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Pharmacy Internship

Students' Learning in a Professional Practice Setting

ANDY WALLMAN



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Abstract

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The aim of this thesis was to explore Swedish pharmacist students' learning during pharmacy internship. Internships are meant to introduce students to professional practice. Education programs have to reflect changes in the professional role, and take into account that learning in a professional practice setting differs from organized formal education. This thesis includes both quantitative and qualitative research approaches and applies workplace learning theories.

A scheme for measuring pharmacy students' reflective ability was developed and shown to be feasible and reliable. Factors important for reflection were found to be primarily social and contextual, especially trained tutor and small pharmacy size. Notably, learning style or critical thinking did not correlate to students' reflective ability. Tutors and students perceived that students used a wide variety of activities supporting learning of a broad repertoire of knowledge and skills, preparing them for coming professional working life. Tutors are most important to support learning. However, the current curriculum and formal activities do not address all these outcomes and learning activities used, e.g. workplace learning.

The first overall conclusion is that internship plays an essential part in the pharmacist education program. The integration of formal and informal learning activities during internship, including raising awareness of incidental learning, is important to support students in learning the professional practice of pharmacy. This integration could possibly be strengthened by introducing further tutor training, different assignments, and by using portfolios.

The second conclusion is that the community of practice is essential for students' learning during internship, especially the student-tutor interaction. Hence, the entire social context has to be considered and it is important to ensure a good learning environment at pharmacies during internship.

In summary, this thesis contributes to the understanding of students' learning during pharmacy internship and introduces educational research on the Swedish undergraduate pharmacy education programs.

Keywords: pharmacy education, educational outcomes, pharmacy internship, advanced pharmacy practice experience, workplace education, tutoring, preceptoring, reflection, reflective practice, reflective journals, learning style, critical thinking

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*I never teach my pupils.
I only attempt to provide the
conditions in which they can learn.*

Albert Einstein

Cover picture: A window from Sweden's first instructional pharmacy, Nordstjärnan in Stockholm. Now the window is on display at the Swedish Academy of Pharmaceutical Sciences museum. *Photo by author.*

List of Papers

This thesis is based on the following papers, which are referred to in the text by their Roman numerals.

- I **Wallman A**, Kettis Lindblad Å, Håll S, Lundmark A, Ring L. A categorization scheme for assessing pharmacy students' levels of reflection during internships. *American Journal of Pharmaceutical Education*, 2008 72 (1) Article 05
- II **Wallman A**, Kettis Lindblad Å, Gustavsson M, Ring L. Factors associated with reflection among students after an Advanced Pharmacy Practice Experience (APPE) in Sweden. *American Journal of Pharmaceutical Education*, 2009 73(6) Article 107
- III **Wallman A**, Kälvemark Sporrang S, Gustavsson M, Kettis Lindblad Å, Johansson M, Ring L. Learning for professional practice – Students' and tutors' perception of what students learn during pharmacy internship. *Submitted*
- IV **Wallman A**, Gustavsson M, Kettis Lindblad Å, Ring L. An exploration of how students learn in a pharmacy internship. *Submitted*

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Abbreviations and Definitions

Abbreviations

AACP	American Association of Colleges of Pharmacy
ACPE	US Accreditation Council for Pharmacy Education
APhA	American Pharmacists Association
APPE	Advanced Pharmacy Practice Experience
CCTSA	California Critical Thinking Skills Assessment
CCTDI	California Critical Thinking Disposition Inventory
CPD	Continuous Professional Development
CTA	Watson & Glaser Critical Thinking Appraisal
DRP	Drug-Related Problems
FIP	International Pharmaceutical Federation
GPEP	Good Pharmacy Education Practice
GPP	Good Pharmacy Practice
LINEA	Learning in Nursing, Engineering and Accountant. A study on early career learning by Eraut <i>et al.</i>
OSCE	Objective-Structured Clinical Examinations
OTC	Over-The-Counter drugs
PILS	The Pharmacists' Inventory of Learning Styles
RPSGB	The Royal Pharmaceutical Society of Great Britain
WHO	World Health Organization

Definitions

Internship	The term is used in this thesis for an intra-curricular workplace experience. The Swedish internship is comparable to the APPE in the US and the Preregistration training in the UK.
Pharmacist	Swedish pharmacists have a five-year Master of Pharmacy degree. They are called pharmacists regardless of workplace.
Prescriptionist	Swedish prescriptionists have a three-year Bachelor of Pharmacy degree. The education program is separate from the pharmacists' education. In Sweden prescriptionists have the same legislative rights as pharmacists.
Tutor	A designated professional practitioner who partakes in the internship education. The term is used in this thesis as equivalent to preceptor or mentor.

Preface

Until now, no specific research has ever been done on Swedish pharmacist students' internship. The last paper concerning the Swedish undergraduate pharmacy education programs was published 30 years ago.¹ This thesis addresses students' learning during the pharmacy internship at the 10th semester of the pharmacist education program. Internship is the last step before the professional working career begins.

As a pharmacy student and later as a teacher and director of studies in social pharmacy, one of my interests has been to discuss the pharmacist's role in society and the development of the profession. I have become more and more interested in methods to increase students' interest in, and knowledge about the professional responsibilities that pharmacists meet in working life. My view, as a student, was that fellow pharmacist students and also pharmacists in Sweden possessed a weak ability to handle and develop their professional practice.

As a newly graduated pharmacist, I entered the world of teaching and my first task included being the responsible teacher for the pharmacy internship. A new curriculum for internship was introduced in 2006, driven by the upcoming deregulation of the Swedish pharmacy market and the need for the university to increase control of internship. The changes included an increased focus on tutor education, building a website to facilitate communication and further strengthen the individualization of internship by supporting students' and tutors' communication about learning.

My belief, shaped from my own experiences as a pharmacy student, was that learning originates in the individual, and that individual students need to think more about their future professional roles. As I had only an introductory schooling in educational science, a pragmatic approach to the curriculum development was adopted. However, this led into studies of other healthcare educational programs, methods, and theories for internship learning. An interest in education and learning began to grow, and the step of turning this development process into research was not a great one.

As I started my PhD studies, I kept much of the lecturing and was still responsible for both development and evaluation of internship. Hence, I was still close to my research object. This research project started out with the aim of evaluating the new internship curriculum and the changes implemented. The project evolved and became a study of workplace learning theo-

ries applied to internship, and I started my explorative journey into learning theories.

My first choice for a theoretical framework was Schön's theory about "the reflective practitioner".^{2, 3} The main reason for this choice was that reflective models are dominant in healthcare sector educational programs,^{4, 5} and that Schön's model includes tutors as an important part of learning, which is very much in accordance with internship in Sweden. Introducing reflection into the course included finding a measurement of reflection in order to be able to assess increased reflective ability as an outcome of the pharmacy internship; this became the first study. The measuring of reflective ability led to more questions about how to support students' learning with reflection as a tool for learning. Hence, a study of factors associated with reflective ability was the next step. The results indicated that the social dimension of learning was crucial, even though Schön's reflective theory focuses on the individual's own process and pays limited attention to the impact of the context.⁶

These results changed my view of the use of reflection in internship. Is reflection used as just one of many activities to learn during internship rather than as a philosophy of learning? Which other activities exist? A broader view of learning in internship was necessary in order to thoroughly understand what students learn beside reflective ability. The results from a workplace learning project⁷⁻¹⁰ presented a promising model that embraces both the individual and the social dimension of learning^{7, 11, 12} for studies of what is learned. This became the foundation for the third paper. During the process the question of how students learn during internship has always been in focus, and the fourth paper centers on this question from a broad perspective.

This thesis is an explorative journey of learning during pharmacy internship and solves some questions, but raises even more.

Andy Wallman
Uppsala, Feb 10, 2010

Background

The focus of this thesis is the Swedish pharmacist students' learning during the 10th semester mandatory pharmacy internship. Internship is often seen as an important part of higher education and of developing professionalism among students by learning in a professional practice setting.^{11, 13-15} Pharmacist education programs have to reflect the changes in the pharmacist's professional role. The role has changed, and is still changing.^{14, 16, 17} Defining the profession of pharmacists is not easy, and numerous studies have been done in this area.¹⁸⁻²¹ Pharmacist education programs often include mandatory work practice. Learning in a workplace diverges from educating students at the university and is in many ways more complex.

To understand learning, different theoretical frameworks can be used. Learning can theoretically be seen as acquisition or as participation or as a combination of these perspectives. These two learning perspectives are commonly seen as contradictory, but combinations of perspectives are possible.^{11, 12, 22} It is also possible to determine learning depending on the degree of organization or planning of the learning as formal or informal learning. Reflection is an example of theory used in many healthcare educational programs approaching informal learning at work.

However, how learning takes place during an internship is often unclear, and the learning goals frequently focus on learning of practical skills. This is the case in the Swedish pharmacy internship as well. Internship is not a free-standing learning experience. Hence, the integration of theoretical and practical training is crucial in supporting students' learning of professionalism.^{11, 14, 15} During the educational program, pharmacy students are socialized into "norms" of shared and expected social behavior and aspirations of pharmacy's value to the society.²³ This socialization is further developed in their internship, which introduces students to a professional practice.¹³ The students are the future pharmacists and their education has to prepare them for future working life.

Pharmacists' education and the diversified profession

Pharmacy education programs have to meet the demands of the broad professional role. Today pharmacists have many different roles, as described in the World Health Organization (WHO) and the International Pharmaceutical

Federation (FIP) report of pharmacy practice.^{24, 25} The pharmacist is a caregiver, decision-maker, communicator, manager, lifelong learner, teacher, leader, and researcher.^{16, 24}

Furthermore, pharmacists work in many different areas such as healthcare, government agencies, regulative organizations, and in pharmaceutical companies, where they are found in various areas such as marketing, regulatory affairs, manufacturing, research, and development.^{18, 26-28} The role of pharmacists within the healthcare systems also varies. They fill several positions as community pharmacists, primary care pharmacists, hospital or ward pharmacists, pharmacy managers, as well as advisory and educating roles.²⁴

A de-professionalization trend seemed to occur in Sweden and other western countries when the pharmacists lost the task of compounding drugs at the pharmacies and the job was reduced to counting pills, labeling, assessing, and monitoring prescriptions.^{18, 20} A counterreaction to the de-professionalization of the pharmacy profession was to try to establish a new foundation for pharmacy practice. Pharmacists are now moving from being prescription dispensers to being pharmaceutical care providers.^{16, 21} Pharmaceutical care is central to modern pharmacy practice and its implementation is seen as the future for pharmacy practice.^{17, 19, 24, 29, 30} This puts great demands on the pharmacist as a practitioner, and requires continuous re-evaluation of one's professional knowledge and behavior, and an adaptation to each patient.^{14, 23, 25, 31-33}

This new role also has an impact on the practice at pharmacies and the services provided.^{32, 34} Today pharmacies in many countries provide pharmaceutical care services, e.g. medication records, counseling, and identification and prevention of drug-related problems (DRP).^{30, 35-37} Pharmaceutical care services imply a closer contact with patients, and pharmacists have to handle more complicated ethical situations.^{38, 39}

However, even today, the pharmacist's role is not always as reflective and professional as one would expect, and pharmaceutical care is not fully implemented in pharmacies across Europe.^{19, 30, 36, 40-43} In practice, the pharmacist's focus is often technical, on performing the task of dispensing drugs within a certain time limit while still following the rules.^{14, 19, 44} The pharmacist's role is not always clear, and difficulties are often experienced both in communication and in the application of their theoretical knowledge in practice.¹⁹ Not even patients receiving a specific medication service provided by the pharmacy are always able to define it, but when they do, they often report a feeling of increased safety in their medication regime.^{34, 45}

The optimal skill mix for a pharmacist at a pharmacy is broad and hard to grasp, and depends on the context; it may vary between different countries and even between pharmacies.³³

As the role of pharmacist constantly evolves, continuous professional development (CPD) becomes one of the defining characteristics of the professional practice.^{2, 24} FIP and WHO state in the Good Pharmacy Practice (GPP)

document that “Pharmacists in each practice setting should accept personal responsibility for maintaining and assessing their own competence throughout their professional working life.”²⁵ In other statements by FIP and WHO, it is concluded that one of the roles of today’s pharmacist is that of a lifelong learner.^{46, 47} They also state that personal assessment and a personal plan for continuous professional development (CPD) are required.⁴⁸ The US Accreditation Council for Pharmacy Education (ACPE)’s accreditation standards and guidelines for the US pharmacy degree program also reflect the increased emphasis on becoming, even as a student, a professional and lifelong learner.⁴⁹

In many countries, most pharmacists work at pharmacies. However, in Sweden a relatively small segment of pharmacists work at pharmacies, whereas the pharmaceutical industry employs relatively many pharmacists in different positions.^{18, 50} This could be due to the presence of prescriptionists at pharmacies and the state monopoly on pharmacy ownership, which resulted in fewer pharmacies per capita in Sweden than internationally.

The state-owned pharmacy chain, Apoteket AB, with monopoly on medicine retail to individuals, has had a large influence on the pharmacist’s role in Swedish pharmacy practice. Apoteket AB has been described as a top-down organization that is rigid in its structures, and staff tend to follow directives and written operating procedures by the book.^{44, 51} Nevertheless, Apoteket AB had the intention of being a learning organization, with active co-workers who contribute to the development of work.⁴⁴ There is an intention to change the pharmacist’s role at pharmacies and this process is slowly taking place, as stated above.^{29, 32, 49}

However, the situation will change due to the ongoing deregulation of the pharmacy market in Sweden.⁵² Different pharmacy owners in a competitive market will probably develop different professional strategies, influenced by the international pharmacy chain owners, and the number of pharmacies will probably increase.

Undergraduate education programs

There is an ongoing discussion about content and quality of pharmacy education programs worldwide.^{53, 54} Pharmacy education programs are adapting to the new demands as well as trying to find their own mix in preparing the future pharmacy practitioners to take on a more professionalized role within healthcare.^{46, 55, 56} They have to further integrate pharmaceutical care and introduce students to professional working life.^{17, 43, 46}

The International Pharmaceutical Federation (FIP) has guidelines for good pharmacy education practice⁴⁶ and quality assurance in pharmacy educations.⁵⁷ The syllabi of the European pharmacy education programs are derived from EC 2005/36, which specifies demands on the education programs.⁵⁸ Education programs in the US are regulated by the ACPE and the

American Association of Colleges of Pharmacy (AACP).^{29, 49} They all acknowledge the speed of change in the pharmacy profession and the need to prepare students for working life in many various sectors, as stated above.²⁷ The pharmacy students' need of developing professionalism has been thoroughly discussed in the US and Canada in recent years, stressing the importance of professional skills and knowledge, including social skills.^{15, 59-61} Studies have evaluated the outcomes of internships in the US, based on standards and the professional perspective showing that learning at workplaces is important for students learning about professionalism.⁶²⁻⁶⁴

Most organizations and legislative bodies agree that pharmaceutical care and intra-curricular internships should be mandatory in order for a student to become a pharmacist.^{46, 49, 58} Internship is also called "Advanced pharmacy practice experience" (APPE) in the US⁴⁹ and "Pre-registration training" in the UK.⁶⁵ The foundation that students get during their education will form the future of pharmacy practice, and the present practice will form students' perceptions of their future profession.¹⁶ Hence, the interaction between school and practice becomes important, as learning continues after entering the workplace setting, introduced by internships.

The Swedish pharmacy education programs are also derived from the European Union legislation.⁵⁸ The Swedish pharmacy programs are similar to most international pharmacy programs, but with less focus on pharmacy practice and internship and instead a broader focus on basic natural science knowledge, and especially on chemistry.⁶⁶⁻⁷⁰

Two academic diploma programs, leading to a license to practice, are available for pharmacy students in Sweden – pharmacist and prescriptionist. Both have the same legal rights after graduation regarding practice at pharmacies.

The pharmacist education program in Sweden is a five-year program leading to a Master of Pharmacy degree,⁶⁶ which is comparable to European pharmacy degrees and the PharmD degree in the US. In Sweden, Uppsala University and the University of Gothenburg educate pharmacists.

The Swedish prescriptionists are also educated at universities. Several universities in Sweden provide equivalent prescriptionists' education programs. The prescriptionists' pharmacy education program is a three-year Bachelor of Pharmacy program separate from the pharmacists' education.

Both programs include pharmacy internships – for pharmacist students a six-month internship in the last semester, and for prescriptionist students nine weeks in the fifth semester. The students have no prior internship within the pharmacy program. This differs from many international pharmacy education programs, which often include some pharmacy experiences earlier in the education program as well as an advanced pharmacy experience at the end.⁶⁷⁻⁷⁰

Theoretical framework on learning

In order to understand learning in a professional practice setting, a theoretical framework has to be applied, highlighting different aspects of learning and learning in work.

Different perspectives on learning

Learning can be described from one of two theoretical perspectives, learning as acquisition and learning as participation, or as a combination of these two perspectives.

