What and How do Nurses Learn on the Job?  
The Development of a Classification  
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Abstract

The aim of this paper is to gain more insight in nurses’ on-the-job learning. A previous study (Berings, Gelissen, & Poell, in press) revealed six main categories of learning content (‘what is being learned’?) and six main categories of learning activities (‘how does learning take place’?) from in-depth interviews with twenty nurses. In this paper, we investigate the content validity of these categories by consulting seventeen supervisors and eight educators in peripheral, top-clinical, and academic hospitals in the Netherlands using semi-structured interviews. These people were considered experts on the content and activity of nurses’ on-the-job learning. Further, we investigate how the different entries in the classification of learning activities are interrelated. The findings of this study lead to a few changes in the organization of the learning contents and learning activities of the previous study and provide a more comprehensive overview of examples in the various categories. Further, the findings of this study provide more insight in the relationship between the different learning activities, which enabled us to construct a framework that shows the relationship between nurses’ on-the-job learning activities with a distinction in primary and follow-up learning activities.

Introduction

Researchers, hospital directors, professional associations of nurses and defenders of nurses’ interests as well as HRD professionals all agree that nurses need to learn continuously and that on-the-job learning is significant if this is to be achieved. The main reason why they need to learn continuously is that the context of health care is constantly changing and nurses need to adapt to new working situations. Examples of changes that demand continuous learning by nurses are the development of new technologies in nursing equipment, changing disease patterns and the shift from internal medical care to care that is, at least partly, provided externally. This means that there is a growth in the complexity of the knowledge and skills required. There has been a shift from task-centred nursing to patient-centred nursing and the boundaries between the work carried out by nurses and that of junior hospital doctors are shifting as well. All these changes imply an increase in the number of times that a nurse is faced with making a choice and with ethical dilemmas. Nurses require knowledge and intellectual skills for critical thinking. They need to be decisive and to work as competent and autonomous caretakers and as members of multi-disciplined and multi-professional teams (Clark, 2001). Another reason for the need for continuous learning by nurses is that the nursing profession will remain more attractive to nurses if they are given greater learning opportunities. Research in the Netherlands (Dik & van Splunder, 2002) has shown that there is a clear relationship between a lack of learning possibilities and nurses leaving the profession.

Although hospitals can provide education and training to enable individual learning, these opportunities are not always available. Moreover, in many situations training or
education has several disadvantages: it does not have impact unless it is well timed, it often seems difficult to transfer what has been learned to the daily work situation, and it is expensive (van Woerkom, 2003). In addition to formal training and education, the most significant sources of learning are the challenges of the work itself and interactions with other people in the workplace (Eraut, Alderton, Cole, & Senker, 1998). On-the-job learning overcomes the problems of training and education that have been mentioned above so that it would appear to be useful to put more effort into improving this method of learning. At present, however, little is known about methods that can be used for this improvement. In order to develop methods for intervention, first more knowledge about nurses’ normal on-the-job learning contents and activities is needed.

Berings et al. (in press) investigated what and how nurses learn on the job, seen from their own perspective. They observed and interviewed twenty nurses of different wards in an academic hospital in the Netherlands. A grounded-theory analysis of the interviews revealed six main categories of learning content (‘what is being learned?): the technical-practical domain, social-emotional domain with respect to others and with respect to oneself (personal coping), organisational domain, developmental domain, and pro-active attitude to work. The analysis also revealed six main categories of learning activity (‘how does learning take place?): learning by doing one’s regular job, learning by applying something new in the job, learning by social interaction with colleagues, learning by theory or guidance, learning by thinking about work experiences, and learning through life outside work. The main categories were divided in sub-categories and illustrated with examples mentioned by the nurses. 

Berings et al. (in press) claim that their categorisation provides many insights in nurses’ learning contents and activities and is more complete, more refined, and overcomes some overlap problems in existing categorisations on on-the-job learning in the field of HRD (e.g., Bolhuis, 2000; Collin, 2002; den Boer & Hövels, 2003; Eraut et al., 1998; Heikkila & Makinen, 2001). However, in their analysis several shortcomings can be identified, as they also indicated in their discussion.

