

Why do nurses utilize textual knowledge sources at work?

Björg Christiansen, Associate professor, Dr. Polit.

ABSTRACT

Aim. The aim of this paper is to shed light on why nurses utilize textual knowledge sources in a hospital workplace setting. The paper focuses on the following research question: Why do nurses utilize textual knowledge sources at work?

Background. Knowledge utilization implies that nurses rely on knowledge sources that are regulated at a more general level. Knowledge utilization may be triggered by uncertainty or novelty in task requirements.

Methods. The data derives from 10 semi-structured in-depth interviews with nurses, conducted during spring-05. Six of them also kept logs for two days during two weeks during the fall semester of 2005. In addition, a focus group interview with three of the nurses was conducted in the spring semester of 2006.

Findings. The reasons for using textual knowledge sources seem to crystallize into three interrelated themes:

1. To fill in gaps of knowledge needed to understand or solve problems at hand
2. To verify and enhance skills
3. A desire to strengthen their professional repertoire

Conclusion. The reason for knowledge-utilization seems to encompass both instrumental and conceptual purposes. This area is in need of further exploration.

KEY WORDS: Clinical nursing, knowledge utilization, textual knowledge sources, research utilization

Introduction

Nurses, both on an individual basis as well as in collaboration with colleagues, have traditionally been responsible for establishing and securing the standards of good nursing practice (1). This responsibility emerges from a mandate given by society (2). Rapid changes and specialization in today's hospitals call for high skilled performance among nurses. Even though nurses find themselves in pressured work situations in hospitals, they still express an obligation to do their work in a quality-conscious way (3,4,5). According to Byrnes and West (6) nurses in today's society are expected to deal with an increasing body of scientific, technical and professional knowledge in addition to meeting patient's needs. Working with different patient groups and levels of responsibility requires that nurses keep up with changing knowledge demands and embrace the notion of continuous learning (7). Despite calls to increase the use of research in nursing, individual as well as organizational determinants seem to create some barriers in this area (8,9,10). In relation to knowledge translation initiatives in health care environments, Estabrooks et al.(11) view *knowledge utilization* as a more common term than either research implementation or knowledge translation.

In this article *knowledge utilization* signifies a broad view on the use of textual knowledge sources as supporting working structures, materialized in hands-on literature, textbooks, articles, intra- and internet, procedures, guidelines and so forth. A feature of such sources is that they are general in nature and not necessarily rooted in local practices. Thus, knowledge has to be adapted by the nurse depending on the patient he or she is working with, both at a group or an individual level. Even if a number of studies has investigated research utilization among nurses in clinical practice (10,11,12), there seems to be a lack of studies concerning what pushes nurses to access and use various textual knowledge sources in a broader sense at work.

Background

Knowledge utilization is an essential component in today's nursing practice (13, 14). Knowledge takes on many forms, each of them rooted in particular epistemological traditions. Knowledge utilization implies that nurses also rely on norms and standards that are regulated at a more general level. Knowledge utilization may be triggered by

uncertainty or novelty in task requirements (15). Benner (16) emphasizes that novices need rules and external knowledge to guide their performance. The expert nurse, however, does not base performance on rules and guidelines anymore. Her/his work is dominated by a deeper tacit understanding of situations and procedures. Like Benner, Eraut (17) claims that the use of guidelines and manuals is especially important for new nurses, and they are often used in novel situations when problems occur.

The primary intention of textual knowledge sources at work is to ensure professional competences, learning and quality. According to Estabrooks et al.(11) it is critical to find a fit between theoretical perspectives and the context in which theory is to be applied. A common interpretation is to distinguish between an instrumental and conceptual use of knowledge. Referring to research utilization in clinical practice; Kirkevold (18) distinguishes between instrumental use which complies with demands in specific situations, while conceptual use enhances a more comprehensive and interpretative understanding of subjects and problems.

