Nurses' experiences from a flexible online course in a higher education learning initiative

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Abstract

Remote healthcare is developing at a rapid pace to create high-quality, efficient, and financially sustainable care. The article aims to describe and explore nurses' experiences of networked learning before and after participation in a higher education lifelong learning initiative. The study was conducted in primary healthcare and hospital units in Sweden with ten nurses (eight women and two men), where the participants answered a web-based questionnaire before and after participating in an online course, *Digital Competence in Care.* The data were analysed with descriptive statistics and qualitative content analysis. The results show increased development of nurses' competence and learning. The mean of digital competence among all participants increased from 4.4 to 8.9 on a scale of 0-10 and the mean of expectations for learning among all participants increased from 7.1 to 9.2 on a scale of 0-10. Furthermore, two themes were identified: *Lifelong learning important and urgent for nurses* and *Networked learning a flexible way to strengthen learning and think outside the box.* The content and design of DCC were experienced as relevant for the participants, and networked learning was perceived as a way of developing and strengthening learning and competence. The participants indicated that sharing experiences and networking with others supported them in solving problems in their daily work, "thinking outside their own box," and putting ideas into action together to support a critical and responsible attitude. The use of authentic work-related problems in the course assignments was experienced as a good thing, as it supported the nurses in their everyday work. Finally, the participants described how they became more courageous and confident in their ability to communicate and work securely digitally, and also that their new knowledge and competence were relevant to the continued development of digitalisation in healthcare settings and medical care, as colleges and leaders turned to them for support and advice.

Keywords

Flexible online courses, healthcare, higher education, lifelong learning, networked learning, nurses, pandemic

Background

Health care in Sweden is a knowledge-intensive area that is undergoing a paradigm shift from physical care meetings to distance care via digital technology. The aging and increasing population, together with declining financial and human resources, has created a gap between the needed and available resources (Stroetmann et al., 2020). In Sweden, there is a push to reform the healthcare sector to include more digital services in healthcare (Swedish Municipalities and Regions, 2016; Erlingsdottir & Sandberg, 2019). The vision of the digitalization of healthcare in Sweden points out, that in the year 2025, Sweden will be one of the worldwide leaders in digitalisation and eHealth with high-quality and equitable healthcare and welfare (2016). According to the World Health Organization (WHO, 2011), the importance of eHealth will continue to increase, with digital technology being used to treat patients, conduct research and education, track diseases, and monitor public health.

Given their documentation responsibilities, nurses are a key person component in healthcare services' digital care information systems (Duplaga, 2016). They are also the professional group in the Swedish healthcare system with the largest number of licensed staff (Swedish Nurses' Association, 2019). The role of nurses in digital care is multidimensional and contributes to development around information management, strengthens patients' health, and provides high-quality, secure digital care (Ross & Cross, 2019; Swedish Nurses' Association, 2019). Digital technology is changing the way nurses work, which creates the need to acquire and assimilate new skills (Ahonen et al., 2016).

To benefit from eHealth, nurses must be flexible, pedagogical, and capable of handling technological changes and challenges (Honey & Wright, 2018). Nurses must also be able to combine the traditional clinical approach with new digital approaches (van Houwelingen et al., 2018). The transition of healthcare from physical visits to digital care meetings has taken place in a short time, challenging nurses in terms of lifelong learning to find new, sustainable ways of developing and increasing their digital competence to use digital technology in and networked learning for both themselves and the patients.

Networked learning is defined as learning in which information and communication technology (ICT) is used to promote connections: between one learner and other learners; between learners and tutors; and between a learning community and its learning resource (Goodyear et al., 2004). According to Goodyear et al. (2004), networked learning is characterised by connections with interactions between humans and learning resources; therefore, networked learning is well suited for nurses' individual learning together with others as well as for communication with patients in care meetings. Therefore, more information and knowledge, and a deeper understanding, of lifelong learning and networked learning needs from the nurse's point of view was required, and a pilot online course, *Digital Competence in Care* (DCC), with the purpose of meeting and increasing nurses' digital competence, lifelong learning, and networked learning, was developed. To the authors´ knowledge, at the time of this study, no such tailored online courses in Sweden met nurses' need for education.

