

RESEARCH ARTICLES

Swedish Students' and Preceptors' Perceptions of What Students Learn in a Six-Month Advanced Pharmacy Practice Experience

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Objective. To identify what pharmacy students learn during the 6-month advanced pharmacy practice experience (APPE) in Sweden.

Methods. Semi-structured interviews were conducted with 18 pharmacy APPE students and 17 pharmacist preceptors and analyzed in a qualitative directed content analysis using a defined workplace learning typology for categories.

Results. The Swedish APPE provides students with task performance skills for work at pharmacies and social and professional knowledge, such as teamwork, how to learn while in a work setting, self-evaluation, understanding of the pharmacist role, and decision making and problem solving skills. Many of these skills and knowledge are not accounted for in the curricula in Sweden. Using a workplace learning typology to identify learning outcomes, as in this study, could be useful for curricula development.

Conclusions. Exploring the learning that takes place during the APPE in a pharmacy revealed a broad range of skills and knowledge that students acquire.

Keywords: advanced pharmacy practice experience, curriculum, pharmacy practice experience, learning outcomes, assessment

INTRODUCTION

As described in World Health Organization (WHO) and International Pharmaceutical Federation (FIP) reports, pharmacists have many different roles: caregiver, decision-maker, communicator, manager, lifelong learner, teacher, researcher, and leader.^{1,2} The development of pharmacy practice has changed the work demands on pharmacists³⁻⁵ as well as led to an increased focus on patient care^{2,5-9} and reevaluation of pharmacists' professional knowledge. The pharmacy curriculum, including advanced pharmacy practice experiences (APPEs), needs to prepare students for this work life,^{10,11} thus, APPE content has to be in line with the different roles mentioned above. (In Sweden, the APPE is similar to a combination of introductory pharmacy practice experiences (IPPEs) and APPEs in the United States, pharmacy internship in the Nordic countries, and preregistration training in the United Kingdom.)

Pharmacy curricula in Europe are aligned with the European Consortium (EC 2005/36), which states that at least 6 months of pharmacy practice experiences in community pharmacy.¹² The desired outcomes for an APPE are often described in terms of attainment/mastery of technical skills and increased professionalism.¹³⁻¹⁵ Learning at a workplace is more multifaceted than that in formal education in a higher education institution setting in that a wide variety of knowledge and skills can be obtained.^{5,16,17} The APPE is supposed to contribute to the transition between theoretical knowledge and professional work; hence, the outcome of an APPE is much more than just the skills developed.

The Learning in Nursing, Engineering and Accountancy (LINEA) project is a large study of novices learning at work during their first years of employment.¹⁸⁻²¹ The project was based on empirical studies of novices in these 3 professions, identifying their perceptions of learning in the workplace.¹⁹ Results from the study can be used as a typology (hereafter referred to as the LINEA typology) for possible outcomes of informal learning in work (ie, learning that occurs in daily work outside organized learning activities).¹⁸⁻²¹ In the LINEA typology, the learning

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outcome categories are not workplace-specific but rather generic in nature, which makes comparisons possible across different health professions settings. The typology consists of 8 main categories: task performance, awareness and understanding, personal development, teamwork, role performance, academic knowledge, decision making, and judgment – all with several subcategories (Table 1).¹⁹

Even though the categories originate from studies of early career learning, they may be applicable to studies of APPE learning, as newly employed graduates and APPE students share many common traits. During APPEs, students are introduced to work similarly to early career learning. However, in practice settings, pharmacy students are “peripheral participators” and do not have the same responsibilities as a newly graduated licensed

pharmacist entering practice.¹⁶ The typology also might support the identification of what is learned during an APPE. The solid empirical and theoretical reasoning behind the LINEA typology make it suitable as a framework for studying what pharmacy students learn during their APPE.

Pharmacy students’ need to develop professionalism has been thoroughly discussed in North America, stressing the importance of professional skills, social skills, and knowledge^{10,15,22} The outcomes of APPEs in North America have been evaluated based on standards²³ or professional perspective.^{24,25}

While learning outcomes for an APPE are stated and assessed in educational practice, little qualitative research has focused on students’ and preceptors’ perspectives on what is learned during an APPE. A broader understanding

Table 1. LINEA Typology for Learning Trajectories in Early Career Learning That Can Serve as a Model for Desired Outcomes of APPE in a Broad Perspective