The increasing emphasis on evidence-based nursing and quality assurance systems seem to challenge a view of the nurse as a self-disciplined professional, underlining the need to interact with updated guidelines and standardized methods as textual tools in daily work. Authors within the sociology of professionalism are examining the current standardization movement which forms the foundation of collaborative international research protocols and guidelines. Freidson (2) argues that standardization may have positive virtues as a corrective to inappropriate or irresponsible discretion, even if standardization also runs the risk of degrading the service and losing unanticipated knowledge. Timmermans & Berg (19) argue in favor of procedural standards as coordinating devices in an ever more complex health care system, transferring scientific knowledge to individual physicians. According to Knorr Cetina (20) quality assessment involves interacting with knowledge objects (sources) closely related to the problems at hand, as a safeguarding practice.

Several studies have investigated issues related to knowledge utilization. Findings in the ProLearn project suggest that nurses address the need to continuously renew their knowledge base as an integral part of professional practice (21). Cultures of knowing, "epistemic cultures" refer to communities in which people learn and share knowledge and which are also the sites of knowledge production (11).

Workplace learning is strongly situated in the work itself and its social and organizational context (22). Professional learning also concerns the characteristics of the respective professional knowledge, accessible knowledge sources, and to what extent these sources are made available at the workplace (23). Whether nurses work independently, collaboratively, or both, guidelines urge nurses to work in line with professional and ethical standards (5,24). An intention of various forms of clinical practice guidelines is to provide evidence-based knowledge for decision making for patient care. Roberts et al. (12), claim that guidelines have been poorly adopted by health care providers. One reason for this may be the static paper-based formats, isolated from the context of care itself. The use of information technology in various forms as an adaptive knowledge tool required for nurses' delivery of care is increasing. This is often linked to research utilization and evidence-based practice. According to Estabrooks et al. (25) Internet use at work among nurses was low compared with other groups despite adequate workplace access.

In a systematic review, which examined individual characteristics of nurses and how they influence the utilization of research, the most frequently replicated result was a positive attitude towards research significant for general, but not specific use (8). In a national survey Egerod and Hansen (13) explored Danish cardiac nurses' attitudes towards evidence-based practice and the types of knowledge they employ in clinical practice. They found that bed-side nurses were less familiar with the concept of EBP. Adamsen et al. (26) identified two important barriers for research utilization among 79 Danish clinical nurses: The quantity of research results was overwhelming, and they were unable to evaluate the quality of the research. In a systematic literature review Meijers et al. (10) found that several contextual factors seem to have a statistically significant relationship with research utilization. These factors include the role of the nurse, multi-faceted access to resources; organizational climate; multifaceted support; time for research activities and workplace learning. A literature review by Spenceley et al. (27) focuses on empirical work that examined nurses' use of information to guide practice. They note a high reliance on informal, interactive sources, influenced by development in the area of information – seeking to support practice. Focusing on professional development amongst nurses in Iran, the participants argued that they benefited more from theoretical knowledge when it was tailored to real needs in practice (28). According to Christensen and Hewitt–Taylor (29) a nursing culture in which following guidelines are seen as the highest quality indicators would be considered to restrict care rather than enhancing it.

Even if the studies referred to illustrate characteristics of nurses' use of especially research based knowledge, there seems to be a need for further studies to delineate *why* nurses relate to textual knowledge sources as part of professional activity.

Aim

Drawing on a selection of data from the study: *Professional Learning in a Changing Society (ProLearn)*, the aim of this paper is to shed light on why nurses utilize textual knowledge sources within a hospital workplace setting, focusing on the following research question:

Why do nurses utilize textual knowledge sources at work?

Design

The project *Professional Learning in a Changing Society* was a four-year study funded by the Research Council of Norway. The project coordinator is working at the Institute of Educational Research, University of Oslo. The project involved four professional groups, represented by ten nurses, teachers, accountants and computer engineers. A qualitative approach was chosen in order to gain insight into how nurses, as well as the other professional groups relate to knowledge as a way to assure high quality work. When studying learning in the workplace, researchers are faced with the challenge of devising methods and techniques that allow informants to articulate the more informal aspect of such processes (17). In order to explore such processes, a

narrative approach allowing informants to describe their work in their own terms was adopted. This paper focuses exclusively on the group of nurses.