The online pilot course Digital Competence in Care

DCC was developed as a pilot course in a collaboration between researchers, educators from higher education, public health workers, and senior nurses from various healthcare settings who met on several occasions and discussed the content and design of the course. This resulted in six statements of the content in digital competence: to have a critical and responsible attitude, to be able to solve problems and put ideas into action, to be able to use and understand digital tools and media, to understand the impact of digitalisation on healthcare systems and society, to have the patient in the center, and to work safe and secure according to the law and ethics. This resulted in a flexible online course containing five sections with content relevant for nurses' digital competence and a design with digital seminaries to stimulate and increase networked learning.

To enable participation given nurses' irregular working hours, it was emphasised that the course must be flexible. Therefore, the course was online with no physical meetings and with recorded lectures (films) and a study guide containing reading instructions for each section. The sections in the course were eHealth; Person-centered care; Documentation in digital medical records; Digital care meetings with patients and pedagogy; Law and ethics in digital care; Remote care - Digital care and organizational development. All course materials were always available for the participants. The starting point in DCC was from the participant's prior experiences and issues related to their work, and the course was designed and conducted with a curriculum of seminars for each

section. Before the seminars, the participants prepared themselves with the course literature, research articles, and their own experiences. At the online seminars, all participants met to share and exchange experiences, learn from each other, and start networking. DCC was designed from the concepts *Bring-Your-Own-Data* (BYOD1)—work with real and authentic problems or issues that the participants identified themselves through their work or activity (Jaldemark & Öhman, 2020) and *Bring-Your-Own-Device* (BYOD2)—the participants used equipment (computer, etc.) from work (organization-owned) (Cheng et al., 2016). DCC was also inspired by *Learning by doing* (Dewey, 1916); for example, the participants worked together with authentic problems and also got support from the seminars where they shared their experiences. The course had two assignments (written and oral): one related to the content in the course literature, films, and research presented, and one related to the organisations'/participants' own data.

To facilitate networking and communication, the course design utilised a range of educational tools and ways of learning that supported networked interaction. The participants engaged in learning activities that encouraged them to create and share knowledge, particularly regarding their own digital work experiences. Since the participants were based in different parts of Sweden, they had the opportunity to compare and discuss issues related to practice. Communication was supported through online discussion (chat fora), mediated by the teachers, and through asynchronous discussions. There were also a scheduled discussion fora called "Zoom drop-in" to not only support learner-directed discussions and questions but also share knowledge and experiences from practice.

The last section in DCC focused on future organisational development. Here, the participants were challenged to expand ideas around development projects for healthcare practice. To visualise a read thread in the DCC course and to practice gamification, all participants and the teachers used and played a digital game on an application, focusing on person-centred care in DCC (GPCC, 2017). The use of different applications is common in healthcare settings, for example, with patients diagnosed with a long-term illness such as diabetes; it was also possible to learn by doing together while playing the game and to reflect and discuss person-centred care together in the network (Table 1).

Table 1 An overview of the pilot course Digital Competence in Care*

Week	Seminars in Zooom (4h/each)	Content	The person-centred game
1	1	eHealth and Person-centered Care (PCC)	Levels 1-3
3	2	Documentation in medical records and digital care	Level 4
4	3	Digital care meetings with patients and pedagogy	Levels 5-6
8	4	Law and ethics in digital care	Levels 7-8
10	5	Remote care - Digital care and organizational development	Level 9

*The DCC course was organized in five seminars at four hours each for a total of 20 hours for 10 weeks.

Aim and Research Questions

The aim of this study was to describe and explore nurses' experiences of networked learning before and after participating in a higher education lifelong learning initiative.

- How do nurses perceive the development of lifelong learning with a focus on digital competence?
- How do nurses perceive the development of networked learning with a focus on digital competence?

Methods

Design
A quantitative design with descriptive statistics was used to describe and explore nurses' experiences before and after participating in the pilot course DCC (Polit & Beck, 2017).

Questionnaire
To gain an understanding of how the DCC-pilot was perceived according to content, design, and relevance, a questionnaire was created. The questionnaire included general questions regarding age, gender, and level of education (bachelor's or master's degree in nursing). Furthermore, the questionnaire included self-rated questions about the participants' experiences of digital competence and expectations of learning, using a 10-point Likert-type scale ranging from 1 = "no competence" to 10 = "very competent" and from 1 = "no expectations" to 10 = "high expectations", before and after participation in DCC, as well as open-ended questions about the content, design, and relevance of DCC.