Task Performance	Role Performance
Range of skills	Prioritization
Speed and fluency	Range of responsibility
Complexity of tasks and problems	Supporting other peoples’ learning
Communication with a wide range of people	Leadership
Collaborative work	Accountability
Awareness and Understanding	Supervisory role
Other people: colleagues, customers, managers	Delegation
Context and situations	Handling ethical issues
One’s own organization	Coping with unexpected problems
Problems and risks	Crisis management
Priorities and strategic issues	Keeping up to date
Personal Development	Academic Knowledge and Skills
Self-evaluations	Use of evidence and argument
Self-management	Accessing formal knowledge
Handling emotions	Research-based practice
Building and sustaining relationships	Theoretical thinking
Disposition to attend to others’ perspectives	Knowing what you might need to know
Disposition to consult and work with others	Using knowledge resources
Disposition to learn and improve one’s practice	(human, paper-based, electronic)
Accessing relevant knowledge and expertise	Learning how to use relevant theory
Ability to learn from experience	(in a range of practical situations)
	Decision Making and Problem Solving
	When to see 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 pressurized conditions
	Judgment
	Quality of performance, output, and outcomes
	Priorities
	Value issues
	Levels of risk

of what students learn during the APPE is essential for further developing APPE curricula. The objective of this study was to identify and analyze, from the perspective of students and preceptors, what students learn during the APPE in Sweden. A secondary objective was to determine whether the results from the LINEA study were applicable in the APPE setting.

METHODS

The Swedish APPE course is a 6-month pharmacy practice at the end of the 5-year master's in pharmacy degree program common to all pharmacy curricula in Sweden.^{26,27} This is the only pharmacy practice experience in which Swedish pharmacy students participate during their education, and includes both introductory and advanced pharmacy practice content. The students practice mainly at 1 community pharmacy and are supervised by trained pharmacy preceptors, but study visits of 1 day to 4 weeks occur, usually at another community pharmacy or at a hospital pharmacy. The main goals of the course curriculum are to familiarize the student with pharmaceutical work at a pharmacy and with the role of the pharmacist in public healthcare (Table 2).¹⁴ Included in the APPE are 2 weeks of lectures at the university, as well as assignments provided by the universities and being completed by the student during the APPE.

The preceptors at the pharmacies are pharmacists or prescriptionists. (In Sweden, prescriptionists are professionals who completed a 3-year bachelor's degree, including a 9-week professional practice experience, and have the same dispensing authority as pharmacists.²⁸) The universities do not require that the preceptors have any work experience or any particular expertise; however, they must undergo a 2-day introductory preceptor training session at a university and are asked to attend a 1-day session for further training prior to each new APPE period.

The study population for this report consisted of pharmacy students completing their APPE at the only 2 pharmacy master's degree schools in Sweden (Uppsala University and Gothenburg University). The 55 students who had been assigned to a pharmacy preceptor in spring 2008 and their preceptors were asked by e-mail to participate.

The 18 students and 17 preceptors who agreed to participate were interviewed. Data to determine heterogeneity on the predetermined factors (see results) were collected in the interviews, and were evaluated during data collection. As a good heterogeneity was reached for the students and preceptors recruited, no further recruiting was needed.

Qualitative semi-structured interviews were conducted to explore a wide variety of aspects of what students learn. Two interview guides were developed, one for students and the other for preceptors. These were based on theoretical reasoning and studies found in the literature,^{5,27,28} ie, previous knowledge on workplace learning, with focus on pharmacy education. The interviews covered questions concerning learning at the pharmacy, views of pharmacists' professionalism, and beliefs about the future for pharmacists in Sweden. Student and preceptor interview guides were similar in content, but differed in perspective; students were asked what the most important thing they learned during the APPE was, while preceptors were asked what they believed was the most important thing students learned. The student interview guide was pilot tested, slightly revised, and retested. The preceptor interview guide was based on the student interview guide.

No ethical committee approval was sought prior to beginning this research as it is not obligatory by Swedish law for this type of study. Nonetheless, all respondents signed a written consent to participate.

All interviews were performed in summer 2008 when students were at the end of their APPEs. All respondents

Table 2. Learning Outcomes Stated in the Swedish Advanced Pharmacy Practice Experience Curriculum

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 health care. On completion of the course, the student should:

- Be able to apply pharmaceutical legislation in pharmacy practice
- Be able to describe and discuss the pharmacist's and pharmacy's role and function in health care
- 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 lifestyle advice and master the border between self-care and when to recommend contact with health care
- Be able to, from different sources, seek, evaluate, and combine information 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

were interviewed separately. In only a few cases were both the student and the student's assigned preceptor interviewed. No compensation was paid to the respondents, but the interviews were performed during working hours at the pharmacy. All interviews lasted approximately 1 hour (range 53 to 93 minutes) and were carried out by 1 of the authors (A.W.). After approximately 10 interviews in each group, saturation was achieved, in the sense that no entirely new perspectives on the research questions were reported by the participants.²⁹

The interviews were recorded on digital media and transcribed verbatim and analyzed using a directed qualitative content analysis.³⁰ The foundation for the predetermined categories was the LINEA typology of workplace learning.²¹ However, an openness was maintained while analyzing the material so that additional categories could be identified if present. Using this typology produces duplications, ie, the same text segment can be found in more than 1 category, depending on the perspectives. For example, reflective discussions about patient encounters might describe learning of communication, learning from experience, and self-evaluation. The same names of subcategories (ie, collaborative work) exist under 2 different main categories.