The learning as acquisition perspective is based on the rational cognitive tradition in which learning is seen as an individual process, originating from the individual's activities. To learn something is considered to put that knowledge or skill into, or make a change in the contents of, an individual's mind.⁷¹ This is done by activities within the individual, which imply that thinking or reflection is privileged and action is an application of the thinking or reflective process. Learning something new includes incorporating the new into existing knowledge, and corrects inconsistencies. Learning includes accumulating knowledge that is explicit, visible, possible to detect and identify.⁷¹ Hence, learning is a process where the individual acquires new knowledge or rearranges old.

Learning as acquisition also implies that learning is something that the individual possesses and is aware of. This is an assumption of transparency in learning in the sense that if something is learned it can be explicitly expressed. It should be possible to articulate and define what is learned and it is also possible to transfer, trade, and share this knowledge with others.⁷¹

It is also possible to identify the best and most desirable learning.²² Learning primarily takes place in formal education through verbal or written instructions or by demonstrations.⁷² Knowledge is not context-bound; it exists independently of the individual and the context. Learning often includes acquiring theoretical knowledge, one subject at a time, in a classroom setting.²⁶ Hence, learning that occurs outside educational institutions is commonly undervalued.

Arising from the dissatisfaction with this undervaluation of workplace learning, the learning as participation perspective evolved.⁷¹ Learning as participation emerged from a social tradition of learning focusing on the social and relational character of learning.⁷¹ Within this perspective, learning is seen as an ongoing process produced and constantly reconstructed through relationships and interactions between people performing their work and participating in daily activities in various situations and social contexts.^{73, 74} This in turn implies that learning is something that is not bound to the individual but rather to the relationships between people.⁷⁵ Knowledge is not something an individual possesses, but rather a social construction.²² This

implies that learning cannot be formal and explicit, and it is not possible to determine the best way to learn. Learning is often informal, not always obvious and recognized as learning in these situations.^{73, 76}

In this learning perspective, action is crucial; without action there can be no learning.⁷⁷ It is impossible to separate the ongoing learning process from action. As opposed to learning as acquisition, thinking and reflection are applications of, and originate from action. Action and learning are intertwined. The activities and actions are embedded within a particular context, and hence the foundation for learning is that it is situational, dependent on the context, and on active participation in everyday activities.^{14, 26, 73}

A “community of practice”, as stated by Lave and Wenger, is a crucial context for learning an occupation or profession.⁷³ They describe the learning process as “legitimate peripheral participation” where newcomers learn through interactions with more experienced old-timers in the community of practice.^{71, 73} Newcomers move toward a full participation and expert status, not only by learning single skills, but also by being shaped into members of the community of practice.

In this thesis a combination of the two perspectives of learning presented above is adopted. A combination of these two perspectives is possible, and they can be seen as complementary instead of contradictory.^{7, 11, 78, 79} Eraut makes a distinction between the two perspectives, and argues that they co-exist. He accepts both an individual process and a social process of learning. He is described as representing a “situated cognitive” theory of informal learning in work, since he connects the individual’s learning closely with the social situation and work context.¹²

A combined perspective acknowledges that an individual learns, but that individuals exist within a community of practice that also learns and evolves over time. Hence, different knowledge and skills can be learned by different activities supporting learning for individuals in their context. It combines the perspective to explain what and how people learn and the contexts’ meaning for the social construction of knowledge as well as for communities of practices’ meaning for learning.^{10, 72, 80} By accepting and adopting that learning at work is the product of the interaction between different dimensions of individual and social factors, learning can both be explicit and tacit. Many activities, social and individual, formal and informal, contribute to learning.¹² By adopting this combined perspective a broader and even deeper understanding of learning is possible.

Formal and informal learning

There is also a distinction between formal and informal learning.⁷⁹ Several definitions and concepts exist around formal and informal learning, and these definitions can be seen on a continuum, depending on the degree of formality rather than on a dualism between formal and informal learning.^{10, 79}

Formal learning is often defined as organized learning and occurs preferably in educational settings outside the workplace, such as lectures and seminars.^{71, 80} These learning activities favor scientific knowledge rather than professional knowledge.^{14, 81} Formal learning might also be arranged in workplace settings to support training and learning at work. This might include meetings with a tutor, shadowing others at work, different assignments, and essays.⁸⁰

Informal learning is defined as learning that is not distinguished as formal.^{79, 82} It can also be characterized according to four principles; learning occurs outside formal education settings, is intentional or incidental, is often experiential, and it is relational.⁷¹

Informal learning is integrated and cannot be separated from the work context in which actions are performed, reflected upon, and developed. Marsick and Watkins state that informal learning usually is intentional but seldom structured.⁸³ However, they also state that learning can take place as a by-product of activities exercised in daily work.⁸³ This sub-group of informal learning is often called “incidental learning” and is less intentional.⁸³ Incidental learning might be tacit, unconscious, and taken for granted, hence it is closer to a view of learning as participation.⁸³ Eraut defines this type of informal learning, at the most informal learning end of the scale, as “implicit, unintended, opportunistic, and unstructured learning in the absence of a teacher”.¹⁰ It is implicit in the sense that acquisition of knowledge and skills happens without the awareness of what is being learned. Incidental learning is unintended and unstructured, in that the activities often are unplanned and happen spontaneously and in an unstructured way outside formal learning activities. However, Eraut does not exclude that informal learning can be explicit as well.⁷

Informal learning is also characterized as experiential and opportunistic; learning rises from experiences that occur through participation in everyday work and reflection on these experiences. By participating, experimenting, and observing, the novice can identify the tacit dimension that professionals cannot explicitly explain.^{11, 26, 73}

Informal learning can, however also be more intentional, and Eraut sees the whole scale as a continuum.⁸⁰ Intentional activities can be supervision and having discussions.^{7, 22} However, there is no best activity for getting results.⁸² Results seem to depend more on a range of individual, group, community, organizational, and societal factors.⁸² Reflection might be seen as an intentional activity to achieve a consciousness about tacit knowledge and skills.^{3, 7}

Reflective practitioner theory

Reflection is also used as a theoretical model for practitioners' workplace learning. The use of reflective practice theories is a common way in the

healthcare sector literature to tackle workplace learning situations, and is therefore part of many workplace experience curricula and internships. Reflective practice has taken place in nursing education^{77, 84-87}, medical education,^{88, 89} and lately also in pharmacy education.^{17, 24, 49, 90-93} As stated by Droege:

“In order for pharmacists to partake in truly interdisciplinary healthcare teams and the profession of pharmacy to demonstrate its unique and indispensable contribution to quality healthcare, pharmacy curricula would teach towards reflective practice...”¹⁷

One of the most quoted books on professional expertise and the idea of reflection in professional practice is *The Reflective Practitioner* by Donald Schön, 1983.² His theory is a revolt against technical rationality, and he states that problems are seldom well-defined and scientific. Instead, they include empirical knowledge and “gut-feelings” and are closely connected to the activity performed.² Reflection is the means by which the complex epistemology of practice may be uncovered.^{2, 3} Schön embraces the idea that the world is constantly changing and that change is positive.³ Reflection can be a way to deal with changes and increase professional confidence and competence.² Schön suggests that reframing and change is essential in order to achieve a higher level of practice, and that individual reflection is the way to reach professionalism. The professional practitioner has to continuously adapt to stay on top of his/her area of expertise; such continuous learning is also one of the defining characteristics of professional practice.²

Practitioners usually know more than they can express, and some of this tacit knowledge can be brought to the surface by reflection and be used to develop new knowledge. Tacit knowledge is part of the artistry of practice, which is also central to the theory of the reflective practitioner. According to Schön’s theory about the reflective practitioner, this tacit knowledge has to be explicitly expressed by reflective discussions or individual reflection.²

From a learning perspective, the central function of reflection is to validate prior learning, or draw attention to the grounds or justification for our beliefs.⁹⁴ If there is reason to doubt prior learning or beliefs because of changes in knowledge, social interactions, personal feelings, or intentions, one must resolve these issues before continuing to learn. Reflection can be seen as the central dynamic, essential to higher learning and changes in behavior when involved in problem-posing and transformation of meaning perspectives.⁹⁴ In professional life, constant acquisition of knowledge is a circular process of entwined thinking and action.⁷¹ Thus reflection can be seen as a way for an individual to apply critical thinking to one’s own work and situation, expanding it to include hunches and conjectures as well as subjective feelings. It is a step beyond technical rationality, and allows personal feelings and artistry to be a part of professionalism and knowledge.²

Reflection encompasses a broader range of knowledge and emotions, including the intuitive grasp of information, creative expressions, and inner knowledge that is not easily rationalized.^{2, 95} Subjective ideas are also included within reflection, as applying them can bring out new ways of handling situations in practice.²

Learning outcomes – knowledge and skills

Learning at a workplace is more multifaceted than formal education; several skills and a wide variety of knowledge are obtained.^{11, 14, 73}

Formal, theoretical knowledge is normally obtained through formally organized learning activities within a prescribed learning framework, such as lectures and seminars, but also arranged learning activities within work, such as meetings with a tutor.⁸⁰

Informal skills and knowledge are important in practitioners' work. These skills are often tacit and implicit and manifest themselves as "know-how".² Informal knowledge and skills are often developed in the situations and contexts where they are performed, hence they are social and contextual.⁷³ In practice, much of the knowledge used is tacit and has to be elucidated and reframed in order to develop practice.

Knowledge about how to make formal knowledge more situated and adapted to the context can be seen as meta-cognitive skills. Meta-cognitive skills are linked to deliberative learning and are needed to review behavior and develop positive attitudes to lifelong learning. Reflection can be seen as such a meta-cognitive skill that can be learned.

One attempt to summarize the different possible learning outcomes, in terms of knowledge and skills at workplaces, was made by Eraut in the Learning in Nursing, Engineering and Accountant (LINEA) project.⁷⁻¹⁰ In this project a typology was developed, derived from empirical studies based on novices' perceptions of learning at workplaces.⁷ The novices were from three different professions; early career nurses, accountants, and engineers.⁷ The model's strength is mainly that it does not derive from only one profession. Hence, it is not workplace-specific but instead generic in nature. The typology consists of eight main categories with several subcategories covering aspects such as task performance, awareness and understanding, personal development issues, academic knowledge and skills, and teamwork.^{7, 9, 96} (Figure 1). All in all, the typology gives support for identifying many aspects of what is being learned at a workplace. Several different outcomes are ongoing processes, since the endpoint is impossible to determine in work. The typology lists both task-related skills that are workplace-specific as well as general professional knowledge.

Even though the typology is developed for early career learning and not for students, it might be applicable. A new employee and a student share

many common traits. In common with a newly graduated employee, students participate in the professional community of practice as “legitimate peripheral participants”,⁷³ as they are not allowed, nor are they competent enough, to take the same responsibilities as a full member of the professional community.

<p>Task performance Speed and fluency Complexity of tasks and problems Range of skills Communication with a wide range of people Collaborative work</p>	<p>Supervisory role Delegation Handling ethical issues Coping with unexpected problems Crisis management Keeping up-to-date</p>
<p>Awareness and understanding Other people: colleagues, customers, managers Context and situations One’s own organization Problems and risks Priorities and strategic issues</p>	<p>Academic knowledge and skills Use of evidence and argument Accessing formal knowledge Research-based practice Theoretical thinking Knowing what you might need to know Using knowledge resources human, paper-based, electronic Learning how to use relevant theory (in a range of practical situations)</p>
<p>Personal development Self evaluation Self management Handling emotions Building and sustaining relationships Disposition to attend to other’s perspectives Disposition to consult and work with others Disposition to learn and improve one’s practice Accessing relevant knowledge and expertise Ability to learn from experience</p>	<p>Decision making and problem solving When to seek expert help Dealing with complexity Group decision making Problem analysis Generating, formulating, and evaluating options Managing the process within an appropriate timescale Decision making under pressurised conditions</p>
<p>Teamwork Collaborative work Facilitating social relations Joint planning and problem solving Ability to engage in and promote mutual learning</p>	<p>Judgment Quality of performance, output and outcomes Priorities Value issues Levels of risk</p>
<p>Role performance Prioritization Range of responsibility Supporting other peoples’ learning Leadership Accountability</p>	

Figure 1. The LINEA typology for outcomes of early career learning at workplaces.⁷

Activities for learning

During internship, students often meet a wide range of learning activities and methods contrary to their previous education, where often only one solution has been provided for learning – most commonly large group lectures. Learning methods during internship are more multifaceted and complex. Much learning is informal and practical, which students are not used to.¹⁴ Students have to learn from experience at workplaces, i.e. mainly by participating in daily work.

It is also possible to break up learning activities at a workplace after the principal level of intention to learn and the time put aside for learning^{7, 80} (Table 1). Most informal learning occurs as a by-product of normal working processes. During an internship, as well as in early career learning, students learn by taking part in everyday work, by extending and refining their skills from trying things out, participation, consultations, and working alongside others. More organized learning activities that may occur at work include several different methods for learning, such as asking questions, observing, and getting feedback on individual performance.⁷ There are also even more organized activities where time is put aside for learning and the intention is to learn; these include meetings with tutors, seminars, and lectures.⁷ Hence, several methods are necessary and it is of interest to study activities promoting learning during internships.

Table 1. *Identified methods for early career learning, which can serve as a model for possible ways to learning during internship.*⁷

Work activity with learning as a by-product	Learning actions within work or learning processes	Learning activity at or near the workplace
Participation in group process	Asking questions	Being supervised
Working alongside others	Listening	Being coached
Consultation	Observing	Being mentored
Tackling challenging tasks and roles	Getting information	Shadowing
Problem solving	Learning from mistakes	Visiting other sites
Trying things out	Reflecting	Independent study
Working with client	Locating resource people	Working for a qualification
Consolidating, extending, and refining skills	Giving and receiving feedback	Conferences
		Short courses

Activities during pharmacy internships

As pharmacy internship curricula range over several different desired outcomes, students participate in many different activities in which they use

different ways to learn. Hence, a number of learning activities are used to support learning, and many different ways to measure these are needed in order to assess students' achievements during internship. As earlier mentioned, the desired learning outcome of pharmacy internship programs, as often described in curricula including the Swedish, is to increase professionalism while acquiring technical skills.⁷ This goal should reflect the content of internship. However, no curriculum can possibly cover all aspects of what is learned during an internship.

Activities identified in previous pharmacy internship research will be described below within four main themes – activities supporting reflection, participation in daily work activities, tutoring, and formal education activities integrated during internship.

Activities supporting reflection

Reflective skills are often central in internship courses, where prior theoretical knowledge is applied to a practical setting. Developing students' ability to reflect is not easily accomplished, but by introducing teaching methods explicitly aimed at stimulating reflection, the outcome might be improved.⁹⁷

Several activities can be used to stimulate and support reflection; these include reflective discussions with tutors, reflective essays, diaries, and portfolios. Tutors can stimulate students' reflection by using reflective discussions in tutoring.³ The principal feature of reflective tutoring is not to provide answers but to let students find out for themselves, and point out the necessity of putting knowledge in its context and relating it to oneself.³ The key question is often not only how to solve a problem, but what you have learned from this experience, and how it will effect your future actions. Reflection-on-action, in discussions with tutors, can stimulate the students to ask questions and find their own answers to the tacit dimensions of a profession by probing into the informal knowledge of practice.³

Another activity for stimulating individual reflection and supporting students' learning from everyday activities is to introduce diaries or reminder systems. This can take the shape of notes where students write down learning opportunities, and situations that they encounter.⁹⁸ In order to be reflective these notes should answer what happened, how the problem was solved, and what was learned from it.⁹⁸

Qualitative studies have been used in order to determine factors of importance for students' reflective skills, which can be of interest when developing new courses where reflective practice is in focus.^{7, 14, 99} Different factors can be hypothesized to influence students' reflective ability such as identity components,^{76, 78, 100-103} for instance age, gender, critical thinking ability, learning style, and social components^{7-10, 26, 65, 98, 104-106} like workplace environment and tutor interaction. Being able to assess reflection is essential in order to certify that students have reached learning goals with regard to reflective learning.^{84, 107} More specific methods aimed at capturing students'

reflection have also been developed; students' journals and essays have then been used to assess reflection using different approaches, e.g. by using taxonomies, critical incidents, portfolios, dialogues, and interviews.^{108, 109}

Critical thinking is closely related to reflection¹⁰² and is frequently used to evaluate reflective interventions and reflective curricula. There are several definitions of critical thinking.^{108, 109} Common features of different definitions regarding critical thinking include a way to make assumptions from reasoning, especially scientific reasoning based on arguments.^{108, 109} Critical thinking tests have been used in the pharmacy setting for evaluating the impact of the reflective education.¹¹⁰⁻¹¹³ However, these instruments are seldom sensitive enough to measure changes during a course.¹¹³

Different reflective activities or other assignments can be combined into reflective portfolios. These are commonly used to promote and assess reflection.^{26, 49, 93} Portfolios suited for assessments are included in a collection of different jobs performed by the student. The focus of the portfolio should be on the student's own learning and development. The assessment is based on what the student chooses to show and what is possible to assess by predetermined criteria, i.e. ability to reflect, ability to socialize, skills and performance, and the extent of the portfolio.^{26, 49}

Participation in daily work activities

At the pharmacy, students' participation in daily work activities offer them opportunities to learn practical knowledge and skills, and to gain working experience, as well as to train and develop their ability to further learn in their practice.^{7, 114, 115} This participation implies getting into several activities such as doing the work, learning from colleagues, and communicating with patients.²⁶ Many of the skills practiced are tacit or informal knowledge.² To discover and learn these tacit skills, students have to participate in daily work, and learning is dependent on the opportunity to learn by participating in professional activity.^{116, 117} These opportunities may depend on several enabling or constraining factors such as the management attitude towards teaching, time put aside for tutoring, and staff attitudes.^{7, 28} Partaking in work often starts with performing simpler tasks. Learning basic technical skills is often the first step for a novice and plays an important role in pharmacy internship curricula.^{4, 118, 119}

Students and junior practitioners also become gradually more and more aware of the high-order skills needed for communicating with patients at the pharmacy, this interaction being one of the defining parts of a pharmacist's expertise.^{120, 51, 118} Learning to communicate with patients is one important goal of internship.¹⁴ Getting an opportunity to meet patients is also necessary in order to build this and other abilities.¹³ Hence, stress, waiting in line, and the layout of the pharmacy might be of importance.

