

Development of Competences for Digital Health Technologies in Basic Nursing Training on an Example of Tallinn Health Care College

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ABSTRACT

Despite of the fact that health care employees spend over 25% of their working hours on information administration using technology, there are no official study opportunities for information security, eHealth and medical devices in Estonia. Tallinn Health Care College commenced the development of a module to teach technologies to improve learners' digital competence.

Aim was to design a crucial subject to develop the competences for digital health technologies in basic nursing training. Following tasks were arranged: to conduct comprehensive overview of scientific literature with the aim to systematize the competences of digital technologies instructed in the field of health care; to design a conceptual framework of the subject; to monitor the functioning of the subject and students' satisfaction with the subject's contents to further develop the subject.

Combined qualitative and quantitative research methods were used. The comprehensive literature overview was created of teaching health technologies and eHealth to design the conceptual framework, it offered the input to structurise the volume and contents for the subject on digital technologies. The analysis of the students' feedback was the ground for monitoring and development.

The list of competences was composed derived from the comprehensive overview of scientific literature, also of topicality of the themes; forms of assessment and feedback, and the factors influencing the whole learning process. Designed conceptual framework helped to structurise the course, and the visual image demonstrates the link between the connections. Continuous monitoring helps to evaluate the functioning of the subject and its continuous development ensures effective teaching.

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1. Introduction

It is inevitable to launch new technology, from the aspect of organisation of work, resulting from aging population, increasing tendency of chronic illnesses, lack of employees in health care, strict requirements on quality of health care services and cross-border mobility of patients (Maibaum et al., 2021). Information technology is a driving force for innovative clinical approaches, and it is essential to initiate comprehensive scientific research, to acquire health knowledge, professional education, and for general development (Fetter, 2009), it is also the basis for evidence-based nursing practice (Bakken et al., 2003); it should be part of professional nursing care in 21st century (Saba, 2001). Professional literature evidently highlights the importance and necessity of teaching knowledge and skills of health technologies (Hart, 2008). Despite of numerous studies, which feature the importance of health technologies on improving the quality and safety and enhancing efficacy, there are several barriers to achieve these benefits on a large scale (Hersh, 2007). Bowers et al. (2011) emphasised that instructing students at the university level in the field of health technologies reduces the use of hospital resources up to 84 hours. In conjunction with findings in literature all over the world, and practitioners' statements, it was also recognised in Estonia that there is the need to teach nurses the knowledge of safe use of information systems, cyber security and medical devices and technologies (Kruus et al., 2014; Jõers-Türn & Leoma, 2016).

Basic training curriculum for the general nurse belongs to the „Health Care“ curriculum group, the aim is to provide internationally recognized professional quality higher education for working in the area of health care and to resume specialty education on the curriculum of Health Sciences or at other open Master's level curricula in Estonia or abroad. Nominal length of studies is 3.5 years, the volume of curriculum in European credit point system is 210 ECTS. (Õde 1467, 2021).

According to the scientific literature, the main issue is that although the health care employees spend more than 25% of their working hours to administer information using technologies (Winter et al., 2013), there is no official training of information security, eHealth and medical devices in Estonia (Mets & Veldre, 2017). Lack of knowledge, skills to participate in development, and to find solutions in process of work have caused barriers between various health technologies, e.g. opportunity for more widespread use of telemedicine solutions (Kruus et al., 2014). In addition, discussions between nurse directors in hospitals have highlighted that nursing students and new nurses are lacking knowledge of health information systems, cyber security, and there are gaps in skilful and safe handling of medical devices. Development of digital health technologies subject helps to fill the missing educational gap in basic nursing training. There was no appropriate training prior, and existing specific knowledge is quite incomplete.

The goal was to develop a necessary subject to develop the competences for digital health technologies in basic nursing training for the general nurse.

Tallinn Health Care College started to develop a module to teach technologies in the framework of ASTRA project to improve learners' digital competence in 2016. The general aim of the project "Institutional development programme for research and development and higher education institutions" (ASTRA) were the activities aimed to improve the efficiency of quality of teaching and research (Õppe ja teadustöö..., 2014).