The analysis was performed using the NVivo (QSR International Pty Ltd, Doncaste) qualitative analysis software.³¹ First, the investigators listened to and read all of interviews to obtain a broad understanding of the material. Before starting the categorization process, the meanings of the categories in the LINEA typology were discussed by the research team. Next, meaning-laden text segments were identified in the transcripts and categorized, if appropriate, into the predetermined categories based on analysis of 2 pilot interviews. After discussions of the pilot analysis, a new subcategory, "new academic skills," was added under "academic knowledge and skills." Next, another 15 interviews were independently analyzed by the investigators with discussions held in between interviews to reach consensus on the categorization of interview content. Approximately 5% to 10% of the original categorizations made were changed as a result of these discussions. After 1 investigator completed an analysis of the remaining 20 included interviews, further consensus discussions were held with the lead investigator. Descriptive texts were then written to explain the content of each category and subcategory. These texts and all categorized text segments were then audited independently in a process inspired by Hill and colleagues.³² A consensus discussion between the 3 primary investigators determined the final results.

RESULTS

The desired heterogeneity was reached in the study population with regard to pharmacy size (small to large),

location (city center, suburban, hospital, mall, primary healthcare centers, and in cities of varying sizes – 1000 to 1.2 million inhabitants), and self-perceived stress level at the pharmacy (from almost no stress to very stressful). Preceptors' mean age was 43 years (range: 28 to 64 years); there were 13 women and 4 men. Their work experience (range: 1 to 39 years) and precepting experience (range: no experience to 8 years) varied as well. Students' mean age was 28 years (range 24 to 40); there were 14 women and 4 men. The results for each category and subcategory in the typology are exemplified and described below. (Respondent quotes are available upon request from the authors.)

Task Performance

Students and preceptors stated several learning outcomes obtained during the course such as tasks or actions crucial for work at a pharmacy. In order to perform these tasks, a wide range of skills was learned, including operating computer systems, using generic and brand names, registering prescriptions, managing supplies, providing self-medication counseling, and providing pharmacotherapy.

The interviewees described an increase in speed and fluency in performing tasks. However, learning basic skills such as computer systems and brand names was perceived to be time-consuming, and was often mentioned as a threshold for further learning and participation in work.

Students found that tasks that they considered simple at the initial stage of the APPE became more complex with increased experience, eg, while communication when dispensing could be perceived as fairly easy initially, it became more complex as they learned more. This included listening to patients, understanding their information needs, and paying attention to drug interactions and patient-related problems such as adherence problems. Preceptors recognized the importance of students' understanding of complexity and brought complex situations to students' attention as they occurred.

During the APPE, students trained and developed skills in communication with a wide range of people. Students mentioned that patients are all different and that they have to communicate with other professionals as well. Both preceptors and students talked about communication skills as an important part of the pharmacist's profession in order to provide good information to patients. Students learned to individualize information and develop communicative ability in order to provide pharmaceutical services. Preceptors emphasized that patient-related communication is the ultimate application of theory previously learned and is essential for pharmacists, irrespective of future workplace.

They experienced that work on a pharmacy depends on collaborative work where collaboration is a key to

efficient work task performance. Preceptors and students believed that lack of collaboration might undermine students' learning opportunities.

Awareness and Understanding

During APPE students learned to be aware of and understand how situations and persons' actions depend on a variety of factors. Students realized how colleagues, customers, and managers think about, and manage, their medications. They found that some patients might be uncomfortable with the medications prescribed and/or not fully grasp their medical condition and therefore need care.

Students reported that they realized that most lay people are unaware of pharmacists' expertise, and confuse the skills provided by different pharmacy workers. Preceptors pointed out the importance of students' developing an awareness of how patients think and how pharmacies function as this knowledge is important even for those who choose not to work in pharmacy practice.

Students and preceptors stated that context and situations affect their behavior and in order to function, students have to understand how a pharmacy works and the pharmacist's role within the pharmacy. Some students found that pharmacists were not as highly valued at the pharmacy as they had expected. They also experienced how stress and external factors affect the pharmacist's work.

The pharmacy organization was understood at 2 distinctly different levels. First, students learned how a pharmacy worked in terms of learning the systems and logistics specific to their pharmacy. Preceptors primarily referred to students' learning about these primary factors. Second, students become aware that work in a pharmacy has to be in line with legislations, rules, and even policies, and culture of the parent company.

