

Students Learning in a Skills Laboratory

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ABSTRACT

Aim: The aim of this study is to gain knowledge about students' learning in a skills laboratory.

Method: All students in the bachelor programme were invited to participate, and they received a written form with five open research questions. The students were asked to freely express their own thoughts and opinions of their learning in the skills laboratory. The average response was 87%. The data was viewed as a unified text from each year in the curriculum. A content analysis was used.

Results: A feeling of security is a prerequisite for the learning process. Learning occurs through: an interactive teamwork and is influenced by a shared, practical environment; training of practical skills; a sensing/kinaesthetic involvement; having a 'modern-minded' master teacher at one's side.

Discussion: Learning is a complex non-linear process comprising many different factors. There seems to be a close link between knowing and being able to.

Conclusion: Learning takes place when thoughts, feelings, behaviour, actions and reactions are altered as result of experience and active teamwork. Learning must be understood as a change in previous competency through learning or relearning in a dynamic non-threatening environment.

KEYWORDS: Skills laboratory, learning, qualitative study, learning model, practical skills.

Background

Learning and training is a part of the bachelor degree in nursing, although unanswered questions remain as to how students learn practical skills.

Students express anxiety and worry about their perceived lack of preparation for practice through lack of time. Ethically it is necessary for students to master basic procedures prior to practising on patients. Peterson and Bechtel (1) describe the changes in healthcare as a complex technological progress necessitating additional nursing skills. In order to meet clinical challenges, skills laboratories have been established (2, 3 & 4). Flanagan et al. (5) underline that the training of practical skills in a laboratory also increases patients' safety.

Bridging the gap between theory and practice, the nursing educator can facilitate the transfer from theory to practical work by focusing on a controlled simulation of reality. Certain teaching strategies linked to the use of skills laboratories facilitate practical learning and self confidence (6). Students acquire unique learning experiences and request time with adequate equipment to get hands-on and visual pre-clinical experiences. In a secure setting, the student's experiences stimulate learning by bridging the gap between 'knowing' and 'doing' (5 & 7).

Many studies underline that significant learning takes place during debriefing periods following each simulation. Debriefing includes reflective practice and discussions between tutors and students. The ability to think critically, reflect, repeat performance and solve problems can aid students in becoming more adept and allowed them to increase understanding and insight (1, 2, 8, & 9).

One of the identified factors conducive to learning is an atmosphere of play. Humour and creativity increase the motivation for learning, strengthen relationships and improve memorising. Exploration, interaction and friendship in the role as nurse and patient was encouraged in a realistic, non-threatening environment. Taking both roles, students derived empathy for the patient and began rehearsing the nursing role. Third year-students guided first-year students and helped them to focus on knowledge and performance (10). The regular use of videotaping reduced stress levels. Practising self and peer evaluation in small groups gave students responsibility and support (11, 12, 13, 14, 15 & 16). These individual factors and various techniques affect learning acquisition, but are only 'parts' of a complex whole.

Lynagh et al. (17) found that medical skills laboratories led to an improvement in procedural skills compared to standard training or no training, when assessed by simulator performance and immediately

post-training. They point out that there is a lack of well designed trials addressing the transferability to clinical practice and the retention of skills over time. Further research must be carried out to address such matters.

The literature shows a lack of research on *how* nursing students learn in a skills laboratory. Consequently, a challenge for nursing science is to produce research focusing on how teaching and learning can improve in a larger context.

Aim

The aim of this study was to gain knowledge about *how* students become competent.

Design and method

Students were asked to describe in their own words their experiences of learning (18, 19 & 20). A descriptive design with a semi-structured questionnaire was used. The questions were answered in an open and unstructured way. Qualitative content analysis was used.

Sample

All students enrolled in the three-year bachelor programme were invited to participate and there was a high rate of response (table 1). Students at different levels ensured the variations and nuances in the learning experience. Thus the data collected represented student experiences from the whole bachelor programme at a middle-sized university college in Norway. Most students were in their late twenties. Five percent were male. Two students were from other cultures.

Table 1. An overview of the student's participation in the study

	1.st	2.nd	3.rd
Total number of nursing students at the university college	101	78	77
Number of participants	95	75	54
Percentage of participants who responded	94%	96%	70%

The average percent of returned responses for all three-years was 87.