Following tasks were set in order to develop the subject Digital Technologies in Health Care:

- to conduct comprehensive overview of scientific literature with the aim to systematize the competences of digital technologies instructed in the field of health care;
- to design a conceptual framework of the subject;

- to monitor the functioning of the subject and students' satisfaction with the subject's contents to further develop the subject.

Constructivist teaching approaches were the basis for course design, it means the priority is the understanding of the activity by the student, which prerequisites mobilising and uniting several resources (learner's knowledge, skills and behavioural aspects) with their prior experiences by constructing their own new knowledge to implement in the future, which is based on received information. (Fox, 2001: 24). Priority was granted to creating appropriate learning conditions with options for knowledge-construction process, which begins with interpretation of experience in a situation designed by the lecturer. First and foremost, from the perspective of social constructivist teaching theories, it is emphasized that learning has constructivist social and a personal metrics. Inclusion of the learner into the learning process and assessment of the influence of their experience is a very important component of teaching. (Jõgi et al., 2013).

2. Methodology

2.1. Methodological approach

Combined qualitative and quantitative research methods were used in current study. Comprehensive overview of scientific literature of teaching health technologies and eHealth over the world in 1990-2018 was produced to create the conceptual framework (Aveyard & Bradbury-Jones, 2019), which offered an input to structurise the volume and contents of the subject on digital technologies. Analysis of students' feedback from academic years 2018/2019, 2019/2020, 2020/2021 was the basis for monitoring and developing the subject Digital Technologies in Health Care (established in 2018).

Compilation of subject's framework of background was based on stages, which consisted of diagnosing the educational need for eHealth and technologies in health care, formulation of educational need goals, mapping the learning contents and its organisation, and creating the learning structure. Learning process, learning contents and teaching strategy were structurised by designing the conceptual framework of the subject. Monitoring the subject meant analysing feedback questionnaires, which were the basis for finding out renewing needs of the learning contents and therefore, necessary correction.

Comprehensive literature overview allows to summarise and present prior research results, identifying gaps in the research at the same time, hence the input for developing the subject derives from earlier appropriate results (Arksey & O'Malley, 2005). Compiling literature overview identified five stages described by Arksey and O'Malley (2005), which are 1) identification of research problem; 2) identification of essential research papers; 3) choice of research papers; 4) mapping the data; 5) collecting, summarizing and presenting the results.

2.2. Comprehensive literature overview

Stage one: identification of research problems was an interactive process, which began with determination of two broad research areas: "telemedicine, eHealth" and "technology in health care and education, learning". Final research problems were determined as follows: • Which courses of health technology and eHealth were described and/or analysed in literature in 1990-2018? • Which are vital competences to offer to the nursing students? • Which is the most efficient length of studies, the most appropriate to achieve the satisfactory competence of the nurses? • Which teaching strategies were used to achieve the aims of the course? • Which input found in literature, is possible to use to design eHealth and health care technologies subject at Tallinn Health Care College.

Stage two: identification of vital research papers was conducted in two databases: MEDLINE and CINAHL. The goal of search strategy was to identify all the published papers, which can be used to contribute to design a course about health technologies and eHealth. Search strategy covered articles published in 1990 up to 2018. The decision to search published papers older than ten years derived from the fact, that medical devices started to use digital data gathering since the beginning of 1990ies, which changed daily work processes and created the need to teach technology.

Stage three covered implementation of criteria for inclusion or exclusion of research papers into the process derived from their titles and abstract. This process resulted in 128 research papers. 32 articles of them could not be accessed. In addition, screening was implemented for all text of 96 articles, of which 21 were not suitable for the selection. Final sample consisted of 75 articles, which harmonised with inclusion and exclusion criteria.

Stage four covered mapping the data and **stage five** collecting, summarising, and presenting the results. Conceptual framework of the subject on health technologies was designed based on these stages. It resulted in a new subject in the Chair of Nursing launched in autumn semester 2018, namely Digital Technologies in Health Care (volume 2 ECTS).