Problems and risks that students' identified included not being allowed to use all of their pharmaceutical expertise in counseling due to company policies regarding service degree and minimizing the time for dispensing and patient counseling. Students identified stress as a risk factor for errors, while realizing that stress is something they have to handle, eg, by trusting computer-aided support in order to minimize risks. Preceptors and students perceived a stressful situation at the pharmacy as a barrier to learning. Students identified problems with communication, for instance in dealing with hearing-impaired patients and patients with dementia. Preceptors expressed their thoughts about problems and risks mostly without specifying them, but stressed that students have to take responsibility and know their limitations. This is closely connected to awareness of priorities and strategic issues, which students mainly perceived as the need to understand

the importance of patient centeredness and that pharmacists sometimes have to bend rules in order to provide good care. Some preceptors mentioned that students have to learn that patients are the main concern of pharmacy work. However, this is sometimes interpreted by students as short waiting times for patients being the highest priority.

Personal Development

During the APPE, students develop professionalism as well as their professional identity. Students and preceptors expressed that one important outcome of the APPE was to "learn how to learn" in a professional setting. Many respondents from both groups perceived self-evaluation as important, referring to this as questioning their own actions. Reflection was regarded as a method of self-evaluation and that increasing reflective skills was an important goal. Respondents also viewed learning to give and receive feedback as important. Students obtained self-management skills and professional self-esteem through successfully handling various situations. They also developed their ability to manage emotions, both their own and the emotions of others.

Students perceived building and sustaining relationships with their preceptor and other members of the pharmacy staff as important in order to work with and learn from them. They also talked about building relationships with patients to build patients' confidence in pharmacy services. Students expressed that they developed a disposition to attend to others' perspectives, especially by observing how differently colleagues act in various counseling situations. This way of acquiring counseling skills was stated as important for professional development, both during the APPE and in the future.

Students also developed a disposition to consult and work with others. This included daring to ask "stupid" questions but also participating in group processes, working together with other staff members on problem solving in daily work. Students stated that they developed methods to learn and improve their skills; however, preceptors mentioned that students sometimes had to be "tricked" into this. Both groups agreed that students' motivation was important for them to learn, but that the preceptors' role in discussing goals and planning the APPE was also important.

During the APPE, students learned how to access relevant knowledge and expertise. They learned who to ask or where to find answers. They often identified 1 or more role models among the staff from whom they learned different aspects of the profession. They also learned how to use manuals, follow written routines, and contact the prescriber when appropriate. Preceptors mentioned that they sometimes introduced real-life or constructed

patient cases to challenge students to learn how to access knowledge.

Students and preceptors emphasized that students improved their ability to learn from experience, ie, learning by doing, by repetition, and by making mistakes. Students also become aware that they learned from daily work without realizing how.

Teamwork

Understanding collaborative work and how groups function is another learning aspect of the APPE. Students achieved an understanding of how colleagues interact within a group and realized that a team effort often was necessary to perform tasks well. They also realized how different team members contribute knowledge based on their respective areas of expertise. Preceptors were aware that students contribute to the work, as they shared their newly updated theoretical knowledge with other staff members.

Students concluded that facilitating social relationships was important to learning and work, and that the relationship between student and preceptor was particularly important to ensure a good learning environment. Joint planning was considered important to training and occurred most often when students participated in planning and individualizing the APPE. Students also found that their learning sometimes had to take a backseat to more urgent problems or tasks.

The final subcategory within teamwork was ability to engage in and promote mutual learning. By participating in work, students found that exchanging information about problems benefited all staff members. For example, all staff members can learn from each other's mistakes and share new information learned in daily work.

Role Performance

Role performance included whether students' acquired or modified a view of what it means to be a pharmacist during the APPE. The students' view of the pharmacist's role is formed by working in the pharmacy and by discussions with other students or with their preceptor. Students exemplified prioritization within the role performance as pharmacists, often taking responsibility for, and prioritizing, patients' needs before rules and legislations when they conflicted.

Students gained a good understanding of pharmacists' range of responsibility, at the pharmacy and in society. They stated that the pharmacists' roles include assuming responsibility for the quality of services provided by the pharmacy, for educating employees and prescribers, and for handling complicated patient counseling situations. However, the interviewees found the pharmacists' roles

vague. Students perceived that their view of the pharmacist's role as society's drug expert was confirmed during the APPE; however, they also observed that pharmacists often fall into the role of "just selling drugs." Students and preceptors mentioned supporting other people's learning as one of the most rewarding roles for pharmacists. Although students realized that pharmacists could serve as pharmacy managers, they felt the pharmacist's main focus still should be counseling patients regarding prescription drugs. Students recognized the leadership role of pharmacists and often saw pharmacists as leaders in the workplace, even if they were not formal managers. Although students stated that they gained insight into leadership, preceptors did not mention this as an outcome.

Students and preceptors agreed that pharmacists need to have accountability and be trustworthy. Students learned that pharmacists have to take on responsibility, including providing good, individualized information to patients. Students also perceived pharmacists as having a supervisory role as evidenced by pharmacists checking prescriptions when dispensing, monitoring patients' use of drugs, founded in a belief that a pharmacist should feel responsible for adequate and safe medication use.

