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E-learning experiences of Nursing students

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E-learning experiences of Nursing students

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The aim of Bachelor's thesis work is to analyze Nursing students' experiences with online training. The aim of the project is to describe objectively various experiences of nursing students with different e-learning tools, virtual platforms and courses.

The main research topics in this study were Nursing and Technology Management. An evidence-based theory about online technologies and nursing process was used to analyze the existing trends in education for future healthcare professionals. The methodology in use was qualitative research in which systemic reviews and inductive content analysis were implemented. The target group of this research were undergraduate students in nursing. The data was collected from evidence-based scientific articles and then analyzed using inductive content analysis.

The study answered established research questions successfully. The results have confirmed the idea that learning can be promoted by using educational technology, and online course appears to replace the traditional one in terms of time consumption, effort, cost, applicability and mutual interactivity. This project is worth further development for the benefit of generations of nursing students both for domestic and international use as technology is constantly in progress and is more and more integrated into nursing degree studies.

Keywords: Nursing students, E-learning, systematic reviews, online course

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Tämän opinnäytetyön tavoitteena on analysoida hoitoalan opiskelijoiden kokemuksia opiskelusta verkon välityksellä. Projekti pyrkii objektiivisesti kuvailemaan oppilaiden kokemuksia erilaisten nettiopiskeluvälineiden, -alustojen ja -kurssien kautta.

Tutkimuksen pääasiallisia teemoja ovat oppimisteknologia ja hoitajuus. Tutkimuksessa käytettiin näyttöön perustuvaa teoriaa hoitoprosessista ja internet-tekniologiasta, nykyisten opetustrendien analysoimiseen tulevien terveysalan ammattilaisten parissa. Tutkimuksessa käytettiin laadullista tutkimusta, joka muodostui systemaattisesta arvioinnista ja induktiivisesta sisällönanalysista. Tutkimuksen kohderyhmänä olivat hoitoalan tutkinto-opiskelijat. Tietoa kerättiin näyttöön perustuvista tieteellisistä artikkeleista, joita analysoitiin induktiivisella sisällönanalysilla.

Tutkimus vastasi menestyksekkäästi asetettuihin kysymyksiin. Tutkimustulokset vahvistavat, että opiskelua voidaan edistää koulutusteknologialla, ja verkkokurssit ohittavat perinteiset opiskelumuodot interaktiivisuudessa, sovellettavuudessa, kustannustehokkuudessa sekä ajan tehokkaassa käytössä.

Tätä projektia olisi mielekästä jatkaa eteenpäin, sillä teknologia kehittyy jatkuvasti ja tulevat hoitoalan opiskelijasukupolvet, niin kotimaassa kuin ulkomailla, tulevat enenemässä määrin hyödyntämään verkko-opiskeluteknologiaa koulutuksessaan.

Asiasanat: hoitotyön opiskelijat, verkkokurssit, nettiopiskelu, systemaattinen kirjallisuuskatsaus

Table of Contents

1	Introduction	6
2	Theoretical framework.....	7
2.1	Technological innovation in E-learning.....	7
2.2	Teaching technologies and online courses.....	9
2.3	Electronic patient health records in Finland	13
3	Aim, targets and research questions	15
4	Methodology	16
4.1	Limitations	17
4.2	Systematic review.....	17
4.3	Data collection	21
4.4	Data analysis	21
5	Results	25
6	Trustworthiness	29
7	Ethical considerations.....	30
8	Discussion.....	31
9	Conclusions.....	32
	References	34
	Figures	42
	Tables.....	43

1 Introduction

Technology and Internet are nowadays deeply integrated into the nursing care process. For example, to become a professional nurse, every nursing student needs to have competence of making a care plan. Every hospital setting or nursing home nowadays is using some type of electronic documentation software when treating a patient. Commonly used ones are Efficia, GFS, Pegasos, Hilikka. These systems allow nurses, doctors and other healthcare professionals involved in the patient's care to create adequate care plan in the beginning and later on to update it according to the patient's changing needs. Electronic healthcare records allow patient and his/her significant others to monitor the care process independently, as well as give access to the patient's files to other wards and healthcare professionals performing necessary examinations or due to patient transfer (Huston, 2014).

A research carried out in 2008 by Vainiomäki, Kuusela has shown that Finnish patient records has been documented inadequately and result in below the standard of that national legislation. A development of better model was suggested to achieve higher quality of work. As practice makes perfection, the researchers believe that creating a training application for making care plan for a variety of patients would improve nursing students' work placement performance in written reporting, their ability to extract necessary data from the patient electronic files and successfully communicate with other team members involved in particular patient's care process.

At the school, e-learning and module study are becoming more and more popular. Especially in nursing study, during the placement working environment requires significant computer science's competences and other technical skills when operating different medical equipments. Therefore, competent nurses need stable development of technical skills and updating computing skills. This can be supported by providing adequate training which involves more computer's sciences and e-learning modules.

This research is analyzing experiences of Nursing students around the world in online courses, e-learning platforms and training applications using systematic review of existing evidence-based scientific articles and content analysis of the main coding categories and concepts related to them so that the main trends can be clearly described and used in further development of online studies in Nursing degree programme.

According to Bonnel and Smith (2010), e-learning is a growing part of today's nursing students' study experience. Traditional face-to-face lectures and seminars are gradually being replaced with a variety of online modules. These modules are heterogenic in structure, they

may contain different theoretical materials such as presentations, training videos, audio-lectures, scientific articles and they use various ways to assess student's knowledge after the completion of the course. Also, modern e-learning environments can provide options for web seminars and videoconferences in order to enhance interaction between student participants and the teacher. With today's Internet access available for any devices such as mobile phones, laptops, computers, tablets, and students being in general more skilled in using information technology, e-learning growth is more and more viewed as a direction to which nursing degree studies are going around the globe.

2 Theoretical framework

Technological revolutions are far-reaching and pervasive changes in technology, which affect many branches of the economy, as well as giving rise to entirely new sectors (Freeman et al., 1982). Incremental innovations are considered continuously and based on the knowledge and resources involved within a certain company as the competence-enhancing. Inventions and improvements as the outcomes may be suggested by engineers and others directly engaged into the product or the process, or, as a result of initiatives and expectations by users (Tidd, 2006). Huston (2013) has indicated that the world is being changed by technologies at an unbelievable speed and apparently technological application will be found in almost all health care settings. The difference between the way how patient was taken care of before and currently is mind blown.

2.1 Technological innovation in E-learning

Innovation can be considered as a generic activity associated with survival and growth. At this level of abstraction innovation process involves several steps which are searching to scan the environment for relevant signals, selecting to decide which of these to respond to, implementing that is to translate the potential trigger idea into something new, requires acquisitions of the knowledge resources, execution of the project. Launching the innovation, sustaining adoption and use in the long term and the last step is to learn to build knowledge base through innovation cycle (Kässi, 2010-2011, p.12). The need for an efficient integration of online studies and possibly even training software in nursing degree programme would profit nursing school's teaching services, making them more "modern" and "customer oriented" for students.

One way to categorize innovations is the 4P's presented by Tidd et al. The categories are product, process, position and paradigm, shown in detail below. In this study, e-learning and module study are considered as product and services offered to nursing students. Learning process is described as constantly developing environment seeking innovative product's chang-

es. Its trend has become popular in nursing degree study with increasing integrated technologies. From the nursing school's point of view, this trend is being taken into serious consideration.

- product innovation - changes in the things (products/services) which an organization offers;
- process innovation - changes in the ways in which they are created and delivered;
- position innovation - changes in the context in which the product/services are introduced;
- paradigm innovation - changes in the underlying mental models which frame what the organization does. (Tidd et al, 2006)

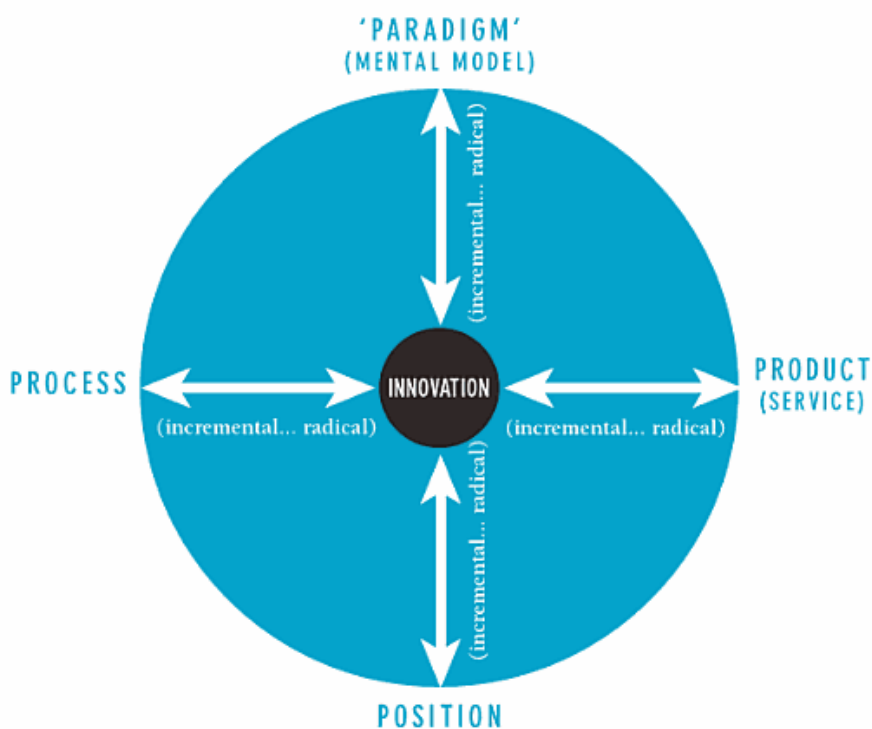


Figure 1 Innovation space (Tidd et al, 2006)