First, their categorization indeed appears to overcome some overlap problems in existing categorizations, but still contains some overlap itself. A recent study in the field of nursing (Estabrooks et al., 2005) overcomes these overlap problems in a categorisation of how nurses learn, by approaching this concept from a specific angle: they created a classification of sources of practical knowledge. They distinguish informal and formal social interactions, experience, documents and a priori knowledge, and divided these categories into subcategories and further refinements. One the one hand, this classification does not contain overlap, but on the other hand it is, in our view, also not complete if one would aim at a categorisation of nurses’ learning activities. The classification is only about knowledge and disregards skills and attitudes. Further, it shows many similarities with the classification of Berings et al. (in press), but does not contain the categories learning by thinking about work experiences and learning by applying something new in the job. Therefore, the ‘specific angle’ approach of Estabrooks et al. (2005) would not be a solution for the overlap problems we mentioned. To be able to develop methods to improve on-the-job learning, it is important to gain insight in on-the-job learning processes and thus, in the interrelationship between the different learning activities. Therefore, if some overlap problems cannot be avoided, it is useful to make the overlap obvious and to
provide a description of the overlap showing the interrelationship between the different activities. That is the approach that we follow in the current analysis.

Second, another point of critique on the study of Berings et al. (in press) is that the data collection technique used has a number of limitations. Although a broad variety of types of learning content and activities of nurses were identified, it is still questionable whether all of them were found. It is conceivable that the interviewees did not remember the most salient examples of learning content and activities (Doornbos, Eekelen, & Koopmans, in press). Therefore, they might not have mentioned those that hardly ever occur or the ones that occur so often that they have become self-evident. It is conceivable that some activities have not been made explicit. This means that the list of examples provided in the categorization may not provide a complete overview. In order to assess the validity of the existing categorization and, if necessary, to complete this list, ideally another data source should be used.

Third, as the study was conducted with interviews, it is questionable whether the researcher completely understands the respondents’ language. All respondents have other ways to verbalize their thoughts (Bernstein, 1983). Therefore, to increase the validity of the outcomes it would be good to verify the findings and interpretations with other people that are, from another perspective, involved with nurses’ learning.

Finally, all nurses in the sample Berings et al. (in press) worked in different departments of the same academic hospital. It would be possible that in other hospitals other learning contents and learning activities are present. For instance, the learning possibilities in academic hospitals might be greater than in peripheral hospitals, which could influence the number of different learning activities the individual nurses use and report. To improve external validity it would be valuable to confirm their findings in different types of hospitals.

The aim of this study is to validate, and if necessary, supplement the existing classification reported by Berings et al. (in press), in order to obtain a realistic classification of nurses’ learning contents and learning activities. This classification can be used to develop intervention methods for the improvement of on-the-job learning. Therefore, we have formulated the following research questions:

1. To what extent does the earlier developed classification of nurses’ learning content and activity present a valid overview of the relevant learning domains?
   a. Which categories or examples should, according to experts, be added to make the categorization more complete?
   b. To what extent does overlap in the classification exist, and is it possible to reduce this overlap; if not, what are the consequences of this overlap?
   c. Are all categories and examples in the classification valid for most functions in the nursing profession?

2. What is the relationship between the various learning activities in the classification?

Research method
Miles and Huberman (1994) recommend getting feedback from earlier or new informants as a procedure to corroborate earlier findings from qualitative studies. Following this logic, we conducted a content validation study, interviewing seventeen supervisors and eight educators from seven peripheral, top-clinical, and academic hospitals, using semi-structured interviews, in the end of 2004. All educators and some supervisors were randomly selected from a database of a regional association for education in hospitals in the Netherlands. To include respondents from different types of hospitals, we purposively selected additional supervisors from randomly selected hospitals. All respondents were considered experts on nurses’ on-the-job learning. The sample included fourteen men and eleven women. Their average years of experience in health care were high (M=27.8; SD=6.6).

We asked the interviewees to react on the classification of learning contents and learning activities that was established in the study of Berings et al. (in press). Initially, we asked the interviewees for a general reaction to the classification and subsequently, we specified our request by asking them whether they recognised all elements, whether they thought the terminology used was appropriate, whether all elements were placed on the right spot in the classification, and whether they thought the classification was complete or whether they had suggestions for additions. Approximately one week before the interview the interviewees had received a copy of the classification by mail accompanied with instructions, in order to prepare for the interview. Three of the interviewees did not manage to read them before the interviews.