During the APPE, students experienced how different areas of responsibility within a pharmacy were delegated. For instance, self-care counseling was commonly delegated to pharmacy technicians, and pharmacists were not normally involved. Students observed that pharmacists had to handle ethical issues and that being a pharmacist included accepting a set of values and ethical guidelines such as not hiding mistakes.

Students realized that pharmacists must stay up to date in their knowledge as the field of pharmacy is constantly developing and that their own knowledge would gradually become obsolete. However, both students and preceptors perceived that pharmacists have trouble finding time for continuing professional development.

Academic Knowledge and Skills

This academic knowledge and skills category includes the application of theoretical knowledge in everyday pharmacy work. Students learned how to use evidence and argument in counseling patients, as exemplified by the students' use of theoretical evidence.

Students were trained in how to access formal knowledge in the practice setting. They experienced adding new sources of information, such as the pharmacy intranet, to already existing academic resources, and also identified colleagues as a source of knowledge. Students also realized that they needed to use research-based practice or evidence-based information, eg, when giving patients advice on complementary and alternative medicine.

Knowing what you might need to know was exemplified by students reading more than needed when they encountered problems. Both students and preceptors expressed that students reflected on their shortcomings in knowledge.

One of the perceived main outcomes of APPEs was learning how to use relevant theory in a range of practical situations. This was described by both groups as students learning how to apply and communicate knowledge they had previously learned. Some preceptors stated that students ought to feel more confident with their theoretical knowledge and that applying it in practical situations is the most important to learn.

Because APPEs are administered by the universities and include theoretical academic lectures, a new category was added: new academic knowledge. Hence, students and preceptors acknowledged gaining new theoretical knowledge that was not applied in practice, such as popular writing, pharmacy history, and leadership. Other new academic/theoretical knowledge was learned directly, such as counseling skills, rhetoric, reflective practice, and pharmaceutical legislation. When preceptors brought up this subject, they mentioned it only in the sense of students learning things when they are at the university.

Decision Making and Problem Solving

Students' abilities to make decisions and solve and analyze problems of a non-academic nature were documented under Decision Making and Problem Solving. Students expressed gaining a better understanding of when to seek expert help (ie, when to ask or when to consult the prescribing doctor) in dispensing situations.

Preceptors and students mentioned that students improve their ability to deal with complexity in various situations, often in patient counseling. They acquired a deeper understanding for safety and complexity in dispensing, including control, interactions, contraindications, and, most important, that all patients have to be treated as individuals. Dealing with complexity also included understanding when to side-step regulations in order to provide good care, and reflecting on the complexity of the patient-pharmacist communication.

Learning problem analysis was often perceived as being associated with patients' ways of handling medications, and situations that occur in patient counseling. Preceptors stated that students learn how to analyze patients' drug-related problems in order to provide proper services. This is often stimulated by preceptors.

Preceptors also stressed the importance of generating, formulating, and evaluating options in practical situations, as they know from experience that the first solution is not

always the best. However, students did not mention this as a learning outcome.

At pharmacies, the students perceived the focus to be on serving patients as fast as possible. Hence, students and preceptors emphasized the importance of students learning to manage processes within an appropriate timescale. A consequence of this focus on time was that preceptors perceived the importance of training decision making under pressurized conditions. However, they tried to teach students to never take a chance despite time pressure, to realize that nobody knows everything, and to learn to recognize their limitations. Students did not mention these learning outcomes.

DISCUSSION

The learning outcomes of advanced pharmacy practice experiences in Sweden appear to cover a wide range of the skills and knowledge needed in pharmacy practice. The analysis of the learning outcomes from a workplace learning perspective provides a deeper understanding of the content of the learning for skills and knowledge. According to the respondents, the APPE provided the students with a solid base of task performance skills for handling work at a pharmacy. During the APPE the students achieved social and professional knowledge, such as how a workplace functions and how to learn at a workplace. Importantly, they also gained an understanding of the complexity of pharmacists' roles and responsibilities connected with the profession. Furthermore, some differences between students' and preceptors' views of what students learn were detected. Using the results from the LINEA study as a fixed typology for analysis supported identification of several outcomes that are not accounted for in the Swedish APPE curriculum. The results relate to 3 main areas: professional skills, knowledge about learning while at work, and social skills.

Much of the learning during the APPE was perceived to center on practical professional skills, such as being able to dispense drugs and to counsel. The main focus that appeared in the interviews, for both students and preceptors, was on basic task performance where operating computer systems seemed to be a great threshold for further learning. The lack of knowledge of brand names also was mentioned by students and preceptors, but this was considered easier to handle. Learning these basic task performance skills was perceived to diminish learning communication skills and patient centeredness, which are supposed to be the main learning objectives for the APPE. In the Swedish pharmacy curriculum, students entering the APPE have no prior practical training in dispensing, communication, drug counseling, or self-medication counseling. This knowledge and these skills are preferably learned in the social

context where they would be used later.^{13,19,33} Based on this, the main focus on APPE should be on the opportunity for students to interact with patients and learn counseling skills.

