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Improving situated learning in pharmacy internship

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Abstract

Aim: The study objective is to evaluate whether a pharmacy internship linked to a practice research project produces student-learning outcomes that are more relevant to new and extended roles of community pharmacists than traditional apprenticeship learning.

Method: A study combining undergraduate pharmacy education, pharmacy practice development and practice research in a participatory action research design. Students contributed to the study during the internship by collecting data and presenting the results to the training pharmacy. A triangulation of methods assessed both internally and externally was used to evaluate student learning for project participants and non-participants alike.

Conclusion: Pharmacy students are incorporated into a situated learning context during an internship. Most pharmacy students learn from the internship experience, but students who participated in the Pharmacy-University Study learned more than those who did not. This implies the creation of a more appropriate situation for learning for future pharmacy students.

Keywords: *Internship, situated learning, pharmacy students, participatory action research*

Introduction

While the integration of user perspectives and experiences is increasingly recognised as a key quality aspect of healthcare and medicine use (Royal Pharmaceutical Society of Great Britain, 1997; Stevenson, Barry, Britten, Barber & Bradley, 2000), it will present a growing problem as new consumerism enters the field of medicine (Morgall & Almarsdóttir, 1999). The implementation of user perspectives into pharmacy practice and education also presents challenges. Practitioners are currently developing new roles in pharmaceutical care, developing skills as care providers, coaches and discussion partners. Students should learn these new concepts and skills as well as extended clinical skills to be prepared for the changing field of pharmacy.

Pharmacy education at the Danish University of Pharmaceutical Sciences is based on a five-year

curriculum comprising four and a half years of theoretical training and a six-month internship at a community or hospital pharmacy. As part of their theoretical training, students learn pharmacotherapy, pharmacology, social pharmacy and pharmacy practice methodology, including pharmaceutical care. Training centres on courses as well as projects on which students work with interviews and user perspectives. However, the education does not provide them with clinical problem-solving skills and patient empowerment in practice (Figure 1).

Students work with medicine users and health professionals during their internship. Apprenticeship is one way of learning in practice and can be defined as 'training in an art, trade, or craft, under a legal agreement defining the relationship between master and learner and the duration and conditions of their relationship' (Encyclopaedia Britannica, 2001). Four main aspects characterise apprenticeship: the practice

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The aims for students after completing their internship in pharmacy:

- to have achieved an understanding of drug functions and importance in practice
- to have gained insight into inter-disciplinary cooperation in the health care sector
- to have gained an overview and practical experience in expediting drugs and providing information
- to have gained insight into pharmaceutical care and clinical pharmacy operations
- to have knowledge of organisational, management and financial aspects of a business and the health care system in a local area.

Figure 1. The aims of internship in pharmacy (Fagbeskrivelsen, 2004).

community, dedication of professional identity, learning without formal teaching and evaluation through practice (Nielsen & Kvale, 1999). As part of advanced studies, apprenticeship is recommendable to supplement the theory based classroom lessons. As a pedagogical method, apprenticeship places the student in a setting/context where the mutual development of practice and knowledge takes place.

Despite these obvious advantages, traditional apprenticeship has been criticised for encouraging apprentices to imitate their master's actions without the support of learning situations that allow reflection. This problem is a confounding factor for Danish pharmacy students. They often report through internship evaluations that they have encountered practices less advanced than those outlined by the theories of pharmaceutical care and patient empowerment. A study in 2000 encompassing all Danish community pharmacies revealed that pharmaceutical care was not evident in practice (Rossing, Hansen & Krass, 2003). Thus students are precluded from learning extended roles from role models and by imitation, which may lead to a limited understanding of the role of the community pharmacist. In order to prepare students for their future roles in health care, learning strategies other than imitation of role models thus need to be incorporated into the internship.

Following Lave and Wenger (1991), the approach to apprenticeship based on the concept of situated learning is argued in this paper. Situated learning implies an understanding of knowledge and learning as relational. The activities in the practice community are maintained and developed based on negotiations between participants and learning is driven by involvement as well as by dilemmas. Thinking, understanding and knowing something are thus developed in a practice setting, in other words, in situations that are part of the development of the practice setting (Lave, 1988).