In order to learn the tacit parts of the profession, internship students need to meet staff members who are open to learning and discussions. Learning

from colleagues involves several activities that are more or less formal, from actively observing their work, shadowing, to working alongside and imitating others' performance.^{7, 80, 121} The processes of actively taking part in the community of practice, solving the problems arising, and performing the common work socialize students into their professional roles.^{13, 73} Participation in pharmacy research projects has also been used to introduce students into the community of practice and foster professional development.^{28, 122} Internship takes place at a workplace, and hence social skills connected to working life are also an important learning outcome.^{14, 26, 73}

Several methods have been identified in the literature for examining practical skills and knowledge.^{49, 65, 106, 123} Examples of such assessments are tutors' judgment, written exams, practical exams, written assignments, and portfolios. Different outcomes in focus for these assessments include task performance and skills, reflection, communication, and theoretical knowledge. Assessment of interns' professional outcomes and skills are often performed by tutors' judgment of the students' performance in daily work at the pharmacy.^{124, 125} Taxonomies can also be used for assessment, for instance the U.S. Pharmacopoeia (USP) medication counseling stages.⁹⁰ Another way to assess pharmacists' provision of pharmaceutical services is the Pharmacy Practice Activity Classification developed by the American Pharmacist Association (APhA), which classifies groups of pharmaceutical care activities performed at a pharmacy.¹²⁶ Formal assessment of professional outcomes such as communication, patient care, and pharmacotherapy counseling have also been used in pharmacy settings by objective-structured clinical examinations (OSCE).¹²⁷⁻¹³¹

Tutors and tutoring

Tutors play an important part in most internships.^{62, 104, 132} Tutors are sometimes referred to as preceptors or mentors.^{3, 49, 62} In order to learn during internship, the students need to have access to learning opportunities at their workplace, as mentioned. This includes a tutor who is trained as such and has time for tutoring.^{62, 133} A tutor acts as a stimulator by activating students when they encounter new situations.^{12, 75} They can also mediate, stimulate to reflection, and introduce students to reflective practice.^{3, 7}

The importance of tutors is discussed by Schön, who finds them of primary importance for developing students into reflective practitioners.³ The discussion between the tutor and student stimulates and initiates reflection, and this interaction is important for learning.^{3, 133, 134}

Tutors can provide support in several ways, including setting goals, facilitating learning, pointing out learning opportunities, assessing and evaluating knowledge and expertise, as well as providing feedback and evaluating students' progress.¹¹⁴ (Figure 1, p 22) Tutors can also be a lifeline for students, helping them into the team and support them in various situations.^{7, 96}

Tutors are also important in fostering students' self-esteem and professional identity.^{13, 73} Role modeling is an important strategy for improving professional behavior as students look to their tutors to identify behavior expected of practitioners.^{13, 135} This is also closely connected with the learning or pedagogical principle of apprenticeship described by Lave and Wenger,^{4, 73} and the theories of novices and experts by Benner.^{4, 119} The apprenticeship offers opportunities for apprentices or novices to learn the profession from their tutors or other experts when they are dealing with tasks and problems in different work situations as part of the community of practice.^{73, 119, 136}

Tutors are also involved in planning internship and learning goals. This can be facilitated by the use of learning style tools to promote self-reflection among students and practitioners and to optimize educations by introducing a discussion about learning styles.^{100, 137} They might also be used in higher education to personalize educations and learning to learn.¹³⁸ Different teaching styles exist, and if the learning style does not align with the teaching style, this could possibly interfere with the students' motivation.¹⁰⁰

In order to support the tutor-student interaction workplaces, the responsible educator and the pharmacy manager should allocate time for regular weekly meetings where students and tutors can discuss and evaluate.¹³ Providing tutors with feedback of their performance is also crucial in order to identify and support areas for improvement.¹³

Formal education activities integrated within internships

Lectures and seminars are common educational activities in internships. These activities are added on, compared to the common workplace learning situation. Providing activities to learn the new theoretical knowledge that is necessary for participating in the working life at the pharmacy can be done by traditional lectures at the university, by providing reading time within the curricula and from the university stimulating learning in the workplace setting.^{14, 26}

Diversity in assignments is commonly used to support learning and for assessing students in pharmacy internship programs. A wide variety of learning outcomes can be the object, using different kinds of assignments. Short written reflective reports on subjects such as communication, pharmacotherapy, and/or drug-related problems have been used.^{106, 123, 139}

Learning during internship differs somewhat from workplace learning, since internship programs often include arranged formal education to some degree. It also occurs in several different contexts including at the host pharmacy, the university, and in interaction between students, clinics, and other professionals.^{61, 123} Students interact with other students in different contexts and constellations, for instance in seminar groups, lectures, and in forums on the Internet. Learning differs within these different contexts, as does the content of the knowledge.

The approach to learning and the methods used may differ between these different contexts,¹³⁶ as may the individuals' intention and degree of organization.⁷ Transferring learning between different contexts can be an obstacle that students have to overcome. Knowledge and skills are often bound to their context.^{7, 76} On the other hand, learning in different social contexts provides opportunities to learn different things and to reach further than learning in one context would allow.⁷ The transformation of learning between different contexts and learning as an ongoing and continuous process has been described by using learning trajectories.⁷ Focusing on trajectories can be useful, as the end goal is hard to define, as is the starting point. Trajectories include an increase in skills and performance or procedure without setting a fixed endpoint, indicating that professionals never can be fully educated and have to be lifelong learners. In professional work there are hardly any end points, as it is impossible to say that you have full expertise to handle all different situations that might occur. Students need to be able to form their own community of practice, and as they are spread geographically, Internet websites with their interactive possibilities can foster this community as well as contribute to learning opportunities.⁷ Trajectories might also explain that different aspects of a subject are learned in different contexts and then brought into the next context for further learning.⁷

Students' learning during pharmacy internship

Internship is supposed to contribute to students' transition between theoretical knowledge and work, introducing students to a professional practice. Hence, the outcome of an internship is much more than learning the skills demanded. The demands are multifaceted, as stated above in the section about the pharmacy profession, and the skill mix is hard to define. It is also clear that pharmacy education programs have to adapt to the changing role of pharmacists.

The contribution of internship to students' development of knowledge and professionalism has been discussed internationally, but not in Sweden. All in all, many factors can have an impact on pharmacy students' learning during internship. As stated above, reflection is a common way to approach the learning situation during healthcare internships. However, few studies and methods exist on how to measure and evaluate students' levels of reflection as an outcome, and no pharmacy-specific methods exist. Being able to assess goals is essential for educators. Factors that support students' learning of reflection are of interest in order to further develop learning activities that support students' learning.

Furthermore, applying a broad workplace learning perspective to internship can identify learning outcomes not accounted for in traditional undergraduate educational research. Many different learning outcomes are desired in

workplace learning settings such as internships, but curricula seldom cover the total outcome of a working life experience. In order to update and develop internship curricula, research has to explore what and how students learn during existing curricula and how to support this learning. Different perspectives can be taken on learning, and these are needed in order to grasp learning during internships. Often individual interventions are studied when assessing learning activities in internships. Identifying learning activities generally to gain an understanding for what and how students learn may develop new ways to support students' learning of the professional practice of pharmacy in different workplace settings.

Aims

The overall aim of this thesis is to gain further understanding of students' learning during pharmacy internship in terms of learning activities and outcomes.

Based on the overall aim, the following research questions are posed:

- Is reflection theory adopted and applied in internship, and if so, how? Is it possible to assess students' ability to reflect as an outcome of the pharmacy internship? What factors and activities are associated with students' ability to reflect?
- What do students learn during internship, from the perspectives of both students and tutors?
- How do students learn during internship, in terms of activities?

The Research Setting

The pharmacist students' pharmacy internship course in Sweden is the research setting for this thesis.

In order to comprehend the present, our history has to be known. The first evidence of pharmacy education in Sweden dates back to 1688, when directives were stated about who could be accepted for vocational education at pharmacies.¹⁴⁰ The pharmacist education was practiced solely at pharmacies until 1837, when the first institute of pharmacy started in Stockholm. Before that, instructional pharmacies had been assigned. The first was the Nordstjärnan (The North Star) pharmacy in Stockholm, which became a head instructional pharmacy in 1816.¹⁴⁰ In the beginning of the 20th century, vocational training at a pharmacy was the main part of the pharmacist education, which at that time began with two years of internship, followed by four months theory, another year or more of internship, and finally theory for two years.¹⁴¹ The Pharmacy Institute was founded in 1837, introducing a more formalized pharmacy education program. The duration and position of internship has varied over the years (Table 2), but the trend is that the practical training and internship has given way to a more academic education.¹⁴¹

Table 2. *The relationship between theory and practice in pharmacy education in Sweden*^{140, 141}

	Pre-theory internship (years)	Theory (years)	Post-theory internship (years)
Pre-1837	Vocational education at pharmacies		
1837	Mixed lectures and practice for about 10 years		
around 1860	2	0.3+2	1
1945	2	1+2	1
1952	1	3	1
1977	-	4	4 weeks included in the theory part
1993	-	4.5	0.5

Pharmacist students' pharmacy internship in Sweden

In general, the curricula of pharmacy education in Europe are aligned with the European Union legislation EC 2005/36, which specifies demands on the education, including a six-month internship.⁵⁸

The pharmacist undergraduate education in Sweden is a five-year program.⁶⁶ In Sweden, Uppsala University and the University of Gothenburg educate pharmacists. Approximately 90 students are accepted twice a year in Uppsala and 90 students once a year in Gothenburg. The universities provide equivalent educations, although some courses differ.

Both universities end their pharmacy program with a six-month pharmacy internship. The students have had no prior internship within the pharmacy program. Uppsala University offers the internship course twice a year, and the University of Gothenburg once, during the spring semester. The internship period is six calendar months, including five days of vacation and two weeks of lectures at the university. Students are employed by the pharmacy during internship and receive a monthly salary from the state-owned pharmacy chain.

The pharmacy internship course in Sweden has recently (in 2006) undergone major changes in order to introduce a curriculum where the focus is more on learning outcomes assessment and ways of learning at a workplace. The goal of the curriculum is to familiarize the student with pharmaceutical work at a pharmacy and the role of the pharmacist in public health and care.¹²³ An important and specific aim is that students shall be able to apply theoretical pharmaceutical knowledge in pharmacy practice. (Figure 2)

The aim of the period of practical training is to enable the student to become familiar with work in a pharmacy, the various activities carried out at pharmacies, and the pharmacies' role in healthcare. Having completed the course, the student shall:

- be able to apply his or her theoretical pharmaceutical knowledge in dispensing and informational activities
- be able to apply pharmaceutical legislations in pharmacy practice
- be able to describe and discuss the pharmacist's and pharmacy's function in healthcare
- be able to support a rational and appropriate medicine use, in dialogue with the customer
- be able to dispense prescriptions and evaluate the rationale in the prescription
- be able to provide self-care health advice at pharmacies including life-style advice, and master the border between self-care and when to recommend contact with healthcare
- be able to, seek, evaluate, and combine information from different sources and present it in a pedagogical way
- comply with the safety and secrecy requirements that apply in connection with dispensing of prescriptions and advising on self-care
- have tools to make ethical evaluations in daily pharmacy practice
- be able to describe the Swedish pharmaceutical service in an international perspective
- have tools to develop his or her leadership skills

Figure 2. Learning outcomes stated in the internship curriculum at Uppsala University.¹²³

Students are stationed at a community pharmacy, in most cases one student per pharmacy. The internship community pharmacies are scattered all over Sweden. So far Apoteket AB has provided all pharmacies, but this will change with the upcoming deregulation. No official requirements are stated by the universities of the internship pharmacies. However, unofficial demands have been that they should have more than five employees including a pharmacist at, or near, the pharmacy, and that they assign an employed pharmacist or prescriptionist as a tutor.

The tutors at the pharmacies are often selected due to their own interest in tutoring. The university states no demands on the tutors with regard to experience or particular expertises. However, tutors undergo a two-day introductory training at the university, and are asked to attend an update session prior to each period of internship. Time is devoted to tutoring at the pharmacies. By a central decision this is financed by the state-owned pharmacy chain. The universities do not pay the pharmacies for hosting the students, nor do they pay any salary to the tutors. They do, however, arrange the biannual tutor meetings where the tutors are trained in several aspects of tutoring, including leadership, assessment, and facilitating reflective discussions.

The curriculum emphasizes important role of the pharmacy tutor. The student-tutor interaction is supposed to be student-driven with the tutor as facilitator (Figure 3). Students and tutors are continuously setting interim targets, aiming to cover all parts of the curricula and professional practice, and tutors guides students through internship. Students are responsible for their learning and tutors assess students' progress and performance and provide feedback. The overall and final goal is the examination and graduation.

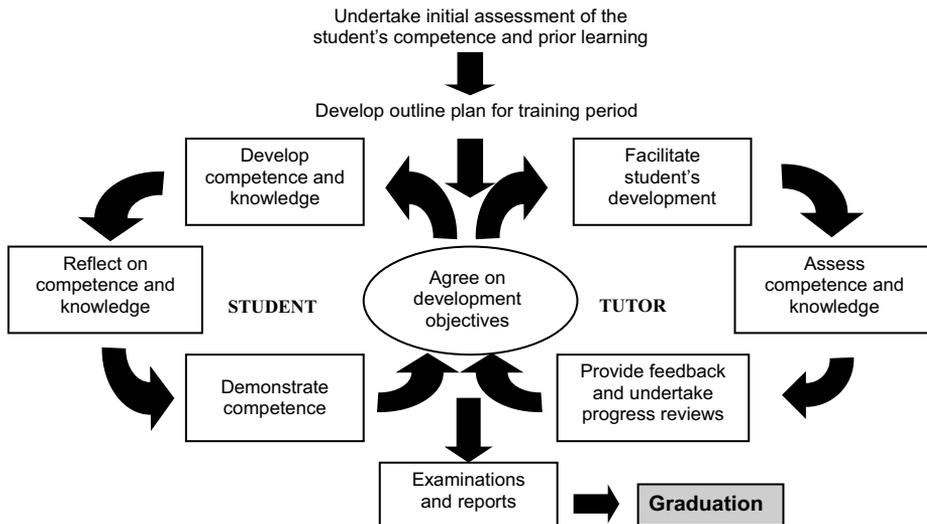


Figure 3. Schematic model for tutor-student interaction used in the Swedish pharmacy internship. Modified from the Royal Pharmaceutical Society of Great Britain's model^{65, 123}

The universities also provide an Internet website with all information on internship. It is also used for students' listing of preferred host pharmacies and the placement process. Assignments are managed through a special function. The website solution includes forums through which students, tutors, and the course administration can communicate, including a student-student forum and one for tutors.

Internship includes several different learning activities (Figure 4). The main activity is participation in daily work at the pharmacy under the supervision of the tutor.