The APPE also was perceived to contribute to students' development of individual learning strategies. For most students, learning about becoming a pharmacist in the workplace was something new. They adopted different individual strategies for learning the professional occupation. However, this knowledge is not covered by the Swedish APPE curriculum, although the results indicate that both students and preceptors perceived workplace learning as important knowledge that prepared students for lifelong learning. The importance of professionals being lifelong learners is also stressed by policy documents on pharmacy education^{10,11,34-36} and in studies.^{5,22,37} In other professions, practice learning experiences has been shown to facilitate students learning from professionals and developing their own practice style, which is important for their early development of professional skills.^{5,13,19,20} Students and preceptors in this study emphasized that reflection was an effective way to learn and that increased reflective ability was a desired outcome of the APPE. This is supported by other studies on practice learning experiences.^{5,13,28} In this study, the focus on reflection might be a result of the lectures in reflective learning at workplaces provided by the university for both students and preceptors.^{26,27} Reflective practice is commonly used in health education in order to foster professionalism.^{17,38-42} Based on this, a focus on knowledge about workplace learning as an outcome in the curricula is important for supporting learning during the APPE as well as for future continuous professional development.

Social interactions, such as those between student and patient, student and preceptor, and student and staff member were perceived to be important to students learning social skills during the APPE. Learning informal skills like social interaction is seen as important to students' future employability.⁴³ Adequate assessment of these skills is difficult but important.¹⁰ In the APPE, reflective portfolios as well as other forms of assessment tools have been used to evaluate both formal and informal skills and knowledge.

Participation in the professional community is important to students' learning.^{16,17,21,26,47} In our study, an important outcome of the APPE was that students learned how to participate in a working community and learn within it. The students were supported by the pharmacy staff members and invited to participate in daily activities with more experienced staff members, which fostered social skills that are needed to perform the pharmacists' job. The importance of the APPE work environment

should be explicitly acknowledged in the curriculum, and students as well as preceptors and other pharmacy staff members might need extra support in this area, ie, information about their role as an APPE site. As a result of our findings, the college will acknowledge the importance of training students in social skills and teamwork during the APPE in the curricula and develop/apply methods for adequate assessment of these skills.

There were few differences between students' and preceptors' view of what was learned during the APPE. However, students tended to focus mainly on task performance and did not mention decision making and problem solving as major learning outcomes. Preceptors, on the other hand, did emphasize these factors. This may be a result of preceptors experiencing problem-solving as essential in their professional role, while students still have to learn basic skills in order to handle their work. Hence, students might have difficulties recognizing more complex processes such as decision making and problem solving. Students also stated that the APPE gave them good insight into the pharmacist's role as leader. However, leadership was not mentioned by the preceptors, which may be a result of their not recognizing their informal leadership role, especially as many of the preceptors were not formal managers. This may be an area for curriculum improvement, as learning leadership skills from managers within the context of the APPE was appreciated by students.⁴⁸

Using the LINEA typology helped to identify different skills and knowledge that students and preceptors perceived are learned during the APPE. The results can be used to identify the differences in the desired and real outcomes of the APPE and support students' learning during the APPE. In addition the typology could be used in curricula development to identify new learning outcomes relevant to professional practice.

A majority of the categories and subcategories in the LINEA typology were represented in this study. Hence, the typology seems to be applicable for describing what is learned during a pharmacy practice experience. This also implies that students' learning at a workplace is much like that of newly employed individuals, a point that is argued by Sawchuk as well.⁴⁹ However, some of the original categories in the typology were not found in this material; nothing was categorized under the main category of "Judgment" or in the subcategories of "value issues" and "group decision making." This could be explained by the fact that developing good judgment and being fully accepted in the workplace take time, which is consistent with results from the LINEA study.^{20,50} No results were found in the "theoretical thinking" subcategory either. This could be explained by students' preexisting focus on theoretical thinking from their previous education. They do not see this as something new to

learn during the APPE, and preceptors may prioritize teaching students to use their theoretical knowledge in practice.

Qualitative interview studies pose a risk for selection bias.²⁹ However, the desired heterogeneous groups were obtained for both students and preceptors. All participants were informed that the interviewer was not the course examiner and that their answers would be treated anonymously and not affect the course grades for the students. In a few of the preceptor interviews, social desirability bias tendencies were noticed by the interviewer. When they occurred, they were discussed during the interview (ie, the interviewer brought up the fact that he was known to be interested in reflective practice and asked the interviewee to disregard this fact).

The use of a typology for identifying what is learned at a workplace is one of many possible ways to study learning during an APPE. Analyzing the APPE from another theoretical standpoint could have elicited other perspectives from the participants. However, the typology was chosen due to its solid empirical and theoretical foundation and its straightforwardness. The analysis was validated in several steps, and finally an independent auditor was used to ensure the correctness of the coding. A qualitative study such as this does not provide any evidence on how common the found learning outcomes are.