A three-year participatory action research project, the Pharmacy-University Study, initiated in the Danish internship pharmacies in 1998 (Nørgaard, Sørensen, Gundersen, Lorentzen & Petersen, 2002; Sørensen & Haugbølle, 2003) aimed to combine undergraduate education, pharmacy practice development and pharmacy practice research. These three areas are not combined traditionally,

which is unfortunate as the fields are mutually dependant on each other. None of the three fields can be changed/developed without influencing or being influenced by the others.

The overall aim of the Pharmacy-University Study was to contribute to the development of pharmacy practice and pharmacy practice research in the area of pharmaceutical care. The aim for pharmacy students during their internship was "to work with pharmaceutical care, acquire a good understanding of patients and gain some experience in pharmacy practice research". In 1999, the students collected data from patients and pharmacy staff on angina pectoris; in the year 2000 the focus was on Type 2 diabetes, and in 2001 on asthma.

The aim of this article is to describe an evaluation of the pharmacy internship in 2000, with special focus on the student outcomes of the Pharmacy-University Study's approach to student learning. The following research questions will attempt to be answered:

1. What are the differences in knowledge about Type 2 diabetes patients in terms of drug treatment, medication records, drug-related problems and the patient's perception and behaviour in relation to illness and medicine (self-assessed knowledge and externally-assessed knowledge level) between students who participated in the Pharmacy-University Study and those who did not?
2. How do students who participated in the Pharmacy-University Study assess the participatory research project as a learning setting?
3. How do students who participated in the Pharmacy-University Study assess their internship compared to the students who did not participate?

Materials and methods

The population

The 153 pharmacy students from The Danish University of Pharmaceutical Sciences who served their internship during the period February–August 2000 made up the population for the evaluation. A total of 107 (69.9%) pharmacy students and 54 (65.1%) pharmacies participated in the Pharmacy-University Study.

The setting

Ninety of the 280 Danish community pharmacies and 11 of the 17 Hospital pharmacies are connected to the University as training pharmacies. In 2000, 153 students undertook their internships at 83 training pharmacies.

Internship is divided into several segments, the time spent is shown in brackets: advisory meetings (a half–two weeks); daily pharmacy work (8–12 weeks); special tasks (about 3 weeks); study visits (about 3 weeks); posted to other pharmacies, medical practice or industry (1–3 weeks), research project (4–5 weeks). Students plan the content of their internship in cooperation with an advisor at the training pharmacy. Materials and manuals have been drawn up with recommendations for the form and content of special tasks, research projects, study visits and posting, etc. Advisors and training pharmacies are approved by the University. The University trains advisors at annual two day seminars where participants exchange experiences, discuss content and educational topics.

Intervention

All students and their pharmacies were given the option of participating in the Pharmacy-University Study. The conditions for participation were: (1) that students were willing to take part and, (2) that the pharmacies were interested, had the time, and would be active participants in the project. A lecture about the project was given to the students prior to the start of the internship and the advisors were introduced and discussed the project at the University's annual seminar for advisors.

The project was run as a participatory research study. In contrast to conventional research, the aim of participatory research is to initiate action in a local setting, leverage the knowledge of local people (in this case pharmacy students and pharmacy staff), and allow local priorities to determine the topic of study, just as participatory research is characterised by collaboration between researchers and practitioners (Cornwall & Jewkes, 1995). Thus, a project group comprising community pharmacists, hospital pharmacists, pharmacy students and pharmacy practice researchers from the University and the Danish College of Pharmacy Practice designed and led the study, developed resources for student education and data collection, conducted data analyses and disseminated results.

The project group decided to link the Pharmacy-University Study to the annual campaign themes organised by the Danish Pharmaceutical Association. Thus, in 2000 the focus of the Pharmacy-University Study was Type 2 diabetes.

As a participant in the study, each student undertook the following educational activities as outlined in Table I. The students were given a detailed

Table I. Educational activities undertaken by each student.