Methods

A survey of students graduating from Oslo University College in 2001/2002 (StudData) was used as a basis for selection, covering the four professional groups. Ten people from each group were chosen for participation based on the following criteria: They had worked for approximately three years; they were under 30; the gendered sample was to correspond to the group's profile in the survey, still ensuring that the sample comprised a minimum of two participants from the minority gender. Of those who met these criteria, the persons with the longest work experience were invited to participate in the study. As a result, 8 female and 2 male nurses were interviewed. The working places of the nurses were hospitals, except for one that was an outpatient clinic. Five of the nurses who worked in hospitals were employed in various intensive care units (postoperative, coronary and pediatric), three in medical wards, and one in a surgical ward.

Data presented in this paper is selected from semi-structured in-depth interviews with the nurses, conducted during spring 2005. Essential topics guiding the interviews were professional identity, learning opportunities and use of knowledge media (literature, manuals, web). The interviews lasted for approximately one hour, and were all audio-recorded. Each interview was thereafter transcribed verbatim. In addition the participants were asked to participate in the next phase of the study by reporting in logs from two days during two weeks (4 days altogether) during the fall semester of 2005. Seven of the nurses agreed to participate. Five of them were employed in intensive care units, one in a surgical ward and one in an outpatient clinic. The following themes were addressed in the logs: deliberations on professional matters and on the use of knowledge sources (books, manuals, web-sites, colleagues etc). They also commented on problem solving events, outcomes and learning. In addition, a focus group interview with three of the nurses was conducted in the spring semester of 2006. They were all employed in intensive care units (coronary, pediatric and postoperative). Even though the limited number and selection of participants in the focus group was unintended, we experienced a richness and complexity in the group's responses. The themes followed up on essential topics that evolved from the analyses of initial interviews and logs.

Ethics

The study is conducted in accordance with guidelines from the Data Inspectorate (<http://www.datatilsynet.no>). The participants were informed that the participation was voluntary, and that they had the right to withdraw at any time. Written informed consent was obtained from each of them prior to the interviews, including their consent to the use of audio recordings. Written informed consent was also obtained in connection with their reporting in logs.

Data analyses

The initial analysis was conducted according to the following steps:

1. Working out themes based on the theoretical framework of ProLearn.
2. Editing the individual interviews and logs into a qualitative, computer based program (Atlas).
3. Codifying data in line with the themes (by Atlas).

For the present article, I have analyzed data from the individual interviews, logs and focus-group interview, focusing on nurses' use of knowledge media such as literature, manuals, web etc in the workplace. Based on these particular text excerpts, the aim has been to interpret the informants' perspectives on why they use knowledge sources as these are applied within a workplace setting. A hermeneutic approach (30) was used where the research question was the basis for

a reflective interpretation of the theme in focus. Following Kvale (31), the analysis involved increasing levels of abstraction. This analytic process implied a transition from description and conceptualizing, to a more comprehensive understanding (31). To enhance the rigor of the research process all steps have been discussed thoroughly in the research group (ProLearn).

Results

The nurses utilize various textual knowledge sources as part of their daily work, and the reason seems to crystallize into three themes: To fill in gaps of knowledge, to verify and enhance their performance, and a desire to strengthen their professional repertoire:

1. To fill in gaps of knowledge needed to understand or solve problems at hand

The nurses feel they need to be cautious about new tasks since any mistake may have serious consequences, and they seem to have a pragmatic and problem-solving relation to textual knowledge sources. Unfamiliar medication or medical expressions and diagnosis encountered in daily work made the nurses consult hands-on literature in order to fill in gaps of knowledge needed to understand or solve problems at hand: *'I looked up in a medical dictionary, and read in Clinical Nursing' (textbook), or: 'I looked up in the Medical Catalogue and Guidelines for handling Medications'*. Medical guidelines adjusted to particular needs on the ward are in demand: *'It takes a lot of time to look up in the Medical Catalogue; it does not tell you exactly what you need; can I mix Diural with another medication?'* Their responsibility for handling medications, made them consult Medical Catalogues and guidelines frequently: *'When I dispense medication I'm not familiar with, I need to know how it is prescribed and side effects'*. Details concerning intravenous administration of a particular medication rarely used on the ward made one informant aware of inadequate guidelines, and she informed her superiors.

