOGY

To reach the project aim of easily usable scenarios and tools, co-operation between nursing lecturers and IT-specialists had to be innovative and intensive. Development of the editor and player were the new tool [1] for creating 360°based on simulation training scenarios. Target user for the editor is nursing teachers with limited technology skills. With the developed editor: you can build non-linear tree-like

simulation structures, insert questions and tasks inside the simulation, do simple editing with the 360° videos and add point of interests in 360° environment.

Editors user interface is node-editor type, where you can easily see structure with one glance. Only the essential features, are implemented into the user interface to keep it as simple as possible. Similar simplicity in mind the player is designed to play simulation scenarios without tweaking. Player is developed to work in internet browser. That makes it operating system and device independent. First implementation of the player needs webserver to work. End goal is develop player to work locally without dedicated webserver or even an internet connection.

In addition, a simulation case manuscript of nursing in post-operative observation in recovery room was written. The case was filmed with 360° video technique. The manuscript case of postoperative recovery room nursing was designed by the nursing lecturers, and recorded in co-operation with the IT-specialists.[4] [5]. The target group of the 360°ViSi postoperative patient care in recovery room were the nursing students on the first course of surgical patient nursing care.

The learning session contains three parts according to the traditional simulation scenario process [2]. The briefing phase containing pretasks to be learned by the students, the 360° simulation scenario and after the scenario the debriefing discussion after the training.

The case was completed in the autumn 2022. The manuscript followed the common post-operative steps of observation using the ABCDE- protocol. The manuscript had to contain detailed structure of the filmed videos, the learning tasks and flowchart of the process. The players possible choices and routes of progress had to be estimated carefully. The case contained learning tasks concerning monitoring, examining, observing the vital signs of the patient according the ABCDE-protocol. In addition, the case contains temperature, pain, nausea and vomiting managements and reporting using the ISBAR-protocol. Students proceeding depended on the choices made and the student received the feedback regarding the answer. The simulation training episode followed a flowchart, and learning tasks were located on video spots, which the students found marked as hands on the 360° video.

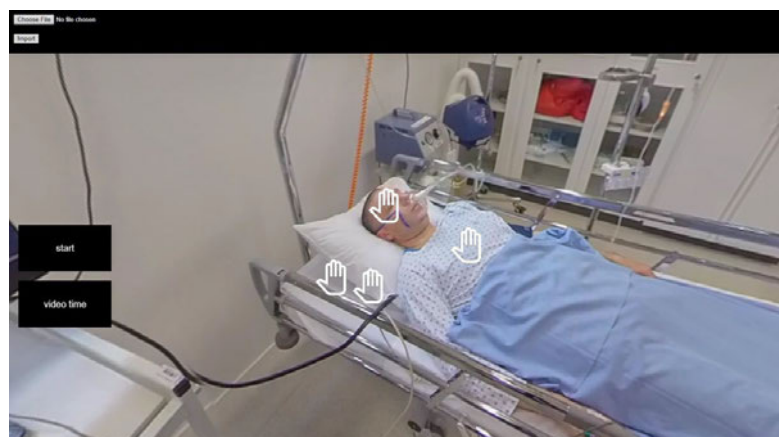


Photo 1. The learning task hotspots were placed on the white hands.

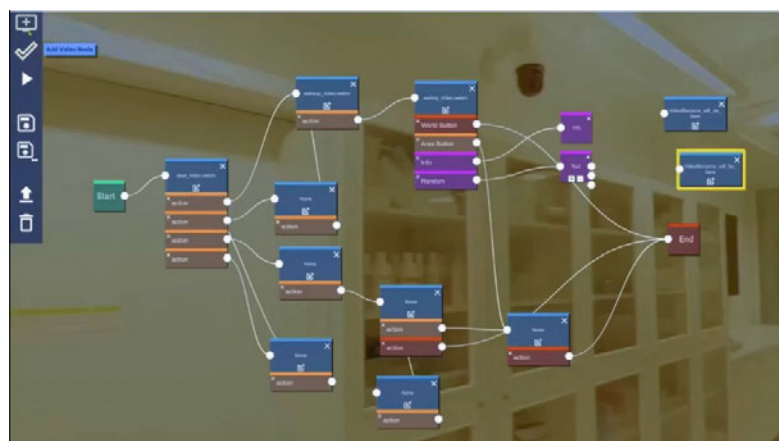


Photo 2. The different 360° videos and the learning task hotspots.

Perspectives of both students and educational staff were explored during the post-operative patient's case developing process to find different levels of impact of 360° technologies for learning. The experiences were collected using the System Usability Scale (SUS) and Fokides & Arvaniti [3] questionnaire modified and translated to Finnish language. The focus group interviews of student groups and teacher groups designed by the nursing academics in the University of Stavanger. The educational staff, nursing lecturer's experiences were collected with SUS and Technical Acceptance Model (TAM) questionnaires and focus group interview.