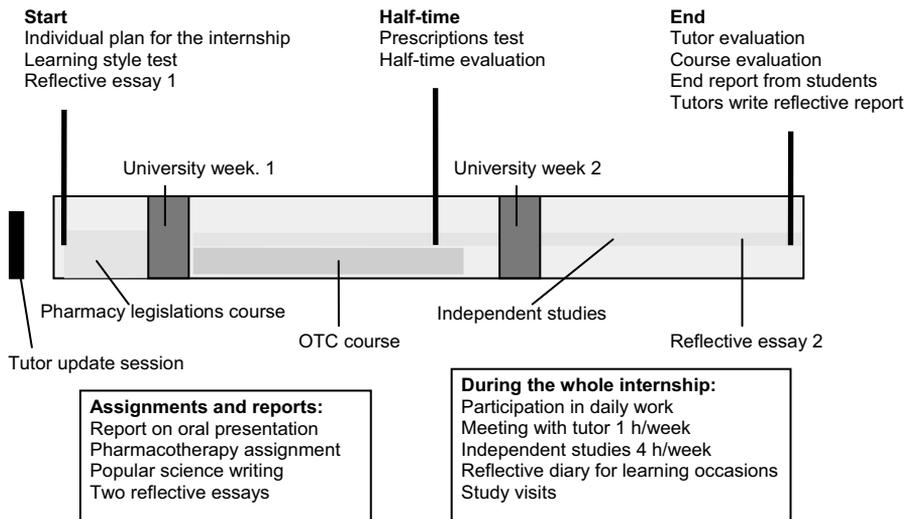


Figure 4. Outline of the Swedish pharmacy internship.

In the Swedish internship, a translation of the Pharmacy Inventory of Learning Styles (PILS)¹⁰⁰ (Appendix 2) is used in the beginning of internship to stimulate discussions between tutor and student about how they can work together to facilitate learning.

The two weeks at the university include lectures in different domains connected to practice such as ethics, oral and written communication, leadership, pharmacotherapy, legislation, and international pharmacy. The content differs somewhat between semesters and universities.

The pharmacy legislation course is administrated by the universities and based on students' independent studies, aided by an Internet training module. Students also have the opportunity to learn by applying their theoretical knowledge on real drug prescriptions at their pharmacies.

Seminars are often arranged in order to support learning of self-medication counseling and over-the-counter (OTC) drugs. They are usually coordinated by the teaching pharmacies in a geographical region and differ

somewhat between these regions. Not all students have this opportunity; some have to rely on independent study for the OTC course.

Students are offered opportunities to several study visits at other pharmacies and pharmacy related workplaces during internship. It is mandatory to visit at least a hospital pharmacy and a different-sized pharmacy, but students can also arrange study visits on their own.

Internship is evaluated in several ways. Several assignments are provided by the university to the students to support their learning and the implementation of theory into practice. The assignments included are all mandatory and consist of two reflective essays about communication, oral and written presentations, and pharmacotherapy cases.

After passing the prescription dispensing test at half-time, students can gain a temporary legal dispensing right if the tutor and the manager at the pharmacy agree. This allows the student to participate in work on the same premises as a registered pharmacist or prescriptionist. The test is mandatory, performed at the pharmacy, and assessed by the tutor. Assessment of the OTC course is done by a written test at the pharmacy, and the tutors are responsible for assessing and discussing the result with students.

The results of the two tests and an evaluation of the student's progress in practical skills are evaluated by the tutor and summarized in a written report at half-time and at the end of internship. The students report on their own progress at the same times. The pharmaceutical legislations course is assessed by a written exam at the university. In order to pass internship, the students must pass the exams, fulfill the time requirements at the internship pharmacy, participate in the weeks at the university, and hand in all assignments. Written reports and assignments are examined at the university by a university teacher.

Materials and Methods

In order to study internship, different approaches and theories were used. This thesis is based on the assumption that collecting diverse types of data best provides an understanding of a research problem¹⁴². Hence, it is not committed to any one system of philosophy. Furthermore, the methods, techniques, and procedures of research are chosen to best meet the needs and purposes of the research question at hand.

In addition, the thesis incorporates both quantitative and qualitative approaches. The differences between quantitative and qualitative methodologies are acknowledged and their compatibility is recognized, accepted, and valued. In Table 3, a short summary of the papers included in this thesis is provided.

Table 3. *Overview of papers included in the thesis.*

	Design/Methods	Study population	Data collection and instruments	Analysis
I	Method development, inter-rater reliability, feasibility and responsiveness	146 students at the start and at the end of internship, 212 essays in total	Written reflective essays from start and end of internship assessed by the scheme	Cohen's kappa Time measurement Paired t-test
II	Cross-sectional survey	262 students at the end of internship	Questionnaires Written reflective essays PILS CTA	Chi-square t-tests Logistic regression
III	Qualitative interview study	18 students and 17 tutors	Interview guide	Directed content analysis Consensus discussions External audit
IV	Qualitative interview study	18 students and 17 tutors	Interview guide	Content analysis

PILS= The Pharmacists' Inventory of Learning Styles, CTA= Watson and Glaser Critical Thinking Assessment

In Paper I, the aim was to develop and evaluate a method for assessing pharmacy internship students' levels of reflection.

Paper II aimed at quantitatively identifying factors associated with pharmacy interns' levels of reflection by the end of internship. A cross-sectional study design was used. The students' levels of reflection at the end of internship, as measured by the instrument from Paper I, was the outcome variable. The paper included a univariate and a multivariate analysis.

Paper III was based on a qualitative interview study. The aim was to analyze what students learn during internship, and if there are any qualitative differences between students' and tutors' views of what is learned. A typology for learning outcomes, derived from the LINEA project, was used as a framework for the analysis. (Figure 1, p 22)

Paper IV provided another angle on the interview data used in Paper III. The aim of the paper was to see how, in terms of learning activities, learning outcomes are achieved during internship. In this case, as well as in Paper III, differences in how students and tutors perceive the methods used were investigated.

Study populations

The study population in Paper I consisted of pharmacist students from Uppsala University during the fall semester pharmacy internship of 2005 (n=83) and the spring semester of 2006 (n=63).

In Paper II, the students above and additionally, students in the spring semester of 2007 (n=53) and the fall semester of 2007 (n=65), in total 262 students, were included in the study. Students in the spring semester of 2006 were excluded since this semester was the first with the new curriculum.

The study population for Papers III and IV was internship pharmacist students from both pharmacy programs in Sweden (Uppsala University and Gothenburg University) who had a pharmacist as a tutor (n=55). Pharmacist students with prescriptionists as tutors were excluded. Pharmacists that were involved in the internship course as tutors during the spring semester in 2008 were also asked to participate (n=55). The tutors and students were interviewed separately. Eighteen students and 17 tutors agreed to participate, and were interviewed individually by the author. Data for determining heterogeneity were collected in the interviews. The interviewees represented a heterogeneous sample of the population regarding several factors; pharmacy size, location, and perceived stress level at the pharmacy varied. Tutors' mean age was 43 (range 28-64); 13 were women, and four men. Their work experience (range 1-39 years) and tutoring (range no experience to eight years) varied as well. Students' mean age was 28 (range 24-40 years), including 14 women and four men.

Data collection methods

A mix of methods was used, including questionnaires, validated tests and interviews.

Reflective assignments and scheme for the level of reflection

In Paper I, a predefined categorization scheme was developed to assess a reflective essay assignment. Before use, the assignment and categorizing scheme were piloted and then tested for inter-rater reliability, feasibility and responsiveness. This scheme was then used in Paper II.

The outline of the reflective essay assignment was inspired by an assignment used by Kansanaho *et al.*⁹⁰ The students were asked to write short reflective essays (1 to 2 pages) about their personal views of patient counseling. The assignment was distributed to the internship students by mail in the beginning and at the end of the course in the fall semester of 2005. The reflective assignment was mandatory in the internship curriculum in 2006 and in 2007 and was distributed through the internship website.

Several schemes and methods for assessing reflective ability were identified, and a scheme developed by Kember *et al.*¹⁴³ was translated and modified. In their study they showed that their coding scheme, based on Mezirow's theory,⁹⁴ is valuable when assessing students' levels of reflection.¹⁴³ The scheme was translated into Swedish from English and tested by rating the essays from the pilot run (n=17). After analyzing the results from the pilot, and having theoretical discussions in the research group, a modified categorizing scheme was developed (Appendix 1) based on the six original Mezirow's levels of reflection⁹⁴, instead of the seven categories used by Kember *et al.*¹⁴³

Questionnaires

A set consisting of a questionnaire, tests, and assignments was used in Paper II. (The questionnaire is available in Swedish upon request.) A questionnaire was distributed to the students by mail in the beginning, and a follow-up questionnaire at the end of the internship program in the fall semesters of 2005, 2006, and 2007, respectively. A merged questionnaire, including questions from both the start and the end questionnaires, was sent out at the end of the spring semester of 2007.

The questions were chosen to cover factors that could have an impact on students' development during internship. There were questions about student characteristics, tutoring, pharmacy placement, and learning style. Student characteristics included age, sex, native language, previous work experience, and perceived importance of internship for future working life.

Critical thinking test

There are several well-validated instruments for measuring critical thinking ability,¹⁴⁴ including the Watson and Glaser Critical Thinking Appraisal (CTA),^{145, 146} the California Critical Thinking Disposition Inventory (CCTDI), and the CCT Skills Assessment (CCTSA).¹⁴⁷ The CTA was developed in 1960.¹⁴⁵ It was earlier the most used measurement in critical thinking evaluations.¹⁴⁸ It is the only critical thinking test that is translated into Swedish (1993) and is commercially available in Sweden.¹⁴⁶ The CTA is an 80-item test performed within a time limit of 40 minutes. It consists of five subtests, all of which assess different aspects of critical thinking.¹⁴⁵

The Swedish version of the CTA was used in Paper II and distributed to the interns' tutors at the pharmacy in parallel with the end questionnaires, two weeks before the end of internship. The CTA was then performed by the students under the tutors' supervision, according to the instructions of the test.¹⁴⁵

Learning styles test

In Paper II, The Pharmacists' Inventory of Learning Styles (PILS) was used (Appendix 2). It is a pharmacist-specific instrument for defining, describing, and measuring learning styles.¹⁰⁰ It consists of a 17-item inventory to determine an individual's dominant and secondary learning style. PILS is constructed around two primary axes – “structured” vs. “unstructured” and “reflecting” vs. “doing” (Figure 5).¹⁰⁰

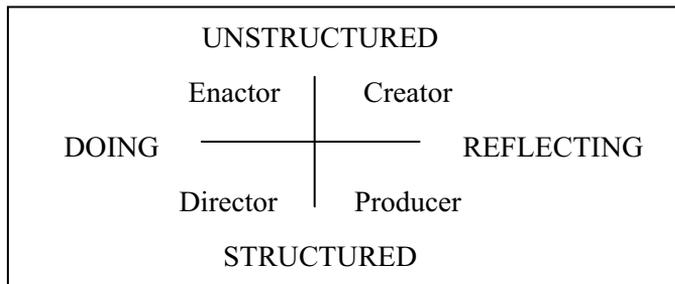


Figure 5. Typology of the Pharmacists' Inventory of Learning Styles¹⁰⁰

Learning style can be defined as “the way in which individuals approach a certain learning situation”.¹⁴⁹ Learning styles are cognitive styles that reflect one's individuality in learning, and these differ between individuals, and might differ for one and the same individual depending on the context.^{150, 151} The learning style has an impact on performance and achievement of learning outcomes.¹⁴⁹ Changes in learning style can be a measurable outcome if

the objective of a course is to change students' preferences of learning methods.¹⁵²

“Doing” individuals (enactors and directors) are those who prefer the opportunity to experiment and try out, while “reflecting” individuals (creators and producers) are those who prefer to observe and practice before trying. Unstructured environments, preferred by enactors and creators, are those in which expectations are defined individually or personally, while structured environments, preferred by directors and producers, are those where expectations are defined externally. The two axes create four quadrants with four corresponding learning styles: enactors, producers, directors, and creators¹⁰⁰ (Figure 5).

PILS was translated to Swedish by the author and then piloted and revised (Appendix 2). The final version was included in the questionnaire that was sent directly to the students two weeks before the end of the course. They were familiar with the test as they had filled it out in the beginning of the course as a part of the introduction to the internship course.

Interviews

Qualitative semi-structured one-on-one interviews were chosen in Papers III and IV in order to explore as many aspects of the research question as possible.¹⁵³ Two interview guides were developed to ensure that most areas of interest were covered during the interviews; one for interviewing students and one for tutors. They were similar in content and questions but differed in point of view, i.e. students were asked what was the most important thing they learned during internship, whereas tutors were asked what they believed was the most important thing students learn during internship.

The interviews included several areas of interest such as view of professional role, work at pharmacy, view of the deregulation of the pharmacy market in Sweden, what and how students learn during internship, and how reflection was used in internship (Appendix 3). These interview guides were developed based on theoretical reasoning and using results of other empirical studies found in the literature.^{14, 114} The student interview guide was tested before the included interviews started. The tutor interview guide builds upon the results from the testing of the student interview guide and was evaluated by follow-up questions after each interview.

All interviews were performed in the summer of 2008, which means that the students were interviewed at the end of their internship. All respondents were interviewed separately. Only in a few cases were both student and tutor at the same pharmacy interviewed, and then it was done separately. All interviews were carried out by the author and each interview lasted approximately one hour (range 53 min - 93 min). Empirical studies have shown that saturation normally is achieved after interviewing 10 to 20 individuals.¹⁵³ After approximately ten interviews in each group, saturation was achieved,

in the sense that no entirely new angles or facts occurred in the answers to the research question. However, all interviews that were planned were performed and included in the study. The interviews were recorded on digital media and later transcribed verbatim.

Data analysis

Quantitative analysis

The data analysis in Papers I and II was carried out using SPSS statistical software for Windows version 12.0.1 (SPSS Inc., Chicago, 2003).

Cohen's Kappa

The inter-rater reliability was calculated by Cohen's kappa, κ , which is used to estimate the level of agreement between two raters, while adjusting for the agreement occurring by chance.¹⁵⁴ It is calculated by inserting the raters' scores into a confusion matrix. The kappa value ranges from 0 to 1, and if there is perfect agreement κ would equal 1. Cohen's kappa values between 0-0.4 are considered poor, 0.4-0.6 fair, 0.6-0.75 good, and > 0.75 outstanding.^{155, 156}

Univariate analysis

In Paper I a responsiveness or sensitivity test was used. It is used to show if an instrument is able to detect a change regarding the parameter studied.¹⁵⁷ The hypothesis for the test was that if students participate in a course with a reflective curriculum their ability to reflect would increase. A paired t-test was used to evaluate the change in reflective ability as measured by the categorizing scheme.

In Paper II, when comparing reflective and non-reflective students in the univariate analysis, chi square was used to analyze categorical data and the independent t-test was used to compare means.

Multivariate analysis

Logistic regression analysis was used to identify factors associated with reflection in Paper II, while adjusting for covariates. Students' levels of reflection at the end of internship, as measured by the scheme described in Paper I, was the dependent variable. The significant variables from the univariate analysis with a p-value of less than 0.05 were included in the logistic regression model as independent variables.¹⁵⁸ Associations are displayed as odds ratios (OR) with 95% confidence intervals.

Qualitative analysis

The qualitative data analysis in Papers III and IV was carried out using NVivo version 8.0 (QSR International Pty Ltd., Doncaster, 2008).

For the analysis in Paper III, a directed qualitative content analysis was used.¹⁵⁹ The basis for the predetermined categories was the results from the Learning in Nursing, Engineering, and Accountant (LINEA) study of workplace learning¹⁰ (Figure 1, p22). However, an openness to the material was kept in that additional categories were allowed to be identified.

First, all interviews were listened to and read to obtain a broad understanding of the material. Before starting the categorization process, the meaning of the categories in the LINEA typology was discussed in the research team. Next, meaning-carrying text segments were identified in the transcripts and categorized into the predetermined categories. Before applying this analysis procedure to the whole material, it was independently tested on two pilot interviews by the author and a co-author. After discussions of the pilot analysis, a new category was added under “Academic knowledge and skills” – the sub-category “New academic skills”. Furthermore, 15 interviews were independently analyzed by the author and the same co-author with consensus discussions in between. Approximately 5-10% of the categorizations were changed in these discussions. After completing the analysis of all interviews, descriptive texts were written to explain the content of the categories. These texts and all categorized text segments were then audited independently by another co-author in a process inspired by Hill *et al.*¹⁶⁰ A consensus discussion with the author and the two co-authors determined the final result and analysis.

The qualitative analysis method used in Paper IV did not use any predetermined categories, in contrast with the directed content analysis used in Paper III. The same approach was used with an initial familiarization, followed by identification of meaning-carrying text segments but then the categories were created during, and as a result of, the analysis. In the next step, the identified categories were clustered together into more general groups. The analysis was conducted by the author and short descriptive texts were written to explain the content of the categories and groups of categories. To strengthen the validity of the analysis, the research team held consensus discussion of the results.

Ethics

No ethical committee decision was asked for since it was not required by Swedish law for this type of studies at the time. Nonetheless due ethical considerations were taken.

All students were informed that the essays, tests, and questionnaires were included in a research study about learning during the internship course and that it was voluntary to have their essays and learning style test (which for some of the students were mandatory in the course) included in the study. The confidentiality of the respondents was protected during the analysis by the use of code numbers.