Research context
The study was conducted in primary healthcare and hospital units in Sweden during the spring of 2020. Ten nurses participated in the DCC-pilot from February to April 2020 for ten weeks. One week before the start of DCC and two weeks after the end of DCC, all participants received an e-mail invitation to the questionnaire, with questions about digital competence and their experiences participating in the DCC-pilot.

Participants
The participants were ten nurses (eight women and two men); three had a bachelor's degree in nursing and seve had a master's degree in nursing. The age varied between 25–62 years (mean = 41.6 y, median = 40,5y).

Table 2 Characteristics of the participants in the pilot course Digital Competence in Care

Participants	Gender	Age*	Education
Nurse 1	Female	33	Master's
Nurse 2	Female	25	Bachelor's
Nurse 3	Female	28	Bachelor's
Nurse 4	Female	62	Master's
Nurse 5	Male	47	Master's
Nurse 6	Female	32	Bachelor's
Nurse 7	Female	53	Master's
Nurse 8	Male	55	Master's
Nurse 9	Female	46	Master's
Nurse 10	Female	35	Master's

*Age mean = 41,6y age median = 40,5y

Data analysis
The data included 20 questionnaires; each participant answered the questionnaire twice. The data were automatically entered into IBM SPSS version 27, from Netigate, and analysed using the same program. Descriptive analyses for comparing differences in digital competence among the participants were conducted using the chi-square test (Polit & Beck, 2017).

The open-ended questions were analysed using summative content analysis, where keywords are derived from the interest of researchers according to Hsieh and Shannon (2005). Answers from the open-ended questions were read repeatedly independently by the authors. Based on differences and similarities, the content was organised into themes through a back-and-forth process by the authors. The themes were illustrated with representative quotes from the participants. The analyses were conducted in Swedish and further translated into English in the final stage of the analyses.

Ethical considerations
The study was conducted following the Declaration of Helsinki (World Medical Association, 2018), assessed by the Ethical Review Agency in Sweden (Dnr: 2019–03353), and conducted according to the ethical principles recommended by the Research Council.

Results

Increased development of nurses' competence and learning

The result showed that the participants' prior digital experiences varied a great deal. Some participants used social media daily to keep in touch with family and friends and occasionally play online games; in addition, some participants had taken several courses in higher education and participated in local development projects at their work. There was an increased development of digital competence and expectations for learning among all participants. The mean of digital competence among all participants increased from 4.4–8.9 on a scale of 0-10 while the mean of expectations for learning among all participants increased from 7.1–9.2 on a scale of 0-10 (Figures 1 and 2).

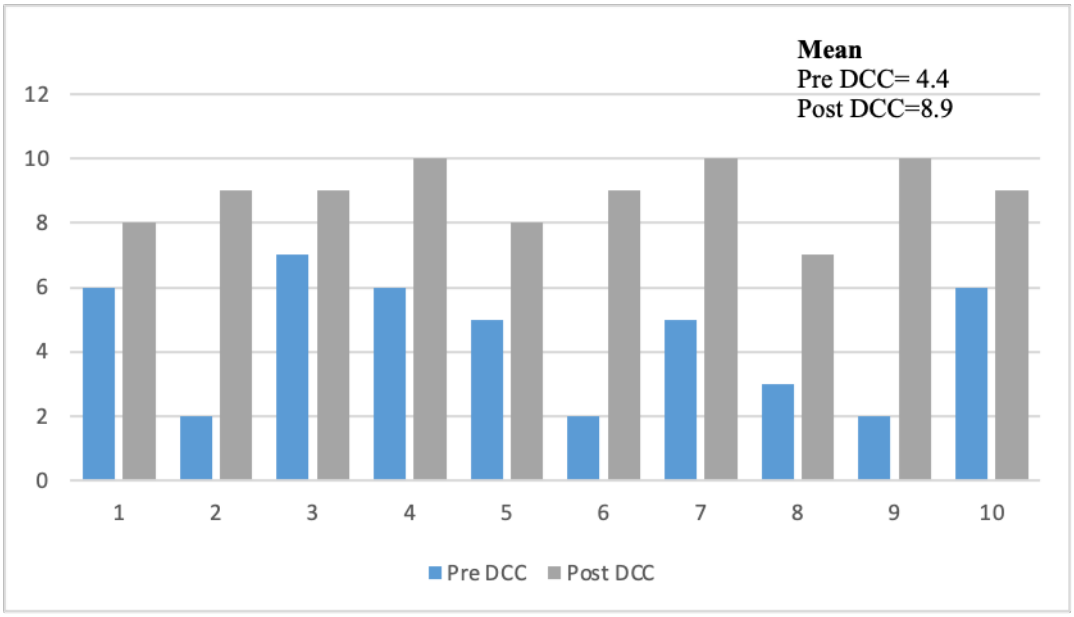

Figure 1 Nurses' self-rated digital competence before and after participating in DCC

