

An Exploration of How Students Learn in a Pharmacy Internship

ANDY WALLMAN¹, MARIA GUSTAVSSON², ÅSA KETTIS LINDBLAD^{1,3}, LENA RING^{1,4}

¹Department of Pharmacy, Uppsala University, Sweden

²Department of Behavioural Sciences and Learning, Linköping University, Sweden

³Planning Office, Quality and Evaluation, Uppsala University, Sweden

⁴AstraZeneca, AstraZeneca R&D Södertälje, Sweden

Abstract

Background: The pharmacy internship introduces students to pharmacy practice. An understanding of learning processes in the internship is vital for educators in order to develop activities that support learning.

Aim: The aim was to analyse students' learning activities in a Swedish pharmacy internship from both students' and tutors' perspectives.

Method: Interviews with pharmacy internship students (n=17) and pharmacist tutors (n=18) were performed, followed by a qualitative analysis.

Results: The results showed that learning activities ranged from formal, organized activities to informal learning by participating in the professional community. There was a perceived lack of integration between formal and informal activities. Tutors and students acknowledged the influence of the context for learning and the importance of tutors for supporting learning.

Conclusion: Both formal and informal learning activities have to be accepted and made explicit. Integrating formal and informal learning activities, using the full continuum of possible learning activities, can enhance learning.

Keywords: *pharmacy internship, pharmacy practice experience, reflective practice, workplace learning, learning activities, semi-structured interviews*

Introduction

The role of pharmacists has changed from manufacturing and dispensing drugs to becoming an integrated part of health care, providing pharmaceutical expertise increasingly focusing on pharmaceutical care (Hepler and Strand, 1990; Montgomery, 2009). Fulfilling this role requires both theoretical knowledge and practical skills, including continuous development of expertise (Droege, 2003). Pharmacy internship courses^a are important for students' integration of theoretical knowledge into everyday practice (Katajavuori et al., 2006) and for learning practical skills (Wallman et al., 2009b). Two types of learning are distinguished - formal and informal learning (Eraut, 2007). Formal learning is defined as organized learning primarily in educational settings outside the workplace, such as lectures and seminars (Eraut, 2000; Lee et al., 2004). These learning activities favour scientific knowledge rather than professional knowledge (Eraut, 1994; Katajavuori et al., 2006). Formal learning can also be in workplace settings to support training and learning at work. This might include meetings with a tutor^b, shadowing others in work, different assignments and essays (Eraut, 2000).

Informal learning is often defined as learning not identified as formal (Colley et al., 2002). Informal learning is characterized by four principles. It occurs outside formal education settings, is intentional or incidental, often experiential, and relational. Informal learning can be more or less intentional, organized and planned (Eraut, 2007). 'Incidental learning' is a less intentional sub-group of informal learning and is described as a by-product of activities in daily work. It cannot be separated from work context in which actions are performed, reflected upon and developed (Marsick and Watkins, 2001).

Informal learning is also characterized as experiential, as learning comes from experiences in everyday work and reflection on these experiences. By participating, experimenting and observing, students can identify the tacit dimensions that professionals cannot explain to them (Eraut, 1994; Lave and Wenger, 1991). Reflection is an intentional activity to achieve awareness of tacit knowledge (Eraut, 2007; Schön, 1987). Other intentional activities are supervision of work and discussions (Eraut, 2007; Felstead et al., 2005).

^aPharmacy internship is similar to advanced pharmacy practice experience (APPE) in the US, and pre-registration training in the UK.

^bTutors are called preceptors in US pharmacy education.

*Correspondence: Dr. Andy Wallman, Department of Chemistry, Umeå University, S-901 87 Umeå, Sweden. Tel. +46 70 55 00 971. Email: andy.wallman@chem.umu.se

Finally, informal learning is relational, arising from social interactions with e.g. tutor, colleagues and socio-cultural tools such as computer systems and physical environment (Säljö, 2000). Hence, it is important that managers and staff have positive attitudes about educating students at the workplace and provide feedback from on-the-job-training to ensure good social context (Eraut, 2007).