Data collection implementation was linked to the students studies of perioperative nursing and was part of the course content. Accordingly, the 360° video simulation was the learning method of patient's post-operative observation. Participation to the research part was on voluntary basis. The research permission and the Turku UAS the Ethical Board Statement research were applied and accepted.

3 RESULTS

The 360° simulation scenario for testing the postoperative care case was developed with the editor and used with the player. Learning experiences had to be assessed during the developing process two times. The Turku UAS IT-specialists created the editor and ADE (Animations Designs and Effects Oy) created the player for 360° video.

The first limited version (with only some 10 learning points) of the case was piloted in May 2022. According to the survey directed to student respondents representing the second year nursing students (n=35 of the whole target group of 135) and group interview (n=78) some deficiencies were found. The students liked the idea of studying and they experienced the scenario fairly immersive, but for example the NEWS point table (National Early Warning Score) for defining the patient condition changes was needed as well as the anesthesiologist's orders and prescriptions. Some technical problems occurred with the audio as the operating theatre nurse's report was very weak. In addition, some students had difficulties with their device in logging in the programme.

The first full version of the scenario was ready to be piloted in the autumn 2022. The scenario contained 18 learning points (hotspots), and the several 360° videos followed each other depending on the choices made by the student. The data collection was directed to second year nursing students on their perioperative nursing course. Twelve (n=12) students from 62 responded to the survey and 43 students participated in the focus group interview. The nursing academics, lecturers (n=5) played also the full scenario and responded to the survey and participated to the focus group interview.

According to the second pilot results, students found learning inspiring when using the 360° videos. However, the scenario should be further developed. The nurses voice while giving the report of the patient was still a bit unclear. Some writing mistakes were found and the feedback from the tasks had to be checked and added. The potential of this method was seen and more different patient cases should be created. Also the outlook of the learning tasks behind the hotspots should be designed more sophisticated. The post operative patient's scenario provided a brief insight to the recovery room of operating department for students who had never visited this kind of nursing environment, and some idea of the nursing there. For the lecturers the possibility to use 360° videos in teaching offers new tools to support nursing student's training also in circumstances where all of the students have no opportunity to practice during their education.

The third phase of developing the scenario is after the final data collection in January and February 2023. Then the 360° video simulation case of post operative patient's care should be ready to be used in teaching and learning purposes. Furthermore, the designed tools, the editor and player, should be easy tools to be used by nursing academics, the lecturers, working in teaching area in the nursing education.

4 CONCLUSIONS

The technology provides an excellent opportunity for the student to practice nursing skills in safe environment before entering the real nursing settings. Practicing in virtual world strengthens the patient safety significantly before students starts training at the operating department. The challenge for nursing educators is to learn to handle this technology. The created 360° videocase and the new tools, editor and player, are free to be used for everybody. For health care education and nursing students, independent learning the 360° video simulation technology offers new possibilities. In addition, it fits to meet also challenges of orientation to new tasks and work.

The 360° video recordings also can offer for teachers possibility to evaluate the students' progress and learning. Furthermore, these videos can be used as research data for when measuring the effectiveness of learning and teaching. For tutors 360° video records make it possible to follow and evaluate student interactions at the lab and watch later to see how the task was taking, and how students were working together. Tutors can reflect on their performance as well and improve in the next classroom. Recording will always require all students informed consent when participating in videos. 360° video can be used to evaluate and improve a new task or activity implemented in the curricula [6]. This requires that VR-teaching methodology is already included in the curricula. After all, imagination is the limit of creating new ways to use this new technology.

REFERENCES

- [1] Developing the 360° ViSi Player: a status. <https://360visi.eu/2021/10/27/developing-the-360visi-player-a-status/>
- [2] C. Huggins. Three Phases of Simulation. <http://www.simulationaustralia.com/files/upload/pdf/research/31-10.pdf>. n.d
- [3] E. Fokides, P. A. Arvaniti, Evaluating the effectiveness of 360 videos when teaching primary school subjects related to environmental education. *Journal of Pedagogical Research* Vol. 4, pp.1-20, 2020.
- [4] T. Leinonen, T. Franck, T. Nurmela, Virtuaalitodellisuus ja 360° videot perioperatiivisen hoitotyön opiskelussa. *Pinsetti*. Suomen leikkausosaston Sairaanhoidajat ry:n ammattijulkaisu. (A Finnish National Journal of Perioperative Nurses) Vol. 34 no.3,pp. 8-9. 2022
- [5] T. Nurmela, T. Leinonen, J. Aho 2023. Terveysala ja tekniikka kehittävät yhteistyössä sairaanhoitajien virtuaalioppimista. *HYVE*. <http://hyve.turkuamk.fi/> 18.1.2022
- [6] T. Nurmela, T. Leinonen, T. Franck, J. Saarinen, M. Österman, J.Aho. Postoperative Care Learning with 360° Video Simulation, *Nordic Forum of Nursing Educators (NFNE2022)* 15.11.2022 Turku, Finland. E-poster. 2022.