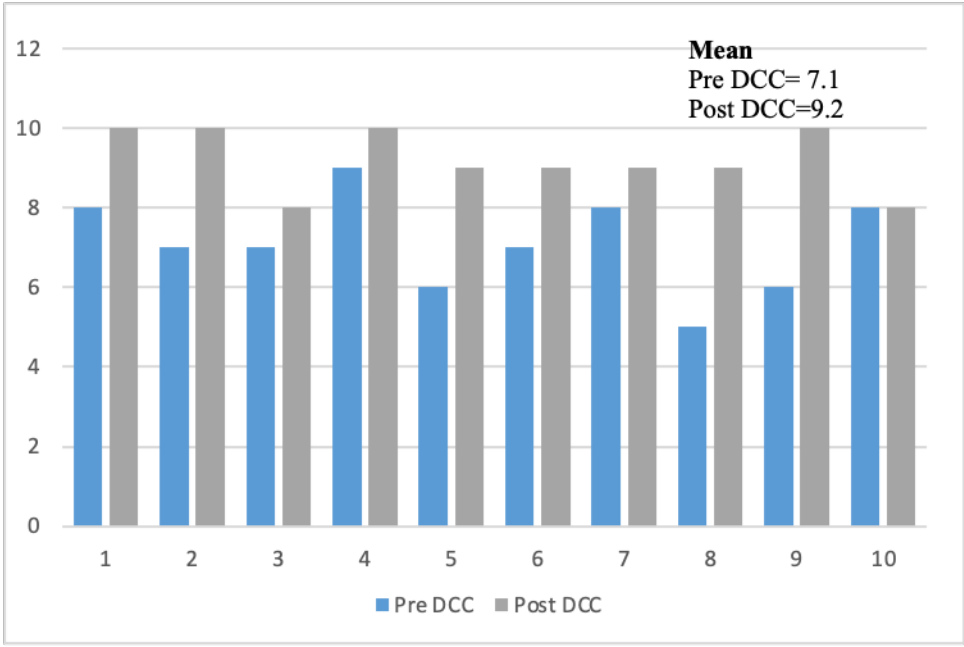

Figure 2 Nurses' self-rated expectations for learning before and after participating in DCC

The open-ended answers

All 20 participants answered the open-ended questions twice. There were some short answers about a couple of sentences, ranging from one sentence to six sentences, but there were also answers with longer texts. Summative content analysis according to Hsieh and Shannon resulted in two themes: *Lifelong learning important and urgent for nurses* and *Networked learning a flexible way to strengthen learning and think outside the box.*

Lifelong learning important and urgent for nurses

There were several comments that nurses must learn more about digital communication because nurses are responsible for giving secure and efficient information to patients and good communication skills are therefore vital. Several participants mentioned as important the need to support care and communicate digitally, in a secure and effective way, with patients who live far from the hospital. However, the nurses found it stressful and impossible to keep up with the digital development and to develop their own skills in their spare time, as there was seldom or never an opportunity to do so during working hours. It was also difficult to find relevant courses with the focus needed in clinical work; the participants experienced a continuous need to strengthen their competence to keep up with the demands of their work. The design and structure of DCC with BYOD1 and BYOD2, where participants worked with authentic related work problems at their workplace, was perceived very positively; the flexibility, with all material always being available, and communication in various fora as well as the Zoom drop-in sessions, enabled participation despite high workloads and working hours.

> *There is a digital revolution going on and we must keep up with it whether we want to or not because many patients are already ahead of us…*

There were also responses about the various levels of competence and attitudes towards learning in different workplaces and how this affected the participants' possibilities to increase their own learning. For example, when the boss was reluctant, it was hard to implement new ways of working. Since the Covid-19 pandemic was ongoing during DCC, the participants expressed a change of interest in the course and in lifelong learning.