The nature of learning embedded in contexts can be linked to theories oriented around a situated learning perspective on learning within communities of practice (Lave and Wenger, 1991). Emphasis on learning in communities of practice is on social aspects of learning in workplaces (Lave and Wenger, 1991). Learning by participation in daily work within communities of practice is a common way to learn during pharmacy internships (Christiansen et al., 2007; Katajavuori et al., 2006). Internship students and new employees share some similarities in how a profession is learned (Eraut, 2007; Miller and Blackman, 2004). This learning process has been theorized as legitimate peripheral participation, describing learning as a gradual process of becoming a professional (Lave and Wenger, 1991). The different kinds of knowledge and ways of learning mentioned above are necessary in order to become a professional pharmacist (Hammer et al., 2003). Several factors are important to support learning of knowledge and skills, especially the impact of tutors in internships. In formal learning, tutors act as teachers; they teach students and provide goals and tasks (Hayes, 2001; Virtanen and Tynjälä, 2008). Tutors also support informal learning by stimulating and enhancing students' self-esteem, professional identity and reflection (Hammer, 2006; Hayes, 2001; Katajavuori et al., 2005; Lave and Wenger, 1991; Schön, 1987; Wallman et al., 2009a). Therefore it is important that professional educational programs use professional practitioners as tutors during internship (ACPE, 2006; FIP, 2000; Hammer, 2006). Learning a profession is suggested to be a learning process starting with learning basic knowledge before advancing to meta-cognitive activities, e.g. reflective activities (Benner, 1984). When basics are learnt, students develop routines, in turn creating time for dealing with complicated problems (Eraut, 2007; Schön, 1983). Practitioners, however, can be trapped in these routines; reflection might be a way to challenge the work routines (Schön, 1983; Short and Rinehart, 1993). It has been shown that students' reflective levels increase during internship (Wallman et al., 2008) and that

tutors have an impact on students' reflection (Wallman et al., 2009a). Reflective diaries, assignments and portfolios are common tools to stimulate, improve and assess students' informal learning in many pharmacy programmes (ACPE, 2006; Christiansen et al., 2007; Kansanaho et al., 2005; Sörensen et al., 2005; Wallman et al., 2009a; Wallman et al., 2008).

In pharmacy courses, as in many other natural science programmes, formal learning activities are more common and informal learning activities often less valued (Colley et al., 2002). Nonetheless, several programmes, especially in the health care sector, include internships and on-the-job training periods. These are often treated as formal in-programme learning activities, and the social context is ignored by educators (Colley et al., 2002). Formal and informal learning activities might be seen as interdependent, coexisting on a continuum ranging from more to less organized learning activities. Therefore, to support and enhance students' learning, educators need more knowledge about the nature of formal and informal learning activities during internships.

Aim

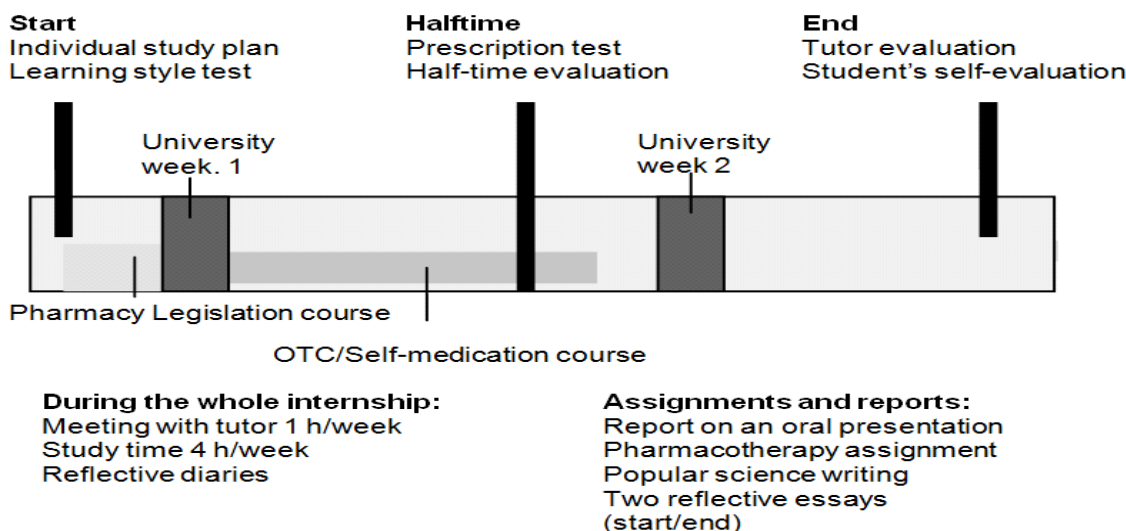
The aim of this study is to analyse, from the perspective of students and tutors, how students learn in pharmacy internship by identifying different learning activities used for learning the professional practise of pharmacy.

