Electronic Assessment and Feedback Tool in Supervision of Nursing Students During Clinical Training

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Abstract: The aim of this study was to determine nursing teachers' and students' attitudes to and experiences of using an electronic assessment and feedback tool in supervision of clinical training. The tool was called eTaitava, and it was developed in Finland. During the pilot project, the software was used by 12 nursing teachers and 430 nursing students. Nine of the teachers participated in the interviews and survey, and 112 students responded to the survey. The data were mainly analysed with qualitative methods. In the eTaitava web-based user interface, the teacher constructs questions to map the students' learning process, and sets them to be sent on a daily basis. According to the findings, four-fifths of the students responded to the questions almost daily. They thought the software was easy to use and answering the questions took about 5 minutes a day. Based on the students' and teachers' experiences, the use of the electronic assessment and feedback tool supported supervision of clinical training. It supported the students' target-oriented learning, supervised the students' daily work, and made it visible for the teachers. Responding to the software questions inspired the students' cognitive learning, and based on the responses, the teachers noticed which students needed more support and could consequently allocate them more supervision time. Responding also supported the students' continuous self-evaluation, and considering the responses structured the students' and teachers' final assessment discussion. By means of the electronic assessment and feedback tool, it is possible to promote learning during clinical training by challenging students to reflect on their learning experiences. Students' professional development process can be supported through pedagogically planned conceptual supervision which is integrated into experiential learning during clinical training.The findings of the pilot study were encouraging, indicating that the method is worth further development and potentially useful in supervision in all fields of education.

Keywords: eLearning; mobile application; nursing; clinical training; supervision; reflection

1. Introduction

Information and communications technology creates new possibilities for supervision, but its introduction challenges the teachers' knowledge, skills, and attitudes as well as the operational culture in education. The fast and continuing development of technology puts pressure on staff competence, budgeting and purchasing of educational institutions, as well as on re-planning the curricula and implementation methods. (Lemke et al. 2009.) Although students and teachers use email every day, educational technology is taken into use surprisingly slowly.

One obstacle to the progression of ICT has been stated to be the autonomy of teachers (Finnish National Board of Education 2011). If the teacher has no interest in starting to use an ICT application in his/her work, educational institutions have hardly ever intervened. Kullaslahti (2011) has studied growth into online teacherhood, and according to her results, teachers' willingness to introduce educational technology was affected by their prior experiences of using information and communications technology, their views on whether the technology facilitates their work, and if its introduction is related to a development project. Introduction of educational technology requires boldness, courage, and self-confidence to disengage oneself from the old and justify one's choices. In addition, skills to use diverse communications tools and tolerance of technical uncertainty are needed. (Kullaslahti 2011.) When the use of ICT is increased in education, it is not enough if the teachers become excited; they are often also required to instruct students in using the technology (Tauriainen 2009). In Finland, ICT has been gradually utilised more in education as younger teacher generations have started their work, and nursing education has not been an exception to this. Students' attitudes towards using ICT in teaching have also become more positive.

ICT tools cannot be simply classified as good or bad; instead, it is essential how people can use them. The surrounding learning environments and pedagogical solutions define their value and significance in supporting learning. (Nurmi & Jaakkola 2008.) Therefore, teachers need to have an innovative approach to experimenting with various technological applications in their own work.

This paper will discuss how an electronic assessment and feedback tool called eTaitava was used as a supervision tool, and the findings of the case study will describe how nursing students and teachers

experienced it. The ICT-based computer and mobile software could provide teachers with an active supervision method to supervise many students at the same time. By using such a helpful tool, it is possible to be aware of many students' clinical learning process during the whole training period.

2. Background

Nursing is a practice-oriented discipline. In nursing education, theoretical and clinical studies are linked throughout the education. A third of the studies is implemented as practical training. In Finland, the training periods taking place in institutional and non-institutional health care have been divided into smaller periods of 3-8 weeks. Clinical training is supervised by a teacher and a nurse as the clinical supervisor. Teachers are responsible for providing the students with the theoretical foundation for the clinical training (Tiwari et al. 2005). Earlier, teachers met their students once or twice during a training period, but they do not have sufficient resources to do it anymore, and thus they have to ensure students' learning by other means (Saarikoski et al. 2009).

The training is evaluated, and the evaluation is based on reaching the objectives set for the training period. At the beginning of clinical training, the students set their own learning objectives, which are based on their learning needs and the learning possibilities offered by the training environment. The objective could be for example to learn how to prepare a sterile operating table, how to insert a cannula into a patient's arm, how to give home care instructions to a patient, etc. The students discuss their objectives with their clinical supervisor who should support them in reaching their goals. In practical training, the supervisors guide the students and are responsible for them.

Clinical training periods are complex and rapidly changing, and students face challenges in finding their own place in the ward and practice teams (Gidman et al. 2011, Jamshidi 2012). Students have experienced clinical training periods as positive if they have had stimulating and visible supervisors, a permissive atmosphere, and possibilities to reflect (Jonsen et al. 2013). During clinical training, students need support for their clinical skills, clinical training situations (Gidman et al. 2011), critical thinking, and problem solving ability (Jamshidi 2012). The supervision provided by nurses as clinical mentors has often been disturbed by lack of time and the pressure of other tasks (Ball & Pike 2005). If students are not provided with a possibility to participate in the care and learn by doing, their learning outcomes remain poor.

According to the Finnish national training development project, training supervision has to be developed and cost-effective models have to be generated for it. New methods are needed to support students' learning and professional growth. (Salonen 2007.) The objective is also to support students in learning to learn and self-direction. (Vänskä et al. 2011.)