> *My colleges asked me for advice and even the most reluctant college suddenly was willing to try with digital patient meetings. I was co-host just like in the seminars and it worked out just fine!*

All participants agreed that the content was relevant in DCC, that digital competence and e-health must be present in all nursing education, and that there must be courses for senior nurses to complete and strengthen their competence and learning. The participants wanted to learn more and new things, especially about legislation, to increase their knowledge of current research, gain competence in becoming safer at work, and be able to support and help patients and colleagues. The open-ended responses showed that the ability to understand and use digital tools and media safely and securely according to the law and ethics was highly relevant to the participants.

> *I really want to understand what I do, to feel safe and have control that I do not do anything wrong or illegal. I need to know what happens to the information about the patient when I press the button on the computer. Not the technological but what and with whom the information ends up.*

Networked learning a flexible way to strengthen learning and think outside the box

The design of DCC-pilot with networked learning was positively perceived by the participants and was experienced as a way of developing and strengthening learning as well as competence. Getting inspiration from others and perhaps starting collaborations in the future was a positive experience for the nurses. The participants also indicated that sharing experiences and networking with others supported them in solving problems in their daily work, "thinking outside their own box," putting ideas into action together, and having a critical and responsible attitude, and that they had learnt by doing this in DCC. The use of authentic work-related problems was also experienced as a good thing because it supported the nurses in their everyday work; DCC did not burden the participants with large assignments intended simply to achieve credits; they could use the results from the assignments immediately in their work, as they were work-related. Finally, the participants described how they became more courageous and confident in their ability to communicate and work securely digitally, and that their new knowledge and competence were relevant to the continued development of digitalisation in healthcare settings and medical care, as colleges and leaders turned to them for support and advice.

My boss asked me if I could start a project on how to develop our digital patient meetings.

Discussion

The aim of this study was to describe and explore nurses' experiences before and after participating in a higher education lifelong learning initiative. This was investigated by developing an online pilot course, *Digital Competence in Care*, and a questionnaire in collaboration with researchers, educators from higher education, public health workers, and senior nurses from various healthcare settings before the start of the Covid-19 pandemic. A positive result was the increased development of lifelong learning with a focus on digital competence and expectations for learning among all participants. Also, all participants perceived that the design and content were relevant for them in the development of their digital competence and that the DCC-pilot enabled participation even during the pandemic. Networked learning was perceived as being a very positive way to learn together with others and as a way of developing and strengthening lifelong learning as well as individual competence. Networked learning implies a togetherness in learning with the sharing of experiences and joint reflections in a network of participants. A study by Dalsgaard et al. (2019) involving midwives showed that networked learning was learning characterised by self-reflection, as the midwives reflected on what they have learned and what they need to learn next, and expansive critical thinking, as they learn and plan how they will apply this learning across different areas of practice. This way of reflecting and thinking was also experienced by the participants in DCC. In addition, the participants indicated that sharing experiences and networking with others supported them in being able to solve problems in their daily work, "thinking outside their own box," putting ideas into action together, having a critical and responsible attitude, and learning by doing (cf. Dewey, 1916). This is in line with Goodyear et al.'s (2004) description of networked learning as characterised by connections with interactions between humans and learning resources.

The assignments in DCC were related to the course material (literature and films) and the participants' own data (BYOD1) (Jaldemark & Öhman, 2020); participants worked with authentic work problems often situated at their workplace (BYOD2), which was perceived positively, as it enabled participation and had an almost instant effect on clinical practice.

Methodological considerations

The questions within the questionnaire were carefully chosen and in line with the current study as well as previous research, but the questionnaire itself was not validated. The open questions were included so that the participants could express themselves freely; the questions made it possible to scrutinize the participants' understanding of what was asked. In considering the results, it is important to bear in mind that the nurses who participated might possess a more in-depth understanding of, or interest in, the area of investigation. The online pilot course was conducted during the pandemic, which could have influenced the results in both positive and negative ways. Due to the pandemic, there was an enormous need for educational possibilities regarding digital competence, but the pandemic also affected the working conditions of the participants and the possibilities to participate in the DCC-pilot. Also, there were only ten participants; with a small sample, it is important to be careful of far-fetched conclusions. While the sample provided useful information about the feasibility and relevance of the content in the DCC-pilot, there is a need for more research to further establish reliable conclusions regarding nurses' experiences of participating in a higher education lifelong learning initiative such as the DCC-pilot.

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