Methods

Research setting: pharmacy internship in Sweden

The six-month internship is a mandatory course in Sweden, aligned with the EC legislation (EC, 2005) within the pharmacist programme's 10th semester. It is managed by Uppsala University and University of Gothenburg (UU, 2006). All students are assigned to a community pharmacy, which provides a tutor. All tutors have undergone a basic tutor education and are requested to participate in annual training sessions. The internship outline is described in Figure 1.

Figure 1: Outline of the Swedish 6-month pharmacy internship at the 10th semester.



Learning is based on participation in daily work at pharmacies under tutors' supervision. The tutor's role is to support students' learning during internship by outlining internship activities together with the student, introducing students to pharmacy work, supervising, providing feedback and undertaking continuous progress reviews. Tutors are recommended to arrange weekly meetings with their students and assist the universities in students' examinations and in final assessment.

Several arranged learning activities are introduced by the universities during internship (Figure 1). Learning at pharmacies is complemented by two weeks of lectures in pharmacy practice-related topics, e.g. communication, ethics, leadership and reflective practice. Furthermore, a two-week pharmaceutical legislation course is integrated into the internship, managed through computer-aided self-study. Two formative tests on practical skills are conducted around mid-term, one for assessing counselling and dispensing skills, another for assessing knowledge about OTC drugs and self-care counselling. These tests are conducted at the pharmacy with the tutor, who evaluates the results. To pass the course, students must be approved by the universities based on the tutors' evaluations, participate in all activities at both pharmacy and university, and pass all assignments and tests.

Study population and data collection

The study population consisted of pharmacy students in internship at pharmacy degree programmes in Sweden. All 55 students who had pharmacists as tutors in the spring of 2008, as well as their tutors, were asked to participate.

Qualitative semi-structured interviews were conducted with the 18 students and 17 tutors who agreed to participate. All interviews were performed in the summer of 2008, at the end of internship. In only a few cases were both student and tutor at the same pharmacy interviewed. All interviews were carried out by AW and each interview lasted approximately 1 hour (53 min - 93 min).

Data for determining heterogeneity (see Results) were collected in the interviews and were satisfactory for these respondents. Saturation was reached after approximately 10 interviews in each subgroup, in the sense that no new aspects of the research question arose (Kvale, 1997); no new learning activities were brought up. However, all planned interviews were performed and included in the study.

Two interview guides were developed, one for students and one for tutors, based on theoretical reasoning and empirical studies found in the literature (Katajavuori et al., 2005;

Table I: Learning activities among pharmacy interns, derived from interviews with students and tutor

More formal,
organized, planned
and intentional
learning activities



More informal,
unorganized, unplanned
and incidental
learning activities

Formal learning activities at the university and pharmacy	Learning activities within work at the pharmacy	Work activities where learning is a by-product
<ul style="list-style-type: none"> • Lectures during university weeks • University-introduced assignments and reports • Self-care seminars at pharmacies <ul style="list-style-type: none"> - student groups - led by tutors or other pharmacy staff • Visiting other pharmacy-related sites <ul style="list-style-type: none"> - other pharmacies - hospital pharmacies - industry - clinics - primary health care doctors - laboratories - drug production units • Planned Shadowing <ul style="list-style-type: none"> - of staff responsible for special areas e.g. special OTC area or logistics • Lectures at the pharmacy <ul style="list-style-type: none"> - Pharmacotherapy - Legislations - OTC • Self-studies <ul style="list-style-type: none"> - reading - Intranet training - reading SOP - reading lecture notes and literature from prior education - preparing for examinations Regular meetings with tutor including coaching and mentoring • Formal use of diaries notes 	<ul style="list-style-type: none"> • Asking questions • Searching information <ul style="list-style-type: none"> - Intranet - Internet - colleagues • Observing and listening to others working • Locating role-models • Being supervised in pharmacy work by tutor or other staff • Receiving feedback on work-related performances • Trial-and-error-learning • - actively trying new ways of counselling <ul style="list-style-type: none"> - tutors providing small tasks in daily work • Reflecting <ul style="list-style-type: none"> - on their own - together with tutor - with fellow students • Writing diaries <ul style="list-style-type: none"> - informal note taking 	<ul style="list-style-type: none"> • Working with patients <ul style="list-style-type: none"> - OTC counselling - dispensing • Tackling challenging tasks and roles • Problem solving <ul style="list-style-type: none"> - individually - in group processes • Trying things out • Working alongside others <ul style="list-style-type: none"> - imitating behaviours • Teamwork <ul style="list-style-type: none"> - participating in collective problem solving • Participating in teamwork <ul style="list-style-type: none"> - performing dispensing with real responsibility - performing OTC counselling • Informal discussions with <ul style="list-style-type: none"> - fellow students at seminars and during university weeks - with tutor and staff at the pharmacy • Consolidating, extending and refining skills