The theory of constructive learning defines learning as the construction of knowledge. Thus, new knowledge is connected to the existing knowledge. The learner observes, interprets and understands things in relation to his/her own background of knowledge. Understanding is an essential part of learning new skills. When learning takes place in genuine environments, people are easily motivated and learning can be seen in behavioural changes. (Rauste-von Wright 1994.) The challenge of supervision is to encourage the transfer of learnt knowledge into practice. The academic staff and clinical mentors can both play their own role in it. The reflection of authentic situations promotes the students' competence to think, decide, and act in actual practice. (Mezirow 1990). There is a need to create and adopt continuing assessment methods which would positively influence students' learning. (Mezirow 1990, Tiwari et al. 2005.)

Feedback is one way to promote students' professional growth, confidence, motivation, and self-esteem (Begley & White 2003). It is important for students to receive both formal and informal feedback, as well as practical information and advice on how to improve their performance (Clynes & Raftery 2008). On-the-spot comments are typical informal methods of giving feedback and vital elements of the clinical learning experience. Summative formal feedback is given by an appointed supervisor and takes place at the end of the clinical training period. According to studies, students have reported dissatisfaction with the received feedback, possibly due to lack of time or the registered nurses' inability to give feedback (Clynes & Raftery 2008.)

Clinical supervisors have experienced it difficult to establish an effective relationship with students, provide feedback, and assess students (Moseley & Davies 2007). Student assessment has been experienced difficult, because there are no clear guidelines or assessment criteria (McCarthy & Murphy 2008). Some supervisors avoid giving negative feedback, because they like to maintain a positive relationship with students. Novice supervisors may avoid the feedback meeting with the student for fear of negative comments or over-reaction to criticism. (Clynes 2008.) There is a clear need to instruct the supervisors on how to give feedback (Clynes & Raftery 2008).

New methods are also welcome in student assessment; for example, it would be facilitated by tools, such as simple skills lists, which would give an overall view on the assessed matters (Barnett et al. 2010). According to the study of Kurz et al. (2009), structured graded skills lists used by students as self-evaluation tools improved their learning results. The student's self-assessment provides valuable insight into the student's self-evaluated competence and ability to evaluate his or her own performance (Pugh 1992). Self-evaluation, which means the assessment of personal objectives, performance and results, supports the development of reflective thinking, which is important in assessing personal competence in relation to demands set by the working life (Poikela & Poikela 2006).

Students understand their own responsibility in learning and gaining skills (Gidman et al. 2011). Assessment criteria and different tools could help them in self-evaluation process. The use of the electronic assessment and feedback tool described in this study is mainly based on the student's self-evaluation of skills list statements.

3. Design

3.1 Electronic assessment and feedback tool eTaitava

The electronic assessment and feedback tool, called eTaitava, connects learners, teachers and workplace mentors in on-the-job training environments (eTaitava 2007, Pirttiaho 2007). eTaitava has been used in approximately 30 educational institutions in Finland.

The use of the assessment and feedback tool can be understood as a technology-supported form of on-the-job learning, where learning is seen as holistic information processing and interpretation. In the clinical training place, learning is supported and controlled by technology to achieve the formal learning objectives. (Tauriainen 2009.)

The application can be used to send diverse series of questions to the student and training supervisor to monitor and assess the student's learning. The teacher constructs the questions through the eTaitava web-based user interface. The questions are saved and set to be sent on certain days. The daily questions can be either open-ended questions or statements such as "I have the basic knowledge of medical diseases" (see figure 1), and the student can answer the questions for example on the scale of 1-5 (fully disagree – fully agree). Another example would be a statement such as "I have practised giving medical injections", which the student would answer using the scale of 1-5 (not at all – very much). (Mettiäinen & Karjalainen 2011.)

The teacher's challenge is to construct series of questions which guide the student's learning process in accordance with the objectives and which the student experiences as meaningful. Based on the students' answers, the teacher has to ensure that the student's learning progresses during the clinical training period.