Data sampling

Two questionnaires with five open-ended questions were employed first in the autumn and then in the spring. All students in the three-year programme received questionnaires. Participants answered the following questions: 1. How has your learning experience in the skills laboratory been until now? 2. Why did you want to become a nurse? 3. What do you expect to learn in the skills laboratory? 4. How do you prepare yourself for the supervision in the skills laboratory? 5. If any, what could be done otherwise to improve your learning?

This article focuses on question 1, which is considered to be the main question.

Method of analysis and interpretation of data

Content analysis with Kvale's (19 & 20) three levels of understanding were employed in a modified form: self-understanding, common sense and theoretical understanding.

At the 'self-understanding level' the interpreter attempts to formulate in a condensed form of what the subjects understand to be the meanings of their statements.

The analysis of the 'critical common sense level', go beyond reformulating the subjects self-understanding and includes a wider frame of understanding.

At the 'theoretical level', the literature review, combined with relevant research is used. After pre-sorting, several attempts were made to understand how students learned. Themes, patterns, opinions, similarities and differences were linked together. At the two first levels, 'self-understanding' and 'critical common sense', analysis was not guided by any specific theory. At the 'theoretical level', the results were discussed according to earlier research and actual theory.

Ethical considerations

The students were given information about the study and participation was voluntary.

In Norway it is not necessary with approval from the regional ethical committee for studies of this kind, since it did not ask for health or patient information.

The first author was a teacher for a small group (5%) of the students at the university college. There were, however, no possibilities of relating answers to specific students. Other personnel at the university college distributed the questionnaires. The data written by the student was treated with full confidentiality.

Results

Analysis of the results shows that there were no fundamental patterns in the way of learning between students from different levels. Nuances were however visible in concrete situations. Tacit knowledge become evident and is expressed in words and nuances.

The main finding is that a feeling of security is a prerequisite for learning and it occurs through interactive team-work, training of practical skills, kinaesthetic involvement and having a 'modern-minded' master teacher. Therefore the results from all three years are presented together.

A feeling of security is a prerequisite for the learning process

Feeling secure, especially at the beginning, seems to reinforce student coping. The possibilities for trial and error without the risk of negative sanctions increase the will to accept challenges and to enhance development. One second-year student expressed: «...Permission to make mistakes gave me a secure feeling in the learning situation. I learned to react more quickly and to acquire more information from the situation at hand.»

The majority of students stated that *something* was missing which prevented learning from being adequate. This 'something' was expressed as a *significant* condition. The analysis revealed this something to be security. One first-year student put it this way: «Well-being is an important factor for feeling secure. I think that well-being and security are two sides of the same coin.»

The quotes demonstrate that students consider security as an important prerequisite for interpersonal cooperation and learning.

Learning occurs through interactive teamwork and is influenced by a shared, practical environment

Peer-assisted learning and team building were positive in the learning process. Playfulness and humour were cited as promoters of opinions, creativity and motivation. Communication and teamwork became an important part of carrying out a nursing skill. The students benefit from collaborating with both students and teachers.

One second-year student wrote: «Differences are like a mirror; I understand myself and the situation more deeply. I see myself more clearly and the events I have been a part of.»

A first-year student described the importance of cooperation and communication in the following way: «Through cooperation with others I have learned about different roles, and I have learned much about the importance of considered and purposeful communication between nurse and patient and between nurse and other health care personnel.»

Students emphasized that a well-equipped and tidy skills laboratory had a positive influence.

Learning occurs through the training of practical skills

Team training gave a good basis not only in executing practical skills but also in becoming aware of important terms and concepts.

'Tacit knowledge' was transformed and given meaning in the social context of having different roles in the team. Unacceptable attitudes or incorrect perceptions were adjusted through feedback and training.

One third-year student described this: «I thought I could learn the different skills in practice. I have learned that this is not always the case. The different hospital departments have become so specialized. One fellow student told me that she has not had the chance to administer intramuscular injections on the wards where she worked, only in the skills laboratory.»