To answer the first research question about how the classification of learning contents and learning activities can be improved, we first summarised the interviews as suggested by Miles and Huberman (1994). Second, we placed all remarks and suggestions made by the interviewees in an interviewee x elements table. The first author commented systematically on each acquired piece of feedback by asking herself whether it would lead to a significant change in the classification. These comments were based on the following criteria:

- Remarks concerning new examples -- Are they truly new: Are they not refinements of existing examples? Do they not overlap with other examples? Are they relevant for most functions in the nursing profession? Are they defined from the perspective of the learner?
- Remarks concerning the deletion of examples or categories -- Are they not relevant for most functions in the nursing profession?
- Remarks concerning terminology -- Are they truly improvements: Are they not too narrow, or too broad?
- Remarks concerning the organization of the classification -- Does the suggestion reduce the overlap in the different categories? Or does the suggestion improve the distinction between the different categories?

Next, the first author separated all remarks into one group that presumably would lead to changes in the classification and one group of remarks that would not lead to an improvement of the classification. The position of each remark was motivated. Next, all three authors intensively discussed these positions and their consequences for the existing classification; during these discussions, we used the transcripts containing the recommendations suggested by the experts to reach informed consensus about the development of a new categorisation.

To answer the second research question about the relationship between the various learning activities in the classification, we performed an analysis that consisted of two separate steps. First we studied the comments of the respondents of this study to find information on the basis of which a relationship between learning activities was
suggested and subsequently, we checked whether our findings could also be found in the interviews with the nurses in the earlier study of Berings et al. (in press).
In the summaries of the interviews conducted in the current study, we selected all comments of the interviewees that explicated a relationship between the different categories of learning activities and organized the findings. To check whether these findings could also be derived from the interviews with the nurses in the study of Berings et al. (in press), we selected the text-fragments in the transcripts that contained words indicating the combinations of learning activities we found in the first step of the analysis, within five lines of the transcripts, using the query-tool of Atlas-ti. Then, we carefully read the fragments and checked whether these fragments actually contained these combinations, and, consequently, evidence for a relationship between the various learning activities as reported by nurses.

Findings

All interviewees recognised the original classification of learning contents and learning activities. Nevertheless, they also made many proposals for improvement. With these proposals we were able to construct a classification with a similar structure, but better-defined items (see Appendix 1 and 2). Further, the interviewees made many comments that indicate relationships between the distinguished learning activities, with which we were able to construct a framework that shows these relationships. Many of the new learning activities that the interviewees mentioned can also be interpreted as working activities, since working and learning are intertwined (Eraut, 2000) However, in this study, we report them as learning activities, because they generate a learning outcome.

What: learning contents

Appendix 1 shows the new classification. An important difference with the classification of Berings et al. (in press) is that the category personal coping is split up into two categories: psychological coping (social-emotional domain) and physical coping (technical-practical) domain. Further, many examples (56) of learning contents are added. Two examples were deleted: ‘writing brochures’, was deleted because four interviewees mentioned that it is highly rare that nurses need to write brochures themselves; ‘methodological acting’ was deleted because the respondents elaborated that this concept includes too many different kinds of learning contents, namely all contents in the subcategories ‘nursing skills’, ‘knowledge of technical nursing’, ‘information transfer to patients’, ‘information transfer to colleagues’, and ‘task-management skills’. The category ‘information transfer to patients’ has been extended to ‘information transfer to patients and family’. Further, in four instances the terminology of examples was changed and in six instances explanations were added. Although we tried to avoid overlap in the classification, it can be observed that overlap is still clearly present. For example, it was also hard to separate the proactive attitude to work from the other categories, because they are very much interrelated.