Students can answer the questions using either a computer or a smart phone. The answers are saved to the database of the eTaitava software, where the teacher can easily see the individual answers and group-specific summaries presented as graphs (Figure 2). The teacher can follow students' learning during the clinical training in real time (eTaitava 2007.) Pirttiaho et al. (2007) have described the technical features of the programme in more detail in their paper.
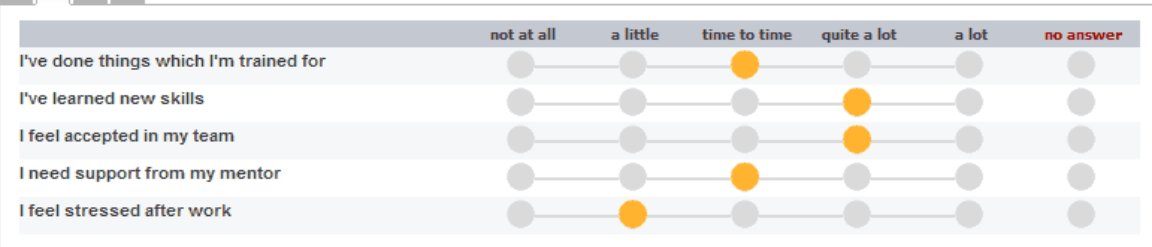
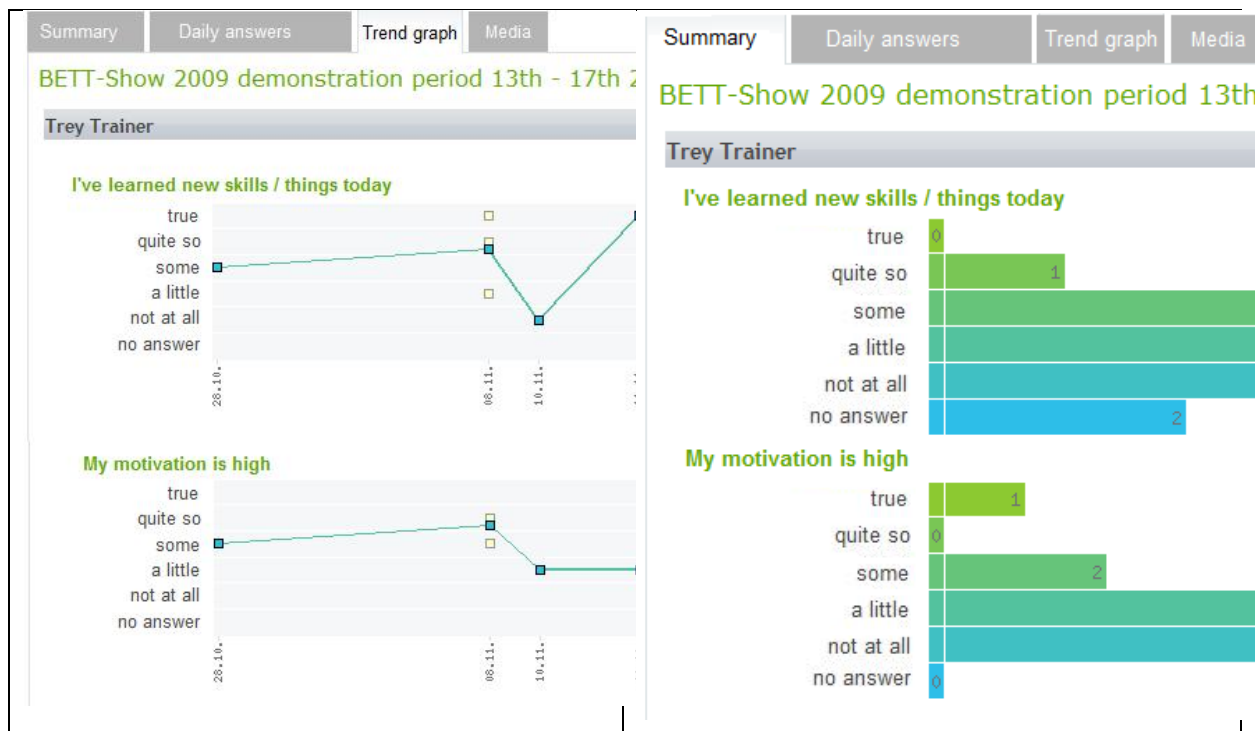**Figure 1.** Students' interface in eTaitava.

Figure 2. All answers are documented in a personal database where the teacher can follow either one student's answers on different days or the whole group's answers.

3.2 Construction of question series

In this pilot study, different series of questions were made for each day of the week. In order to facilitate the introduction of the programme in different clinical training periods, such question series were made for Mondays, Wednesdays, and Fridays which were applicable to all clinical training periods. The questions for Tuesdays and Thursdays were made separately for each clinical training period (see table 1). The same questions were repeated in different weeks in order to be able to follow the progress of learning, which was easy by means of the graphs generated by the programme.

Table 1. Question themes and related examples for different days of the week.

Day of the week	Question themes and examples
Monday	Adaptation to the work community and the student's activity *In my opinion the work community has a positive attitude to me.* *I have challenged my supervisor's habits and practices.*
Tuesday	Learning of substance (e.g. anaesthesia nursing) *I have practised entry of patient data into the anaesthesia information system.*
Wednesday	Factors affecting the student's learning *My personal learning objectives guide my learning.* *The learnt theoretical matters help me in my learning.*
Thursday	Learning of substance (e.g. anaesthesia nursing) *I know how to check the ventilator operation.*
Friday	Cooperation relationship with the supervisor and assessment of personal learning *I have received feedback on my work from my supervisor.* *I have searched for further information on clinical training matters at home.*

Registered nurses' professional competence requirements have been considered in construction of the questions. In the weekly progressing questions, attention has been paid to the progress of the learning process through motivation and commitment, identification of different matters, and training into mastering the necessary competence and more extensive entities. In all the phases, the questions aim at encouraging students to the continuous assessment of their work.

3.3 Programme introduction

The teachers who participated in making the questions started using the programme with their own students. After the first pilot, the eTaitava software was presented to all nursing teachers (N=70) and all who wanted could start using the software. The teachers received personal guidance in using the programme.

Before a training period, students had an orientation, during which they were told about the objectives and procedures of the clinical training. At the same time, they were taught to use eTaitava. The students were invited to answer the questions sent by eTaitava every day after their shift in the ward.

The supervising teacher presented the idea of the electronic assessment and feedback tool at the clinical training places and taught the supervisors to use eTaitava. Using the programme was voluntary for the supervisors, and they were encouraged to assess the student's progress once a week by using eTaitava.

According to an earlier study of Mettiäinen and Karjalainen (2011), students (n=112) found it easy to use eTaitava. The questions sent by eTaitava were similar in different weeks and half of the respondents understood that it was a useful way to follow their learning process. Half of the respondents thought the contents of the questions were well designed; the rest of them found them too easy or boring. (Mettiäinen & Karjalainen 2011.) After the first survey, the questions sent by eTaitava have been developed several times.