*Abbreviations: SOP=Standard operating procedures, OTC= Over the counter

Katajauvuri et al., 2006; Wallman et al., 2008). These guides were developed for multiple research objectives and covered questions concerning learning in the pharmacy, view of professionalism in pharmacy and beliefs about the future for pharmacists in Sweden. The student interview guide was piloted, slightly revised and re-tested. The tutor interview guide was based on the student interview guide.

No ethical committee decision was applied for, as it was not required by Swedish law for this kind of study. Nonetheless, the respondents signed participation consents.

Analysis

The qualitative analysis was performed by AW, using NVivo software (QSR, 2008). First, all transcripts of the interviews were read for familiarisation and a broader understanding of the material. Meaning carrying text segments relating to different learning activities and methods were then identified. Identified activities and methods were divided, according to degree of planning and organization, into three main groups (Table I). To strengthen the validity of the analysis, the research team held consensus discussions of the results.

Results

Heterogeneity was obtained in the study population: Pharmacy size, location and perceived stress level at the pharmacy varied. Tutors' mean age was 43 (range 28-64); 13 were women and 4 men. Their work experience (range 1-39 years) and tutoring (range no experience to 8 years) varied as well. Students' mean age was 28 (range 24-40 years, including 14 women and 4 men).

The resulting learning activities categories used in pharmacy internship, as perceived by tutors and students, were identified and are described in Table I.

Structured and intentional learning activities were placed in the Formal learning activities category. They included activities stated in the curriculum as university lectures, seminars on OTC-drugs at the pharmacies, study visits to pharmacy-related sites and work on assignments. Students, and even more so tutors, reported problems integrating these formal learning activities into practice at the pharmacy. Tutors perceived these activities as something students do aside from work at the pharmacy. The university weeks and seminars about OTC-drugs were often regarded as important by students, not primarily for their content, but rather for opportunities to meet and discuss with fellow students.

This category also included other pharmacy activities such as regularly organized meetings with tutors, planned shadowing of other personnel and self-studies. Formal student-tutor meetings are to be held every week. These formal meetings, when students and tutors have allocated meeting times, were reported as almost non-existent during the last part of internship. Students stated that tutors delegated teaching of special competence areas, e.g. logistics, to other staff. Planned shadowing was described as tutors assigning students to pharmacy staff who allocated time to be shadowed during routine work. Formal learning activities stimulating reflection included work with reflective essays and formal meetings where students and tutors reflect together. However, formal reflective diaries were seldom used, according to students and tutors.

Activities that are informal but intentional and semi-structured were classified as Learning activities within work. They included asking questions, observing and listening, being supervised, and reflecting. Both students and tutors perceived that these activities were most important for learning. Tutors, however, identified some teaching activities in work that students did not always think of as learning activities. Students seldom mentioned that tutors introduced them to observing others' daily work or provided them with smaller tasks when working, while tutors presented these as deliberate ways of enhancing learning. Reflection was also perceived as an activity for validating new knowledge and putting it into practice. These more informal activities included moments of reflection on problems occurring in daily work. Tutors perceived that they supported students' reflection by discussing routines and tasks, or discussing other staffs' counselling methods. Students and tutors stated that they reflect about situations that they encounter, but without the support of formal diary notations. The learning context seemed to be important and both students and tutors mentioned that all personnel at the pharmacy were involved in educating students. Students tended to fall back on regulations and try to find the "right" way to do things. Eventually, though, often by observing how different colleagues performed daily work and reflecting about this, students understood that they had to find their own working methods. Both students and tutors identified tutoring as a learning activity and emphasized that it was important to allocate time for meetings, although stress often interfered.