Innovation is not only the 4P's but it can also be divided to incremental and radical innovation. The degree of novelty involved represents the second dimension of innovation shown in the figure 1 (Tidd et al, 2006). Incremental innovation is usually underestimated and it often provides more profit than radical innovations. Processes are mostly based on this type of change. It is also important to build a good product/service platform to base build on so that it is worth improving. Cumulative incremental improvements to platform technologies often create significant commercial and social benefits.

2.2 Teaching technologies and online courses

Bonnel and Smith (2010) indicated that applied technologies in education for the health professionals have enhanced the learning process significantly, have also increased patient safety, and promoted interdisciplinary collaboration. New approaches to innovative educational methods have come into use recently in form of self-study or online courses. Teaching technologies in nursing has several advantages compared to traditional ones since new generations of students are more comfortable with technology.

According to Mayes and De Freitas (2004), there are no specific pedagogical models for e-learning, only enhancements of already existing teaching models adjusted to online study environment. Pedagogical models usually align with a particular approach or learning theory. Mayes and De Freitas (2004) divided learning theories into 3 following groups:

- associative - learning happens through structured tasks;
- cognitive - learning happens through understanding;
- situative - learning happens as social practice.

Dyke et al. (2004) overviewed in their research main learning theory perspectives together with indication of the types of e-learning modules they support. Another researcher, Ravenscroft (2004), linked pedagogical theory to concrete examples of e-learning innovation.

Learning theories are implemented using pedagogical frameworks or models with emphasis on specific approach. Conole (2010) defined six types of tasks the learners can do according to pedagogical profile:

- assimilative - reading, viewing, listening;
- information handling - working with data or text;
- communicative - discussion, criticism etc.;
- productive - for example, writing an article or an essay;
- experiential - practising, applying etc.;
- adaptive - simulations or modelling.

Application of teaching methods in e-learning can be illustrated by the following figure:

Perspective	Approach	Characteristics	E-learning application	Models and frameworks
Associative	Behaviourism Instructional design Intelligent tutoring Didactic E-training	Focuses on behaviour modification, via stimulus-response pairs; Controlled and adaptive response and observable outcomes; Learning through association and reinforcement	Content delivery plus interactivity linked directly to assessment and feedback	1. Merrill's instructional design principles 2. A general model of direct instruction
Cognitive	Constructivism Constructionism Reflective learning Problem-based learning Inquiry-learning Dialogic-learning Experiential learning	Learning as transformations in internal cognitive structures; Learners build own mental structures; Task-orientated, self-directed activities; Language as a tool for joint construction of knowledge; Learning as the transformation of experience into knowledge, skill, attitudes, and values emotions.	Development of intelligent learning systems & personalised agents; Structured learning environments (simulated worlds); Support systems that guide users; Access to resources and expertise to develop more engaging active, authentic learning environments; Asynchronous and synchronous tools offer potential for richer forms of dialogue/interaction; Use of archive resources for vicarious learning;	3. Kolb's learning cycle 4. Laurillard's conversational framework 5. Community of Inquiry framework 6. Jonassen's constructivist model 7. n-Quire model
Simulative	Cognitive apprenticeship Case-based learning Scenario-based learning Vicarious learning Collaborative learning Social constructionism	Take social interactions into account; Learning as social participation; Within a wider socio-cultural context of rules and community;	New forms of distribution archiving and retrieval offer potential for shared knowledge banks; Adaptation in response to both discursive and active feedback; Emphasis on social learning & communication/collaboration; Access to expertise; Potential for new forms of communities of practice or enhancing existing communities	8. Activity Theory 9. Wenger's Community of Practice 10. Salmon's 5-stage e-moderating model 11. Connectivism 12. Preece's framework for online community
Assessment				13. Gibbs and Boud models 14. Nicol and the REAP framework
Generic				15. The OU (SOL) model 16. The OU LD & Course Business Models 17. The 3D pedagogy framework 18. Bigg's constructive alignment 19. The Hybrid Learning model 20. Gee's affinity

Figure 2 Pedagogical Models and their use In e-learning (Conole 2010).

Salmon (2003) established 5 stages supporting effective e-moderating in discussion forums which can be identified as follows:

- access and motivation;
- online socialization;
- information exchange;
- knowledge construction;
- development.

In addition to this, Salmon (2003) suggested a range of e-activities to promote effective online communication which can be illustrated by the following figure:

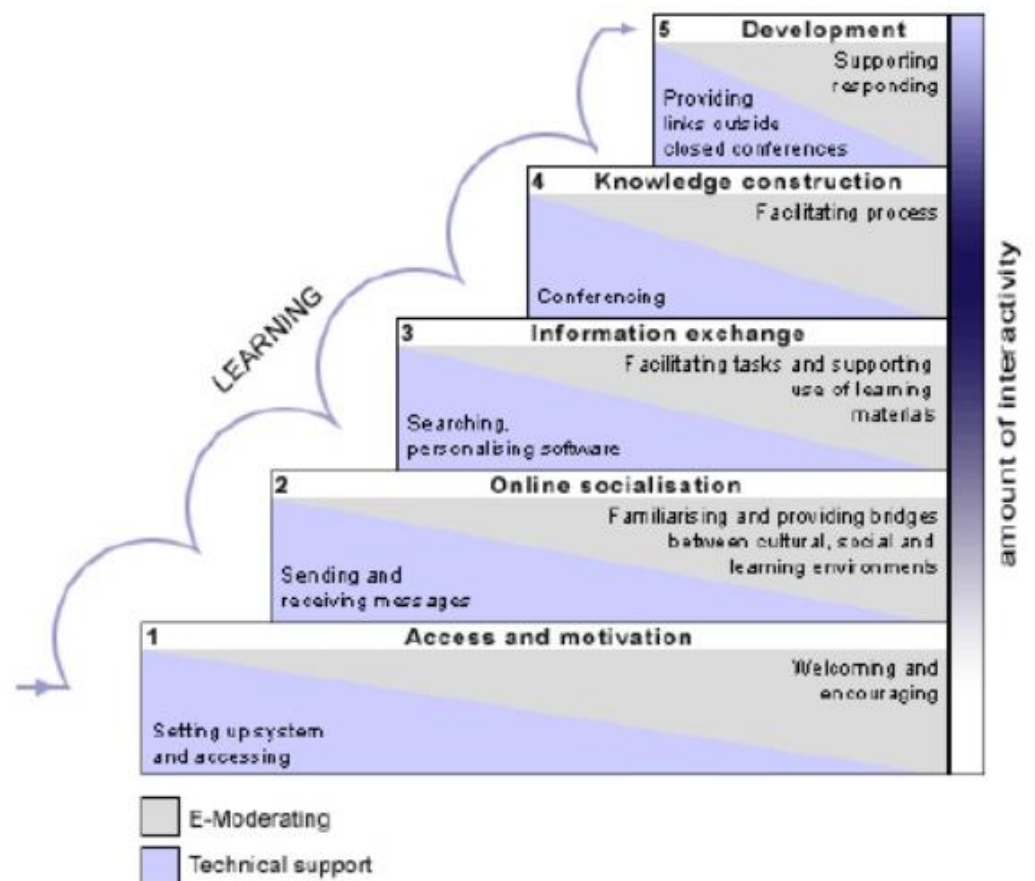


Figure 3 The e-moderating model (Salmon 2003).

Distance or open learning model described by Tait (2003), Mcandrew and Weller (2005) offered students possibility to study course material at their own pace, to work on activities and assignments and to connect with other students. Participants got support from teachers located in centralized Regional centres. Bean (2010) identifies key characteristics of this model as follows:

- Relationship between technology, people and ideas. The aim is to maximize the connection between these elements, using modern technological resources. Pedagogy is viewed as a way of bringing technology into the service of students, facilitating communication of ideas.
- Relationship between trust, open sharing and community. Trust is associated with reliability and security, Open sharing is connected to modern technology and its ability to provide open information exchange between the participants. As students take the same online course, they share common tasks and goal, so they form a community.