4. Aims of the study

The purpose of the empirical study was to determine nursing teachers' and students' attitudes to and experiences of using the electronic assessment tool in supervision of clinical training.

The studied questions were:
1. What factors contributed to the teachers' use of the new electronic assessment and feedback tool eTaitava?
2. What was the significance of eTaitava for students' learning in teachers' opinion?
3. What was the significance of eTaitava for students' learning in students' opinion?

5. Methods

5.1 eTaitava users

The target group was nursing students and teachers in one Finnish University of Applied Sciences. Twelve of seventy (17%) nursing teachers learnt to use the software and used it in their own work with their students.

During the first year, eTaitava was used by all 12 groups, which had 430 students. eTaitava has been in use during 19 clinical training periods, which consist of 3–7 weeks depending on the substance area, i.e. surgical, medical, perioperative, public health nursing, and basic nursing. One student group used it in three training periods, and five groups in two training periods. In addition, supervisors (N=10) from two special fields participated in using eTaitava during the first year (see table 3).

5.2 Data collection and sample

After the first year, nine of the twelve teachers who had used the software were interviewed. The interviews were implemented as group interviews for three persons at the same time. The interviews took about 1.5-2 hours. The interview themes were the teachers' experiences, and programme benefits and disadvantages. After the second year, all 12 teachers were sent a web-based questionnaire with seven open ended questions. Eight of them answered (see table 2).

After the first year, the survey was sent to 430 students (to all eTaitava users during the first year), and 112 of them answered. In this report, two questions are re-examined. Other findings concerning the students' experiences were described in the earlier report (Mettiäinen & Karjalainen 2011).

Table 2. Data collection methods and number of participants.

Focus group	Method	Number of respondents
Teachers (n=12)	Interview	9
Teachers (n=12)	Survey with 7 open ended questions	8
Students (n=430)	Survey (two open ended questions in this report)	112

Table 3. Clinical training periods during which the respondents (students n=112, teachers n=9) used eTaitava in the first year.

Clinical training period	*Number of groups*	*Number of students (respondents)*	*Number of teachers*	*Number of supervisors*
Basics of Nursing (4 weeks)	3	27	2	-
Medical Nursing (4 weeks)	2	17	4	6
Surgical Nursing (4 weeks)	2	6	2	-
Perioperative Nursing (7 weeks)	2	22	2	4
Public Health Nursing (3 weeks)	5	51	4	-
Home Care (3 weeks)	5	53	4	-

5.3 Analysis

During the three group interviews, the researcher wrote down what was stated. The qualitative data from the open ended questions and interviews were analysed by using thematic analysis and categorisation. The data were analysed inductively and deductively through the processes of comparative and content analysis. After the three-step inductive process based on the data (Miles & Huberman 1994), the data were classified into subcategories. After this, the subcategories of student and teacher data were reviewed side by side and the data were re-classified. The categories describing the students' responses were quantified. Finally, joint top categories were formed to describe the benefits of the programme.

6. Findings

6.1 Information on respondents

83% of the student respondents (n=112) were 20–25 years old and 95% were female. Almost all the students (94%) had a positive attitude towards using information and communication technologies in education. The teachers' (n=12) age varied from 30 to 56 years and their work experience as teachers from 2 to 27 years. They were all female.

The respondents included both teachers and students who had used eTaitava in several clinical training periods. Most of the students who answered the questionnaire had used eTaitava in the three-week training

period of public health nursing and/or in clinical training in home care. The teachers had also used the programme most in these periods (see table 3).

79% of the students answered the questions almost every day, 15% 3–4 times a week, and the rest of them once or twice a week. Most of the students did it at home after their shift. Most (68%) of them estimated it took five minutes to answer the questions, and the rest of them reported that it took 10–15 minutes.

6.2 Factors motivating introduction of new technology

In the interviews and questionnaire, the teachers were asked what factors contributed to testing the new electronic tool in supervision of clinical training. The contributing factors can be classified into four categories: 1) general interest in new methods, 2) desire to develop training supervision, 3) need for new supervision methods, and 4) compliance with others' decision.

Some teachers had a genuine interest in new teaching methods. When eTaitava was presented to them at the health care teachers' meeting, they experienced it inspiring and interesting. As they were offered the possibility to use the new tool, they started using it out of pure interest or desire to develop their own professional competence.

The teachers also had the desire to develop training supervision, and they considered eTaitava a suitable tool. They wanted better means to support the student's learning process and self-assessment. They experienced that new structure was needed for training supervision. eTaitava was seen as a tool enabling closer contact with the student. The software also makes it possible to improve the professional and target-oriented interaction between the student, supervising nurse, and supervising teacher, and thus it improves the quality of training supervision and supports its uniformity.

The teachers stated that there is an acute need for new methods. Students complete their clinical training periods around the region and regular visits to the students' training places are not possible due to lack of time and resources. It is impossible for the teacher to see the students weekly in these cases. During the brief visits, it is not always possible to have enough deep discussions to support the student's learning, especially if the teacher and student do not know each other in advance.

Some teachers also participated in using the software out of obligation. Other colleagues of the same course had agreed on introducing the software, and hence the rest of the teachers complied with their decision. For some, a contributing factor was that their superior had allocated them resources for learning this new software.

6.3 Teachers' experiences of the benefit of using the new tool

The teachers were asked how they experienced the benefit of using the eTaitava software in training supervision. The benefits of using the software can be classified into four categories: 1) it made the student's learning process visible for the teacher, 2) it structured the student's learning process, 3) it provided the teacher with information about the allocation of supervision resources, and 4) it structured the student's assessment discussion.