2.3. Conceptual framework

Design of conceptual framework was most of all based on aims and expected results of the curriculum, however, students' prior knowledge was considered, as well. Bloom's taxonomy was the basis for specific aims of the course (Krathwohl, 2002), it covered all the dimensions of knowledge: facts, theory, procedural knowledge and metacognitive knowledge. Appropriate teaching methods were selected according to goals and subject content, these methods resulted in conditions to achieve learning outcomes. Appropriate assessment methods were selected to evaluate the goals, assessment criteria were designed, which were based on the fact that the assessment would be formative. Conceptual framework allowed to design a necessary model (see drawing 1), which visualizes connections between competences, appropriate teaching methods, assessment and feedback and factors influencing whole learning process.

2.4. Monitoring and developing the course

Anonymous feedback questionnaire completed by the nursing students (323) was used to monitor the designed subject. One of the aims of quantitative educational research is to provide evidence-based recommendations that can ultimately benefit students (Turner et al., 2013: 301). Sample consisted of second year nursing students of Tallinn Health Care College that completed the subject in autumn and spring terms of academic years 2018/2019, 2019/2020, 2020/2021. Suitable sample for the research was compiled based on timetable. 642 students together were in the sample, filling the questionnaire was voluntary and the final sample consisted of 323 students' replies, which were statistically analysed and results were compared to the existing data in literature.

The questionnaire was submitted twice every term before the beginning of the subject and at the end of it. Subject feedback questionnaire was compiled by the members of ASTRA project workgroup. The questionnaire submitted in the beginning of the course consisted of a single open question. It was as follows: What are your expectations on the subject? The aim of the questionnaire was to study students' expectations on current subject. Course feedback questionnaire consisted of 13 questions, seven of which were multiple choice questions and six were open questions. There were no questions with multiple possible answers. Multiple choice questions were designed to evaluate the subject, open questions were aimed to comment on lecturer's work, and to assess whether the subject completed the expected contents, and which

were the topics to be addressed in more detailed way in the future. The questionnaires were expected to be completed electronically in Moodle online environment in two parts.

At first, coding the data was carried out. The data were inserted into Microsoft Excel 2011 to analyse the results of the questionnaire. To prevent possible errors during data analysis, the mistakes that might occur while data insertion process were avoided, after data insertion the credibility of the data and coding the characteristics was checked. Inductive contents analysis method was used when analysing data from open questions. The analysis was highly text-based. Qualitative content analysis allows to focus on main meanings of the text, which is relevant from the perspective of admission probability. Qualitative content analysis allows to analyse latent contents, too, it means to read between the lines, it means to code the hints, intentions, and goals of the author of the text, and several interpretation possibilities of numerous connotations. The qualitative content analysis is carried out mostly to compile an overview of the researched text as a whole, to see the text and/or author's ideas whole pattern or their complete structure. (Kalmus et al., 2015).

Sentences from free comments of the feedback were simplified into expressions of similar meanings (substantive codes) and were merged and categorised under certain titles. Categories were named after the contents of the expressions. In data analysing process the results were merged, grouped accordingly with academic years and finally compared. The data analysis resulted in 8 different subcategories, which were merged to four main categories, which reflected the connections between them (see Table 1).

Table 1.

Categorisation of students' feedback

Substantive code	Subcategory	Main category
Lecturer's subject competence	Teaching competence	Influencing factors
Lecturer's prior experience		
Preparation	Lecturer's preparedness	
Different level of students		
Understanding the goals	Wording of learning outcomes	Learning outcomes
Level of competence achievement		
Teaching method suitability	Achievement of learning outcomes	
Learning style		
Means of study	Technical resources	Learning activities
Technical support		
Size of study group	Organisation of studies	
Number of lecturers		
Forms of feedback	Reflection of results	Assessment and feedback
Assessment aspects		
Student's preferences	Individuality of the student	
Group dynamics		

Learning process assessment was a result of categorisation and the analysis, which was based on that.