E-learning is a broad concept that involves the transfer and usage of knowledge through educational programmes integrated with interactive electronic systems (Vaona et al., 2015). Applying the latest software to education takes advantage of the increasing availability of Internet and mobile internet access around the globe allowing a broad use of educational materials across diverse settings and deliver information to remote learners.

Worldwide researchers have looked for methods that can be used to improve the relevance, increase the reach and accelerate the educational process for health professionals (Crisp 2008). Through modern advanced online learning platforms the student may gain significant theoretical knowledge in various areas of Nursing and practice safely different common scenarios of, for instance, nursing care plan creation and nursing interventions. Structurized online study has potential to help the learner to practice clinical reasoning, diagnostic and reporting skills.

Technology is an option for professional education in healthcare, which when used properly may facilitate several aspects of learning environment. Important task of such technology is to utilize what students already know, engage them in learning the content, apply to relevant assignments and motivate. E-learning environment gives the possibilities to access more than provided information, makes them think outside of the box (Fink, 2003).

The need for teaching development in education is extremely strong as also being described by Fink (2003). Author has defined that significant learning experiences consist of the following process element: students' engagement to their own learning, a high-energy level associ-

ated with it, high outcome or results derived from motivated students, and the value in life after the course.

Previous systematic reviews done by Cook (2008) and Lam-Antoniades (2009) on the efficiency of e-learning focused on Kirkpatrick's outcomes (Kirkpatrick 1996): satisfaction, knowledge/attitudes, skills (in a test setting), behaviours (in a practice setting), and effects on patients. The findings of these reviews were as follows:

- a. e-learning was associated with large positive effects when compared with no educational intervention.
- b. effectiveness of e-learning was found to be similar to traditional methods.
- c. e-learning and conservative face-to-face educational interventions take almost the same time to participate in or to complete.
- d. interactivity of studies, practical exercises, continuous repetition, and feedback option play an important role in e-learning and seem to be associated with improved learning outcomes.

As integration of e-learning tools and their development is still going on in various educational settings, new approaches and systematic reviews on this topic will be required in future.

2.3 Electronic patient health records in Finland

According to the patient record law from 1992 issued by Ministry of Social Affairs and Health in Finland, all patient information should be properly documented and is confidential (Ministry of social affairs and health 1992). Electronic version of patient documentation was created to enhance multidisciplinary performance, increase patient safety, and bridge up the gaps in clinical context. This healthcare technology is here to stay and it is constantly developing, becoming more complex, creating an adaptation challenge for the fresh nursing students going to their work placements and later on to work as a newly qualified registered nurse. Finnish nursing documentation which is defined by Kinnunen & Junntila & Liljamo (2014) is based on the decision-making process and a standardized terminology: Finnish Care Classification system (FinCC). Using FinCC has nursing diagnoses (FiCND), nursing interventions (FiCNI), and nursing outcomes (FiCNO) documented in a structured way. The core feature is to register, record, and form a joint register of patient records.

Nursing diagnosis is a part of nursing process which considers conclusions based on critical thinking skills, scientific knowledge, social skills, and multi-sided knowledge about patient and his/her situation (Paans, Nieweg, van der Schans, Sermeus, 2010). According to Leach (2008), planning phase of nursing process is important, since goals of care are formulated in this part, which should be realistic and achievable with such available resources as facilities, health care

professional skills, patient's own contribution. Saba (2007) has indicated that nursing interventions are designed activities to achieve expected outcomes to a nursing diagnosis and the nurse should evaluate the effects of the chosen methods for the intervention. Nursing process's evaluation is described as a continuous process to evaluate whether the set goal is met or not with recent diagnosis and interventions. If the intended goals are not achieved using current nursing interventions, new care plan will be made and adjusted with new interventions to achieve newly set goals.

FinCC was developed firstly in the late 1990s by defining nursing interventions and diagnoses at the University Hospital of Kuopio in Finland. It was then expanded remarkably in 1995 when the Minister of Social Affairs and Health implemented a broader project within public healthcare organizations. A few years later, the common model for the nursing documentation was drawn and was carried out in different electronic patient record systems. Educational and training purposes were emphasized when the nursing documentation model had been implemented. The new care plan's structure form creates new aspects and possibilities for meaningful use of the nursing documentation (Saba, 2012).

FinCC has a clear table of components to describe structure orders and activities in making a patient's care plan (Liljamo, Kinnunen, Ensio, 2012). Each category of diagnosis, planned intervention, actual intervention has their own hierarchical orders that allow user to select main component and subcomponent based on the particular patient's needs. These components allow nurses to design care of the patient in a holistic way. FinCC structures computerized nursing care plan providing all nurses with clear view on how to perform their duties. This feature allows nurses to be transferred to other wards in a rotation manner without losing continuousness of care and avoiding confusion in a fast-paced working environment (Hakanen & Välikallio 2013).

Electronic patient health records are used on daily basis in Finnish healthcare settings. Each patient has their own care plan which is created by health care professionals based on the current needs. This patient documentation is updated all the time if there is any change. Patient care plan is made using a software application which is specially developed for healthcare facilities. Nurses and other healthcare professionals are important contributors to this process which requires knowledge, skills, decision making, nursing process, and ethics. Depending on cases and needs, software is being modified and upgraded constantly. Keeping patient's records up-to-date improves the quality of care by supporting holistic approach and providing possibility for continuous monitoring and evaluation (Hämäläinen & Reponen & Winblad, 2008).

Patient record is a legal document. All the patient health record systems the authors have used themselves had an electronic signature of the person making the entry so that every procedure and every examination can be traced back to the healthcare professional who performed it (Act on the status and rights of patients, Ministry of Social Affairs and Health, 1992). Patient records give possibilities for future development and research, which can be used for statistical and epidemiological studies to monitor the health of a population. These requirements are important for quality development, audit of care, and peer review. Patient records also provide means of administration and teaching (Hämäläinen & Reponen & Winblad, 2008).

Electronic patient documentation system is also a channel of communication between nurses and other healthcare professionals. Therefore, comprehensive documentation skill is very important. For example, in such situation that nurses who come to the next shift read the report of the previous shift in the electronic patient records, which are so-called “silent reports” (Strople & Ottani, 2006). Nurses in Finland still use some paper charts and forms when taking care of the patient or making an assessment. Some of the typical examples of still existing paper patient documentation are Fluid Intake List, Blood Sugar & Insulin list for diabetic patients, nursing assessment tool that contains the patient’s biographical information such as name, age, reason for admission, allergies, diagnosis, medication, and the patient’s medical history (Elsevierhealth, 2003). However, this paper document data is transferred to the electronic health records on a regular basis.

There is a variety of patient documentation software being used nowadays in Finnish healthcare settings. However, systems in different cities and units do not allow direct data transfer and communication with each other. Seamless care services cannot be sometimes guaranteed in patient re-location or transfer. Finnish Government’s projects aim to overcome such issues by creating unified electronic patient health record system that would be used in all healthcare facilities throughout the country. The new system is to be named Apotti and it is scheduled to be applied by 2021 (Oy Apotti Ab, 2012).

3 Aim, targets and research questions

The target of this project is to analyze nursing student’s experiences with online training from existing literature. The aim of the project is to describe objectively various experiences of nursing students with different e-learning tools, virtual platform and courses.

In this thesis, the authors would like to address the following questions:

What is the general experience of nursing students about e-learning?

What are the advantages and disadvantages of online courses in nursing studies?

4 Methodology

Exploratory research is selected for this thesis. The research objectives include identifying problems that students experience during the course and possibilities to solve them, gaining solution. The characteristics of the problematic situation will be considered as researcher's perspective approaches and formulate alternative courses of action and gathering information (Kinnear, Taylor, 1996). The empirical part of the thesis includes qualitative research which was carried out to gather information. Inductive approach was used in this thesis to identify common concepts on e-learning experiences of nursing students from the reliable data sources and then form a hypothesis based on the findings. Qualitative research helps to reveal the nature of certain situations by enabling the researcher to gain an insight about the nature of a particular phenomenon, to develop new concepts and discover problems associated with the researched phenomenon. Moreover, it also provides means through which the researcher can evaluate the effectiveness of particular policies, practices or innovation (Leedy, Ormrod, 2001).