As the students answered the questions sent by eTaitava daily, the teachers experienced that they received almost real-time information on how the students' clinical training was going, if they had a supervisor in the training place, and if they had been able to participate in work duties. The software offers the possibility to follow the student's learning and competence development during the training weeks, which provides the teacher with a deeper picture on the student's learning. The teachers experienced that before the introduction of the eTaitava software, the students were so to say "thrown to the wolves" in the training places.

The teachers found that responding to the questions in the software helps students set better learning objectives for themselves and concentrate on the essential in their learning. Responding forces the students to think about the learnt issues and thus structures their learning.

The software provided the teachers with a tool to consider how often to visit each student, and thus they can allocate more resources to students who need more face-to-face meetings. With the help of the software, the

teachers were informed earlier if the students had difficulties in the training place, and they were able to intervene in the situation in time.

The software reports structured the final assessment, as the teacher now had data on which to base the assessment discussion and assess the achievement of the student's objectives. In eTaitava, questions can also be made for supervisors to help them in the assessment of the student's learning. eTaitava has been found to be at its best when the supervisors have also used it. This is a new way for the supervisors to give feedback and assess the student's competence, which are exactly the areas that have been found difficult in face-to-face contact (Mosely & Davies 2007).

As a whole, the software was experienced very informative. The teachers using the software considered that they could not handle the supervision of several students without eTaitava. It was experienced a necessary tool which they also wanted to use in the future. The software was especially valuable if the students' training places were far away and the teacher had no possibility to meet them.

The only negative feature from the teachers' viewpoint was the workload, as it takes a fair share of time to go through the answers. However, along with experience, they learnt to see the reports more effectively and in a selective manner, and thus found the essential information faster.

6.4 Students' experiences of using the new electronic assessment tool

The students were asked how eTaitava supervised their activities in the ward and what was the significance of eTaitava for their learning process. According to the findings, the significance of the continuous ICT-based supervision tool for learning during clinical training is that it can 1) supervise students to create better learning objectives, 2) supervise students' daily training activities, 3) inspire students' cognitive learning process, and 4) help students in self-assessment and reflection.

The students thought eTaitava helped them construct their learning objectives and update them. With the help of the questions sent by the programme, they became more aware of what they should learn.

eTaitava supervised the students' activities and helped them to pay attention to the asked matters: "It gave my clinical training a buzz, because it brought out the development needs." Answering the questions reminded them of the objectives of the whole clinical training period: "I maybe did some things more frequently, because eTaitava reminded of them weekly." eTaitava encouraged students to practise even things that were not in their own objectives: "I noticed that there was something I had not done at all, and I had not even thought that it could be done."

The questions in eTaitava also helped students become aware of some matters: "I considered the meaning of the work community more." eTaitava encouraged students to give feedback and find out things from the literature: "'Have you given feedback to your supervisor' made me understand that it can also be done."

Answering eTaitava questions helped students evaluate their learning experiences and the development of their competence. It also showed what the students had to practise more: "It mainly helped to analyse my own learning and clinical training as a whole."

In addition, answering eTaitava questions helped students think about matters both more independently and with their supervisor: "And answering the questions and giving vent to my feelings probably helped, as I only met the teacher for a couple of times and did not talk about the clinical training matters to others that much." eTaitava helped students reflect on their learning: "Answering the questions made me think what had happened during the day."

6.5 Meaning of the electronic assessment and feedback tool for learning and supervision

Based on the students' and teachers' experiences, it can be stated that the electronic assessment and feedback tool was useful in the supervision of the students' clinical training. It supported target-oriented learning, and supervised the students' daily activities and made them visible for teachers. Answering to the questions in the programme inspired the students' cognitive learning and, based on the answers, the teachers noticed which students needed more support and could allocate them more supervision time. Answering also

supported the students' continuous self-assessment, and considering the answers structured the final assessment.

Table 4. Benefits of using the electronic assessment tool as experienced by teachers and students (n means how many students underlined the aspect in question).

Students	Teachers	Summary
How did eTaitava guide your activities in the ward and what was the significance of eTaitava for your learning process?	How did you experience the benefit of using the eTaitava software in training supervision?	Benefits of the electronic assessment and feedback tool:
It guided me to create better learning objectives (n=27).	It structured the student's learning process.	It supported the student's target-oriented learning.
It guided my daily training activities (n=48).	It made the student's learning process visible for me.	It supervised the student's daily activities and made them visible for the teacher.
It inspired my cognitive learning process (n=19).	It provided information for me on the allocation of supervision resources.	It inspired the student's cognitive learning and helped the teacher to identify the students in need of more support and supervision.
It helped me in self-assessment and reflection (n=28).	It structured the student's assessment discussion.	It helped the student in continuous self-assessment and structured the final assessment discussion.

7. Discussion

7.1 Ethics and reliability

The students and staff were informed about the project when the electronic assessment tool was taken into use. The use of the programme was voluntary but recommended for the students. Using the programme was voluntary for the teachers. The supervisors in clinical training places were informed of the software which the students used, and it was voluntary for them to use it.

The research permit was received from a vice president of the university of applied sciences. Both the teachers and students were told that answering the questionnaires and taking part in the interviews were voluntary. No identifiers were attached to the respondents' data, and the students' anonymity was maintained during the whole research process.

Participation in the study did not harm the students or teachers, but possibly helped them consider learning during the clinical training in a deeper manner.