According to students, hands-on experiences linked to practical skills made learning more to remember. Positive feedback gave the students self-confidence. Acquiring practical skills takes time. Lack of time and crowded skills laboratories were the only factors the students criticized. One first-year student explained: «On occasions when I had ample time to learn, I learned most effectively.» The students felt that this form of learning is indispensable as a preparation for practical studies.

Learning occurs via a sensing/kinaesthetic involvement

The students stated how learning improved when feelings were involved. Their bodies had something to *tell* them. Students seem to learn through the body. Second and third-years students most clearly expressed ideas about body learning. Through sense training, they became more conscious, of and familiar with, body language and their own ability to feel and register impressions. Kinaesthetic learning became a gateway to changing attitudes and behaviour.

Students learned that simply washing the patient was more than patient hygiene. When they washed one another they had to include each other's experience, which increased understanding of the patient's needs. In these cognitive, social and emotional transferral processes, students linked practice with theory, especially in terms of how learning takes place. One third-year student wrote: «The way I was physically touched reflects a lot. Some of them sort of dusted me down, to put it ironically. I didn't like that kind of body wash.»

A second-year student recounted what she experienced when they practised various motions in relation to moving patients: «As a patient, one can become hypersensitive and irritable. While we were working on moving patients, the nurse constantly approached the bed in an unprofessional manner. In addition, the nurse was wearing shoes with wooden soles that made a noise. Didn't realize that I was so sensitive to pressure, noise or sounds, but I was irritated and thereby increasingly less cooperative.»

The skill in moving patients should not be seen as an isolated technique to be acquired. The students became more conscious of the sig-

nificance of observing, or sensing in such a manner that they were able to transfer this kind of instinct to practice.

Most important was the recognition of the fact that it takes time to acquire practical skills. A third-year student stated this as follows:

«Reflection made my experiences more distinct and helped me to identify the content and put into words some of the basic skills concepts. I had to cross some personal boundaries [in terms of the body] before the situations become ways of thinking and acting».

Various situations became important starting points for reflection and new insight.

Only in the category of kinaesthetic involvement there seems to be a fundamental difference in learning development from first to second and third-year students. The knowledge was no longer 'tacit'.

Learning occurs best with a 'modern-minded' master teacher by one's side

The students did not wish to have a traditional teacher just reproducing existing practice. They wanted a 'modern-minded' master teacher providing suggestions, being «door-opener, guide or pathfinder». They emphasized the importance of a teacher's guidance and a good role model who mastered the curriculum. One who followed up and stimulated understanding. Concise and tangible feedback provided the best learning effect and helped them reach their goals.

A third-year student expressed the view of the ideal teacher as: *«I learn best from teachers who have a high level of tolerance, are available and have an open attitude. The teacher must recognize my learning needs, not expect that I should copy unquestioningly whatever he/she does, even though I am the student. The teacher must not be pedantic, but should rather motivate and release energy, inspire learning, and be pleasant to be with. I need a person who questions and challenges me.»*

This quote confirms that the teacher's attitude contributes to directing student behaviour. Good guidance helped the students to see areas where additional work would give them increased learning and help them reach their learning goals. Furthermore, students wished for more time for guidance, because the acquisition of practical skills called for a solid integration of theory and practice.

The final pattern of the results is summarized in the model below:

A model of how students learn in a skills laboratory

The first part of the figure symbolized the early stage in the learning processes. There is a shared focus on learning, including the sharing of knowledge, skills, attitudes, and relationships which all influence the learning situation. Through different and/or repeated simulated learning sessions, the 'pieces of the puzzle' security, interactive teamwork, training, sensing/kinaesthetic and master teacher gradually fall into place.

In the second part of the figure, the puzzle pieces are fixed. The arrow point symbolizes that learning has taken place. Now the student understands and can do something new, because of changes in knowledge, skills and attitudes. The model shows that learning is a complex process of a relatively lasting behavioural change.

The development of the model

The complexity of the students' learning processes was difficult to describe in words. This fostered the idea of visualizing the process. The end of the analysis phase showed five factors which variably influenced students learning. The first piece that went into the puzzle was /feeling secure, because the students described this as the most important factor for learning. Later in the process, the other pieces, interactive teamwork, training of practical skills, sensing/kinesthetic learning and the modern-minded master teacher, fell into place. The last big jigsaw piece combining all, symbolizes the students experience of learning. The model has been adjusted during the research period after comments from peers, in order to meet the intention that the model should be as self-explanatory as possible.