CONCLUSIONS

The LINEA typology seems to be applicable for describing APPE students' learning and highlighting the breadth of workplace learning. Using the fixed workplace learning typology for analysis helped identify informal learning outcomes. The APPE is perceived as a bridge between theoretical knowledge and practical application, providing students with a wide variety of knowledge and skills and preparing them for their careers in more ways than cited in the curriculum. However, learning focused on basic skills seems to draw attention from more advanced processes during the APPE.

The APPE curriculum in Swedish colleges of pharmacy does not cover all of the important learning outcomes that were perceived by the preceptors and students, such as learning at a workplace, social skills, and teamwork, which are important for working as a pharmacist at a pharmacy. This is something that the educators might consider in order to further support learning (ie, applying a broader workplace-learning perspective to identify possible and already existing outcomes of pharmacy practice experience courses).

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REFERENCES

1. WHO. The role of the pharmacist in the health care system: preparing the future pharmacist: curricular development: report of a third WHO. Consultative Group on the Role of the Pharmacist, Vancouver, Canada, 27-29 August 1997. *WHO/Pharm/97/599*. Vancouver, 1997.
2. FIP. Standards for Quality of Pharmacy Services – Good Pharmacy Practice. The Hague: International Pharmaceutical Federation, 1997.
3. Wiedenmayer K, Summers RS, Mackie CA, Gous AGS, Everard M. *Developing Pharmacy Practice – a Focus on Patient Care*. World Health Organization and International Pharmaceutical Federation, The Hague, 2006.
4. Droege M. The role of reflective practice in pharmacy. *Educ Health*. 2003;16(1):68-74.
5. Katajavuori N, Lindblom-Ylänne S, Hirvonen J. The significance of practical training in linking theoretical studies with practice. *High Educ*. 2006;51(3):439-64.
6. Cipolle RJ, Strand LM, Morley PC. *Pharmaceutical Care Practice: The Clinician's Guide*. 2nd ed. New York, NY: The McGraw-Hill Companies, Inc, 2004.
7. Montgomery AT, Källemark Sporrang S, Henning M, Tully MP, Kettis Lindblad Å. Implementation of a pharmaceutical care service: prescriptionists', pharmacists', and doctors' views. *Pharm World Sci*. 2007;29(6):593-602.
8. Harding G, Taylor K. The social context of pharmacy. *Pharm J*. 2002;269:395-397.
9. Hassel K, Shann P, Noyce P. The complexities of skill mix in community pharmacy. *Pharm J*. 2002;269:851-854.
10. APhA academy of students of pharmacy and AACP council of deans. White paper on pharmacy student professionalism. *J Am Pharm Assoc*. 2000;40(1):96-102.
11. FIP. FIP Statement of Policy on Good Pharmacy Education Practice. International Pharmaceutical Federation, The Hague, 2000.
12. European parliament and the council. Directive 2005/36/EC of the European parliament and the council of 7 September 2005 on the recognition of professional qualifications. *2005/36/EC*: Journal of the European Union, 2005. <http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2005:255:0022:0142:en:PDF>
13. Sörensen EW, Haugbølle LS, Herborg H, Tomsen DV. Improving situated learning in pharmacy internship. *Pharm Educ*. 2005;5(3):223-233.
14. UU. Pre-registration training with pharmaceutical legislation. Course description. Uppsala: Department of Pharmacy, 2006.
15. Campagna KD, Boh LE, Beck DE, et al. Standards and guidelines for pharmacy practice experience programs. *Am J Pharm Educ*. 1994;58(Winter Supplement):35S-47S.
16. Lave J, Wenger E. *Situated Learning. Legitimate Peripheral Participation*. Cambridge: University of Cambridge Press; 1991.
17. Eurat M. *Developing Professional Knowledge and Competence*. London: The Falmer Press; 1994.
18. Steadman S. The LINEA Project. Glasgow, Scotland: SRHE Conference; 2002.
19. Eraut M. Early career learning at work and its implications for universities. In: Entwistle N, Tomlinson P, editors. *Student Learning and University Teaching*. Leicester: BJEP Monograph Series II, 2007:113-133.