The study has limitations. The target group of the study was 430 students. The loss was 74 %, which weakens the reliability of the results (Munro 1997). The low response rate may have been influenced by the fact that more than six months had gone since some students had used the eTaitava software, and some students had already started their summer holidays. It is also possible that those students who did not actively use eTaitava or did not like it did not respond. Because using the programme was voluntary for the students, some of them did not use it at all, and some tried it only a few times and did not commit to using the programme. The results of the student questionnaire cannot be generalised, but they are encouraging for further research.

75% of the teachers who used the programme participated in the interviews. The interview time did not suit to three teachers. Based on the teacher interviews, it is worth investing in further development.

Some clinical training supervisors participated in using the programme. Two supervisors were interviewed, but the results will not be discussed in this report.

7.2 Introduction of the programme

This paper described the use of a new electronic assessment and feedback tool during nursing students' clinical training. The study investigated the students' and teachers' experiences of the new supervising method and the effects of the technology-supported clinical training on the students' learning.

The introduction of new educational technology often takes place in projects (Kullaslahti 2011). The participants of this development project were voluntary nursing teachers. They were 12, which is about a fifth of the nursing teachers in the university of applied sciences. The main contributing factors for the teachers starting to use the new tool were a general interest in new methods, a desire to develop training supervision, and a need for new supervision methods. The results confirmed the results of Kullaslahti's study (2011) on the development into an online teacher stating that personal interest in information and communications technology and motivation to develop the substance were factors which contributed to the introduction of new educational technology among teachers.

With the traditional supervision method, the teachers met the students only a few times during a clinical training period (Saarikoski et al. 2009). In the busy working life, do not have time for face-to-face meetings anymore, and thus new methods are needed (Salonen 2007). Via the ICT-based programme, the teachers are able to supervise many students at the same time and follow their learning process step by step.

The challenge for the teachers is to create right and appropriate questions for different training periods. The teachers experienced the construction of the questions difficult, and the questions were modified and refined several times during the two first years. In addition, Kullaslahti's study (2011) showed that diverse trials, as well as permitting mistakes and learning from them are typical for online teaching. Approximately half (n=7) of the teachers who used the programme participated in constructing and modifying the questions.

eTaitava cannot be defined as a good or bad tool (Nurmi & Jaakkola 2008) as its value and meaning for learning depend on the use of the software. The software enables an institution-specific way of programming the contents, and in principle every teacher can utilise it as he/she sees best. The introduction of a new method always requires persistence to learn a new way of working; in this case, a new way of supervising students.

7.3 Educational technology can be used to support reflective learning

As the students answered questions sent by the electronic assessment and feedback tool almost daily, they experienced that it guided their daily training activities, helped them in self-assessment, and inspired their cognitive learning process. The students thus had a chance to reflect on their learning experiences during the whole training period.

The findings confirmed the results of earlier studies, pointing out that educational technology can be used to support students' reflection and assessment of the learning process during training periods, both in nursing education and in other disciplines, too.

In the study of Dearnley et al. (2008), students used electronic portfolios with mobile technology (Pocket PC) to reflect and assess their practice experiences, processes, and outcomes in clinical settings. In addition, according to Biggs (2003), the portfolio made it possible to achieve positive effects by reflecting on the goals of learning, for instance how the student managed to connect theoretical knowledge and patient care in the clinical context. In Lai and Wu's (2012) study, students did three online activities developing critical thinking using tablets. In these activities, students could reflect their feelings of the daily practice, nursing process, and management of patient problems. Students' perceptions of the web learning environment were positive and they thought it supported their nursing and reflection skills.

In Mettiäinen and Vähämaa's (2013) study, nursing students reflected on their learning experiences of clinical training by taking part in a web-based discussion weekly. By sharing their feelings, they noticed the value of peer support. Web-based supervision enhanced professional discussion and helped students connect theoretical knowledge to the practice. It can possibly lead to a deeper understanding and show as better clinical skills. (Mettiäinen & Vähämaa 2013).

Niinimäki (2010) used mobile supervision based on text messages with teacher education students. The students answered the sent questions that assessed the development of their competence. This helped students focus their attention on the key aspects of the teaching practice and provided a basis for the students' self-assessment. In Tauriainen's study (2009), vocational upper secondary students used the mobile phone during on-the-job learning periods and wrote an online diary. The students called one another and talked about the events and work. They sent photographs which helped them recall the learnt matters. The use of the mobile phone and web environment became more active during the study; some average users became active users, but the number of passive users remained the same. The use of technology supported information processing and enabled the exchange of thoughts and experiences. According to Tauriainen's results (2009), professional skills developed further among students who utilised educational technology more.

7.4 Learning becomes visible for teachers through educational technology

The use of the programme made the students' learning process visible for the teachers, and hence they could better allocate their time to students who needed more supervision and support. Prior studies have also shown that along with online teaching, education has become more student-oriented (Kullaslahti 2011, Valtonen et al. 2007).

In Niinimäki's study (2010), where teacher education students reflected on their training experiences by using text messages, the teachers commented on them only if necessary – not all messages of all the students. In Lai and Wu's (2012) study, the web-based reflection environment allowed for the teacher to identify the student's problems sooner and made it possible to provide more individualised supervision when needed. In Tauriainen's study (2009), the students wrote what they had done and learnt during the day in an online diary, and thus the teacher became aware of each student's learning progress. Supervision in the web-based discussion forum offered the teachers the possibility to follow and guide the students' learning process step by step (Mettiäinen & Vähämaa 2013).

7.5 Challenges of using educational technology

The students experienced the use of the electronic assessment and feedback tool easy. For a majority of young people, learning to use educational technology is not a problem (Tauriaisen 2009). The students who answered the questionnaire thought eTaitava was useful for their learning process. However, the questionnaire was only answered by 26% of the student users. The use of the programme was voluntary but recommended for the students. Based on the log data, all students did not use the programme actively.