2. To verify and enhance skills

Various paper and electronic texts are also consulted in order to verify and enhance skills. One of the nurses in our sample was not well acquainted with the use of a particular research based procedure for consciousness-registration of patients suffering from cerebral hemorrhage: Apart from seeking support from the doctor and other colleagues, she had read a text-book and studied the Glasgow Coma Scale scheme. Responsibility for patients with unusual medical diagnoses inspired nurses to consult medical and surgical methods in text-books and on the hospitals intranet. Pain and nausea relief, treatment of head-injuries and wounds are examples of standardized guidelines consulted by the informants in order to enhance their level of performance. Nurses expressed confidence in the procedures displayed on intranet: *'Very well explained; how things are done, what can happen and why'*.

However, they seem, to prefer small-format knowledge sources: *'A handbook in my pocket instead of running to and from the computer'*. Although appreciative of the hospitals' intranet, paper-based sources seem to be more convenient: *'the book is even better, you copy what you need and put it in the patients' folder, ready for use, because you can't always leave the patient'*. They emphasize that knowledge-sources in use are new and updated, preferably evidence-based. In relation to that, another informant explains why a binder is a practical knowledge source: *'So you can exchange (tear out) and replace a new procedure, for instance'*.

3. A desire to strengthen their professional repertoire

The nurses also report on use of textual knowledge sources in relation to more in-depth learning, when time is available. The wish to learn is then linked to a desire to strengthen their professional repertoires, and may have a more general character: *'I notice I have a desire to learn a*

lot'. This informant used web-resources in a critical way: *'.....you browse a word and read a bit, but then there is something about the quality, not knowing the author ...'* The need to extend one's knowledge is particularly linked to a more in depth understanding of responsibilities at hand. One example relates to technical equipment used on intensive wards: *'I don't like just to be told what to watch for...Hey, I want to know why! I take a great interest in it....'*

Everyone felt that it was positive to learn new things. 'That there's new things, get out of the usual routine, that there's a research based foundation for what's done'. A patient suffering from a particular syndrome made the nurse look up in a medical textbook: *'How come there is a phase of increased production of urine after a renal failure?'* Particular diagnoses (like diabetes and meningitis) or responsibility for monitoring patients suffering from coronary diseases seem to stimulate them to develop their knowledge, exceeding the need for filling in gaps: *'I would like to get an overview of all side-branches of coronary arteries'*. In doing so, the informant primarily used textbooks about anatomy. Some of them had access to medical search options on internet apart from medical textbooks as sources. One of the informants was frustrated because they are denied access to internet at her workplace, even if they have computers in the patient -room: *'My interest to search for research-based knowledge is waning....'*

Even if time pressure often inhibits in-depth studying at work, some workplaces seem to support professional growth: *'we have a binder on the ward where we collect articles from the internet and from newspapers- new research and methods'*. A concern for particular medical treatment on the cardiac ward involved the nurses in a search for 'best practice'-reports. For instance; *'What we explore now is whether we should cool down the patient or not after a serious heart attack. There is a rapid change of things going on; urging you to update yourself'*. In such cases it is not unusual that relevant articles from journals are posted on the wall in the lunch room. It is not necessarily bedside nurses that look for research-articles themselves. According to our results, it is more commonly done by nurses with a particular responsibility for professional development on the ward (Advanced Practice Nurses). In addition to the doctors, these specialist nurses seem to be responsible for updating procedures in binders and booklets used by the other nurses. One of the informants did however inform how she experienced a lack of a particular procedure on the ward as a motivation to seek relevant knowledge and work out a proper guideline.