All respondents in the interview study signed a written consent to participate in the interviews and accepted being audio-recorded. All students were reassured that their answers would not influence the course grading and the tutors were in turn reassured that their answers would not affect their positions as tutors.

No compensation was paid to any respondents, but they were allowed to complete questionnaires, write essays and answer the tests, as well as participate in interview, during working hours at the pharmacy.

Summary of Findings

Paper I – Measuring reflective ability

The data collection in the spring semester of 2005 (n=83 students) generated 56 essays in total, 30 essays written at the start (response rate=36%) and 26 essays written at the end of internship (response rate=32%). The data collection in the spring of 2006 (n=63 students) generated 126 essays in total (start and end essays, n=63 each), with a response rate of 100% due to the fact that the assignment then was a mandatory part of internship and no students chose to opt out. In total, 80 students wrote essays both at the start and end of their internships.

Categorizing scheme for level of reflection

In our categorizing scheme, based on the Kember *et al.* scheme¹⁴³, each level builds upon the earlier one and every level of reflection is at one separate step in the scheme (Appendix 1). Of the six levels used, there are three non-reflective levels and three reflective levels. (Table 4)

Table 4. *The six levels of reflection according to the categorizing scheme.*

6. Premise reflection	Reflective
5. Process reflection	
4. Content reflection	
3. Introspection	Non-reflective
2. Thoughtful action	
1. Habitual action	

To better guide the raters in performing the categorization, each level of reflection in the categorizing scheme was exemplified by a pharmacy-specific example extracted from the pilot study essays.

The scheme analysis consists of three steps:

1. Identify parts of the text carrying meaning regarding reflection.
2. Categorize the quotes one by one into a specific level of reflection according to the categorizations scheme as described below.
3. Read through the entire essay in order to decide upon a final category that responds to the overall achieved level of reflection in the essay.

This overall categorization was given a score ranging from 1-6 and was guided by the highest level achieved. The six different levels of reflection are described in Appendix 1.

Inter-rater reliability, feasibility and responsiveness

The evaluation of the categorization scheme showed that it has a good inter-rater reliability, feasibility, and responsiveness. The total Cohen's kappa for all essays (n=182) was $\kappa=0.63$ (considered good) and the mean time for categorizing one essay was three minutes. Finally, the responsiveness test indicated that changes in the level of reflection can be captured by this assessment method, and that students' levels of reflection increased over time during the internship course.

An increase in the level of reflection score was observed in comparison of the start and end essays (Figure 6). The mean score at the start was 3.08, and at the end 3.78 ($p<0.001$). At the start of internship 25% of the students were categorized as reflective and at the end 60% ($p<0.114$). Viewed proportionally, 58% increased their level of reflection between the start and the end of internship, 31% reached the same levels, and 11% decreased their levels.

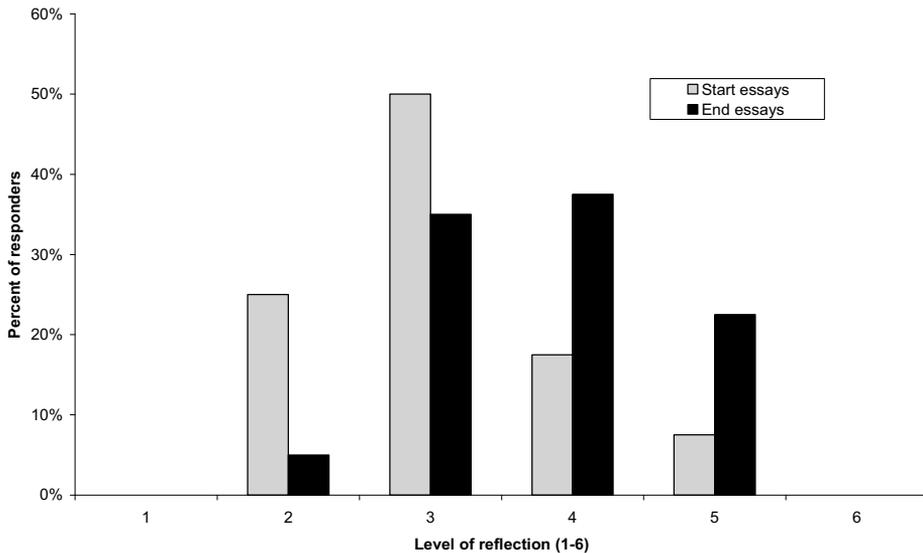


Figure 6. Level of reflection over time based on essays at the start and end of the internship (n=160). (Level 1 is the lowest level of reflection and 6 the highest.)

Paper II – Factors associated with the level of reflection

The overall response rate was 71% (186/262). The response rate for students completing all components was 50%, taking the internal attrition into account, but for each subtest the response rate varied between 30-92%.

In the univariate analysis, there was no correlation between level of reflection and critical thinking (CTA) score ($p=0.86$). Nor was there any correlation between students' level of reflection and preferred learning style. The only individual factor found to be associated in the univariate test was the student reporting already having employment after graduation. The other factors found to be associated with high reflective ability were all social components, i.e. factors such as small number of employees at the pharmacy (1-10), the tutor's level of education (prescriptionist), the tutor's sex (woman), tutoring received from trained formal tutor, students who perceived it important to discuss critical thinking with the tutor, and students who were satisfied with tutor discussions about the pharmacists' role.

According to the logistic regression analysis, receiving formal tutoring (OR=5.3), being at a small pharmacy with 1-10 employees (OR=19.8), and a high perceived importance of discussing critical thinking with the tutor (OR=1.2) remained independently associated with reflection (Table 5).

In conclusion, this study indicated that social components are of greater importance to students' level of reflective skills at the end of internship than individual components. The ability to reflect was independently associated with students having a formal tutor, the size of the internship pharmacy, and the perceived importance of discussing critical thinking with the tutor. However, students receiving most of the tutoring from their formal tutor had a fivefold greater chance to be reflective at the end of the course. Students at small pharmacies (1-10 employees) with high perceived importance of discussing critical thinking were more reflective. No correlation between level of reflection and individual characteristics, critical thinking, or learning styles could be observed.

Table 5. *Logistic regression analysis of factors associated with reflection, including all variables with $p < 0.5$, and semester from the univariate analysis.*

Variable	Odds ratio	95.0% CI	P-value
STUDENTS' CHARACTERISTICS			
Internship year (Semester)			
Fall -05	1		0.968
Fall -06	1.35	0.27-6.69	0.712
Spring -07	1.20	0.22-6.64	0.835
Fall -07	0.99	0.20-4.8	0.991
Students already employed after graduation			
No	1		
Already has employment after graduation	2.84	0.96-8.39	0.60
TUTORING			
Tutor's educational level			
Pharmacist	1		
Prescriptionist	1.67	0.54-5.2	0.377
Tutor's sex			
Male	1		
Female	3.68	0.49-27.40	0.204
Tutoring at the pharmacy			
Informal tutor provided most tutoring	1		
Formal tutor provided most tutoring	5.27	1.63-17.09	0.006*
Discussing the pharmacist role with tutor			
Students' perceiving it important to discuss critical thinking	1.21	1.02-1.45	0.034*
WORKPLACE ENVIRONMENT			
Number of employees at pharmacy			
--31	1		0.087
20-30	6.67	0.77-57.48	0.084
10-20	4.17	0.63-27.52	0.139
1-10	19.83	1.91-206.12	0.012*

*= $P < 0.05$, CI= Confidence interval

Paper III – What students learn during internship

Internship is not only focused on students learning the practical skills for work at a pharmacy. By analyzing the learning outcomes from a broader workplace learning perspective, a deeper understanding was obtained of the content of the learning in terms of skills and knowledge. The results indicated that internship provided the students with a solid base of task performance skills, but also social and professional knowledge such as how a workplace functions, and how learning takes place at a workplace. It also gave them an insight into the pharmacist profession. The material showed some differences between students' and tutors' view of what is learned, and what is important. Using the results from the Learning in Nursing, Engineering and Accountant (LINEA) study as a fixed typology for analysis has supported the identification of several learning outcomes that are not accounted for in the curriculum.

Professional skills

Much of the learning aims at learning practical professional skills such as being able to dispense drugs and provide counseling. The main focus, according to the interviews with both students and tutors, was on basic task performance. This focus on task performance such as handling computer systems seemed to be a great threshold for further learning. It hampered learning of more complicated tasks such as communication skills and pharmaceutical care, which are supposed to be the main learning objectives of internship.

Learning to learn at a workplace

During internship students also achieved personal development in areas such as learning strategies, and discovered new ways to learn. Learning at a workplace was something new for most students; hence, they also had to learn different ways to learn in this new environment, although this is not something the curriculum mentions. The students and tutors in this study emphasized reflective activities as a way to learn, but also that an increase in reflective ability itself was seen as a desired outcome of internship.

Social skills

Social interactions – student-patient, student-tutor, and student-whole pharmacy staff – were perceived to be important for learning during internship. Many students had no or limited workplace experience prior to internship. Hence, they had to learn how to manage this new context. Participation in the professional community was closely connected to students learning during internship, both as a gained understanding of its importance as an outcome and as a way to learn during internship

Differences between students and tutors

There were few differences between students' and tutors' views of what was learned during internship. However, students tended to focus mainly on task performance and did not mention decision making and problem solving as major learning outcomes. Tutors, on the other hand, emphasized these outcomes. Students were not able to recognize more professional processes such as decision making and problem solving. Students also stated that they got a good insight into the pharmacist's role as a leader. However, leadership was not mentioned by the tutors.

Applying the typology on pharmacy internship

The LINEA typology helped identify different skills and knowledge that students and tutors perceived are learned during internship. The results can be used to identify the differences in desired and real outcomes of internship, in order to better design goals in the curriculum and support students' learning during internship. A vast majority of the categories and sub-categories in the LINEA typology were found to be represented in this study. Hence, the typology was applicable for describing what is learned during a pharmacy internship. This also indicates that students' learning at a workplace is much like novices'. However, some of the original categories in the typology were not found in this material; nothing was categorized under the main category "Judgment", or in the subcategories "Value issues" and "Group decision making".

Paper IV – How students learn in a pharmacy internship

The learning activities involved in the pharmacy internship, as perceived by tutors and students, can be studied in various ways. In this analysis of semi-structured interviews with students and tutors, the learning activities used can be split into three main categories, depending on the time set aside for learning and the intentions of the different processes leading to learning. These categories are: Formal learning activities at the university and pharmacy, Learning activities within work at the pharmacy, and Work activities where learning is a by-product (Table 6).

Formal learning activities at the university and pharmacy

Structured and intentional learning activities connected to the curriculum were placed in the *formal learning activities* category. Learning was the main intention with these activities, and they were planned and organized. Many activities connected with the curriculum outside the pharmacy fell into this category, such as lectures at the universities, seminars about over-the-counter drugs (OTC), study visits to various sites, and work with assign-

ments. In this category, activities at the pharmacy could be identified as well, including formal meetings with tutors, shadowing of other personnel, and independent study. Tutors and students often expressed that they had problems integrating formal learning activities, such as lectures at the universities and work, with assignments to practice at the pharmacy. Tutors seemed to find it harder to connect these lectures and assignments with practice than did students, and they had trouble integrating them into the education at the pharmacies. They considered these activities to be something the students do aside from the pharmacy work. Formal meetings between students and tutors are stated in the course directives to be held every week. However, these formal meetings, when students and tutors have allocated meeting times, were reported as almost non-existent during the last part of internship.

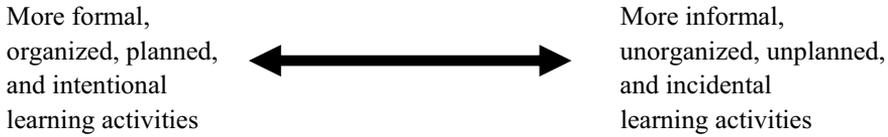
Learning activities within work at the pharmacy

This category, *learning activities within work*, included learning activities that are informal, but intentional, semi-structured, and performed in daily work. In this category, activities such as learning from others, asking questions, observing, being supervised, and reflecting were placed. Both students and tutors agreed that these activities were the most important to learn during the internship, although students did not always perceive that learning took place in all activities that tutors reported they used as active learning activities. Discussions in daily work, both with tutors and others at the pharmacy, were found vital for learning. The learning climate seemed to be important and both students and tutors mention that all personnel at the pharmacy are involved in educating the intern. Reflective activities were often used in order to validate new knowledge, and to put new knowledge into practice. Students tended to fall back on regulations and tried to find the “right” way to do things but eventually understood that they had to find their own ways in communicating with clients.

Work activities where learning is a by-product

Work activities where learning is a by-product include activities that happen unintentionally and spontaneously. These are informal, incidental activities closely connected with 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. Having discussions 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.

Table 6. *Learning activities among pharmacy interns, derived from interviews with students and tutors*



Formal learning activities at the university and pharmacy	Learning activities within work at the pharmacy	Work activities where learning is a by-product
University lecture weeks University-introduced assignments and reports Self-care seminars at pharmacies <ul style="list-style-type: none"> - student groups - groups lead by tutors or other pharmacy staff Visiting other pharmacy-related sites <ul style="list-style-type: none"> - other pharmacies - hospital pharmacies - industry - clinics - primary healthcare doctors - laboratories - drug production units Planned shadowing <ul style="list-style-type: none"> - of staff responsible for special areas e.g. OTC or logistics Lectures at the pharmacy <ul style="list-style-type: none"> - Pharmacotherapy - Legislations - OTC Independent study <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	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 <ul style="list-style-type: none"> - actively trying new ways of counseling - tutors providing small tasks in daily work Reflecting <ul style="list-style-type: none"> - independently - together with tutor - with fellow students Writing diaries <ul style="list-style-type: none"> - informal note-taking 	Working with patients <ul style="list-style-type: none"> - OTC counseling - 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 behaviors Team work <ul style="list-style-type: none"> - participating in collective problem solving Participation in work performing dispensing with real responsibility Performing OTC counseling 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

OTC= Over-the-counter drugs, SOP= Standard operating procedures,

Discussion

In this thesis, the overall aim was to gather further understanding of students' learning during pharmacy internship in terms of activities and outcomes. This was examined from a workplace learning perspective.

The adoption of reflective theory in internship was studied. The developed scheme for measuring pharmacy students' level of reflective ability showed a plausible way to measure reflection as an outcome. The factors associated with students' levels of reflection were mostly social, including having a trained tutor and internship at a smaller pharmacy. However, reflective skills were not the only thing learned during internship.

Learning ranged over a wide spectrum of outcomes and the use of a workplace learning typology helped identify the multiplicity of skills and knowledge achieved. This included implicit and informal outcomes such as social skills, teamwork, and learning how to learn at workplaces.

In order to achieve all these different outcomes, several activities and methods were used to support learning. These ranged from organized formal learning activities; lectures, seminars and meetings with tutors, to informal, incidental learning by daily participation in work. Tutors seemed to be vital for many of these activities. Reflection was found to be used as one activity, among others, to support learning. Both tutors and students did, however, emphasize the importance of reflective learning activities.

Methodological considerations

This thesis incorporates both quantitative and qualitative approaches. The methods, techniques, and procedures of research were chosen to best meet the needs and purposes of the research question at hand. The thesis is also interdisciplinary in the sense that it combines perspectives of both natural sciences (social pharmacy research) and humanistic sciences (educational research), with their different traditions and pre-understandings. Although using a combination of different traditions of research is challenging, it may highlight aspects that would not have appeared using only one discipline. Further research should preferably be done in such inter-disciplinary settings, involving workplace learning researchers in pharmacy practice research. To study learning during internship from a workplace learning approach proved to be useful. Applying other theoretical approaches, e.g. from

a professional perspective, could possibly further contribute to increased knowledge about the complex learning situation in internships.

The setting for this thesis was the Swedish pharmacy internship. Internship is performed in a pharmacy retail monopoly chain that is specific to Sweden. However, in many aspects the situation is similar to any large pharmacy chain. Regarding pharmacy internships, the Swedish internship can be compared to many other pharmacy educational programs with longer internships at the ends of the programs. The results are also validated against the learning situation for early career learning, as the analysis in Paper III showed that the typology derived from early career learners' experiences are applicable in the internship situation as well. The methods and instruments used should be applicable for studies of internships and workplace learning in different settings.