In his study, Tauriainen (2009) divided students into four user groups based on their technology use activeness. Some students remained passive users of educational technology, but according to Tauriainen, it was more a question of interest in and attitude to studies and educational technology than competence. One reason for the differences between the user groups can be different learning styles. (Tauriainen 2009.)

Students experienced the use of the eTaitava software in a variety of ways. Some students experienced answering the same questions frustrating and others wanted to have more demanding questions. Some students wanted to have questions more seldom, others wanted to have more questions at the same time. Some experienced the programme as a useless extra which was easy to forget. (Mettiäinen & Karjalainen 2011.) Similar results have been received in earlier studies. In the study of Dearnley et al. (2008), there were students who did not see the benefits of using the PocketPC or were afraid of using it.

According to Seppälä (2002), the utilisation of educational technology requires reflection, activeness, and self-direction in the learning process from the student. In addition, technology enthusiasm and willingness to try are needed. Both students and teachers should learn new courses of action and learning strategies (Tauriainen 2009).

The software was introduced on the nursing teachers' initiative. They had a need to develop training supervision. Only 20% (n=12) of them started using the new tool. The teachers' autonomy has also earlier been identified as a factor that slows down the introduction of new technology in the school environment in Finland (Finnish National Board of Education 2011). The teachers' tight schedules may hinder the eagerness with which teachers develop their teaching, as well.

Most teachers who participated in the pilot project experienced the programme easy to use, and they found that the use of the software had pedagogical benefits. It offers the means to make the supervision uniform and to structure the assessment of learning during clinical training.

All teachers did not experience the programme meaningful, and they participated in using the programme because their colleagues wanted to use it. In their opinion, it took too much time to use the programme, and they did not have time to follow the students' answers in eTaitava.

Along with experience, the teachers learnt to use the programme more effectively. Starting the programme for a student group and setting the timing of the questions kept them busy first, but after a couple of times, active users experienced the mentioned tasks simple and easy. Also Dearnley et al. (2008) note that many educators are at the novice or advanced beginner level regarding the use of electronic tools.

Training is critical for teachers and clinical supervisors, because if the supervising staff is not competent with the used technology, they are not able to encourage students to use it. It is vital that students have an appointed person who can support them in technical questions with ICT devices. (Dearnley et al. 2008.) In addition to pedagogical and substance competence, teachers should have willingness and competence to teach students to use the technology (Tauriainen 2009). This has an important role in encouraging students. The teachers' attitudes to technology are also reflected in the students' attitudes.

According to this study, the students used mostly computers at home, but in the future, studying on the move will be probably more and more common. Increase in the use of mobile Internet connections and mobile devices and the availability of better data connections at a lower price have enabled implementing online studies as mobile studies (Tauriainen 2009).

According to prior studies, supervisors have experienced assessment and feedback giving for students difficult. Effective support systems are needed, including preparation and support for both students and mentors (Gidman et al. 2011). Technology gives new possibilities, but at the same time challenges the teachers' and students' know-how and attitudes.

The electronic assessment and feedback software described in this study is a good tool for supervising practical training periods in the future as well. Its use should be developed further, and the teachers utilising the programme are the most adept people to develop it. In the future, it could be mandatory for the students to use it, because then every student would be committed to using it. Applying a tool that supports reflection is beneficial for developing one's competence according to the results of both this and prior studies. The teachers' commitment to using technology should be initiated based on their own interest and inspiration, since forcing them to use it does not necessarily lead to a meaningful end result.

8. Conclusions

The purpose of this study was not to investigate the features of the eTaitava software but its benefits for learning. The objective was to integrate the use of the electronic tool into learning during clinical training. The objective was achieved for the part of the students and teachers who were committed to using the programme.

The results of this and prior studies confirm the conception that learning can be promoted during clinical training by using educational technology and by challenging students to reflect. It was easier to maintain target-oriented learning during the whole training period by using the electronic assessment and feedback tool. The students' professional development process can be supported and structured with pedagogically planned conceptual supervision which is integrated with experiential learning during the clinical training.

This pilot study yielded results that were particularly encouraging, indicating that the project is worth further development. However, attention should be paid to the software features, such as user-friendliness, in the introduction of the programme. eTaitava is a good and efficient alternative to supervising training and could be a useful supervision method in all fields of education.

References

Ball, J. and Pike, J., (2005) Managing to Work Differently. Results from the RCN Employment Survey, RCN, London.

Barnett, T., Cross, M., Shahwan-Akl, L. and Jacob, E. (2010) The evaluation of a successful collaborative education model to expand student clinical placement, Nurse Education in Practice 10, pp 17-21.

Begley, C. and White, P. (2003) Irish nursing students' changing self-esteem and fear of negative evaluation during their preregistration programme, Journal of Advanced Nursing 42(4), pp 390-401.

Biggs, J. (2003) Teaching for Quality Learning at University, second ed. The Society for Research into Higher Education & Open University Press, Buckingham.

Clynes, M. (2008) Providing feedback on clinical performance to student nurses in children's nursing: challenges facing preceptors, Journals of Children's and Young People's Nursing 2(1), pp 29-35.

Clynes, M. and Raftery, S. (2008) Feedback: An essential element of student learning in clinical practise, Nurse Education in Practise 8, pp 405-411.

Dearniey, C., Haigh, J. and Fairhall, J. (2008) Using mobile technologies for assessment and learning in practice settings: A case study, Nurse Education in Practice 8, pp 197-204.

eTaitava. (2007) Ao Jyväskylä Vocational Institute. http://www.peda.net/img/portal/664066/eTaitava_en.swf?cs=1164287053. Read 6.6.2012.