Discussion

Security

According to the students in this study, feeling secure is fundamental to the learning processes, which is also shown in the model. Some students expressed that moderate anxiety can also promote learning, while strong anxiety restricts it. They describe anxiety during injection training. If the teacher or a peer student helps them to master this moderate anxiety, they learn about the importance of security and cooperation.

This is also presented in the research literature (7, 9 & 21). Neither the literature nor our study explored when anxiety hinders or block learning. Jensen (22) states that students at the end of the bachelor study in nursing realized that the relationship between confidence and anxiety was an important part of the learning process. Our finding supports this.

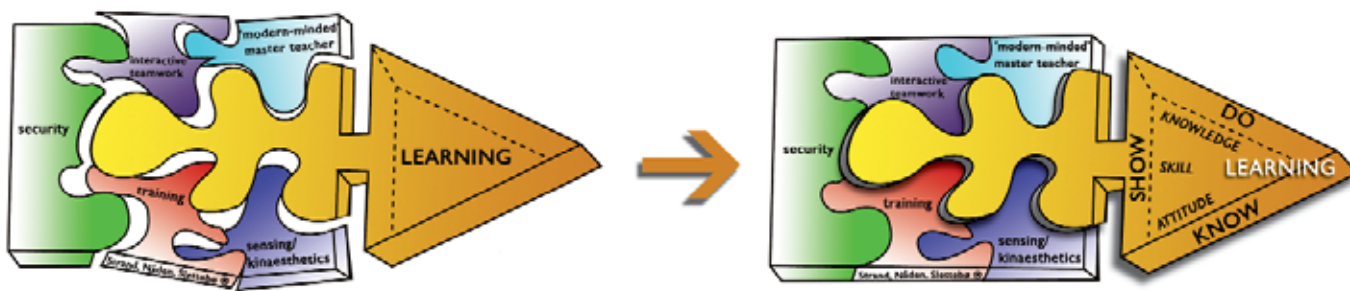
Interactive teamwork is influenced by the shared practice environment

The students indicated that their mutual relationships and teamwork activated and invigorated their learning. Time and space to be in agreement with fellow students leads to an increased understanding of learning and the ability to act. Disagreement can also aid students in reflection on their mistakes. In both cases, dialogue might foster understanding of the subject matter. This is also supported by Ker et al, Bakthin & Dysthe (11, 23, & 24).

Spouse (25) states that *socio-cultural theories* are helpful in understanding the complex interaction associated with supervising and learning professional craft knowledge.

Language in a social context provided an important foundation for thinking and awareness. The students learned that there is an interaction between feelings, the body and language itself. Their 'emotional barometer' had to be adjusted as a result of their experiences. The students in the study confirm that learning was optimal when they were actively involved, particularly in situations associated with interactive teamwork and self-consciousness. Students became aware of their attitudes and how they used their voices and postures in learning situations. By learning to interpret the reactions of others, the students learned about themselves. Thus 'learning by doing' gained renewed

Figure 1. The jigsaw puzzle model of learning



stature (26). Students emphasized that being more confident verbally motivated and increased their achievements. In addition, sharing experiences promotes confidence in the learning situation. This is in accordance with Weidner & Popp (16) who claim that positive outcomes identified by peer learners include a decreased level of stress or anxiety when working with peers compared with clinical instructors. Daley et al. (10) stated that those students learned not only with and from each other, but also by teaching each other.

Christiansen (27), Jensen (22) and Hessevaagbakke & Buberger (28) emphasize the importance of students learning from and with each other. This is a learning resource which the teacher should embrace. Also the student's own initiative and their mutual support are very important learning resources. Havnes (29) writes that there is an increasing interest in peer learning in higher education.