Discussion

Instrumental utilization of knowledge

Results from the ProLearn study show that nurses are part of a working culture where textual knowledge sources play an essential part, both collectively shared and individually acquired. Consulting textbooks, medical catalogues and digital tools is an inherent part of professional tasks and hospital routines, and as expressed by Estabrooks et al (11), indicates a 'cultures of knowing'. Examples from the data material illustrate why nurses relate to handbooks and binders containing continuously updated, preferably evidence-based procedures. Nurses feel a personal responsibility for updating themselves in accordance with professional demands at work, knowing not only how to perform but also why. The nature of the work (ill patients, fatal consequences of errors, visibility of the job etc), combined with a personal responsibility for ongoing tasks, makes the nurses consult and use different sources of knowledge. Apart from using colleagues as knowledge sources, the nurses utilized manuals, textbooks, internet, medical catalogues, handbooks and binders with procedures. The learning logs in particular, showed that knowledge utilization was often triggered by a procedure to be performed in relation to a patient or a motivation to improve their understanding of the medical case at hand. Even if they knew what to do, they needed to be reassured about their choice (15). Filling in gaps of knowledge and verifying and enhancing skills, resembles an instrumental utilization of knowledge sources in order to comply with demands in specific situations (18). In line with Estabrooks (11) and Khomeiran and Kiger (28) it is essential to tailor theoretical

knowledge to real needs in practice. Utilization of such knowledge sources is, according to Eraut et al. (32), a contextual condition for learning at work, particularly utilized by new nurses as guidelines for actions. Nevertheless, even as more experienced nurses, they seem to make use of information sources often carried in their pockets or in the patient's folder, 'ready to use'. In this context the use of various clinical guidelines seems to function as tools of validation to ensure quality and support their performance, not primarily as problem-solvers in novel situations, as suggested by Benner (16) and Eraut (17). Even as more experienced nurses they frequently seem to engage in a process of self-monitoring that is a balance between feeling competent and feeling uncertain in relation to their own level of clinical competence. They prefer local knowledge sources, adapted to challenges in daily work, updated and practical in use. Even when faced with familiar routine situations, a need may arise to verify and extend one's knowledge and insight. The preference of paper based tools seems to be contrary to Roberts et al. (12) claim that the use of information technology in various electronic forms is a more adaptive knowledge tool.

Interacting with knowledge sources as monitoring devices is, as expressed by Knorr Cetina (20), a safeguard in practice. In addition these processes are usually mediated by new technologies and artifacts. As data indicate this is particularly at stake in addition to medical and technical aspects and procedural performance which occur more often at intensive care units. Even if the informants in the ProLearn study expressed great confidence in procedures displayed on the hospitals intranet, as a knowledge source it was either not sufficiently adjusted for patient care on the ward, or it was inconvenient since it was not at hand. The various paper-based tools seem to be considered both flexible and updated. In line with Estabrooks et al. (25), this is an area that needs further investigation since computers are increasingly taking over as distributors of knowledge in hospital wards.

Conceptual utilization of knowledge

The nurses also report on their use of textual knowledge sources related to more in-depth learning when time is available. The desire to learn is then linked to a personal wish to strengthen their professional repertoires that goes beyond problem solving and procedural performance. Jensen emphasize that a desire to learn is not only directed by knowledge itself. Motives seem to be closely integrated into a sense of professional duty and the quest for social recognition (21). Experiencing a gap between their present understanding and a potential level of knowledge seems to motivate a conceptual use of knowledge sources, and made our informants look into literature to accumulate knowledge on topics like anatomic features of the heart, particular electrocardiograms, diagnosis and symptoms. A deeper insight may improve their ability to act and argue in a professional way, thus strengthening their identity as professionals and making work more enjoyable.