Data collection and instruments

To me as a researcher, being a pharmacist and a pharmacy teacher, exploring pharmacy education has its own advantages and disadvantages. Being active as a lecturer in the internship course has allowed me to keep a very close connection with my research object, internship, and has enabled a transition of research into practice and vice versa. The research is alive in practice and the results are instantly put into practice. The fact that the researcher is close to the research objects, sharing language and experiences with the respondents, opens up for relevant questionnaires and penetrating interviews.¹⁵⁵ On the other hand, if the interviewer had been unacquainted with the area, it might have led to more explicit explanations from the respondents in the interviews, and insights that might only be gained by fresh eyes. The risk that respondents' answers to questionnaires and interview questions are altered to be socially desirable also increases. The interviewees might, for example, promote reflective practice and reflective tutoring, since they know that the interviewer has lectured in this area. In order to prevent this, I resigned as the responsible teacher and examiner at the internship before conducting the study. Additionally, all participants were informed that their answers would be treated anonymously, both in questionnaires and interviews, and would not affect the grading of students or the relationship between the tutors and the universities. Students and tutors were also interviewed separately. In some of the interviews, bias tendencies were noticed by the interviewer. When it occurred, this was discussed during the interview.

Besides the inherent risk of the researcher being a teacher at the university, as discussed above, a selection bias might have been present among the respondents. Students who are more interested in completing questionnaires and the essay assignment, or participate in interviews, might be more reflective or at least more willing to share their thoughts. The overall response rate

was rather low in the quantitative Paper II, which was a concern. Self-selection to interviews, as in Papers III and IV, was also a source of potential selection bias. However, the desired heterogeneity was reached for both students and tutors in the interviews. In conducting interviews and later analyzing the data, it is always important to remember that it is the interviewee's perceived opinion that it is expressed, which might more or less reflect the actual situation.

In this thesis, a number of instruments were used in order to measure specific outcomes.

Measuring level of reflection. The categorization scheme developed in Paper I and later applied in Paper II was found to be feasible, reliable, and sensitive, and will be further discussed below in the section on reflection. The assignment was also well accepted. However, the validity is a concern in this study. Some students can probably be reflective in their work and have a reflective thinking process, but might not be able to formulate this in a short written essay. Some students might also have a resistance towards writing this kind of assignment regardless of their level of reflection. This might have contributed to the poor response rate during the first semester when the assignment was not a mandatory element in the course.

Measuring learning styles. Pharmacists' inventory for learning style (PILS), used in Paper II, is relatively untested compared to Kolb's Learning Style Inventory (LSI),¹⁶¹ but PILS has been shown to correlate well to LSI.¹⁰⁰ PILS was developed for pharmacy professionals, is feasible and is useful as an learning tool in the education, which motivated the choice. The pattern of distribution of respondents in different learning styles was found to have similarities to those in earlier studies of practicing pharmacists.¹³⁷

Measuring critical thinking. Critical thinking was measured in Paper II with the Watson and Glaser Critical Thinking Appraisal (CTA).¹⁴⁶ It might, however, be too insensitive for measuring small changes in critical thinking among students, as it was developed for measuring critical thinking in a general population.^{162, 163} Another alternatives was the California Critical Thinking Skills Assessment (CCTSA), which has been more frequently used in studies, especially in the US.¹⁴⁷ The reason for not choosing the CCTSA in this study was that it is not available in Swedish and that it appears to be less feasible. However, CCTSA and CTA correlate very well.¹⁴⁷ The score reached by the students on the CTA included in this study are high compared to those in other studies,^{145, 164} as was the level of reflection.^{90, 143} This way, the hypothesized relationship between reflection and critical thinking could be masked due to ceiling effects.

Identifying outcomes with a fixed typology. A fixed typology, derived from the Learning in Nursing, Engineering and Accountant (LINEA) study,⁷ was used for identifying learning outcomes from a workplace learning perspective. This is one of many possible ways to study learning during an internship. However, the typology used for learning outcomes had a solid empirical foun-

dation and covers a wide variety of possible workplace learning outcomes.⁷ We also allowed other categories, besides the predefined, to be identified. The analysis was validated in several steps and finally an external auditor was used in order to assure the accuracy of the coding. The LINEA typology was found suitable for identifying learning outcomes of a pharmacy internship, given the similarities between students and recently graduated professionals. However, some of the original categories in the typology were not found in this material (Paper III); nothing was categorized under the main category “Judgment” or in the subcategories “Value issues” and “Group decision making” (Figure 1, p 22). This could be explained by the fact that building a judgment and fully accepted participation in the group at a workplace takes time. This is consistent with the results from the LINEA study and also supports workplace learning being an ongoing process that is initiated during internship, but has to be continued in professional practice.^{9, 96}

Learning a profession or learning how to work at a pharmacy?

It is clear that the pharmacy profession is undergoing a change worldwide and is still searching for an identity.⁵⁴ The ongoing search results in it being hard to define the desired learning outcomes of pharmacy programs, including internships. This might be an explanation for the focus found in Paper III on task performance during internship. As no deeper identity of the profession is at hand, focus from both students and tutors stay on the known tasks. Participation in the professional community is, however, closely connected to students’ learning during internship, both as an outcome of internship as well as a way to learn during internship.^{10, 11, 73, 165}

Students and tutors stated in Paper III that learning the computer system and other basic skills are prioritized before more meta-cognitive processes. Meta-cognitive learning processes are supposed to help the students, alone or with support from a tutor, to reflect upon and evaluate their learning of the pharmacists’ professional role. This result might indicate that internship educates for routine pharmacy work rather than for the pharmacists’ professional role.

In Sweden, finding a professional identity seems to be even harder since the role of prescriptionist is similar to that of a pharmacist.¹⁸ Both have the same legal rights and responsibilities. Hence, few specialized roles or tasks are at hand for each profession. During internship, students might have a prescriptionist as tutor. Learning a profession at a workplace is usually mediated by learning from a senior professional in the apprenticeship situation.^{4, 73} Even though the results from Paper II indicated that students with a prescriptionist as tutor become reflective as well, the preferred situation

should be that every pharmacist student should have a pharmacist as a tutor in order to learn the pharmacist profession rather than just learning to work at a pharmacy.

In Paper III students stated that they learned about the professional role of pharmacists but that they considered it unclear. Tutors perceived that learning to become a pharmacy practitioner is important, even though not all students are going to work at a pharmacy in the future. Students also stated that they visited other sites where pharmacists work in order to obtain a broader perspective of the pharmacists' field of work. Results from Paper III indicated that they also discuss the professional role with their tutor. The most relevant result indicating that learning is being done for a profession rather than for a specific pharmacy situation, was that students and tutors perceived learning how to learn in a workplace as important during internship. An awareness of the context is necessary for learning.¹³⁶ Results from Paper III underlined that students became aware of others' attitudes toward pharmacists and pharmacy services. Increasing the awareness and initiating students to the profession can be done by more formalized activities, for instance by introducing students to the use of reflective portfolios^{28, 49, 93} or participation in practice-oriented research projects.¹²²

The uncertainty of the pharmacists' role further stresses the need for students to learn how to learn at a workplace in order to keep up with changes. Internship has to broaden students' repertoire of ways to learn and initiate students to workplace learning (Papers III and IV). The importance of preparing pharmacy students for lifelong learning by pharmacy practice has also been shown in a recent study.¹⁶⁶ Preparing for continuous professional development (CPD) is becoming a more and more important goal in pharmacy curricula,^{24, 46, 49} and will be included in the Swedish pharmacist educational program as well. This implies that transferable professional knowledge and skills that are not pharmacy-specific, are equally important and should also be further promoted by the curriculum.

In Sweden, the pharmacy chain, Apoteket AB, had an intention to be an learning organization that prioritizes CPD.⁴⁴ Pharmacists have to be reflective and able to attend to the patients' and society's needs in order to advance future pharmaceutical services.¹⁷ Building a common base for knowledge within the community of practice is also important in order to develop the profession.¹³⁶ This supports the fact that workplace learning is an ongoing process that is initiated during internship and is continued in professional practice.⁹

The use of a fixed typology for the analysis in Paper III supported the identification of different skills and knowledge that students and tutors perceived were learned during internship, beyond what is accounted for in the curriculum. The results of Paper III can be used to identify the differences between the actual outcomes and the desired ones of an internship. This might also inform educators on how to better plan and support students'

learning during internship by broadening internship to explicitly include transferable, professional knowledge and skills instead of getting stuck in basic workplace-specific skills.

Participation in daily activities in the work context

The main learning environment for Swedish internship students in this study was pharmacies within the Swedish pharmacy chain, Apoteket AB. This included students working with pharmacists and other pharmacy staff. This environment can be seen as a community of practice, and by participating in it students become a part of the professional community. However, the practice differs somewhat between pharmacies. Different traditions might thrive at different pharmacies even though they are part of the same company. Hence, each pharmacy becomes its own community of practice, included in the greater community consisting of all pharmacies. Participating in daily activities within the community of practice includes being a member of the workforce, and thus teamwork becomes an important factor.

Professional identity and professional skills are developed in communities of practice at pharmacies.⁷³ The results from Papers II, III, and IV stressed that learning depends to a high degree on environmental and social factors such as the pharmacy tutor and staff. Paper IV showed that students saw it as important that the staff and management were informed and willing to contribute to the education of the student. Interaction with others at the pharmacy was perceived as a great source of knowledge. This is also supported by findings in other studies.^{7, 14, 75, 114}

Providing learning opportunities also includes giving students a chance to interact with patients. According to the interviews, this ambition might, however, be obstructed by stress and company policies about minimizing waiting time and service. Opportunities to participate in the community of practice is essential for learning the profession.^{7, 13, 73, 75, 136} Hence, the management of teaching pharmacies and the responsible educator have to reserve time for the student and all staff should partake in the responsibility of having a student present at the pharmacy. Hosting a student at a teaching pharmacy should not be seen as a burden. Students provide the pharmacy with feedback on their performance,⁶¹ and students might also contribute updated theoretical knowledge.

Practitioners, in addition, develop the profession that they act in. By using reflective activities and introducing students to reflections about their professional roles and about their practice, the practice will evolve.³ This might contribute to the culture at Apoteket AB, as well as other chain pharmacies, by balancing the top-down structure that is present today.⁴⁴ Pharmacists' professional role is described as bound by rules and legislation.¹⁸ Boundaries might be softened by an increase in reflection and other intentional activities, which can lead to opportunities to discuss the professional role outside of the box.

Massive changes are forthcoming in Sweden as the deregulation of the pharmacy market has started, and more are to come. These changes will alter the context in which internship takes place and the demands on internship as a course. As the diversity increases, different company cultures will affect individual internships in different ways. This will put new demands on the coordination and quality assurance of internship in order to ensure that the students' educational programs are equal regardless of their pharmacy placement. Internship pharmacy certifications are used in some countries to assure the quality of the practice context.^{49, 65, 106} Implementing this in Sweden could further improve the social learning context.

Reflection – a learning activity among others?

Reflection, as Schön describes it in his theory about the reflective practitioner, has its foundation in a cognitive tradition of learning,³ not incorporating social factors.⁶ He was among the first to describe and propose reflective thinking as the basis for learning in the professional setting. His theory is well-known and has been used in several different educational settings, especially in healthcare education programs.^{86, 87, 143, 167} Schön's model can be seen as an introductory model that has inspired many professionals and researchers to further investigate learning in professional settings.^{6, 11}

As shown in this thesis, taking part in activities during internship provided students with experiences that might initiate reflection. Reflection can be supported by different social and individual components and may subsequently contribute to the development of professional skills.

In Paper II, the results indicated that individual factors were of less importance for the student's ability to reflect. Hence, reflection can be seen as a tool to support learning in a complex context by contributing to the meta-cognition of knowledge and skills in the social context.

During internship students were exposed to different problems and situations in a professional workplace environment (Paper III). They used prior theoretical knowledge and transformed it into practical skills. This can be seen as an individual process, where learning is performed by the individual student while developing skills. Schön's and Mezirow's views of reflection suggest that it is a cognitive process but that it can be stimulated by external factors such as discussion with a tutor.^{3, 94} The importance of tutors was also shown in Papers II and IV.

Other social context factors were also shown to be associated with reflection. The identified association between reflective ability and the number of employees at the internship pharmacy (Paper II) could depend on differences in the working environment, which is another social component. At small pharmacies with few employees, individuals have to reflect more about their own roles and about how the work is structured in order to perform the tasks

at hand. At a larger workplace every individual often has an area of expertise and it is possible for professionals to maintain more rigid positions within the structure. Smaller groups that share the same values and face similar conditions are a good ground for learning.¹³⁶

The support from the social context seems to be of importance for novice practitioners' ability to reflect, and this is also found in other studies.^{7, 9} In Papers III and IV these findings were further confirmed as students described reflective activities as being supported by tutors and others. The results also suggested that the social setting is probably even more important for students, as they are still learning the basics and lack the skills to identify and reflect upon their own professional behavior. Learning from more experienced professionals might also support students' reflection regarding their role as professional practitioners.^{2, 7, 14} This is also confirmed by the results in Paper IV.

The results in Paper II showed a trend that the proportion of reflective students increased over time, from one cohort of internship students to the next. This could be an effect introducing reflective activities during internship. Since the spring of 2006, Swedish tutors have been trained in reflective tutoring, and reflective essays and reflective diaries have been introduced as learning activities in internship. The insignificant result could be an effect of the time needed to fully implement a change in teaching at the course, since the teaching is mediated by tutors who need to adopt a new way of teaching and learn it themselves before being able to support their students.

Results from Paper II showed that tutoring had a major impact on students' ability to reflect, and also that students' own attitudes toward tutoring are important. Students who received most of their tutoring from their formal tutor were more reflective (Paper II). This could be an effect of the training of the formal tutors in reflective tutoring. The informal tutors at the pharmacies did not participate in this training, and were probably not as apt to support reflective discussions as formally trained tutors. Tutors can support students' reflection by assessment and discussions of reflection and professional learning.^{11, 168} The differences in tutoring and the reasons for these findings need further investigation, but the results from Paper II point out the importance of training of the tutors, and that reflection is a skill that a trained tutor can foster in students.

Students' reflection can also be stimulated by several individual formal activities. It is now mandatory for students to write the essay assignment used in Paper I in the beginning and at the end of internship. Reflective essays and journals have been used in earlier studies.^{77, 90, 102, 167, 169} Paper IV points out that these essays are perceived by students as a good learning opportunity. The essay assignment used was also straightforward and easily integrated into the internship course. The topic of the assignment, communication and patient counseling, was selected because pharmacy students and pharmacists always have an opinion regarding this topic, as it is essential in

work at pharmacies. Hence, it is usable both as a baseline measure of level of reflection, before any educational intervention, and as an outcome. The results from Paper IV showed that, in order to obtain the full use of these essays as a reflective activity, they should be complemented with follow-up discussions with the tutor or fellow students.

Measuring the level of reflection is difficult but necessary if stated as an outcome, both in research and as a goal in an internship curriculum. Outcomes of reflective interventions have earlier been measured by different methods including assessing critical thinking skills.¹⁰³ In Paper II a critical thinking test, CTA, was used in order to compare students' critical thinking to their reflective ability (measured by the scheme developed in Paper I), but only a weak correlation was found. Bourner discusses further the similarities and differences between critical thinking and reflective thinking.¹⁰² The results of this study strengthened his conclusion that reflection and critical thinking is not the same. Critical thinking can be seen as a way to make assumptions from reasoning, especially scientific reasoning based on arguments.^{108, 109} Reasoning is also an important element in reflection.¹⁰⁸ However, reflection encompasses a broader range of knowledge and emotions and subjective ideas.^{2, 95} Hence, critical thinking tests are not optimal for evaluation of interventions aiming at improving the students' reflective ability. Schemes like the one developed in Paper I should provide a more accurate measurement of the outcome of reflective activities. It can also be used as a valuable complement in supporting both the student and the tutor in assessing and developing reflective skills. It can be used both as a formative and a summative assessment, but attention has to be paid to the fact that the reflective writing may be affected by the assessment situation.⁹³ Students may not reflect on their own but rather write what they believe the examiner wants.⁹³

The scheme seems to be a promising and feasible way to assess pharmacy students' reflective thinking during their internships. It may be useful as a routine assessment of reflective skills in pharmacy education settings as well as in a research setting. By using a scheme with well-defined levels, assessing an intangible skill such as reflection is possible.

In pharmacy internship settings, the combination of individual approaches such as reflection, and social context approaches such as situated learning, are often combined and are seen as complementary. Reflective activities support the way students assimilate and make knowledge individualized and at the same time useful within the work context for them as students and later as practitioners.^{14, 28} This is in line with the combination of perspectives adopted in this thesis. The results of Papers III and IV indicated that reflection is an activity supporting learning, both during internship as well as in future working life. At the same time the findings confirmed that students and tutors acknowledge the importance of learning as participation within the community of practice at the pharmacy, and that tutors and interactions

with other staff are essential for promoting reflection. Hence, reflection should be seen as one of many activities contributing to students' learning.