1. Presenting the entire study to the staff
2. Taking multiple-choice test on knowledge of diabetes
3. Completing self-study material on diabetes care
4. Interviewing two diabetes patients selected at the pharmacy about their medicine- and illness- related experiences, knowledge, perceptions and behaviours
5. Condensing the qualitative data and communicating all data to the project group
6. Collecting questionnaire data from pharmacy staff about their knowledge and perceptions of and their behaviour towards diabetic patients
7. Communicating results analysed by the projects group to pharmacy staff
8. Participating in staff meeting discussions about utilising the results in the pharmacy
9. Retaking a multiple-choice test on knowledge on diabetes
10. Participating in an evaluation of the Pharmacy-University Study
11. Participating in an evaluation of the internship

The students who undertook their internship at hospitals and participated in the Pharmacy-University Study ($n = 10$) had slightly different content as they had no direct customer contact. However, they carried out corresponding activities and were thus not excluded from the study.

manual for all their tasks, which they were asked to follow. The scheduled workload was estimated at 40 h. The students who did not participate in the Pharmacy-University Study only completed activities 2, 3, 9 and 11 (Table I).

The evaluation method

The students' knowledge was assessed on different levels according to Bloom's taxonomy (Bloom, 1956): a three-dimensional evaluation approach. A battery consisting of a multiple-choice test, a case study and a questionnaire measuring self-reported student outcome was used to assess the students' results of the pharmacy internship and the Pharmacy-University Study.

A multiple-choice test, before and after the intervention was used to assess fact recognition. The test consisted of 30, short true or false statements regarding Type 2 diabetes. The statements were divided into three areas: pathology, pharmacology, and non-medical treatment. The Danish College of Pharmacy Practice developed the instrument originally as a self-test for the Danish Diabetes Campaign in 2000 (Appendix 1).

One case study was completed to assess knowledge using a relevant context. The case study dealt with a Type 2 diabetes patient and involved clinical problem solving as well as patient counselling (Appendix 2). Researchers at the University assessed the students' answers. The objective of the case study was for students to demonstrate their ability to apply the knowledge they had gained, analyse the problems presented and synthesise a solution based on the experience (both practical and theoretical) they had gained during their internship. The students were

informed that the purpose of working on the case was to reflect on what they had learned during their internship. The intention was for casework to be carried out at the pharmacy, with no help from outside resources. The scheduled time was approximate one hour.

A questionnaire was used to assess self-reported student knowledge and social involvement in the pharmacy as outcomes for the internship. The questionnaire consisted of 78 items in total: 55 with fixed response categories on different scales and 23 open-ended items where respondents could make comments on different topics (Appendix 3). All three instruments were pilot tested for face validity but not statistical validity.

All students enrolled in internship had the opportunity to complete each instrument, with responses treated anonymously. The evaluation was conducted as part of the standard quality assurance procedure for the internship; thus data collection proved to have some weak points in that it was not possible to identify individual student responses. In addition, concerning the multiple-choice tests, students were not aware whether they were participating in the Pharmacy-University Study or not, and therefore, it was not possible to split the student groups at baseline.

The student's assessment of participatory action research as a learning setting and the student's overall satisfaction were assessed by a questionnaire (Appendix 3).

The results were computed and tested using SPSS 10.0. Where nothing else is mentioned, the mean of the score is presented. The statistical tests conducted are independent of *t*-tests at group level, as no individual identifiers were used.

Results

Question 1

Multiple-choice test. The test (Appendix 1) was carried out at baseline and at the end of the study period.

At baseline, 99 students completed the test, a response rate of 64.7%. By the end of the study, 129 (84.3%) students had completed the self-test. A total of 85 (65.9%) of the responding students participated in the Pharmacy-University Study while 44 (34.1%) did not.

At the end of the internship, the students who participated in the Study achieved significantly better results in all three areas of the self-test than non-participants. The results were as follows: non-medical questions ($p < 0.0001$), pharmacology ($p = 0.024$) and pathology ($p < 0.0001$, Figure 2).