Working within a setting where medical treatment is central may contribute to the informants underlining of evidence-based practice. Several studies report either barriers to the use of evidenced based knowledge or concern over an unbalanced standardisation of skills, arguing that it will mean an erosion of intuitive and unquantifiable knowledge (12, 13, 26, 29). Our informants did not share this pessimistic vision. On the contrary they were actively looking for formal devices that would help them in improving their work. Actively looking for formal devices that would help nurses in improving their work represents a standardization of professional decision making. These preferences may of course be strong early in their career, whereas the value of experience tends to be upgraded in later phases (33). However, Freidson and Timmermans & Berg, emphasize that handling the balance between discretion and formalized methods and regimes represents a challenge among professionals in to-days society (2, 19). This challenge is also present in nursing cultures (29). Positive attitudes towards evidence-based knowledge-forms among nurses may gradually transform professional work and learning into a more academic style that also mirrors international trends concerning the use of research in daily work.

Conclusion

Results from our project suggest that the nurses in our study have an active relation to combinations of knowledge sources like textbooks, handbooks and net-based resources as part of their professional performance and development which seems to go beyond meeting formal requirements. The data illustrate the role that an affiliation to more abstract forms of knowledge may play in this regard (21,15). In line with the findings of Estabrooks et al.(8) and Egerod & Hansen (13), our informants seem to have a positive attitude towards research utilization. The reason for knowledge-utilization seems to encompass both instrumental and conceptual purposes (18). This area is in need of further exploration.

Limitations and recommendations

Based on selected data material, the aim of this article was to illuminate why nurses utilize textual knowledge sources within a workplace setting. The extensive data material allows for various aspects of knowledge-seeking practices and learning at work to be explored. However, future observational studies are required to focus on how referring to knowledge sources interferes with patient care. This is not least important on intensive care units where computers more often are placed near the beds.

Acknowledgement

The author would like to express her gratitude to the ProLearn group: www.pfi.uio.no/prolearn/

Accepted for publication 8.10.2010

Björg Christiansen, Associate professor, Dr. Polit., Oslo University College, Faculty of Nursing, Postbox 4 St. Olavs pl., NO – 0130 Oslo, Tel.: +4722453738, Fax: +4722453855, E-mail: bjorg.christiansen@su.hio.no

References

1. Elstad I, Hamran T. Et kvinnefag i moderniseringen. Sykepleien mellom fagtradisjon og målstyring. Oslo: Ad Notam Gyldendal AS;1995.
2. Freidson E. Professionalism the third logic. Oxford: Blackwell Publishers Ltd; 2001.
3. Bjørk IT. Sykehusavdelingen – et miljø for læring? *Vård i Norden*. 2001; 21:4–9.
4. Vareide PK, Hofseth C, Norvoll R, Røme K. Stykkevis og helt –Sykepleieres arbeidsoppgaver, kompetanse og yrkesidentitet i sykehus.Oslo: 2001. SINTEF Rapport STF78 AOI3506.
5. Christiansen B. Good work-how is it recognized by the nurse? *Journal of Clinical Nursing*. 2008;17: 1645–1651.
6. Byrnes M,West S. Registered Nurses'clinical reasoning abilities: A study of self perception. *Australian Journal of Advanced Nursing*. 2000; 17: 18–23.
7. Lahn LC, Jensen K. Models of professional learning. Exploring the epistemic tool perspective.In: L'Harmattan. *Professional Learning/La formation professionnelle*. 2006. p.63–82.
8. Estabrooks CA, Floyd JA, Scott-Findley S, O'Leary KA, Gushta. Individual determinants of research utilization: a systematic review. *Journal of Advanced Nursing*. 2003; 43(5):506–520.
9. Scott-Findlay S, Estabrooks CA. Mapping the organizational culture research in nursing: a literature review. The Authors. *Journal compilation*. 2006;498–513.
10. Meijers JMM, Janssen MAP, Cummings GG, Wallin L, Estabrooks CA, Halfens RYG. Assessing the relationships between contextual factors and research utilization in nursing: systematic literature review. The Authors. *Journal compilation*. 2006;622–635.
11. Estabrooks CA, Thompson DS, Lovely JJE, Hofmeyer A. A guide to Knowledge Translation Theory. *The Journal of Continuing Education in the Health Professions*. 2006; 26(1): 25–36.
12. Roberts DW, Patel VL, Stone PW, Bakken S. Knowledge content of Advance Practice Nurse and Physician Experts: A Cognitive Evaluation of