How: learning activities

The categorisation of learning activities could also be made more refined. An important difference with the new classification (see Appendix 2) and the classification of Berings et al. (in press) is that we deleted the subcategory ‘practising’ in the main category ‘doing one’s regular job’, since practising is not encountered in other than educational settings. The subcategory ‘learning by thinking about work
experiences’, now called ‘learning by reflection’, now contains three, instead of two, subcategories, based on the moment of reflection (before, during or after action). The subcategories ‘asking for feedback’ and ‘obtaining feedback’ are merged into one category ‘asking for and obtaining feedback’, since these activities usually feature together. The broad termed category ‘work-experience’ has been narrowed down in ‘taking care of patients’ and ‘asking questions to colleagues’ has been broadened to ‘consulting colleagues’. The category ‘observing colleagues’ has been changed in ‘watching colleagues’, because the sound of this term is less ‘scary’ in Dutch, as indicated by Further, also in this categorisation many new examples (21) were added in order to obtain a more complete overview. No examples were deleted, because the experts confirmed that all examples in the classification can be relevant for most nurses. Finally, in ten instances the terminology of examples was changed and in six cases explanations were added.

Despite the current culture of evidence-based working in the nursing profession in the Netherlands, with an increased importance of academic knowledge at the expense of other forms of knowledge (Clarke & Wilcockson, 2002), we can see that many of the learning activities the interviewees mentioned are based on so-called informal experiential and interactive sources (cf. Estabrooks et al., 2005). This could be explained by the notion that knowledge obtained by the use of media, education or information meetings often do not address the nurses’ immediate or context-specific needs. Further, for instance consulting colleagues is less time consuming than searching the library or Internet. Visiting information meetings, such as symposia and conferences are often expensive and time consuming. Therefore, the interviewees advised us to add ‘obtaining resources’, such as time, money and means, on the learning content ‘learning and collecting information’. Although we tried to avoid as much overlap in the classification as possible, we need to observe that, also in this classification, overlap is still clearly present. For example, learning by social interaction with colleagues is also a part of taking care of patients. And learning together by reflection is also a part of learning by social interaction with colleagues. To answer our second research question, we studied this relationship between learning activities.

The relation between different learning activities

Even though this was not explicitly asked in the interviews, the supervisors and educators in the nursing profession made many comments indicating that ‘learning by social interaction’ and ‘learning by reflection’ are related to the other main categories: ‘learning by doing one’s regular job’, ‘learning by applying something new in the job’, ‘learning by theory or supervision’ and ‘learning by life outside work’. Also it was indicated many times that reflection often takes place in social interaction: ‘joint reflection’. The content of social interaction, individual reflection and joint reflection is located in doing one’s regular job, applying something new in the job, theory or supervision or life outside work. Therefore, these last four activities can be regarded as primary learning activities, which are often succeeded by the follow-up learning activities social interaction, and individual and joint reflection, where a deepening of the primary learning experiences takes place (see Figure 1).

<table>
<thead>
<tr>
<th>Primary learning activities:</th>
<th>Follow-up learning activities:</th>
</tr>
</thead>
<tbody>
<tr>
<td>doing regular job</td>
<td>social interaction</td>
</tr>
<tr>
<td>applying something new in the job</td>
<td>joint reflection</td>
</tr>
<tr>
<td>theory or supervision</td>
<td>individual reflection</td>
</tr>
<tr>
<td>life outside work</td>
<td></td>
</tr>
</tbody>
</table>

Figure 1. Framework of the relationship between different learning activities.
In order to validate the findings in the transcripts of the interviews with the nurses in the study of Berings et al. (in press), we selected 51 text-fragments in the transcripts that contained words indicating combinations of primary and secondary learning activities. After carefully reading these fragments together, we identified 41 fragments indicating these combinations. For example, a nurse who took the initiative to work at the emergency room for a couple of days, told the interviewer how he and another nurse discussed how he had performed in trauma care: “She asked me for what reason I had behaved the way I had and if I thought that was the best way to handle such cases”. In this example ‘learning by applying something new in the job’ is followed-up by joint reflection. The other 10 fragments did not explicitly indicate such a combination. The 41 fragments selected together represented all combinations and herewith confirming the analysis of the interviews of the supervisors and educators.