3. Results

3.1. Outcome of literature overview

The results were presented as a cross-section of the questions raised in stage 1. There are 22 countries represented in the articles. 59% of studies were published in 2007-2017. Most studies (31) were aimed at the nursing level of bachelor's or professional higher education. The articles were categorised into four various subcategories based on their input: practical training and

teaching strategies; competences; overviews of curriculum and general suggestions. The sample (75) consisted of 43 articles, which belonged to the group of main single input category: hands on information (17), suggestions (13), teaching strategies (8), competences (4), curriculum (1). In addition to articles with single contents categories, the rest of the articles had a combination of various inputs: hands on information and teaching strategies (13), competences and suggestions (5), curriculum and suggestions (2), suggestions and teaching strategies (2), hands on information and suggestions (1), hands on information and curriculum (1), competences and curriculum (1), competences and teaching strategies (1). Competences, suggestions, and teaching strategies (2), competences, hands on information and curriculum (1), hands on information, suggestions and curriculum (1). Suggestions, competences, teaching strategies and hands on information (1). List of all input values (1).

3.1.1. Described courses on health technologies and eHealth in 1990 up to 2018

There are various terms available in different countries to describe the same technology, which altogether make the field complex, and therefore courses with various focuses have been described. In general, all the courses and curricula described belonged to the field of information technology and computer sciences competences. The working process covered mainly courses and curricula belonging to information technology and computer sciences competences, which were aimed to health care employees. In addition, there were specific subfields of health (such as pharmacology, pathology and biomedicine informatics, and medical imaging or radiology) and eHealth, telehealth and telematics courses. Because the search was not narrowed to nursing, it covered all health specialties, in addition to traditional medical and health informatics courses and curricula, specific fields were described as well, such as pharmacology, pathology and biomedicine informatics and medical imaging or radiology. In addition, courses on eHealth, telehealth and telematics were involved. Main aims for contents of trainings mentioned in studies were first informatics and its subtopics by specializing, such as nursing, medical, health, clinical, biomedical, pharmacy, pathology informatics. Secondly, eHealth, telehealth and telematics. Thirdly, electronic medical records, which have several forms in literature in English: EMR (*electronic medical record*), EHR (*electronic health record*), PMR (*personal medical records*) or EPR (*electronic patient record*). In addition, information technology, computer sciences and competences, gamification on educating and picture archiving and communication system or PACS (*picture archiving and communication system*).

3.1.2. Highlighted competences when teaching nursing students

It was in particularly focused on defining students' competences, however, two articles also emphasised the importance of lecturer's competence. E.g., Ornes and Gassert (2007) concluded that "/.../ nursing lecturer is the greatest blocker in terms of including technology in curriculum.". Vottero (2017) addresses the same issue noting that nursing teachers often instruct some "topic based on their convenience not their competence". As of future of nursing, Gassert (2008), included that informatics, telemedicine and eHealth should be a part of other subjects in the curriculum, not only as a single course, and the students should be able to function when using high-tech environments, such as operating theatres, which „combine observing infrared, system of nurse calls, wireless phones and electronic boards, which can be viewed on computer screens or from large monitors, and which are strategically placed in a surgical suite.“ (Gassert, 2008: 508).

Seven main competences, which should be considered when developing the course, resulted from the included studies:

- digital competences and skills to administer information systems (carrying out common activities that are important in clinical work by using a computer and information systems);
- data collection and their visualisation (e.g., decisions over amount of data and importance of data in information systems, and ability to find quickly and present important information);
- communication tools for collaborating (online communication tools for communicating with a patient and telecommunication);
- science-based medicine (access to medical and health information and the assessment online);
- theory, philosophy, definitions and concepts of health technologies and eHealth;
- legality, safety, privacy and ethics on addressing health data;
- diagnostics and observation methods and devices (e.g., digital radiology, use of monitors).

3.1.3. Efficient volume of courses

There is no absolute answer, however the analysis of papers and authors' conclusions resulted in that it is the most effective if to integrate health technologies and eHealth into subjects of the curriculum, not to have a single subject only. Volume of courses varied in literature, from intensive five weeks in a row (15 contact classes) up to four hours a week within the whole semester. In addition, the summer school with intensive teaching for a week was described, it means eight hours of lectures and seminars every day for five days. (Winter et al., 2013; Cummings et al., 2016; Vottero, 2017).