- Clinical Practice Guideline Comprehension. In: Park HA et al. editors. Consumer-Centred Computer-Supported Care for Healthy People. IOS Press; 2006. p.476–480.
13. Egerod I, Hansen GM. Evidence-based practice among Danish cardiac nurses: a national survey. *Journal of Advanced Nursing*. 2005; 51:465–473.
 14. Edgar L, Herbert R, Lambert S, MacDonald J, Dubois S, Latimer M. The Joint Venture Model of Knowledge Utilization: a guide for change in nursing. *Canadian Journal of Nursing Leadership*. 2006;19:41–55.
 15. Lahn L, Christiansen B. Good professional work in accounting, engineering, nursing and teaching. From practice based to research based quality assessment? Forthcoming.
 16. Benner P. From Novice to Expert. California: Addison Wesley Publ. Comp; 1984.
 17. Eraut M. Non-formal Learning and Tacit Knowledge in Professional Work. *British Journal of Educational Psychology*. 2000; 70: 113–136.
 18. Kirkevoold M. Vitenskap for praksis? Oslo: Ad Notam Gyldendal; 1996.
 19. Timmermans S, Berg M. The gold standard. The Challenge of Evidence-Based Medicine and Standardization in Health Care. Philadelphia: Temple University Press; 2003.
 20. Knorr Cetina K. Sociality with objects: social relations in post-social knowledge societies. *Theory, Culture and Society*. 1997; 14:1–25.
 21. Jensen K. The desire to learn: an analysis of knowledge-seeking practices among professionals. *Oxford Review of Education*. 2007; 33:489–502.
 22. Eraut M, Alderton J, Cole G, Senker P. Learning from other people at work. In: Harrison R, Reeve F, Hanson A, Clarke J, editors. Supporting lifelong learning Volume 1 Perspectives of learning London: Routledge & Open University Press; 2002. p.127–145.
 23. Klette K, Smedby JC. Modes of professional learning. Forthcoming.
 24. Pogorzelska M, Larson EL. Assessment of Attitudes of Intensive Care Unit Staff Toward Clinical Practice Guidelines. *Dimensions of Critical Care Nursing*. 2008; 27(1): 30–38.
 25. Estabrooks CA, O'Leary KA, Ricker KL, Humphrey CA. The Internet and access to evidence: how are nurses positioned? *Journal of Advanced Nursing*. 2003; 42(1):73–81.
 26. Adamsen L, Larsen K, Bjerregaard L, Madsen JK. Danish research-active clinical nurses overcome barriers in research utilization. *Scandinavian Journal of Caring Science*. 2003; 17: 57–65.
 27. Spenceley SM, O'Leary KA, Chizawsky LLK, Ross AJ, Estabrooks CA. Sources of information used by nurses to inform practice: An integrative review. *International Journal of Nursing Studies*. 2008; 45: 954–970.
 28. Khomeiran RT, Yekta ZP, Kiger AM. Professional competence: factors described by nurses as influencing their development. *International Nursing Review*. 2006;53: 66–72.
 29. Christensen M, Hewitt-Taylor J. From expert to tasks, expert nursing practice redefined? The Authors. *Journal compilation*. 2006; 1531–1539.
 30. Alvesson M, Sköldböck K. *Tolkning och reflektion. Vetenskapsfilosofi och kvalitativ metod*. Lund: Studentlitteratur; 1994.
 31. Kvale S. *InterView*. København: Hans Reitzels Forlag; 1997.
 32. Eraut M, Maillardet F, Miller C, Steadman S, Ali A, Blackman C, Furner J. What is Learned in the Workplace and How? Typologies and results from a crossprofessional longitudinal study. Nicocia: EARLI biannual conference; 2005.
 33. Lahn, L.C. (2003) Competence and learning in late career. *European Educational Research Journal (online)*, 2., 1, 126–140.