Finnish National Board of Education (2011) Information and communication technology in education. Tools, effectiveness and benefits. Situation in 2011. Memos 2011:2. http://www.oph.fi/download/132877_Tieto-_ja_viestintatekniikka_opetuskaytossa.pdf.

Gidman, J., McIntosh, A., Melling, K. and Smith, D. (2011) Student perception of support in practise, Nurse Education in Practise 11, pp 351-355.

Jonsen, E., Melkender, H-L. and Hilli, Y. (2013) Finnish and Swedish nursing students' experiences of their first clinical practice placement – a qualitative study, Nurse Education Today 33(3), pp 297-302.

Jamshidi, L. (2012) WCES 2012 the challenges of clinical teaching in nursing skills and lifelong learning from the standpoint of nursing students and educators, Procedia – Social and Behavioral Sciences 46 (2012), pp 3335-3338.

Kullaslahti, J. (2011) Competence and development of the online teacher in higher education, Acta Universitatis Tamperesis 1613, Doctoral's Dissertation, University of Tampere, Tampere (In Finnish, abtract in English).

Kurz, J., Mahoney, K., Martin-Plank, L. and Lidicker, J. (2009) Objective Structured Clinical Examination and Advanced Practice Nursing Students, Journal of Professional Nursing 25(3), pp 186-191.

Lemke, C., Coughlin, E. and Reifsneider, D. (2009) Technology in Schools: What the Research Says, An Update, Cisco, Culver City. http://tinyurl.com/yczj9hp.

Lai, C-Y. and Wu, C-C. (2012) Supporting Nursing Students' Critical Thinking With a Mobile Web Learning Environment, Nurse Educator vol. 37, 6, pp 235-236.

McCarthy, B. and Murphy, S. (2008) Assessing undergraduate nursing students in clinical practice: Do preceptors use assessment strategies? Nurse Education Today 28, pp 301-313.

Mettiäinen, S. and Karjalainen, A-L. (2011) ICT-Based Software as a Supervision Tool in Nursing Students' Clinical Training. AICT2011, The Seventh Advanced International Conference on Telecommunications. http://www.thinkmind.org/index.php?view=article&articleid=aict_2011_4_10_10017.

Mettiäinen, S. and Vähämaa K. (2013) Does reflective web-based discussion strengthen nursing students' learning experiences during clinical training? Nurse Education in Practice 13 (2013), pp 344-349.

Mezirow, J.(1990) Critical reflection renewing learning as a catalyst. In Mezirow J. et al. (ed.) Fostering critical reflection in adulthood: A guide to transformational and emancipatory practice, Jossey-Bass, San Francisco.

Miles, M.B. and Huberman, A.M. (1994) Qualitative data analysis (2nd edition), Sage, California.

Mosely, L.G. and Davies, M. (2007) What do mentors find difficult? Journal of Clinical Nursing 17(12), pp 1627-1634.

Munro, B. (1997) Statistical methods for health care research. 3rd ed. Lippincott, New York.

Niinimäki, J. (2010) Case: Mobile supervision of teacher trainees in vocational teacher education, SeOppi, Education & training 01/2010, pp 14-15.

Nurmi, S. and Jaakkola, T. (2008) Do learning objects help to learn? In Ilomäki, L. (ed.) Digital learning materials as part of the learning environment, Finnish national Board of Ecucation, Helsinki, pp 8-15.

Pirttiaho, P, Holm J.-M., Paalanen, H and Thorström, T. (2007) eTaitava – Mobile Tool for On-the-Job Learning. In Sanchez, I-A. (ed.) IADIS international Mobile Learning Conference, Lisbon, pp 218-222. http://www.iadis.net/dl/final_uploads/200706C036.pdf. Read 6.6.2012.

Poikela, E. and Poikela, S. (2006) Assessment in the context of problem based learning. In Nummenmaa, A.R. & Välijärvi, J. (ed.) The teacher's work and learning, University of Jyväskylä, Jyväskylä, pp 139-153.

Pugh, B.J. (1992) Feedback in clinical teaching, Nurse Educator 17(1), pp 5-7.

Rauste-von Wright, M. and von Wright, J. (1994/2003) Learning and education, WSOY, Porvoo-Helsinki-Juva.

Salonen, P. (2007) Development project of clinical training 2004-2006. Final report, Centria University of Applied Sciences.

Saarikoski, M., Kaila, P. and Leino-Kilpi H. (2009) Clinical learning environment and supervision experienced by nursing students – changes during ten years, Hoitotiede 21, pp 163-173.

Seppälä, P. (2002) Mobile learning - flexible studying, Yliopistopaino, Helsinki.

Tauriainen, P. (2009) Technology supported on-the-job learning, Doctoral's Dissertation.University of Oulu, Oulu (In Finnish, abstract in English).

Tiwari, A., Lam, D., Yuen, K.H., Chan, R., Fung, T. and Chan, S. (2005) Student learning in clinical nursing education: Perceptions of the relationship between assessment and learning, Nurse Education Today 25, pp 299-308.

Valtonen, T., Kukkonen, J., Pursukainen, T. and Hatakka, J. (2007) eLearning environments challenge teachers' conceptions of learning, Kasvatus 38(5), pp 444-453.

Vänskä, K, Laitinen-Väänänen, S., Kettunen, T. and Mäkelä, J. (2011) How can you develop as a training supevisor in social and health care? EDITA, Helsinki.