Qualitative research method is the most appropriate if the aim of the researchers is to analyze individuals or a community's experiences of a specific phenomenon. The main advantage of qualitative research is its ability to present how target group experiences the chosen research phenomenon through various textual descriptions. Qualitative research method enables the authors to convey richness and intensity of a phenomenon in a way that a quantitative research method cannot (Nicholls, 2011). Common characteristics of qualitative research are:

Qualitative Research
<ul style="list-style-type: none"> • Subjectivity valued • Multiple realities • Discovery, description, understanding • Interpretative • Organismic • Whole is greater than the parts • Report rich narrative • Researcher part of research process • Participants • Context dependent

Table 1 Common characteristics of qualitative research method (Streubert Speziale & Rinaldi Carpenter, 2007).

4.1 Limitations

Systematic reviews are done to combine the results of previous studies to arrive at a summary estimate of effect of researched phenomenon (Garg, 2008). This means that the summary done in such a review depends on the reliability of the primary scientific materials used to arrive to these conclusions. Simulation as an educational form for nursing degree students was excluded from this research because it occurs partially in simulation laboratories where the instructor is physically present. Distance learning strategies such as correspondence, television or radio based courses and broadcasts were also excluded from the scope of this study. The titles and abstracts of pre-selected range of articles were reviewed by both researchers separately to evaluate if the materials meet the inclusion criteria.

In addition to this, the primary articles are usually very diverse in their design, methodologic quality, specific interventions used, and sometimes even target group. Conclusions to which researchers arrive in the primary articles are always subjective to a certain degree (Garg, 2008). This also needs to be taken into consideration when conducting systematic reviews.

4.2 Systematic review

Systematic review summarises and critically analyzes the results of available studies on the chosen topic. Systematic review integrates collected data from different sources and then follow the pattern of identification, selection and synthesizing important research available to achieve a desired review. The researchers use systematic review is to gather all relevant materials for this study, thus making use of inclusion and exclusion method during data collection as explicit criteria to have a better conclusion. Chosen systematic review based on the explicit criteria of inclusion/exclusion approach was applied to eliminate irrelevant materials, which are not required for the researchers' area of interest. Systematic reviews follow a specific protocol which defines (Cochrane Handbook for Systematic Reviews, 2011)

- the way primary articles are found;
- how the relevant studies are judged in terms of their usefulness in answering previously set review questions;
- how the results of the selected separate studies are brought together to give an overall measure of effectiveness (advantages and disadvantages).

Inclusion criterion	Exclusion criterion
- topic of the article is on the experiences of e-learning for nursing students;	- Quantitative study's materials were excluded from this study
- searched articles mostly from such reliable sources as Joanna Briggs Institute database, database, Cochrane Database of Systematic Reviews and CINAHL database;	- Wikipedia, normal websites and so on
- year 2007-2017	- year before 2007
- only peer reviewed (full text)	- full books, HTML forms
- only articles in English language were accepted.	- Articles in languages other than English were also excluded

Table 2 Inclusion and exclusion table.

The literature search for systematic review can be described using the following figure:

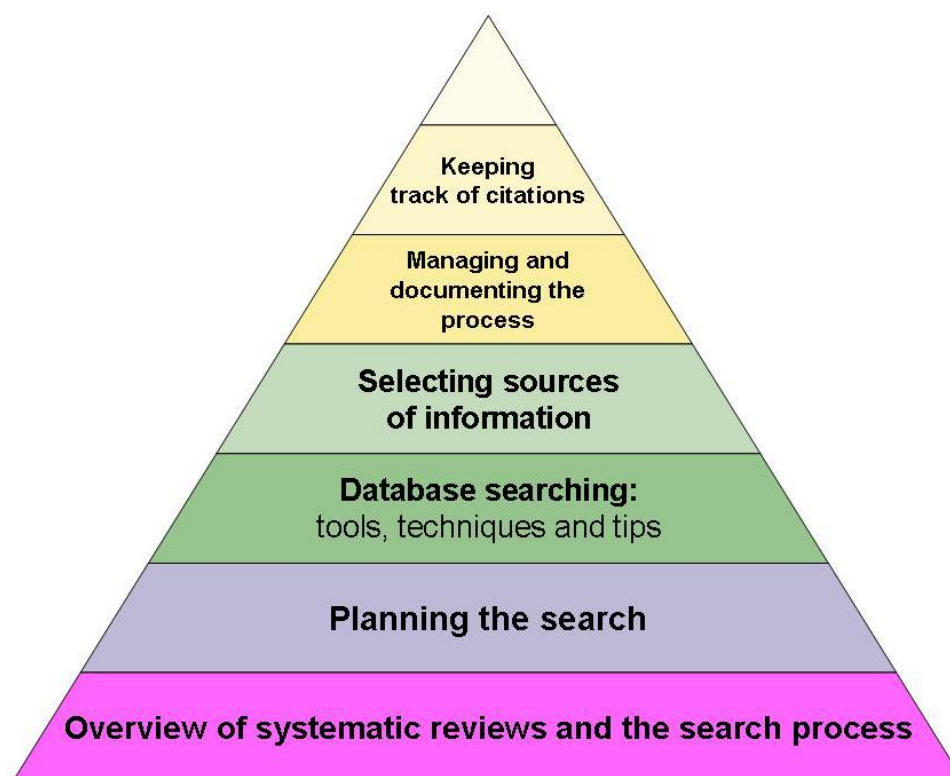


Figure 4 Systematic Review. Literature Search (The University of British Columbia, 2011).

The review questions for this study can be stated as follows:

How effective is e-learning in the current nursing degree studies?

What are the concepts nursing students associate with online module studies?

A research strategy is an empirical inquiry that investigates a contemporary phenomenon within its real-life context. An effective research strategy gives researchers possibilities to collect the background information and analyze it in order to create evidence or the data to reach a specific conclusion. Different research strategies have various approaches, which include such basic elements as the analysis of literature review, case study, interview, observation, experiments, survey and so on. Research survey and analysis of academic articles strategies are commonly used tool to accomplish the research aims and objectives (Flick, 2009)

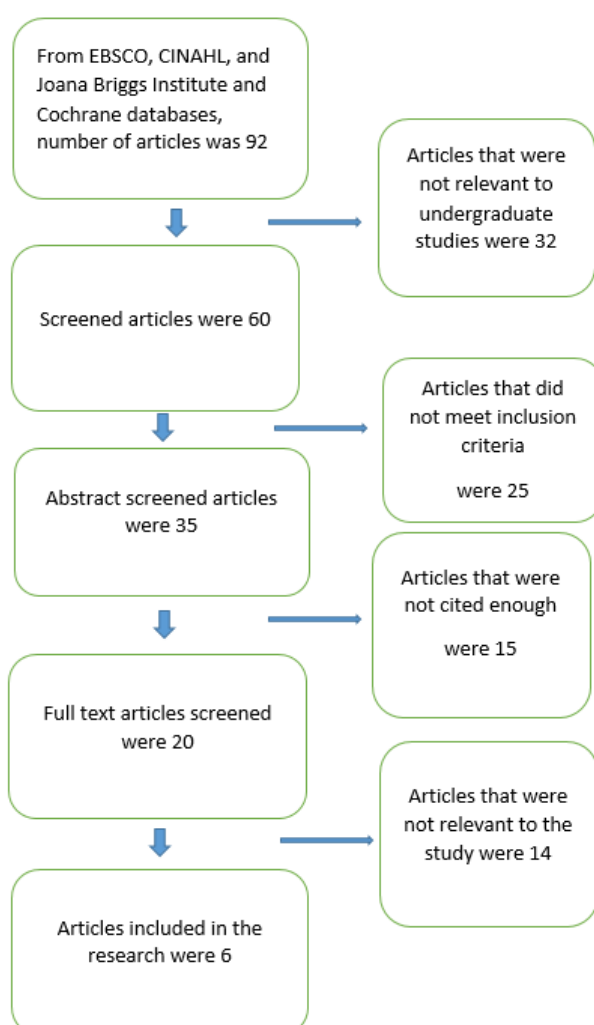


Figure 5 The systematic search process.

Searching 'Key Words' were used such as e-learning*, and nursing*, online course nursing*, innovative learning methods*. In all, 6 articles were included for qualitative content analysis.

Content analysis was used after data was collected to identify and explain different concepts related to the researched phenomenon (Bonnell and Smith, 2010). This method helped the authors to summarize and evaluate objectively various concepts associated with e-learning experiences of nursing students in order to detect upcoming trends in attitudes towards this type of education practices. Content was constructed of the concepts expressed by the nursing students in the previous evidence-based researches.