Student-tutor interactions

The tutor-student interaction is vital for learning during internship. Paper II showed that the level of reflection achieved by students is dependent on having a trained tutor, as discussed above. The formal tutors are also instructed to discuss the pharmacist's role at pharmacies, and this is a frequently discussed subject at tutor education meetings.¹²³ Another reason may be that the formal tutors constitute a self-selected group of pharmacists and prescribers with a special interest in mentoring others. Tutors who are interested and put time aside for tutoring foster learning.⁹⁻¹¹ The tutor's role as an experienced practitioner from whom the students can learn and who functions as a role model has also been found in other works.^{11,14}

The results from Paper IV indicate that formal meetings between student and tutor are not sufficiently frequent, and do not seem to be as important an activity for learning as the curriculum assumes. A facilitating factor might be that time is put aside for tutoring in a way that is suited to the individual student and tutor. It may well be more effective to use frequent small tutoring moments rather than less frequent, longer meetings. The reported importance of tutors for students' reflective activities (Paper IV), and their overall importance for providing learning opportunities, including their assessment role, suggests that further demands on tutor training is important. In several countries such demands are standard, requiring working life experience and CPD in tutoring.^{49, 65, 106}

In order to individualize internship and generate a discussion about learning between tutor and student, a learning style test (PILS) is used in internship. However, no relationship was found between learning styles, as measured by PILS, and reflection (Paper II). The argument for the assumption that learning style is a factor associated with reflection is that the learning styles test, PILS, is based on two primary axes. (Figure 5, p 42) Creators and producers (reflecting) were presumed to score higher on reflection than enactors and directors (doing). On the other hand, enactors and directors are more geared to learning by doing. Hence, they might reach a higher level of reflection if reflection is considered to follow after doing different activities.

Nevertheless, PILS might be an effective tool for initiating discussions between students and tutors, and might stimulate students' reflection on their learning when used at the beginning of internship. Students and tutors stated in the interviews (Paper IV) that this test initiates a discussion on how internship can be individualized, and which learning activities could be preferred to best support the student's learning. This is supported by other studies.^{100, 151}

The examinations performed by tutors could be strengthened by further tutor training. The training could then focus on assessment of practical examinations by role play and on introduction to how to discuss the examinations with students focusing on feedback. More standardized tests developed by the universities could also support these examinations. A further step could be to introduce objective-structured clinical examinations (OSCE) exams. OSCE seem to be a promising and very reliable way to examine internship outcomes such as skills and performance.^{128, 131} Unfortunately, OSCE are stated to be very resource-demanding.¹²⁷

Seen in the light of the quality assurance improvement of the course, introducing portfolio and OSCE exams contribute validated assessment methods that strengthen the focus on practical and social skills as a desired outcome of internships.

Paper IV showed that the learning activities students use during their internships are similar in many ways, but differ both between individuals and in the tutoring provided. Some common traits are imposed by the mandatory parts of the course. This way lectures and seminars are activities attended by all students. However, the results from the interviews indicated that students and tutors often fail to align the formal learning of lectures and the informal learning at pharmacies. By further training of tutors in what students are supposed to learn from formal learning activities and how to discuss these activities, integration may be facilitated.

Integrating formal and informal activities

As stated, learning during internship does not only occur in the pharmacy context but also at the university, and in seminar groups. Students report that the latter two settings are important in order to meet and discuss with fellow students. These discussions foster an identity, as well as contribute to students' deeper understanding of pharmacy work. However, transferring knowledge learned in these contexts, especially from the formal lectures, to pharmacy practice setting is not easily accomplished. As mentioned, tutors report that assignments and formal education at the university tend to be separated from pharmacy work. The university weeks and seminars do, however, also function as opportunities for students to meet and discuss their situation from a distance. This is as important as the content of the week and the students express that they appreciate this opportunity to interact with fellow students. The personal meetings these activities represent contribute to students forming their professional identities.

Integrating knowledge from different settings is vital in order to develop professional skills,⁷ and can be strengthened in internship. If students manage to bridge learning from these different contexts and communities, they may gain from all of them in order to reach further.⁷

The opportunity to interact through forums at the website used in the Swedish internship course is appreciated but not often used in student-student discussions. It is mostly used for getting information by both students and tutors, and sometimes for asking questions directly of the course management. Introducing Internet solutions as a community for discussions involves some difficulties, such as psychological distance where face-to-face communication is superior for asking difficult questions and getting feedback.¹¹⁷ In order to develop useful discussion forums some stimulating efforts can be made by the educator. This can be done by introducing reflective questions, and by stimulating students and tutors to discussion by providing answers to questions, and providing useful information.^{116, 117}

In the Swedish internship, assignments are often introduced during the first university week. The assignments that are followed up during the second university week, such as pharmacotherapy cases and popular writing assignments, are generally perceived as “better” by the students than the assignments that have no follow-up, such as the reflective assignments. Follow-up and feedback seem to be vital, and this is supported by other studies.¹³ Some students do, however, express that it is just another written piece that has to be done. When students write essays that are to be assessed, they might conform to what they think is expected of them rather than giving free range to their own, independent thinking.⁹³ It is also important to ensure student buy-in.⁹³ Efforts have to be made to explain the purpose of reflective writing and other assignments, and their functions as learning experiences.

Reflective diaries are provided to the students to stimulate recognition of learning opportunities in daily work. However, these diaries are seldom used. Students and tutors nonetheless recognize that they reflect, both individually and together, about situations that they encounter, but without using formal diary notations. Reflective diaries, assignments, and combinations of these into portfolios are common activities for stimulating and improving pharmacy education programs, and especially internships.^{28, 49, 90} It could be of interest to further develop these activities in Sweden to support learning as participation in daily work. Formal portfolios have not been used in Sweden, but the use of several mandatory assignments and essays and the voluntary reflective diary can be seen as a portfolio without having defined it as such. Introducing formal portfolios could strengthen the integration of formal assignments and other tasks, and reinforce the work at pharmacies by providing an opportunity for students to reflect on the integration of the included assignments and its relevance for work practice.

Assignments, essays, and diaries may increase in value if discussed and further integrated. Thus more time should be set aside for giving students feedback on these. This does not necessarily have to be at the university, but can advantageously be performed at the pharmacies, i.e., in discussions with tutors or with other students. This is in line with the results from Paper IV showing that the integration of different learning activities was of impor-

tance to make full use of the learning opportunity. Tutors can support students' integration of formal learning activities and the more informal learning at pharmacies. An integration of theory and practice, formal and informal learning opportunities, would increase learning from the formal activities.

Different assessment methods that stimulate integration of formal and informal learning have been identified in the literature, and some are also used in Sweden. Essays and assignments are examined at the university, and practical examinations, performed by the tutors, are used. According to the interviews, these examinations were not perceived as vital learning opportunities by students. The use of portfolios for examinations could be one promising way to introduce an exam that specifically aims to integrate theory and practice. By examining social and tacit skills, the awareness and focus could shift to the incidental learning occurring in participation in the professional community. 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.

Conclusions and Implications

This thesis contributes to the understanding of students' learning during the pharmacy internship. In doing this, it introduces educational research on the Swedish pharmacy education. The following conclusions were drawn in the included papers:

It is possible to measure pharmacy students' level of reflective ability as an outcome using the scheme that has been further developed and evaluated in this study. It seems to be feasible and valid and could be useful both in future research as well as in routine assessment.

Social factors are important for learning reflection. This includes formally educated tutors and the learning environment at the pharmacy. Individual characteristics are of less importance. No correlation could be found between students' levels of reflective ability and levels of critical thinking skill, nor to their learning styles.

The Swedish internship provides the students not only with a solid base of task performance skills, but also with social and professional knowledge. The typology for workplace learning used highlighted the breadth of learning outcomes occurring during internship. Students tended to focus on learning basic skills while tutors emphasized more meta-cognitive, generic skills. However, the curriculum does not cover all important learning outcomes. Several generic skills are notably not addressed, such as how teamwork functions at a workplace, and how to learn at a workplace, which are important factors both for learning to become, and later working as, a pharmacist. This is something that the educator should address in order to support learning, and the curriculum needs to be revised to include these subjects.

Students use a wide range of learning activities during internship, on the whole continuum from formal lectures to informal learning by participation in daily work. Reflection plays a vital part in pharmacy internship learning – but primarily as one learning activity among others. Contextual and social factors seem to be most important in supporting learning, particularly tutoring by trained tutors.

Overall conclusions and implications

This thesis shows the importance of internship in introducing students to working life. The results indicate that during internship students use a wide variety of activities supporting learning of a broad repertoire of knowledge and skills preparing them for coming professional working life.

The first overall conclusion is that internship plays an essential part in the pharmacy education program. The integration of formal and informal learning activities during internship, including raising the awareness of incidental learning, is important to further support students' learning of the professional practice of pharmacy. Additionally, accepting the social dimension of learning and the full continuum of learning activities used in workplace learning can improve the education program, as well as learning during internships, if explicitly stated in internship curricula. However, the formal education provided during internships from the universities should be more closely connected to and integrated with the informal learning at the pharmacy. Involving tutors in discussion and follow-up on assignments and learning style tests can be one possibility. Another potential way is to introduce portfolios, which should include assignments designed to stimulate learning. Portfolios may also be used for assessment of informal outcome, and measurement of the level of reflective ability could be one sub-evaluation for assessing portfolios. Hence, educators can stimulate reflective activities that integrate informal and formal learning and thereby improve the opportunities to learn. Thus, reflection seems to play an important role in internship, primarily as an activity supporting students' learning. Furthermore, this can be reinforced by further development of the lectures given for both tutors and students about reflective learning activities as well as expanding this with further lectures in workplace learning. One possibility for increasing focus on workplace learning could be to include this as an explicit goal in the internship curriculum. By educating the tutors as well as students, the effect could possibly be that the knowledge about workplace learning is introduced in future practice as well, opening up for future evolution of the professional practice. Regarding the whole education program for pharmacists, the importance of internships as a learning activity should be recognized and possibly expanded.

The second overall conclusion is that the community of practice is essential to students' learning during internship. The social interaction between student and tutor is especially important. Tutors with appropriate tutor training seem to contribute more to students' learning. Therefore, tutors should be chosen with care, and be educated. Introducing some kind of certification of tutors and making the introductory tutor training mandatory could be one way to increase the quality of tutoring as well as support tutors in their assessment of students in practical skills. For this reason, some kind of quality assurance system for examination might improve the assessment or, at least,

further support the tutors in their assessment. This can be done by continuing to develop the existing examination forms for dispensing counseling and self medication in that direction and even introducing objective-structured clinical examinations (OSCE). Introduction of assessments that are closely connected to the practice might stimulate students' awareness of the importance of the community in which they act and further support the integration of formal and informal learning outcomes. To ensure that students are participating in a good learning environment, an accreditation of pharmacies and tutors could be used, where the university checks and approves teaching pharmacies. This might also have the effect that all staff members at the pharmacies become more aware of their roles as educators and the importance of the learning environment at the pharmacies.

Future studies

The goals of internship need to be up to date in order to meet the demands on the changing pharmacist role. The qualitative Papers III and IV generate questions regarding how common different opinions of outcomes are, as well as questions about learning activities used. In order to further investigate this, quantitative studies such as questionnaires based on the results from Papers III and IV, might contribute. Expanding the respondents to include management and colleagues at internship pharmacies, the learning environment for internship can be further explored in order to understand the entire community of practice in which internship takes place. Observational studies can be of interest as well, in order to further explore learning activities in depth in the real context.

The need for integration of formal and informal activities could be further investigated, determining, introducing, and evaluating specific activities like portfolios that are designed to support integration. This approach can be expanded to include the prescriptionist students' internship and study if the results are valid for the shorter internship course that is included in prescriptionists' education program as well.

How pharmacy education programs can meet the challenge of the ongoing change in the pharmacists' role could be of interest for further studies. This includes defining the desired learning outcomes of undergraduate pharmacy education programs as well as the desired outcomes of internships. This can also include determining tutors' and students' views of the pharmacy profession that exists today and might also include other professionals', society's, and companies' views of the needed knowledge and skills in the future. Studies focusing on the learning content and goals of pharmacist education programs are ongoing internationally, and could be done in Sweden as well. The aim would be to answer the question – Do pharmacist education programs prepare students for the pharmacy profession of the future?

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Apotekspraktik – Studenters lärande i en professionell miljö

Avhandlingen har som övergripande syfte att studera studenters lärande under apotekspraktiken på apotekarprogrammets tionde termin. Under praktiken ska studenterna omsätta teoretisk kunskap från utbildningen till praktiskt handlande och introduceras till ett professionellt yrkesliv. Apotekarutbildningar måste kontinuerligt förändras för att förbereda studenterna för kommande yrkesliv då rollen som apotekare har förändrats och kommer utvecklas ytterligare.

Vad och hur studenter lär under praktiken är i fokus för denna avhandling för att få en djupare förståelse för praktikens plats i utbildningen till professionella apotekare. Internationellt finns det omfattande forskning om farmaciutbildningar och denna avhandling introducerar vetenskaplig forskning om apotekarutbildningen i Sverige. Till grund för avhandlingen ligger framför allt teorier runt arbetsplatslärande och reflektion. Reflektion har fått en betydande roll både inom hälso- och sjukvårdsutbildningar och på senare tid även inom farmaceutisk grundutbildning och fortbildning.

Lärande i arbetet kan förstås som förvärvande av kunskaper eller som deltagande i olika sociala sammanhang. Olika aktiviteter för lärande kan sorteras i ett kontinuum mellan formella och informella aktiviteter, baserat på graden av organisation och planering. Internationellt och i Sverige används många olika aktiviteter för att stödja lärande inom apotekspraktikkurser. Exempel på sådana aktiviteter är lärande genom deltagande i arbete, lärande med hjälp av handledning, reflektiva diskussioner och dagböcker, samt lärande genom formella läraaktiviteter som integreras i praktikutbildningen såsom föreläsningar, seminarium och inlämningsuppgifter.

I denna avhandling har flera olika metoder med både kvalitativa och kvantitativa ansatser använts för att studera lärande under praktik. Enkäter och olika mätinstrument har skickats ut till studenter på kursen. Detta skedde mellan 2005 och 2007 och totalt deltog 262 studenter i enkätstudien som undersökte praktikstudenters uppfattningar om lärande, praktiken mm. Dessutom mättes deras reflektiva förmåga, lärstil och nivå av kritiskt tänkande. Den reflektiva förmågan mättes med ett instrument som utvecklades i det första delarbetet i avhandlingen. Instrumentet är i form av ett schema som stödjer identifikation av sex nivåer av reflektion utifrån tolkningar av uppsatser som studenter har skrivit.

I slutet av vårterminen 2008 intervjuades 18 studenter och 17 handledare. Intervjuerna var semistrukturerade djupintervjuer och berörde deras syn på apotekarprofessionen och lärandet under praktiken. Två olika analyser gjordes utifrån intervjuerna – en riktad innehållsanalys, baserad på kategorierna från en tidigare arbetsplatslärandestudie, med syfte att identifiera vad studenterna lär och en kvalitativ innehållsanalys med syfte att identifiera vilka lärtaktiviteter som användes under praktiken.

Resultaten visade att kategoriseringsschemat som utvecklades är användbart för att mäta graden av reflektion baserat på skriftliga uppsatser både vad gäller tidsåtgång och tillförlitlighet i nivåställningen (Artikel I). En ökning av studenternas reflektiva förmåga kunde observeras med hjälp av schemat. Att kunna mäta reflektion är en förutsättning för att kunna studera vad som påverkar reflektion, vilket gjordes i den andra artikeln.

Resultaten från enkätstudien och testerna analyserades för att finna faktorer som var förknippade med studenternas reflektiva förmåga i slutet av praktiken (Artikel II). I den multivariata analysen visade sig två faktorer vara viktiga för den reflektiva förmågan; om studenten uppfattade sin utbildade formella handledare som huvudsaklig handledare och att studenten var på ett litet apotek med mellan en och tio anställda.

Resultaten från analysen av intervjuerna visade att typologin från en tidigare arbetsplatslärandestudie, LINEA-studien, var tillämpbar för att beskriva vad som lärs under apotekspraktiken. Resultaten visade på en stor bredd i vad som lärs under praktiken (Artikel III). Vad som faktiskt lärs omfattar mer än målen i kursplanen. Exempelvis framhöll både handledare och studenter att studenterna lär sig hur de kan lära i den praktiska situationen på arbetsplatsen och hur gruppdynamiken fungerar på en arbetsplats samt att de fick en insyn i den farmaceutiska professionen. Studenterna tenderade dock att fokusera mer på att lära sig basal yrkesskicklighet medan handledarna hade en intention att lära studenterna problemlösning och beslutsfattande.

Vidare analyser (Artikel IV), som fokuserade på olika lärtaktiviteter, visade att studenterna använder många olika aktiviteter för att lära sig under praktikperioden. De använde alltifrån formella, planerade och organiserade aktiviteter som föreläsningar och seminarier, till aktiviteter där de var mer omedvetna om lärandet som sker, som genom deltagande i det dagliga arbetet under praktiken på apotek.