**Conclusion and discussion**

The aim of this study was to validate, and, if necessary improve on an earlier developed classification of learning contents and learning activities in the nursing profession, as previously reported in Berings et al. (in press). In particular, we set out to investigate possible amendments to the classification by getting systematic feedback of new informants who can be considered experts in the nursing profession. Based on the valuable remarks and suggestions of these experts, we were indeed led to make several changes to the classification, leading to important improvements.

However, some points of critique on our research method and findings are relevant. First, we should remark that the initial study of Berings et al. (in press), was conducted by the same authors who conducted this validation study. To guard for possible biases, only the first author of both studies collected all data and performed first analyses, which kept the second and third author as relatively objective judges. Our choice for having one author conduct the first separation of interviewee remarks into one group or remarks that would and one group of remarks that would not lead to an improvement of the classification, also enabled us to have a profound and structured discussion about the changes needed. However, this procedure might have directed the discussion in a particular way and other outcomes would have been possible had we followed a procedure in which all three authors would have conducted this first separation of interviewee remarks.

Although we tried to avoid as much overlap in the classification as possible, overlap is still obviously apparent. Further, we should notice the fact that, the domains, sub domains and examples mentioned in the classification do not all have the same breadth. For instance, ‘learning by doing’ is a much broader example than ‘answering colleagues’ questions’ is. However, on both these issues, we may deem that an improvement has been reached in comparison to the original classification.

By grounding our classification in the data and by using multiple sources, we have been able to explicate the existing multidimensionality of the learning contents and learning activities as reported by nurses more profoundly. This classification can be used to develop intervention methods for the improvement of on-the-job learning. For example Berings, Poell, and Simons (in press) argue that a useful way to improve nurses’ on-the-job learning could be making them aware of their on-the-job learning styles. Presumably, the findings of this study allow the construction of an
encompassing structured instrument for identifying nurses’ learning styles, which gives justice to the complexity and diversity of on-the-job learning by nurses. HRD-professionals can use such an instrument to improve nurses’ on-the-job learning.

References


# Appendix 1  What: Nurses’ learning contents

<table>
<thead>
<tr>
<th>What: Nurses’ learning contents</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>technical-practical domain</strong></td>
<td></td>
</tr>
<tr>
<td>general skills</td>
<td>computer skills, administrative skills, Dutch and English language skills, analytical thinking, logical thinking, punctuality, accuracy</td>
</tr>
<tr>
<td>nursing skills</td>
<td>following protocols, ‘restricted and risk-bearing actions’, nursing calculation, adjusting care to patients with particular problems, reporting incidents</td>
</tr>
<tr>
<td>knowledge of technical nursing</td>
<td>knowledge of pathology, knowledge of medication: possible complications, effects and side-effects</td>
</tr>
<tr>
<td>information transfer to patients</td>
<td>information transfer, directing patients to correct information sources, answering questions, forwarding, asking questions and follow-up questions, testing information that patients collected themselves</td>
</tr>
<tr>
<td>information transfer to colleagues</td>
<td>answering questions, asking questions and follow-up questions, teaching clinical classes, reporting in patient files, elaborating protocols</td>
</tr>
<tr>
<td>physical coping</td>
<td>ergonomical posture, dealing with devices</td>
</tr>
<tr>
<td><strong>socioemotional domain</strong></td>
<td></td>
</tr>
<tr>
<td>socioemotional contact with patients and family</td>
<td>empathy, empathic treatment, patience, active listening, encouraging dedication to therapy, dealing with aggressive people, emotional support, showing interest, taking patient diversity into account</td>
</tr>
<tr>
<td>socioemotional contact with colleagues</td>
<td>emotional support, showing interest, active listening, collaborating, diplomacy, giving feedback, reacting positively to feedback, taking colleague diversity into account</td>
</tr>
<tr>
<td>daring to communicate</td>
<td>holding each other responsible for quality control, assertiveness, honesty about (near) errors, sharing opinions, indicating one’s boundaries, asking for help, honesty to patients about situation</td>
</tr>
<tr>
<td>appearance</td>
<td>showing professionalism, confidence, tranquillity, sense of humour, enthusiasm, timing (showing the right appearance at the right moments)</td>
</tr>
<tr>
<td>psychological coping</td>
<td>putting things into perspective, work-family balance, self-confidence, drawing the line, positioning oneself in the nursing team, handling emotions, assuring work pleasure, dealing with dirty work</td>
</tr>
<tr>
<td><strong>organizational domain</strong></td>
<td></td>
</tr>
<tr>
<td>task-management skills</td>
<td>planning, prioritizing, keeping the overview, elaborating nursing schemes, working in a structured way</td>
</tr>
<tr>
<td>co-ordinating tasks</td>
<td>offering guidance to nursing students, structuring meetings, choreographing 24-hour treatment, organizing rounds, administration of materials, administration of waiting list, preparing duty rosters, and for supervising nurses: leadership, performance assessment of team members</td>
</tr>
<tr>
<td>role and environment skills</td>
<td>sensitivity to situation in direct work environment, understanding different roles in and outside the organization, transmitting patients to other caretakers, critical reflection on the organization, and for supervising nurses: developing and implementing policies</td>
</tr>
<tr>
<td><strong>developmental domain</strong></td>
<td></td>
</tr>
<tr>
<td>learning and collecting information</td>
<td>collecting information, evaluating reliability of information sources, interpreting information, looking up protocols, asking questions, asking for feedback, formulating learning objectives, scanning for learning opportunities, keeping up with specialist journals, obtaining resources (time, money, means, etc.)</td>
</tr>
<tr>
<td>self-knowledge</td>
<td>knowing one’s weaknesses and strengths, knowing one’s boundaries, self-reflection</td>
</tr>
<tr>
<td>proactive attitude to work</td>
<td>working efficiently, decision making, helping colleagues, independent work attitude, roster-technical flexibility, keeping up with innovations, thinking ahead, taking initiatives, taking responsibility, everyday quality control</td>
</tr>
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</table>
## Appendix 2  How: Nurses’ learning activities