Work activities where learning is a by-product was described by both groups as informal, incidental activities closely connected to participation in daily work. Activities included were working with others, learning from meeting patients, trial-and-error, problem solving, interacting with others and consolidating, extending and refining skills. Discussing and solving problems arising in daily work, both with tutors and others at the pharmacy, were expressed as common learning methods. Students described that they tend to assimilate and imitate how others worked. However, they had some difficulties recognizing the learning dimension in working, especially in the latter half of the internship, when they were more incorporated in the workforce and sometimes felt exploited. Tutors, on the other hand, were well aware of students' work-related progress and expressed that students needed time to consolidate their skills. Both groups mentioned that a stressful climate may have negative impact on students' learning opportunities. On the other hand, they believed that this forces students to handle pressure at work.

Discussion

In this study, learning during pharmacy internship in Sweden was examined from students' and tutors' perspectives. Our results identified a wider variety of learning activities. They ranged from formal to informal, varying in level of organization and planning, and in the intention of the activities. Some difficulties were identified – a rather poor integration between formal lectures and assignments of informal learning situations at the pharmacy, and difficulties in awareness of learning

occurring in daily work. It was also evident that social context was of great importance for learning.

Formal lectures and seminars seemed to have a synergistic effect, as they not only provide formal knowledge but also, according to the interviewees, gave students opportunities to discuss experiences with fellow students. These discussions connected the students' experiences with the context in which they should be applied. However, a problem is that students, and even more so tutors, did not integrate formal learning activities such as assignments and lectures into practice. Feedback on assignments was perceived as essential by the students, which is supported by other studies (Hammer, 2006; Plaza et al., 2007). Learning could be further enhanced if formal assignments and lectures were actively followed up and discussed with the tutor or fellow students.

Many of the activities identified were not expressed explicitly in the curriculum. The awareness of learning in daily work can be increased using semi-structured activities such as reflection. This may prevent routinization and turn daily work into a learning experience for consolidating knowledge and skills. In Sweden, reflective activities are introduced to tutors and students, as in many other pharmacy programmes (ACPE, 2006; Christiansen et al., 2007; Sørensen et al., 2005; Wallman et al., 2008). Reflection, as a tool for learning, was perceived important by both groups in this study. If students could be even more aware of learning as a product of their participation in the professional community, as defined by Lave and Wenger, the quality of learning could be improved.

Opportunities to participate in the community of practice is essential for learning the profession (Billett, 2002; Eraut, 2007; Hammer, 2006; Lave and Wenger, 1991; Wenger, 1998). Internship pharmacy certifications are used in some countries to assure the quality of the practice context (ACPE, 2006, CU, RPSGB). Implementing this in Sweden could further improve the social learning context. Our results indicate that learning in internship is social to a great extent and that pharmacy staff support the students' learning at the pharmacy. In particular, the tutor was perceived crucial to support learning activities, ranging from acting as a formal teacher to supporting students' informal learning in daily work. This is in line with other studies emphasizing the importance of assigned tutors for workplace learning (Eraut, 2007; Hammer, 2006; Hayes, 2001; Katajavuori et al., 2005; Sørensen and Haugbølle, 2008; Wallman et al., 2009a). The social context's importance has to be acknowledged to further support learning.

Methodological Considerations

Self-selected interviewees always involve a risk of selection bias, which can be reduced by selecting heterogeneous groups (Kvale, 1997). The interviewer being a university teacher, lecturing in reflective practice and formerly responsible for internship, may also bias the results. To reduce the risk of interviewer bias, all participants were informed that their answers would be treated anonymously and not affect the assessment of students or the university's interaction with the tutors. In some of the interviews bias tendencies were noticed, e.g. when respondents forced the importance of reflection obviously to please the interviewer. This was then discussed during the interview. Another possible risk, considering the author's position, is that of analysing bias. On the other hand, being close to the material and being able to interpret lingo and

underpinning meaning used by the interviewees can contribute to the analysis (Robson, 2002). A qualitative study like this does not determine how common the different learning activities are, but provides the range of possible activities. The results are based on the Swedish setting but may be applicable to other countries that have similar internships..