The process of inductive content analysis can be described using the following figure:

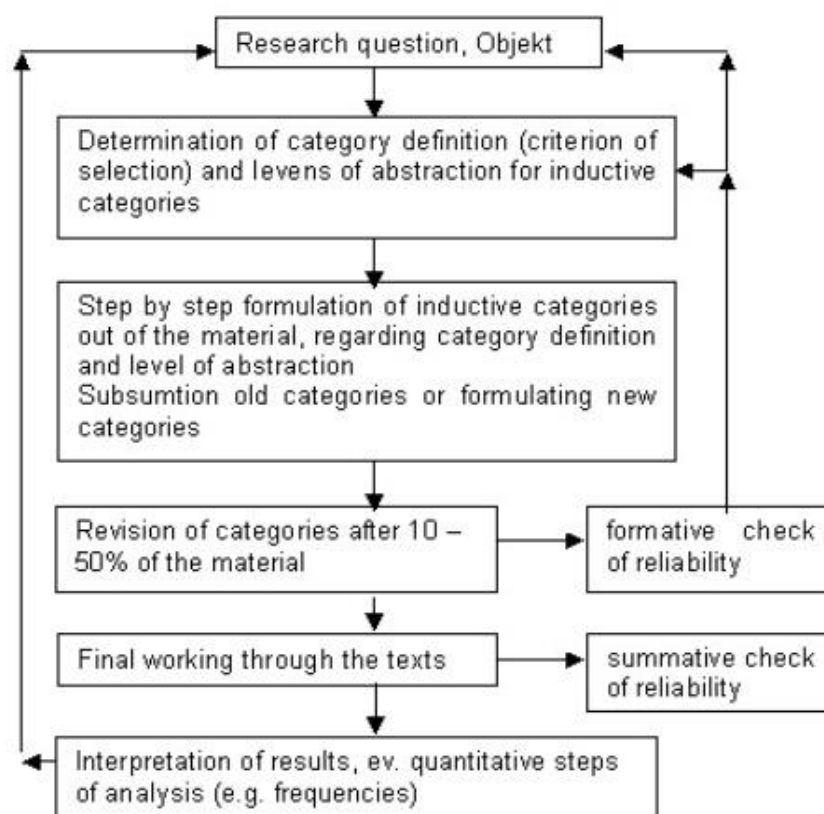


Figure 6 Step model of inductive category application (MAYRING 2000).

Conceptual inductive content analysis has been chosen by the authors for this research as it provides valuable insight into potential targeted users' thoughts towards training software, various online courses and e-learning in general. Inductive content analysis is a qualitative research method which is used to develop theory and identify general trends by studying documents, recordings and or printed and verbal material. Inductive content analysis relies on

inductive reasoning, in which broader trends emerge from the collected data through repeated examination and comparison (Mayring 2000).

The main idea of the inductive content analysis is to formulate a criterion of definition, derived from theoretical background and research question, which determines the aspects of the textual material taken into account (Mayring 2000). After that the selected data is worked through and different suitable categories are deduced. Then those categories are revised again and reduced to reliable main categories.

The aim of the research is to find out attitudes and experiences towards distance online learning, to identify its upcoming trends as a future learning form from the perspective of contemporary nursing students. Suggested study modules' advantages and disadvantages are compared to traditional courses and lectures using the methodology described in this chapter.

4.3 Data collection

Online learning in this research is identified as a specific mode of learning that is technology based, is fulfilled through the Internet and excludes face-to-face contact with the educator. These e-learning strategies can be either separate training applications, web based platforms, online courses or discussion forums (McCutcheon et al., 2014).

More and more scientific articles are dedicated to researching of the e-learning phenomenon in nursing and medical studies nowadays. For this thesis research the authors limited the articles to be reviewed based on the previously set inclusion criteria.

Studies selected for this research included:

- qualitative studies, which described in detail students' perceptions of the e-learning;
- systematic reviews, which summarized and reported the effects of e-learning in teaching both theory and clinical skills;
- pilot studies, which reported the impact of new educational methods in e-learning trialed on undergraduate nursing students.

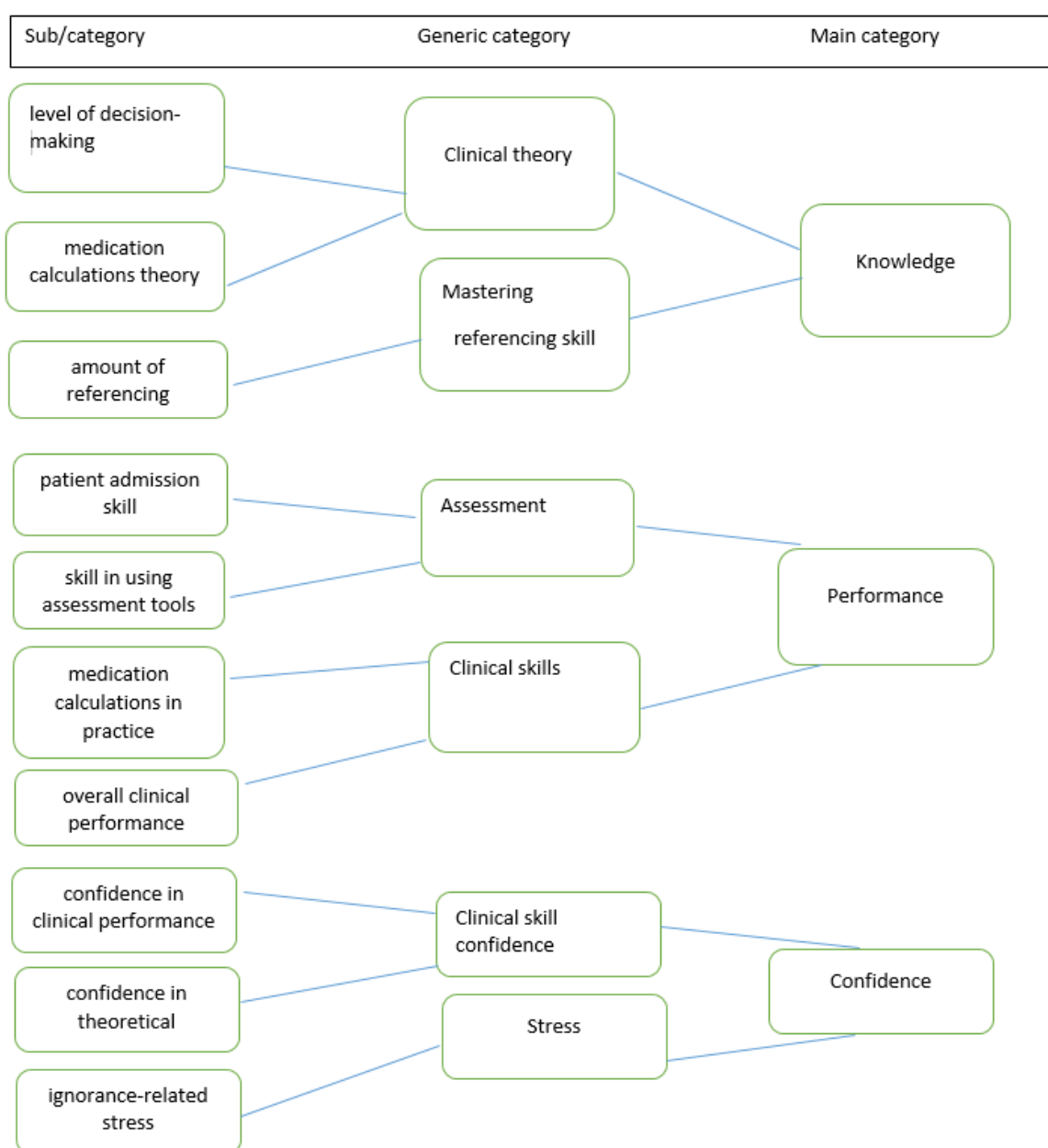
4.4 Data analysis

Beck (2001) suggested that the purpose of qualitative data analysis is to organize received data so that it can be synthesized, interpreted and presented in a written form and spontaneously analyzed during the data collection (Pop, Ziebland, Mays, 2000).

Borkan (1999) has illustrated the process of data analysis, which requires several steps such as recording notes, arranging collected data, and revising the data.

Then purpose of making any content analysis is to identify, to give examples and to explain coding rules for each category. Those category definitions are then combined within a coding agenda(Beck, Polit, Hungler, 2001). In this thesis research the collected data was analyzed using inductive qualitative content analysis.