Training of practical skills

Enough *time* must be set aside for drilling practical skills, and for demonstrating their complexity. Students who practice learning skills in laboratory adapt more readily to the clinical field (8). The statements of students confirm the significance of time and space. They find it irresponsible to be sent into practice in the first and second-year without learning the basic skills in advance. Learning to listen to themselves and others was time-consuming. Spending one day practising one particular skill should be considered only as a starting point for developing adequate competence. Further personal participation and involvement is required. Thus learning became dependent on time and personal psychological processes in the interplay with social and contextual processes. The learning environment supports the linking of theory and practice. In line with other studies, our students express that they enjoyed learning in the clinical skills centre (30). Hessevaagbakke & Buberger (28) state that reflection and dialogue on practical skills promote learning.

Sensing/kinaesthetic learning

Merleau-Ponty (31) describes the basic interchange between body and subject with touching and being touched. To touch and be touched is a learning experience since individuals are both subject and object at the same time. The body is something we have as objects, and something we are as subjects. Posing questions and being open to impressions in the situation at hand are important in gaining an understanding of one's feelings and learning from them. For instance students found it more difficult than first presumed to perform certain actions in practice after reading the theory about the topics. Their physical experiences gave meaning to the situation and influenced them in a positive way. As mentioned before, it was only the students in the second and third-year who expressed this dimension. This may be due to a higher level of consciousness and maturity than in first-year students. Teacher experience tells us that it takes time to develop this kind of sensitivity. Inner processes, such as quiet reflection, are decisively important in the acquisition of knowledge, and awareness is an important key to change (32). This is fully in line with the students' opinions. In the reflective process, their bodies told them something they perhaps understood intuitively or had related to theory, but had not fully comprehended. Thus, reflection helped them to memorise knowledge as well as to express and understand the central terms of nursing science. Solvoll (33) discusses that sense experiences have potentialities in learning caring skills, and underlines the importance of participation and dialogue in the learning situation. Larsen (34) writes that students learn through the body. Their perceptions of touch, smell and emotion are mostly non-verbal, but get embedded in students' memories because of the practical training.

The 'modern-minded' master teacher

Different surveys conclude it is difficult to describe the term 'master teacher' fully (35). In the European understanding of the master teacher, learning occurs in a shared practical environment. Our students do not want a teacher who demands reproduction and carefully supervises all activity. The teacher should support and guide them so that they themselves discover what they are able to achieve. This new con-

cept was called a 'modern-minded' master teacher. Students want a teacher who challenges them, but at the same time instills trust and confidence (36 & 37). The teacher functions as a 'guide' and a 'pathfinder' and should pose questions which make the students aware of their own thought processes (38). Several students found themselves to be more creative and eager to pose questions when they were involved in a dialogue. The ability to ask questions was a key to learning. By actively posing questions, students found that they developed a more reflective and critical mode of thinking. In addition, the learning environment was found to be more secure when feedback was given. An increased appetite for learning was a result. Schüssler and Imsen (39) maintain that a lack of feedback is one of the reasons which lead to frustration among students. Godson et al. (40) evaluated student nurse learning in the clinical skills laboratory. The authors argued that mentor feedback was important.

The 'modern-minded' master teacher, who guides, poses questions, challenges and supports students is a crucial element in a communicative and interactive learning process.

A study from 2009 (41) supports our finding. Medical students also wanted teachers to be considerate and take them seriously and responding to questions. The students appreciated enthusiasm and didactic skills that stimulated to deep and active learning.

The accuracy, relevance and interpretation of the data were reviewed and confirmed by two competent colleagues (42). To ensure that the findings reflected students' voices, third year students were asked to comment on the findings for communicative validation (20).

Implications for further research

The model can be tested in skills laboratories or in practice to see if this is an effective way of learning. A pilot test study is currently being developed. Moreover, an investigation is needed on how the broader use of information and communication technology and simulators can have an impact on learning.

Summary and conclusion

This study has examined students' responses to how they learn in a skills laboratory. The responses have been sorted into four categories: interactive teamwork, training of practical skills, sensing/kinaesthetic involvement and having a 'modern-minded' master teacher. Students' responses point to the importance of feeling secure while training and developing nursing skills.

This study shows that learning take place when thoughts, feelings, reactions, behaviour and actions are altered as a result of experience and active-teamwork. In this perspective, learning must be understood as something new; a supplementary proficiency or a change in previous competency through learning or re-learning.

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