Conclusions

In summary, our results show that students use many different learning methods. The learning activities in the pharmacy internship ranged from formal to informal, including incidental learning activities. The importance of integrating formal and informal learning activities, including raising the awareness of incidental learning, should be reflected in curricula for better use of the full continuum of possible learning activities. Accepting the social dimension of learning and the full continuum of learning activities is important to further support students' learning of the professional practice of pharmacy.

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References

- ACPE (2006) Accreditation standards and guidelines for the professional program in pharmacy leading to the Doctor of Pharmacy degree. The Accreditation Council for Pharmacy Education Inc. Available at http://www.acpe-accredit.org/pdf/ACPE_Revised_PharmD_Standards_Adopted_Jan152006.pdf (Accessed 2nd December 2009)
- Benner, P. (1984) From novice to expert. Menlo Park, CA, Addison-Wesley.
- Billett, S. (2002) Workplace pedagogic practices; participation and learning. *Br J Educ Stud*, **50**, 457-481.
- Christiansen, F. V., Sørensen, E. W., Söndergaard, B., Rump, C. & Haugbølle, L. S. (2007) Bedømmelse af praktik i videregående uddannelser [Assessment of internship in higher education]. *MONA*, 54-69.
- Colley, H., Hodkinson, P. & Malcom, J. (2002) Non-formal learning: Mapping the terrain, A consultation report. University of Leeds Life Long Learning Institute. Available at http://www.eses.pt/ip/ip/NonFormal_EducationMethods/nonformaleducation/Non-formal%20learning.pdf (Accessed 2nd December 2009)
- CU Studieophold på apotek [Pre-registration internship at pharmacy]. Det Farmaceutiske Fakultet, Københavns Universitet Available at <http://www.kursus.dfuni.dk/course/category.php?id=8> (Accessed 2nd December 2009)
- Droege, M. (2003) The role of reflective practice in pharmacy. *Educ Health* (Abingdon), **16**, 68-74.