The content of the articles revised in this research revealed the following concepts associated with the four main coding categories:



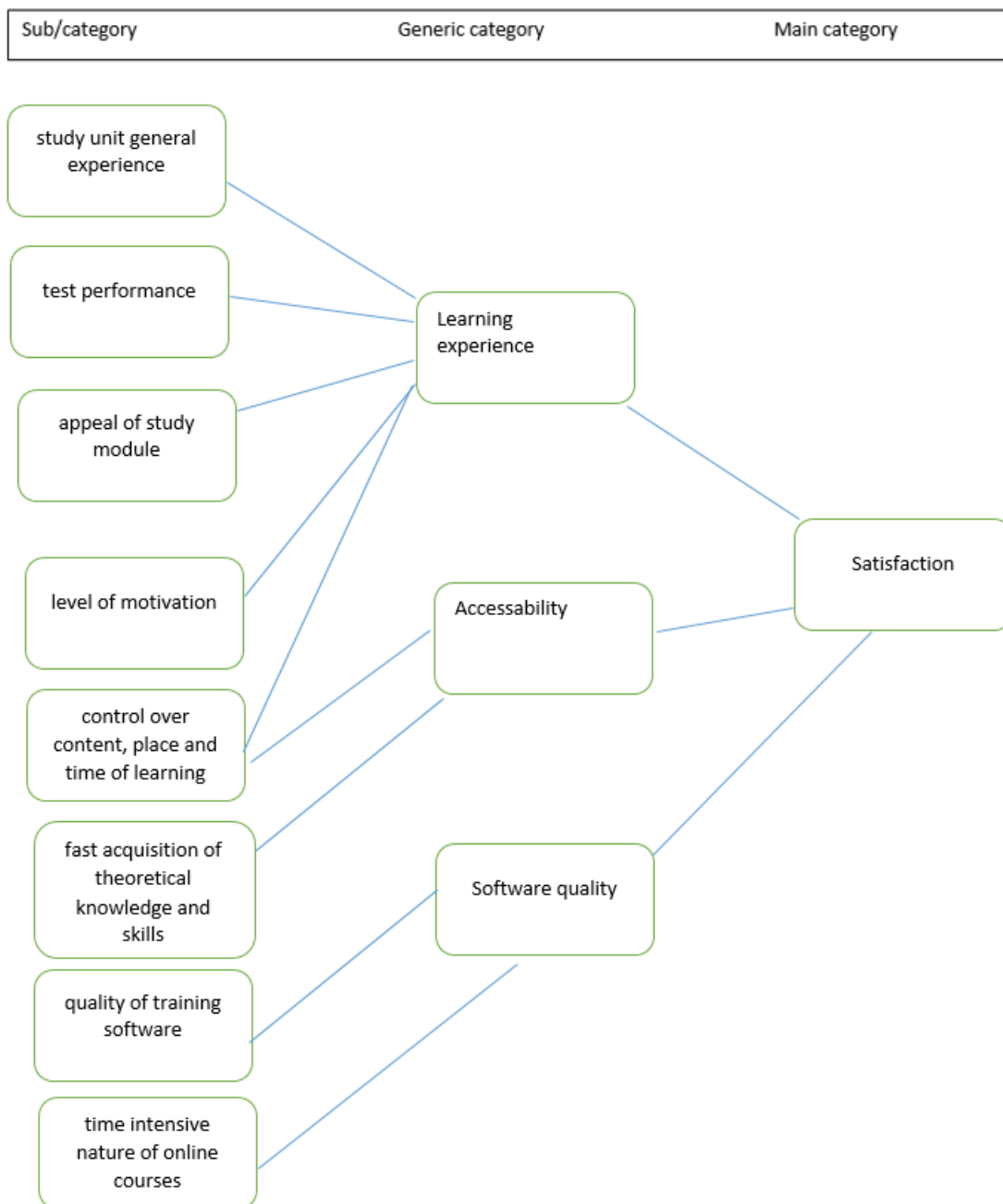


Figure 7 Coding categories and concepts.

In this research the authors identify the categories as follows:

1. Knowledge - the fact or condition of knowing something gained through experience or association.
2. Performance - execution of a specific action.
3. Confidence - feeling of being certain about something.

4. Satisfaction - the quality or state of being satisfied with something.

Concepts associated with Knowledge category can be defined as follows:

- level of decision-making (Feng et al. 2013, McCutcheon et al. 2014) - level of the students' ability to make clinical decisions in various situations.
- medication calculations theory (McCutcheon et al. 2014) - general or abstract principles of calculating the correct dosage of drugs, drip rates and dilution ratios.
- amount of referencing (McCutcheon et al. 2014) - the amount of referring to evidence-based sources of information by nursing students.

Concepts associated with Performance category can be defined as follows:

- patient admission skill (McCutcheon et al. 2014) - a learnt ability to admit patient to the ward following specific hospital protocol.
- skill in using assessment tools (McCutcheon et al. 2014) - an ability to use effectively hospital assessment tools.
- medication calculations in practice (McCutcheon et al. 2014) - an ability to calculate drug dosages, drip rates and dilution ratios.
- overall clinical performance (Feng et al., 2013) - general ability to perform clinical duties in hospital.

Concepts associated with Confidence category can be defined as follows:

- confidence in clinical performance (Feng et al. 2013, McCutcheon et al. 2014) - feeling certain about one's ability to perform clinical duties.
- confidence in theoretical knowledge (Feng et al. 2013, McCutcheon et al. 2014) - feeling certain about one's knowledge in general or abstract principles in nursing.
- ignorance-related stress (McCutcheon et al. 2014) - mental tension due to lack of knowledge.

Concepts associated with Satisfaction category can be defined as follows:

- study unit general experience (Feng et al. 2013, McCutcheon et al. 2014, Childs et al. 2005) - overall opinion about participation in a study unit.
- test performance (McCutcheon et al. 2014) - ability to perform in a series of questions or exercises for measuring knowledge or skills.
- appeal of study module (McCutcheon et al. 2014) - level of attraction of the study module to the nursing students.

- level of motivation (McCutcheon et al. 2014, Cook 2007, Welsh 2003) - level of motivating stimulus the students experienced while participating in online course.
- control over content, place and time of learning (Ilkay and Zeynep 2014) - power over content, place and time of learning.
- fast acquisition of theoretical knowledge and skills (Ruiz et al., 2006) - quick gain of theoretical knowledge and skills.
- quality of training software (Childs et al. 2005) - degree of excellence of educational software used in the online module.
- time intensive nature of online courses (Childs et al. 2005) - highly concentrated essence of online courses with short time period allocated for its completion.

5 Results

In the results, the contributed factors can be classified into four categories:

1. Knowledge - the fact or condition of knowing something gained through experience or association.
2. Performance - execution of a specific action.
3. Confidence - feeling of being certain about something.
4. Satisfaction - the quality or state of being satisfied.

Narrative synthesis approach was selected for this systematic review to structure the data relying predominantly on use of words and text (McCutcheon, Lohan, Traynor and Martin, 2014). This approach allowed the authors to summarise the findings and analyze them using conceptual inductive content analysis.

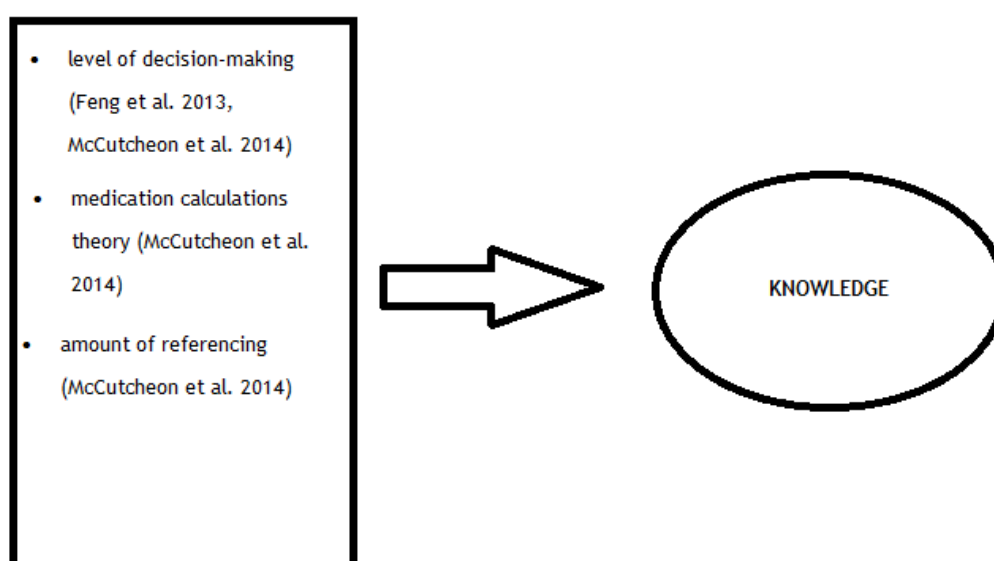


Figure 8 Coding category Knowledge and its concepts.

McCutcheon, Lohan, Traynor and Martin (2014) have identified and evaluated previous studies' outcomes on theoretical knowledge, clinical skills, self-efficacy and satisfaction of the undergraduate nursing students enrolled into various online courses. Based on the objective evidence, students' level of theoretical knowledge was improved significantly in most cases, however, some students preferred contact lectures in terms of gaining theory base.

Situated e-learning is a special form of e-learning which is based on case study. In this type of module students had an opportunity to practice their already existing clinical reasoning skills in designing nursing interventions for particular patient cases. Situated e-learning module is therefore somewhere in-between traditional online courses and simulations. Analysis of the collected data showed that situated e-learning had an overall significant positive impact on students' performance but no significant effect on their theoretical knowledge. Compared to contact studies, situated online course was proven to be significantly effective on performance and diminished on theoretical knowledge acquisition (Feng et al., 2013).