<table>
<thead>
<tr>
<th>How: Nurses’ learning activities</th>
<th>Examples</th>
</tr>
</thead>
</table>
| learning by doing one’s regular job | taking care of patients  
learning by doing, learning from success, learning from mistakes  
contact with patients and family  
empathy, observing, conversations with patients and family, asking for feedback  
watching colleagues*  
imitating positive colleague behaviour, not adopting negative colleague behaviour  
helping others learn  
preparing and giving presentations, answering colleagues'* questions, student supervision |
| learning by applying something new in the job | broadening tasks  
doing other peoples’ tasks, searching for new situations, participating in special interest activities or workgroups  
job rotation  
working in different departments or institutions, temporarily doing someone else’s job in one’s own department |
| learning by social interaction with colleagues | consulting colleagues*  
asking colleagues informative questions or help  
asking for and obtaining feedback  
inter-collegial testing, openness to feedback, converting feedback into positive action  
exchanging knowledge and experience  
brainstorming together, conferring, casuistry meetings, (multidisciplinary) patient meetings, team meetings, day evaluations, team transfers, rounds, workgroups |
| learning by theory or supervision | checking media  
books, television, specialist journals, the Internet, protocols  
visiting information meetings  
internal or external: symposia, congresses, clinical classes, lecture nights, conversations with patient associations  
education  
internal or external: retraining, courses, workshops, education  
direct supervision  
supervision and coaching: practising with supervision, work supervision, annual performance assessment interviews, personal development plan interviews |
| learning by reflection | planning  
prospective reflection: reasoning, logical thinking, creating step-by-step plans, writing down: at home or at work, deep or shallow, on knowledge, skills or attitude, alone or together with others  
making intermediate adjustments  
concurrent reflection: deep or shallow, on knowledge, skills or attitude, alone or together with others |
| learning through life outside work | looking back  
retrospective reflection: at home or at work, deep or shallow, on knowledge, skills or attitude, alone or together with others, self-reflection  
go through all phases of life in and outside the hospital: raising children, sickness and death in one’s own circle, personal conversations, volunteering in clubs or associations, television, patients’ stories |

* Wherever colleagues are mentioned in this appendix, in addition to nurses of one’s own department, this represents nursing students, colleagues of other departments, other institutions of healthcare, colleagues of other disciplines (doctors, physiotherapists, psychologists, etc.), or professionals in external healthcare as well.