3.1.4. Teaching strategies to be implemented

There the most important aspects of teaching strategies were highlighted; to measure teaching benefits (a questionnaire is compiled at the beginning and at the end of the course on students' knowledge and skills, which offers capacity for research to collect data and clear information about teaching benefits); main principles to enhance the effectiveness of studies (reasonable use of time between tests, lectures, exercises and resting) (Hincapie et al., 2016); various teaching forms (online, individual and classroom teaching should be divided equally), and how to forward it (to use slides with your audio, discussion forums, reading tasks, self-assessment questionnaires, course projects; to use gamification learning platforms and samples from real life) (Vottero, 2017). About assessment, one should use three ways from best practices: written exam, competence assessment and subjective feedback in practical seminars. There is an option to use immediate feedback assessment cards. In addition interesting *Time motion study* type was used, there students completed common health information system tasks and by finishing different instructions they received feedback which was used to compare the student's speed of doing the tasks to the practicing nurse's speed to receive information for additional learning needs. (Henricks et al., 2003).

3.1.5. Input to develop the course

As a general recommendation, libraries should instruct information literacy and common programmes (Word, Excel, PowerPoint). In addition to basic knowledge for text processing, spreadsheets, presentation programmes, the students need to access relevant and modern medical knowledge – e.g.: Medline, to understand Boolean logical operator, to assess the quality of found sources, to use MESH descriptors, to optimise search engine use. Also, students should be offered the technology classes in simulation centre, so that it could be integrated with other subjects or to combine teaching health technologies with simulation training, too. It requires modern technology park corresponding to real working situation, and

to cooperation with health technology companies. Ehnfors and Grobe (2004) propose an idea to unify understanding of level criteria and competences. All nurses could have newly designed nursing informatics certificates if they demonstrate their knowledge and skills in specific fields of informatics. Furthermore, the authors add that in addition to the students, the teachers/lecturers should be competent enough to compile video, chatrooms, discussion boards and group tasks using information technology. (Ehnfors & Grobe, 2004).

Collecting and assessing students' feedback is an important part of studies. Different principles can be implemented for that, e.g., Edirippulige et al., (2012) offer every student five open questions about the course. Hincapie et. al, (2016) provide the students with online pre- and postquestionnaires about the subject to evaluate their acquired knowledge and to collect feedback. Additionally, the authors use IF-AT initial feedback assessment technique scratch cards to record the answers received in the classroom. Henricks et al., (2003) inform that it is recommended to use three components of assessment and feedback for students: written exam, observation of competences, subjective/oral assessment during rotations and practical seminars.

3.16. Topics to be addressed throughout the subject

- Principles of Estonian Health Information System's structure, health data structure, how and where health data are collected;
- Clinical documentation and information processing – essential for main goals, such as description of course of illness to curing process;
- Medical classification systems and terminology, and objective signals demonstrating health status, and subjective observation and analysis. Alignment and analysis of objective and subjective data, their standardisation and coding: ICD-10 diagnosis, DRG (*diagnose related groups*) grouping system, use of uniform taxonomies from perspective of information technology and nursing informatics;
- Medical examinations in radiology, in a laboratory etc.;
- Health information systems – health information systems of hospitals, primary health care and state, electronic health records and medical history, integrated electronical patient's information system; searches and reports of medical information system; integrating clinical and non-clinical information systems; user interface analysis; software for medical institutions in Estonia.
- E-services in health care – decision support to health care employee and the patient, automated assessment of medicine side effects, remote monitoring, health website etc.
- Data protection, safety of data and quality of data; sensitive personal data, patients' privacy; standardisation of data and their validity, aggregation of data, secondary use and sharing, *big data* analysis, assessment of implementation of electronical data and validation of data.
- To pay more attention on threats from medical devices. ECRI is designated an Evidence-based Practice Center by the U.S. Agency for Healthcare Research and Quality and a federally certified Patient Safety Organization by the U.S. Department of Health and Human Services. ECRI institute has listed technology-related risk factors, such as alarm fatigue, risks from radiation therapy, errors on administering medications when using infusion devices, spread of cross-infection on using endoscopes, incompatibility of devices, threat of surgical burns, technology-related threats in anaesthesia.

3.2. Conceptual framework

The collected data formed a schematic conceptual framework, observing the simplicity, logic and practicality of the visual. It is based on easy-understandable statements, which are simple to interpret and associate with. Four main components are in the centre of the framework, the most important statements supporting them were added. Arrows demonstrate the links between them.