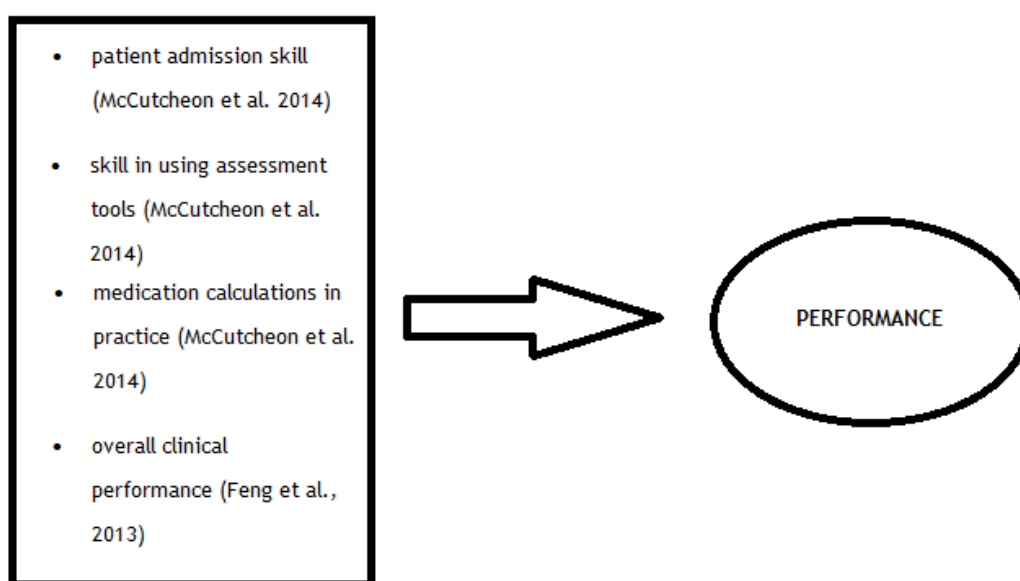


Figure 9 Coding category Performance and its concepts.

Nursing students reported their clinical skills following an online learning intervention to be less or similar to those obtained during face-to-face studies (McCutcheon, Lohan, Traynor and Martin 2014). However, as the authors have already mentioned above, with the situated e-learning module it was vice versa: students felt that their clinical skills have improved significantly when compared to theoretical knowledge (Feng et al., 2013).

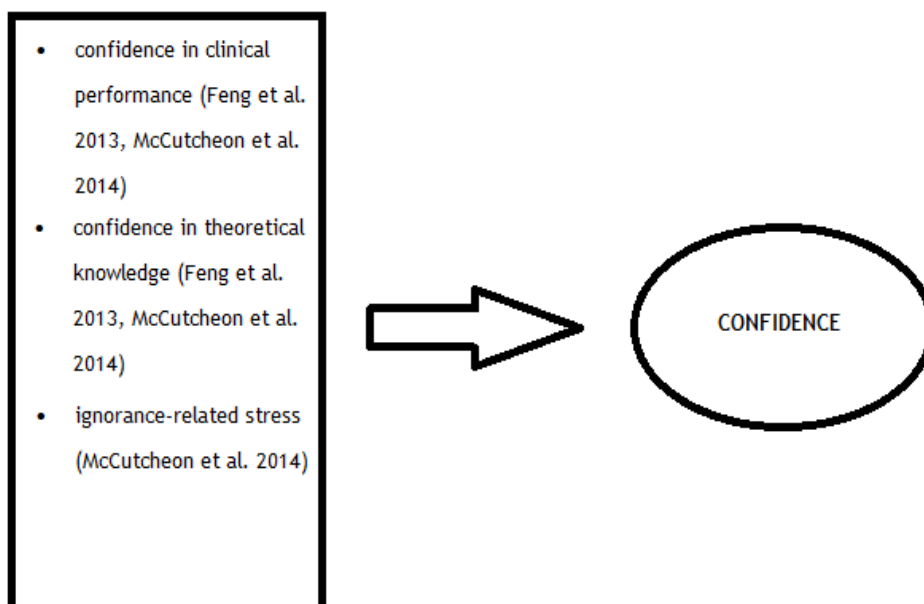


Figure 10 Coding category Confidence and its concepts.

According to McCutcheon (2014) students' confidence has been improved significantly after participating in e-learning modules as well as in their self-efficacy with medication calculations. Some students reported experiencing ignorance-related stress due to lack of knowledge they acquired from online courses. Confidence in clinical performance was increased substantially in groups of students taking situated e-learning modules (Feng et al., 2013).

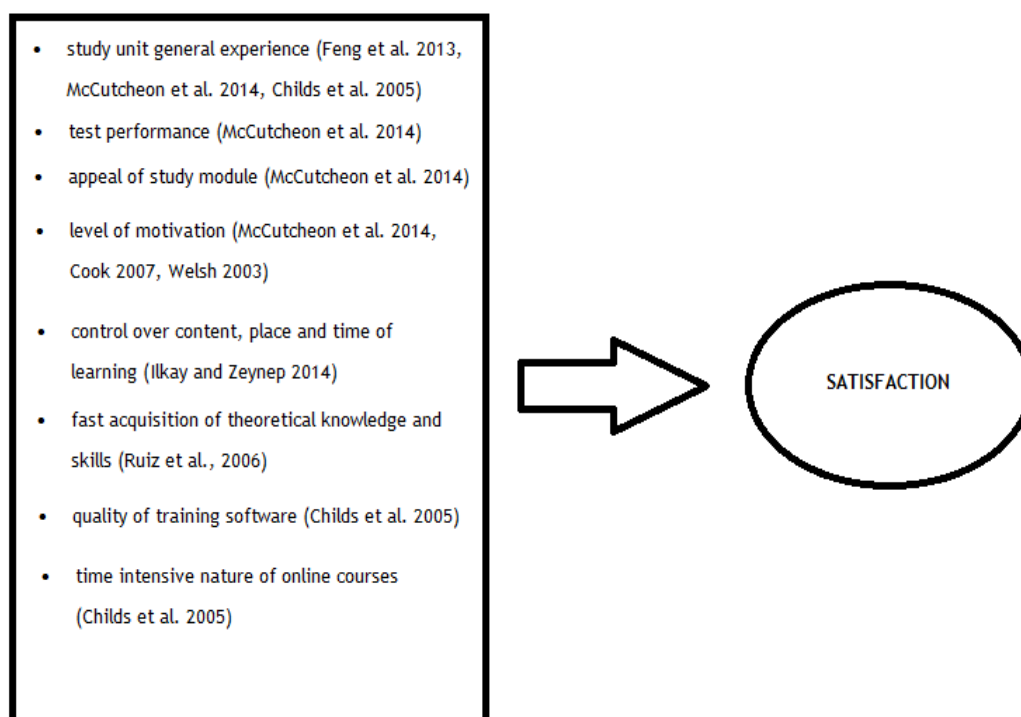


Figure 11 Coding category Satisfaction and its concepts.

User satisfaction with e-learning mode in general was varied: some nursing students found it to be interactive and exciting while others felt disadvantaged (McCutcheon, Lohan, Traynor and Martin 2014). Nursing students participating in situated e-learning module reported it to be more individualized and structured as the study materials were delivered online and not in the classroom (Feng et al., 2013).

The study that was carried out by Ilkay and Zeynep in Turkey (2014) demonstrated the results from meta-analysis that e-learning can increase students' own control over the content, place, and time of learning. Technology enhances student's ability to obtain theoretical knowledge and skills faster than traditional instructor-lead methods. An additional strength of different e-learning modules is their ability to standardize course's content and delivery when compared to traditional lectures with teachers. Automated tracking and reporting of learners' activities lessen faculty administrative burden. Application and web-based platforms can be designed to include outcomes assessment to determine whether learning has occurred through standardised testing which can be also timed if necessary (Ruiz et al., 2006).

However, there are potential disadvantages associated with e-learning. Amongst them are named technology-related costs, lack of information exchange and interaction with other learners, absence of the physical presence of the teacher, decrease in motivation to learn, and attenuation of the desire to compete with other learners (Cook 2007, Welsh 2003).

E-learning modules were also tested in workplace studies for NHS employees and as part of degree studies for medical students in North-East England. Afterwards, feedback from the trainees and trainers was collected. Both educators and students mentioned poor design of educational packages, lack of competition between the suppliers, inadequate technology, lack of skills, costs, time intensive nature of online modules as factors affecting negatively the effectiveness of e-learning programs. However, at the same time e-learning integration into studies was seen as positive solution towards supporting life-long learning for various healthcare professionals (Childs et al., 2005).