20. Eraut M. Learning during the first three years of postgraduate employment – the LINEA Project Padua, Italy: EARLI Conference, 2003.
21. Eraut M, Maillardet F, Miller C, et al. Learning in the professional workplace: relationship between learning factors and contextual factors. *AREA conference paper*. San Diego, CA;2004.
22. Hammer DP, Berger BA, Bearsley RS, Easton MR. Students' professionalism. *Am J Pharm Educ*. 2003;67(3):Article 96.
23. Zarembski DG, Boyer JG, Vlases PH. A survey of advanced community pharmacy practice experiences in the final year of the PharmD curriculum at US colleges and schools of pharmacy. *Am J Pharm Educ*. 2005;69(1):Article 2.
24. Kassam R, Poole G, Collins JB. Development of an instrument to assess the impact of an enhanced experiential model on pharmacy students' learning opportunities, skills and attitudes: a retrospective comparative-experimental study. *BMC Med Educ*. 2008;8:17.
25. Thompson DF, Farmer KC, Beall DG, et al. Identifying perceptions of professionalism in pharmacy using a four-frame leadership model. *Am J Pharm Educ*. 2008;72(4):Article 90.
26. Wallman A, Kettis-Lindblad Å, Gustavsson M, Ring L. Factors associated with reflection among students after an advanced pharmacy practice experience (APPE) in Sweden. *Am J Pharm Educ*. 2009;73(6):Article 107.
27. Wallman A, Kettis-Lindblad Å, Håll S, Lundmark A, Ring L. Evaluation of a categorization scheme for assessing pharmacy internship students' level of reflection. *Am J Pharm Educ*. 2008;72(1):Article 5.
28. Katajaviuri N, Lindblom-Ylänne S, Hirvonen J. Pharmacy mentors' view of practical training. *Res Sci Educ* 2005;35(2-3):323-345.
29. Kvale S. *Den kvalitativa forskningsintervjun (InterViews)*. Lund: Studentlitteratur, 1997.
30. Hsieh H-F, Shannon SE. Three approaches to qualitative content analysis *Qual Health Res*. 2005;15(9):1277-1288.
31. NVivo [program]. 8.0 version. Doncaster: QSR International Pty Ltd, 2008.
32. Hill CE, Thompson BJ, Nutt Williams E. A guide to conducting consensual qualitative research. *Couns Psychol*. 1997;25(4):517-572.
33. Wenger E. *Communities of Practice - Learning, Meaning, and Identity*. Cambridge: Cambridge University Press;1998.
34. ACCP. ACCP White paper: a vision of pharmacy's futures roles, responsibilities, and manpower needs in the United States. *Pharmacotherapy*. 2000;20(8):991-1022.
35. ACPE. Accreditation standards and guidelines for the professional program in pharmacy leading to the Doctor of Pharmacy degree. Chicago: The Accreditation Council for Pharmacy Education Inc., 2006. www.acpe-accredit.org/pdf/ACPE_Revised_PharmD_Standards_Adopted_Jan152006.pdf
36. Mills E, Black P, Blenkinsopp A. Future quality management strategies for pharmacy pre-registration training: a scoping study. Department of Medicines Management, University of Keele, Royal Pharmaceutical Society of Great Britain, West Midlands Workforce Deanery, 2009.
37. Huynh D, Haines ST, Plaza CM, et al. The impact of advanced pharmacy practice experiences on students' readiness for self-directed learning. *Am J Pharm Educ*. 2009;73(4):Article 65.
38. Platzer H, Blake D, Ashford D. An evaluation of process and outcomes from learning through reflective practice groups on a post-registration nursing course. *J Adv Nurse*. 2000;31(3):689-695.
39. Nicholl H, Higgins A. Reflection in preregistration nursing curricula. *J Adv Nurse*. 2004;46(6):578-585.
40. Mamede S, Schmidt HG. The structure of reflective practice in medicine. *Med Educ*. 2004;38(12):1302-1308.
41. Powell JH. The reflective practitioner in nursing. *J Adv Nurse*. 1989;14(10):824-832.
42. Kansanaho H, Cordina M, Puumalainen I, Airaksinen M. Practising pharmacists' patient counseling skills in the context of reflectivity. *Pharm Educ*. 2005;5(1):19-26.
43. Employability working group report. Working Group on Employability. Report to ministers. *Bologna Conference*. Leuven, 2009.
44. RPSGB. Pre-registration Training: Royal Pharmaceutical Society of Great Britain. <http://www.rpsgb.org.uk/acareerinpharmacy/preregistrationtraining/> Accessed 2008.
45. Katajaviuri N, Hirvonen J, Lindblom-Ylänne S. The development of excellence in pharmaceutical knowledge: new curriculum for the B.Sc. (Pharmacy) Studies. *Pharm Educ*. 2003;3(3):149-160.
46. Christiansen FV, Sörensen EW, Söndergaard B, Rump C, Haugbølle LS. Bedømmelse af praktik i videregående uddannelser [Assessment of internship in higher education]. *MONA*. 2007(3):54-69.
47. Calomo JM. Teaching management in a community pharmacy. *Am J Pharm Educ*. 2006;70(2):Article 41.
48. Sorensen TD, Traynor AP, Janke KK. A pharmacy course on leadership and leading change. *Am J Pharm Educ*. 2009;73(02): Article 23.
49. Sawchuk PH. Theories and methods for research on informal learning and work: towards cross-fertilization. *Stud Cont Educ*. 2008;30(1):1-16.
50. Miller C, Blackman C. Interim report for nursing, the LINEA project. Sussex: University of Sussex, 2004.