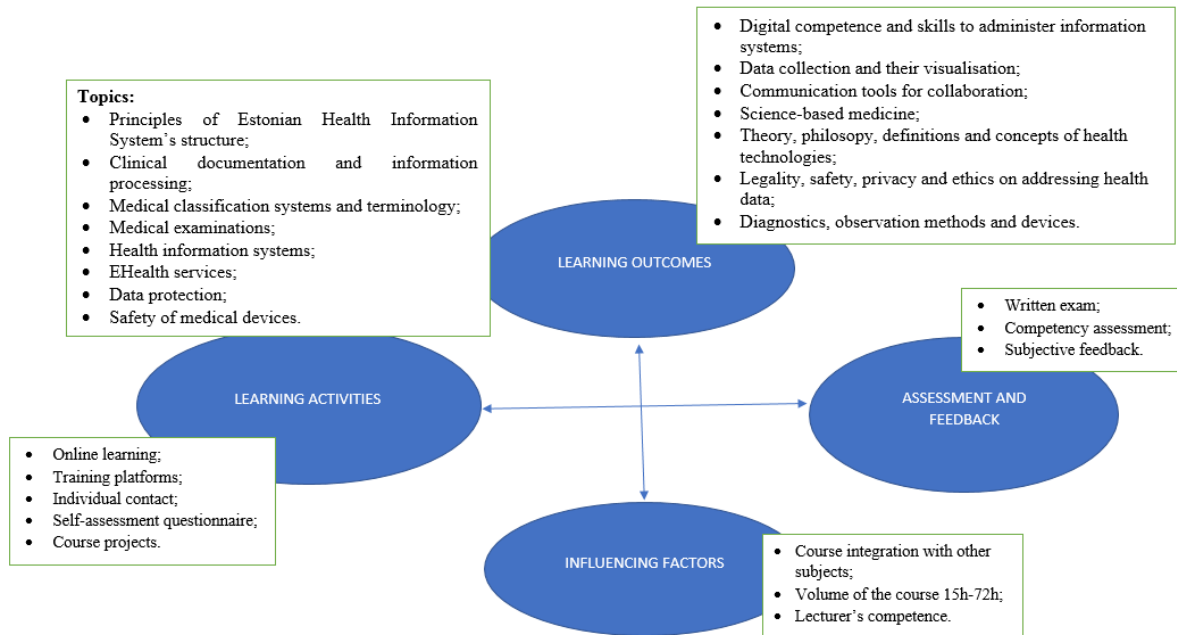


Figure 1. Schematic conceptual framework

3.3. Outcome of monitoring the developed course

Monitoring the course was based on prequestionnaire and feedback questionnaire completed by the students (N=323) in Moodle environment. It was found during the analysis that the students preferred to learn more about new IT solutions, cyber security and medical devices. If no specific topic was mentioned, then it was replied that they would like to acquire new and interesting knowledge. More information was enquired about University of Technology (TalTech) master's studies on Health Care Technology. More than 78% of students found that the subject was interesting, and their expectations were met, it corresponded the curriculum, the volume was enough and knowledge acquired was possible to implement in daily work in the future. The subject was assessed in 45% of the cases with 'good', 36% as 'very good', 'satisfactory' was received in 19% of cases. The question 'Which topics should be covered more detailed' was replied that there was more need to know about medical devices and various software, in addition, cyber security was of their interest. It was separately highlighted that there is the necessity for a task, which was regarding the analysis of Patient Portal website. It was also mentioned that addressing radiological imaging did not harmonise with other fields. In addition to feedback on Moodle environment, the students would have liked to receive oral feedback to their assignments.

3.3.1. Further development of the course

Cooperation agreement was signed between Tallinn Health Care College and TalTech in 2019. It was aimed to knowledge transfer in eHealth, health innovation, personal medicine and other linked fields. The goal of common collaboration is to develop digital capacity of Tallinn Health Care College simulation centre by including master students of TalTech Health Care

Technology curriculum in the process of development of digital capacity. In addition to development of the subject, there is an idea of implementing functions of Patient Portal, digital prescription, image bank and E-Ambulance in simulation centre in collaboration with TalTech.