Resultaten visade också på att det fanns brister under praktiken vad gäller integrationen mellan formella och informella aktiviteter samt att stimulera det omedvetna lärandet som sker i det dagliga arbetet. Exempelvis sågs de obligatoriska uppgifterna (formell aktivitet) inte som något som diskuterades på apoteket och inte heller såg studenter och handledare alltid kopplingen mellan uppgifterna och arbetet på apotek. Studenter och handledare såg studenternas möjligheter att reflektera som en viktig aktivitet för att medvetandegöra det informella lärande i det vardagliga arbetet. Den sociala miljön på

apotek ansågs också vara av stor betydelse för studenternas lärande, eftersom det är där de samspelar med, och lär sig av, mer erfarna kollegor.

Slutsatserna från de fyra delarbetena är att:

Det är möjligt att mäta studenters reflektiva förmåga, baserat på skriftliga uppsatser, med hjälp av det utvecklade kategoriseringsschemat.

Sociala komponenter är av större betydelse än individuella för studenternas reflektiva förmåga i slutet av praktiken – att studenten har tillgång till en utbildad handledare är viktigt liksom den sociala situationen.

Under apotekspraktiken lär sig studenterna en mängd färdigheter och kunskaper. Kursplanen täcker dock inte bredden av det lärande som sker under praktiken speciellt arbetsplatslärande och sociala färdigheter uppmärksammas inte i tillräcklig grad i undervisningen. LINEA-typologin var användbar för att identifiera lärandets innehållsliga bredd.

Under praktiken använder studenter aktiviteter för lärande som varierar alltifrån formella till informella aktiviteter. Reflektion uppfattas som en viktig aktivitet som stödjer lärande under praktiken. För att stödja studenters lärande är det betydelsefullt att utbildaren/handledaren erkänner och stödjer såväl formella som informella läraaktiviteter under praktiken.

Två övergripande slutsatser dras i denna avhandling. Den första är att apotekspraktiken fyller en viktig funktion i apotekarutbildningen då den bidrar med en mycket större kunskapsbredd än rent apoteksrelaterade kunskaper och integrerar teoretiska och praktiska kunskaper och färdigheter. Praktiken innebär att studenterna bygger upp professionella kunskaper och färdigheter för apoteksarbete men också mer generella färdigheter som arbetsplatslärande och hur arbete i grupp fungerar i arbetslivet. Studenterna använder en stor repertoar av aktiviteter för att lära sig under apotekspraktiken. Det är viktigt att lägga fokus på att integrera olika läraaktiviteter och använda hela det tillgängliga galleriet av aktiviteter, från formellt till omedvetet lärande, för att optimera lärandets utfall under praktiken. En möjlig utveckling för att stärka denna integration är att införa portföljssystem som stöd för att integrera undervisningen. Reflektiva aktiviteter kan i högre grad användas för att medvetandegöra det omedvetna lärandet i dagliga arbetet. Kursplaner kan uppdateras för att innefatta mer generella, informella professionella kunskaper och därmed stärka deras plats i utbildningen.

Den andra slutsatsen är att den sociala utbildningsmiljön, och då speciellt handledarnas roll, är mycket viktig för lärandet. Handledare är involverade i många aktiviteter och stödjer studenters lärande på flera olika sätt. En möjlighet att främja detta kan vara att satsa ytterligare på att utbilda och stötta handledarna. Det är också viktigt för lärandet att säkerställa en god lärmiljö för studenterna på apoteken vilket skulle kunna göras genom en certifiering av utbildningsapotek.

Sammanfattningsvis så bidrar avhandlingen med en förståelse av lärandet under apotekspraktik och vikten av att studenter får en möjlighet att lära i en professionell miljö.

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Appendices

Appendix 1. Level of reflection categorization scheme

The categorization scheme used for analysis of reflective essays.

In the scheme, the categories build upon each other as the students reach higher levels. The level of reflective thinking increases from the bottom to the top. Levels 1 to 3 are non-reflective, while levels 4 to 6 are reflective.

6. Premise reflection	Reflective
5. Process reflection	
4. Content reflection	
3. Introspection	Non-reflective
2. Thoughtful action	
1. Habitual action	

Non-reflection

1. Habitual action. Habitual action is a unconscious act that takes place without thought and can be performed at the same time as another act. A description of an act performed without thought or having to focus could be, for example, writing using a keyboard (for a skilled typist). A description of the course of events can be categorized as habitual action. For example: "At first, I received the prescription, then I registered it and, finally, I handed over the drug to the customer, while I gave him/her information.

2. Thoughtful action. Thoughtful action draws upon existing knowledge. The starting point lies in previously existing knowledge, and choices between different alternatives regarding how to perform the task are made either unconsciously or not at all. Why a certain choice is made is not questioned and no interpretation is made. No thought is given to the consequences of the act except according to the previously learned action. An example of this is a description of communication with a customer that corresponds totally to existing theoretical knowledge without evaluation of different options. "If a customer comes into the store angry, it is important not to get angry yourself".

3. Introspection. Introspection refers to thoughts about oneself, one's own thoughts or feelings about performing a task. There is no comparison between the actual task and one's previous experiences, nor are there any thoughts as to why these feelings occur or what they might lead to. An example of this is a description of how it feels to learn something, or how the student feels in a counseling situation. "An angry customer came into the pharmacy, and that felt terrible."

Reflection. *The definition of reflection as it is used below, is that a situation is identified in relation to an actual experience. This problem must somehow be analyzed in order for the task to be executable. Previous knowledge is used in the specific situation and is questioned and criticized when necessary.*

4. *Content reflection.* Content reflection pertains to what one perceives, thinks, or feels, or how one acts when doing a task. There should be a questioning or an interpretation of behaviour in order to be categorized as reflection, otherwise it is most often categorized as

"2. Thoughtful action". Content reflection, on the other hand, is based on a person's previous knowledge or a previous experience and the person consciously thinks of what he/she does in order to solve the actual problem. They do not, however, reflect upon why the action taken works or how their own behaviour developed. What effect the thought, feeling, or act might have should be discussed. For example, "When I meet an angry customer, I smile to get a positive reaction in return. It's usually easier that way".

5. *Process reflection.* Process reflection refers to how one performs the functions of perceiving, thinking, feeling, or acting, and to an assessment of how effective the performance is. There should be a proposal for, or an interpretation of, behaviour for a categorization as process reflection. For example, a person smiles to solve the problem, but also thinks further on how he or she thinks it might work out. They also consider how a kind reception from another person can reduce their own irritation. Reflection of process can also contain reflection of how they feel and act themselves when they meet the angry customer, and how this is considered as a problem, as well as how they handle their own feelings. One's thoughts and beliefs about how the thought, feeling, or act has an effect should be discussed in addition to how others apprehend the act. For example, "When an angry customer enters the pharmacy, I often feel that I easily become irritated myself. I know that this won't improve the situation, so I try to answer with a smile to calm the customer. Most often the customer is not annoyed with me, rather it is the waiting time or something completely different. To answer with a smile is often nicer and I don't gain anything from getting annoyed myself."

6. *Premise reflection (Theoretical reflection).* Premise reflection relates to why one apprehends, thinks, feels, or acts the way one does and the consequences of that existing knowledge sets the framework for how one act in different situations. This should include an analysis of the whole situation/problem; "what" and "how" should be put into context. Consequences should be considered so that they can be included in a deeper understanding or reinterpretation of the problem. Alternative methods should also be considered, often leading to questioning of prejudice based on a theoretical reasoning. This could lead to a reinterpretation of the situation so that the starting point is different the next time the same kind of problem occurs, and thus the action becomes different. This can be very hard to identify in written essays; the behaviour must be controlled the next time it happens. For example, "When an angry customer enters the pharmacy, I often feel that I easily become irritated myself. I know that the situation won't be improved by this, so I try to answer with a smile to calm the customer. Most often it's not me he or she is annoyed with, rather it is the waiting time or something completely different. To answer with a smile is often nicer and I don't gain anything from getting annoyed myself. I have tried different alternatives and when I get annoyed it's better to get help from someone else. This takes time, though. However, I have to make sure not to take this personally and let it affect other things that I do and so on..."

Appendix 2. Swedish version of PILS

(for English version see original reference¹⁰⁰) The test as used in internship (in the study a version without categorization was used (without the letters A,B,C,D), and an opt-out option check-box was added below.

PILS LÄRSTILSTEST

Tänk på några tillfällen när du nyligen var tvungen att lära dig något nytt för att lösa ett problem. Detta kan vara vilket tillfälle som helst: när du deltog i en kurs på universitetet, när du lärde dig ett nytt dataprogram, eller när du listade ut hur du skulle sätta ihop din nya grill eller IKEA-möbel.

Sätt ett kryss i den kolumn som bäst beskriver vad som fungerar bäst för dig i de situationer som du tänkte på.

När jag försöker lära mig något nytt...

	Oftast	Ibland	Sällan	Aldrig
1. vill jag se på hur andra gör innan jag prövar själv	<input type="checkbox"/> B	<input type="checkbox"/> D	<input type="checkbox"/> C	<input type="checkbox"/> A
2. vill jag använda en manual, lärobok eller introduktionsguide först	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D	<input type="checkbox"/> A
3. föredrar jag att arbeta ensam framför att arbeta med andra	<input type="checkbox"/> A	<input type="checkbox"/> C	<input type="checkbox"/> B	<input type="checkbox"/> D
4. vill jag anteckna, eller skriva ner saker under tiden	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D	<input type="checkbox"/> A
5. är jag kritisk mot mig själv då saker inte går såsom jag hoppats	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D	<input type="checkbox"/> A
6. brukar jag jämföra mig med andra människor för att veta om jag når upp till kraven	<input type="checkbox"/> B	<input type="checkbox"/> D	<input type="checkbox"/> C	<input type="checkbox"/> A
7. vill jag undersöka saker grundligt istället för att bara kasta mig in i dem	<input type="checkbox"/> B	<input type="checkbox"/> D	<input type="checkbox"/> C	<input type="checkbox"/> A
8. visar jag mig från min bästa sida under press	<input type="checkbox"/> C	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> D
9. vill jag helst ha mycket tid att tänka igenom något nytt innan jag testat det	<input type="checkbox"/> D	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> A
10. lägger jag ner mycket tid på detaljer	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> A	<input type="checkbox"/> D
11. fokuserar jag på att förbättra saker som jag gjort fel tidigare	<input type="checkbox"/> C	<input type="checkbox"/> A	<input type="checkbox"/> D	<input type="checkbox"/> B
12. fokuserar jag på att förstärka saker som jag gjort rätt tidigare	<input type="checkbox"/> B	<input type="checkbox"/> D	<input type="checkbox"/> A	<input type="checkbox"/> C
13. vill jag göra den som lär mig nöjd	<input type="checkbox"/> D	<input type="checkbox"/> B	<input type="checkbox"/> A	<input type="checkbox"/> C
14. litar jag på min instinkt	<input type="checkbox"/> D	<input type="checkbox"/> C	<input type="checkbox"/> A	<input type="checkbox"/> B
15. är jag oftast den som har gjort färdigt först i en grupp	<input type="checkbox"/> A	<input type="checkbox"/> C	<input type="checkbox"/> D	<input type="checkbox"/> B
16. vill jag att ta kommandot över situationen	<input type="checkbox"/> C	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> D
17. är jag välorganiserad	<input type="checkbox"/> B	<input type="checkbox"/> A	<input type="checkbox"/> C	<input type="checkbox"/> D

Använd nu dokumentet "PILS kategorier och diskussionsunderlag" för att se din lärstil och för att få tips på hur du kan använda detta för att planera din praktiktid. Summera nu antalet gånger du ringat in varje bokstav

A = B = C = D =

Din *övergripande lärstil* är den bokstav du ringat in flest gånger.

Din *sekundära lärstil* är den näst mest frekvent inringade bokstaven.

A= Enactor Entreprenör

Du tycker om att ha direktkontakt med andra och har lite tid eller tålmod för indirekta jobb som innebär lugn och stillsam argumentering

Du tycker om att leta efter och undersöka möjligheter när de kommer och har en entreprenöranda. Du lär dig bäst på ett praktiskt och okomplicerat vis , inte under traditionella katedrala föreläsningar.

Även om du inte finner något större nöje i att leda andra, gör du det ändå eftersom du känner dig bäst lämpad för jobbet. Du är självsäker, har starka åsikter, och värdesätter effektivitet. Du bryr dig om tid, och gillar att se ett jobb bli klart.

Ibland leder ditt fokus på effektivitet till att kvaliteten på ditt arbete får lida, och att du kanske inte ägnar lika mycket uppmärksamhet åt andras känslor och önskemål som du borde.

B= Producer Producent/Frambringare

Generellt sätt föredrar du att arbeta ensam, i din egen takt, och på din egen tid, eller med ett väldigt litet antal likasinnade människor.

Du tenderar att undvika situationer där du är föremål för all uppmärksamhet eller där du konstant blir sedd – du föredrar att vara den som observerar (och lär från) andra.

Du har förmågan att lära från dina egna och andras misstag.

Du prioriterar starkt att få saker och ting ordentligt gjorda, och att följa reglerna, men ibland är du din värsta kritiker.

Du värdesätter organisation och uppmärksamhet för detaljer.

C= Director (Ledare)

Du är fokuserad, praktisk och målinriktad. Du finner ofta dig själv i ledarposition och tycker om den utmaningen. Du har inte mycket tid eller tålmod för dem som tvekar eller har svårt att bestämma sig, eller för dem som spenderar för mycket tid på opraktiska, teoretiska saker.

Du är bra på att dra snabba, avgörande slutsatser, men känner att din snabbhet vid vissa tillfällen kan orsaka mindre perfekta resultat. Du får hellre ett bra jobb färdigt inom tidsramen än att leverera ett excellent arbete för sent.

Du tycker om att befinna dig i högpresterande, energiska och dynamiska miljöer

D = Creator (Kreatör)

Du tycker om miljöer där du får tänka fritt, där tid och resurser inte är särskilt begränsande.

Du har näsa för att få andra engagerade och underhållna och tror uppriktigt att detta är det bästa sättet att motivera andra och få dem att göra sitt bästa. Du är mest bekymrad – ibland alltför bekymrad – för hur andra uppfattar dig och du prioriterar harmoni högt.

Du finner det inte särskilt svårt klara av komplexa, tvetydiga och teoretiska situationer (förutsatt att det inte är för stort press att prestera), men ibland har du svårt att klara av praktiska vardagssysslor.

***Diskutera Nu tillsammans, handledare och student.** Det finns givetvis inget som är bättre eller sämre utan det är bara olika och passar dig som person olika bra. Vilka professionella, sociala eller personliga karaktäristika har ni gemensamt/olika? Vilka undervisnings- och inlärningsmetoder fungerar bäst för er? Vilka undervisnings- och inlärningsmetoder fungerar inte bra för er? Ge några exempel på vilken typ av feedback som motiverar dig. Ge några exempel på den typ av feedback som gör dig nedslagen. När ni diskuterat dessa frågor har ni förhoppningsvis ett bra underlag för att planera praktiken och handledningens former.*

Appendix 3. Interview guide for students

This is a non-validated translation. The questions were posed in the study in Swedish. The interview guide for tutors was similar but with a focus on students' learning.

Introductory Questions

What is your name?

How far are you into your internship and in which pharmacy?

Are you satisfied with your placement?

Has your formal tutor been your principal tutor?

Do you have any previous experience of working in a pharmacy?

Why did you choose to enter the pharmacy program?

Do you already have employment for after the program?

The Pharmacy Profession

When do you feel that you have succeeded in your work in a pharmacy?

What tasks do you have at the pharmacy as a student?

How do you perceive the conditions pharmacists have for their work in a pharmacy?

How would you describe your relationship to customers?

How would you describe the cooperation with other colleagues/other professionals, e.g. prescriptionists?

What is difficult or hinders you in your practice at the pharmacy?

What is the core of the pharmacist's pharmacy work?

Your Own Professional Role

How do you view your future professional role as a pharmacist?

What are your professional strengths as a future pharmacist?

What are your weaknesses?

Where do you think pharmacists should work in society?

Development of the Pharmacist's Role

How do you think the pharmacist's professional role will evolve?

How would you like it to evolve?

Do you think the upcoming deregulation of the pharmacy market will influence the pharmacist's professional role?

Learning during internship

What does learning mean to you?

How do you perceive the education during internship?

What supports your learning? Learning work tasks? Learning to become a pharmacist?

When do you feel that you have learned something in internship?

Describe a situation where you really felt that you learned something.

What is difficult or hinders you in your learning during internship?

How do you perceive the previous knowledge you had when you entered internship?

What do you perceive is the most important you've learned during internship?

How do you perceive that you have evolved as a pharmacist during internship?

Did your perception of a pharmacist change during internship?

How do you perceive the university's part in internship?

Reflection during internship

What does "reflection" mean to you?

Do you think you had opportunities for reflection during internship?

How did you perceive the reflective activities introduced in internship?

Do you think you will use reflection in your future working life?

Concluding questions

Do you have any thoughts about this interview that you want to share?

Is there anything else you would like to add?

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