- Eraut, M. (1994) Developing professional knowledge and competence. London, The Falmer Press.
- Eraut, M. (2000) Non-formal learning and tacit knowledge in professional work. *Br J Educ Psychol*, **70**, 113-136.
- Eraut, M. (2007) Early career learning at work and its implications for universities. In *Student Learning and University Teaching* (eds. N. Entwistle & P. Tomlinson) Leicester, BJEP Monograph Series II.
- European Parliament and the Council (2005) Directive 2005/36/EC of the European Parliament and the Council of 7 September 2005 on the recognition of professional qualifications. 2005/36/EC. *Official Journal of the European Union*.
- Felstead, A., Fuller, A., Unwin, L., Ashton, D., Butler, D. & Lee, T. (2005) Surveying the scene: learning metaphors, survey design and the workplace context. *J Educ Work*, **18**, 359-383.
- FIP (2000) FIP Statement of policy on good pharmacy education practice. International Pharmaceutical Federation Available at <http://www.fip.org/files/fip/Statements/latest/Dossier%20004%20total.PDF> (Accessed 2nd December 2009)
- Hammer, D. (2006) Improving student professionalism during experiential learning. *Am J Pharm Educ*, **70**, Article 59.
- Hammer, D. P., Berger, B. A., Bearsley, R. S. & Easton, M. R. (2003) Students professionalism. *Am J Pharm Educ*, **67**, Article 96.
- Hayes, D. (2001) The impact of mentoring and tutoring on student primary teachers' achievements: a case study. *Mentoring & Tutoring: Partnership in Learning*, **9**, 5 - 21.
- Hepler, C. D. & Strand, L. M. (1990) Opportunities and responsibilities in pharmaceutical care. *Am J Hosp Pharm*, **47**, 533-43.
- Kansanaho, H., Cordina, M., Puumalainen, I. & Airaksinen, M. (2005) Practising pharmacists' patient counseling skills in the context of reflectivity. *Pharm Educ*, **5**, 19-26.
- Katajavuori, N., Lindblom-Ylänne, S. & Hirvonen, J. (2005) Pharmacy mentors' view of practical training. *Res Sci Educ*, **35**, 323-345.
- Katajavuori, N., Lindblom-Ylänne, S. & Hirvonen, J. (2006) The significance of practical training in linking theoretical studies with practice. *Higher Education*, **51**, 439-464.
- Kvale, S. (1997) Den kvalitativa forskningsintervjun (InterWievs). Lund, Studentlitteratur.
- Lave, J. & Wenger, E. (1991) *Situated Learning. Legitimate peripheral participation*. Cambridge, University of Cambridge Press.
- Lee, T., Fuller, A., Ashton, D., Butler, D., Felstead, A., Unwin, L. & Walters, S. (2004) Learning as work: Teaching and learning processes in the contemporary work organization. Learning as work research papers. Leicester, The Centre for Labour Market Studies.
- Marsick, V. J. & Watkins, K. E. (2001) Informal and incidental learning. *New Directions for Adult and Continuing Education*, 2001, 25-34.
- Miller, C. & Blackman, C. (2004) Interim report for nursing, the LINEA project. University of Sussex Available at http://www.sussex.ac.uk/education/documents/linea_publication_3.pdf (Accessed 2nd December 2009)
- Montgomery, A. T. (2009) Pharmaceutical care in Swedish community pharmacies - Studies of a counselling service [Doctoral thesis]. Department of Pharmacy. Uppsala, Uppsala University.
- Plaza, C. M., Draugalis, J. R., Slack, M. K., Skrepnek, G. H. & Sauer, K. A. (2007) Use of reflective portfolios in health sciences education. *Am J Pharm Educ*, **71**, Article 34.
- Qsr (2008) NVivo. 8.0 ed. Doncaster, QSR International Pty Ltd.
- Robson, C. (2002) *Real world research*. Oxford, Blackwell.
- RPSGB Pre-registration Training. Royal Pharmaceutical Society of Great Britain Available at <http://www.rpsgb.org.uk/acareerinpharmacy/preregistrationtraining/> (Accessed 2nd December 2009)
- Schön, D. A. (1983) *The reflective practitioner: How professionals think in action*. New York, NY, Basic Books.
- Schön, D. A. (1987) *Educating the reflective practitioner*. San Francisco, CA, Jossey-Bass.
- Short, P. M. & Rinehart, J. S. (1993) Reflection as a means of developing expertise. *Educ Adm Q*, **29**, 501-521.
- Säljö, R. (2000) *Lärande i praktiken - ett sociokulturellt perspektiv [Learning in practice - a socio-cultural perspective.]*. Stockholm, Prisma.
- Sörensen, E. W. & Haugbölle, L. S. (2008) Using an action research process in pharmacy practice research - A cooperative project between university and internship pharmacies. *Res Sci Educ*, **4**, 384-401.
- Sörensen, E. W., Haugbölle, L. S., Herborg, H. & Tomsen, D. V. (2005) Improving situated learning in pharmacy internship. *Pharm Educ*, **5**, 223-233.
- UU (2006) Pre-registration training with pharmaceutical legislation Course description
Department of Pharmacy Available at <http://www.apoteksfarmaci.se> (Accessed 1st December 2009)
- Wallman, A., Kettis-Lindblad, Å., Gustavsson, M. & Ring, L. (2009a) Factors associated with reflection among students after an advanced pharmacy practice experience (APPE) in Sweden. *Am J Pharm Educ*, **73**, Article 107.
- Wallman, A., Kettis-Lindblad, Å., Håll, S., Lundmark, A. & Ring, L. (2008) Evaluation of a categorization scheme for assessing pharmacy internship students' level of reflection. *Am J Pharm Educ*, **72**, Article 05.
- Wallman, A., Källemark-Sporrong, S., Gustavsson, M., Kettis Lindblad, Å., Johansson, M. & Ring, L. (2009b) Learning for Professional Practice - Students' and Tutors' Perceptions of What Students Learn in an Advanced Pharmacy Practice Experience. *Am J Pharm Educ*, In Press.
- Wenger, E. (1998) *Communities of practice - Learning, meaning, and identity*. Cambridge, Cambridge University Press.
- Virtanen, A. & Tynjälä, P. (2008) Characteristics of workplace learning among Finnish vocational students. *Eur J Voc Train*, **2**, 199-213.