COVID pandemic crisis in 2020 demonstrated the need for increased use of remote application both on counselling people with chronic diseases and to assess their need for treatment. In light of this, input was provided to the curriculum to increase the volume of the subject and to address the content of the remote service. Currently there are three topics focused on within the subject: e-solutions, cyber security and remote services. Students of Tallinn Health Care College and TalTech have the opportunity to participate in joint eHealth hackathon, where new digital health team projects are launched. The students work together with the idea of specialists of various fields, which offers great opportunities to collaborate with international interdisciplinary team of health technology.

4. Discussion and conclusions

There are various terms about same technology in use in different countries; it makes the field complex, and therefore courses on different focus were described. Included studies revealed seven main themes, which to consider on determination of competences. Based on that, the input was given to learning contents by focusing the topics as follows: Estonian Health Information Systems, clinical documentation solutions, health telematics and telemedicine, data safety and cyber security, safety of medical devices and radiological imaging examination. The students have been satisfied with addressing these topics; however, it was mostly reported that radiological imaging examination part is illogical concerning coherence with other topics. That is the reason why it is discussed whether to change the focus of the topic and addressing medical devices might be focused on more in the future.

Volume of subjects varied as mentioned in the literature, from intensive continuous five weeks (15 contact classes) up to four hours a week within the whole semester. It was concluded based on the analysis of articles and authors' conclusions that it would be most effective to integrate teaching health technologies and eHealth within all the subjects of curriculum, not simply to instruct a single course. The volume of initially developed course was 2 ECTS, however it was increased since 2021 to 3 ECTS because the topic of remoted services was addressed more during pandemics of COVID-19.

The questionnaire will be further developed, it will be carried out in the beginning and at the end of the course, and will offer ability to collect data for research, and clear information about teaching benefits. In addition, the use of problem-based and real-life examples and gamification learning platforms was recommended, and the sharing of teaching evenly between online, individual and classroom-based learning. Three ways should be used on assessment: written exam, competence assessment and subjective feedback in practical seminars. The concept of this course was developed by considering all these aspects. Various ways were used on assessment but so far, the most effective and the one received most positive feedback was peer assessment. Technology park should be modern and correspond to real working situation and to collaborate with health technology companies. Vottero (2017) discusses that of specific tasks, there should be a discussion of using social media as a health care employee. Fetter (2009) recommended the students to find a 'patient' from their family or to log into the Patient Portal themselves to insert and have a look at real data. World practice allows to create a personal health account regarding inserting health information (e.g., Google Health) and collect data. Karamanlis et al. (2012) used Google Health and Microsoft Health Vault as a personal medical record card in lab sessions. Fronczek et al. (2017). Otero et al. (2010) recommended the students a group task (to be in a role of health consultant) to assess the health care

organisation – to describe their structure, existing resources, IT components and current situation regarding the use and capacity of health information system, and to suggest, what to do in order to improve the use of IT in health care by the nurses. These tasks have become most popular, however it should be considered that flexible and reasonable assessment system is needed to motivate the student.

There are major differences in regional development in health care in Estonia, to cope with these challenges solutions are to be developed, which could ensure and improve the sustainability of health sector, its accessibility and quality. The coping option could be more widespread use of various information and communication technologies in nursing specifically. Hereby, the important and leading role of the College is seen on development of digital skills and on implementing digital structure in learning process. Next step in collaboration between two higher educational institutions covers digitalisation of Tallinn Health Care College simulation centre, which could be a test lab for various services and products in health care in the future.

4.1. Conclusion

Comprehensive overview of scientific literature demonstrated the list of competences, topicality of theme, forms of assessment and feedback and the factors influencing whole learning process. Designed conceptual framework contributed on structuration of the subject and the visual image demonstrates the links between topics, learning outcomes, assessment and feedback. The visual is also helpful in monitoring the course and its continuous development. Continuous monitoring is necessary and helps to assess the performance of the course and the satisfaction of the students. The information received from the feedback is important in implementing changes. The further development of digital technologies as well as the implications of nursing and computer science must be taken into account. Improving the learning process and the acquired skills and competencies are essential. It is important that the level of knowledge is raised not only through formative assessment but also through complex teaching.

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