Another similar study was conducted summarising effects of implementing specialized e-learning modules for postgraduate physicians in Germany, UK, Hungary, Spain and Switzerland in 2008. Results of the study showed that after completing five test online courses focusing on acquisition, appraisal, application and implementation of findings from systematic reviews of therapeutic interventions, participants felt significantly more confident about assessing research evidence. All five educational modules had audio-visual materials included into their theoretical bases. Feedback of the participants demonstrated more positive attitude towards e-learning after completion of the test courses. The dropout rate was small, re-assuring the

researchers that computer-based learning is an acceptable method of learning in postgraduate education (Kulier et al., 2008).

Based on data analysis results, nursing students' theoretical base was improved in various aspects after taking online courses. Their clinical decision-making skills as well as referencing and knowledge of medication calculation rules were better after finishing e-learning study modules according to Feng et al. (2013) and McCutcheon et al. (2014).

Students' clinical performance has got mixed feedback after completion of online courses. Medication calculation in practice has improved as well as using a variety of patient assessment tools (McCutcheon et al. 2014). However, some of the participants felt that e-learning modules were not as productive for acquiring clinical skills and their overall clinical performance (Feng et al., 2013) was diminished after online studies when compared to traditional face-to-face studies with an actual instructor.

Majority of students who took online modules had their confidence level higher in theoretical knowledge than in clinical performance (McCutcheon et al. 2014). However, in case of situated e-learning studies, clinical performance improvement got better feedback than expansion of theoretical knowledge from the participants (Feng et al. 2013). Some nursing students reported the phenomenon of ignorance-related stress (McCutcheon et al. 2014), which they associated with online courses.

Overall experience of online study modules for nursing students was positive (Feng et al. 2013, McCutcheon et al. 2014, Childs et al. 2005). Online courses appealed to some students as exciting and interactive (McCutcheon et al. 2014), however, part of the respondents found them less motivating (Cook 2007, Welsh 2003). According to study conducted by Ilkay and Zeynep (2014), nursing students had more control over content, time and place of study with online modules than with traditional contact lessons. Students also named fast acquisition of theoretical knowledge and skills (Ruiz et al., 2006) and good test performance (McCutcheon et al. 2014) as positive sides of e-learning. Poor quality of training software and time intensive nature of online courses (Childs et al. 2005) were mentioned as current problems needing improvement in e-learning.

6 Trustworthiness

Trustworthiness aims to support the motion that the research findings are worth considering. Guba (1981) and Guba and Lincoln (1994) have identified the following principles to support the rigor of the study:

- credibility;
- dependability;
- confirmability;
- transferability.

Credibility refers to reports or publications being authentic so that the readers can believe that the data presented are a true reflection of the participants' view, experience or belief (Moule & Goodman 2009, 188). The authors of this study ensured credibility by following the appropriate method of conducting a systematic research.

Dependability is a criterion met once researchers have demonstrated the credibility of the findings. Dependability in qualitative research can be identified as consistency of findings over time and conditions (Streubert Speziale & Rinaldi Carpenter, 2007). In this thesis research authors ensured dependability of findings by using step wise replication approach: both of the researchers analyzed collected data separately and their findings were later compared.

Confirmability criterion can be fulfilled if the researchers leave a so-called audit trail, which can be later followed by other researchers (Streubert Speziale & Rinaldi Carpenter, 2007). Basically, confirmability of the study illustrates that similar results can be corroborated by other researchers later on. In our thesis research confirmability is ensured by connecting hypothesis closely to objective reality and established trends in nursing and medical professional education.

Transferability refers to the probability that these particular study findings can have meaning to others in similar projects (Streubert Speziale & Rinaldi Carpenter, 2007). To ensure transferability of this thesis research, the authors tried to concentrate on general trends in modern learning interventions such as the expanding of the different online modules in both under- and postgraduate education.

The researchers tried to avoid plagiarism by using paraphrasing and appropriate referencing as recommended by Laurea UAS official guidelines. Quotation marks were used accordingly in some cases as the authors wanted to retain some of the original meanings and references were sufficiently provided.

7 Ethical considerations

Ethical principles that guide nursing researchers are the same that guide nursing practice. These principles are set out in the codes of conduct nationally or internationally (Moule &

Goodman 2009, 56). In this study collected data were sourced via electronic databases, therefore there is a remarkable risk for researchers. Careful observations and ethical issues when selecting the primary material were considered with high attention so that copyright were not violated throughout this study.

Articles were checked twice to ensure their accuracy to increase reliability and trustworthiness. Since the ethical dilemma is always present in this type of research so researchers ensured their views by avoiding plagiarism and bias, proper use of in-text citation, and referencing technique to report findings. Additionally, academic fraud can be eliminated by reporting findings from analyzed articles in the original forms. Even though English articles were merely selected, the internalized materials described the e-learning phenomenon in nursing study around the globe so can be fairly generalized. Ethical decision-making methods are used in this study to avoid errors, fabrication and misinterpretation of findings. Theory was backed by scientific evidence and referenced.

8 Discussion

The findings and results support the aforementioned theories about e-learning's experiences from student's point of view. Technology has no doubt become an important part of life, healthcare and education, and its application should be continuously improved and serve users in daily activities, learning process and working life. That is why e-learning modules are going to grow as part of Nursing and medical education around the globe.

The result of the research shows that there are both advantages and disadvantages when it comes to online courses in Nursing degree studies. From the students' perspective, e-learning provides them with more autonomy in planning their own study timetables, more space for creativity and inspiration. In addition to this, online courses seem to be equal to traditional studies in providing theoretical basis in Nursing.

Online modules had varied impact on nursing students' clinical performance as some of the respondents felt that traditional face-to-face courses provide them with better clinical skills than e-learning courses without an instructor present.

E-learning modules increased students' confidence level in general, however, some of the respondents associated it with ignorance-related stress phenomenon and felt disadvantaged because of the online nature of studies.

Amongst important improvements to be done to the e-learning courses nursing students mentioned increasing quality of training software and online platforms as well as setting realistic timetable for the modules.

Despite the growing popularity of the online mode of study and its student-controlled nature, there is also a clear need for teacher who will be in charge of the course and provide the participants with inspiration, great life experiences, professional know-how and advice.

9 Conclusions

The purpose of this thesis was to answer the following research questions:

What is the general experience of nursing students about e-learning?

What are the advantages and disadvantages of online courses in nursing studies?

The fact is that educational facilities implement online modules more and more into their curricula. This happens because of constantly growing impact of technology on our lives as well as the dictated need to save financial resources by switching studies to more and more independent mode.

For this reason, the authors decided to conduct research on existing literature about general experiences of Nursing students with e-learning modules in different countries. This research was also meant to benefit the teaching and learning processes by analyzing collected data from reliable sources on the chosen topic. Through careful analysis of the evidence-based material both advantages and disadvantages of the existing e-learning courses can be identified. This would allow educational institutions to work on the problems and make online courses better in future.

The objective was also to gather opinions of the nursing students towards training software and their views as users onto integration of these applications into their degree studies. Quality of the educational software available nowadays was questionable, however, the students expressed optimism towards its further development and inclusion into their studies as they recognized the importance of getting acquainted with modern healthcare-related applications which are implemented successfully into working life and further professional development studies after graduation.

The results have confirmed the idea that learning can be promoted by using educational technology, and online course appears to outweigh the traditional one in term of time consumption, effort, cost, applicability and mutual interactivity.

However, this study had its own limitations which were, for instance, great variety of scientific material on this topic in design, methodologic quality, specific interventions used, and sometimes even target group and subjectivity of authors of the primary articles.

This research is worth further development in order to successfully implement new online courses into the future nursing students' study based on objective evidence provided by reliable scientific sources. Deeper analysis of the material can be done using conceptual content analysis method. This way researchers will reveal new concepts associated with online courses which will help to take the learning experiences of nursing students to a whole new level.

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Figures

Figure 1 Innovation space (Tidd et al, 2006).....	8
Figure 2 Pedagogical Models and their use In e-learning (Conole 2010).	10
Figure 3 The e-moderating model (Salmon 2003).	11
Figure 4 Systematic Review. Literature Search (The University of British Columbia, 2011).18	
Figure 5 The systematic search process.	19
Figure 6 Step model of inductive category application (MAYRING 2000).	20
Figure 7 Coding caterogies and concepts.	23
Figure 8 Coding category Knowledge and its concepts.....	25
Figure 9 Coding category Performance and its concepts.	26
Figure 10 Coding category Confidence and its concepts.....	27
Figure 11 Coding category Satisfaction and its concepts.	27

Tables

Table 1 Common characteristics of qualitative research method (Streubert Speziale & Rinaldi Carpenter, 2007).	16
Table 2 Inclusion and exclusion table.	18