Case study. In the final part of their internship, all students were asked to consider a case study (Appendix 2), which was optional and anonymous.

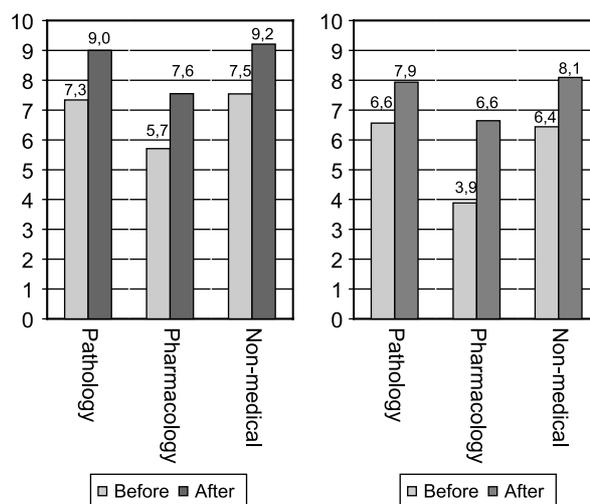


Figure 2. Results of self-test for students who participated in the Pharmacy-University Study and those who did not. (a) Participants in the Pharmacy-University Study. (b) Non-participants in the Pharmacy-University Study.

Results of the case study revealed that Pharmacy-University Study participants achieved higher scores that proved to be statistically significant. The test between groups showed no differences in use of study material and time spent on the case study (Table II).

Self-assessed knowledge. All the students evaluated their own knowledge in the areas of “drug treatment of Type 2 diabetes”, “medication record and drug-related problems” and “patient’s perception and behaviour in relation to illness and medicine”. This evaluation was carried out at the end of the internship, however, students were asked to assess their knowledge before the internship as well. The questionnaire is shown in Appendix 3.

One hundred and forty-nine students responded to the questionnaire, a response rate of 97.4%. One hundred and seven (100%) of the students participating in the Pharmacy-University Study responded, compared to 42 (91.3%) of the non-participants (Figure 3).

Table II. Results of case study.

	Participants in Pharmacy-University Study	Non-participants in Pharmacy-University Study
Number of students, response rate	80 (74.7%)	39 (84.8%)
Average score (30-point scale)	21.9	18.5*
Use of study materials	15%	17.9%
Average time spent	40 min	38 min

* $p \leq 0.000$.

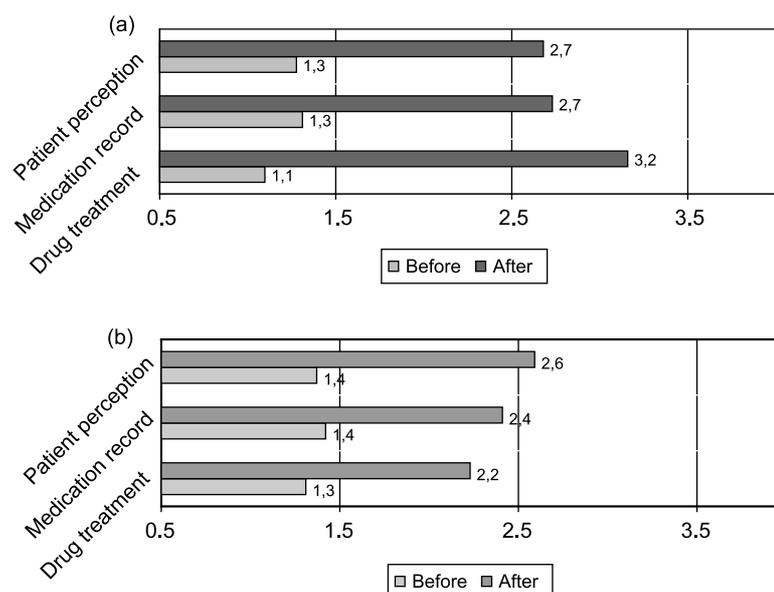


Figure 3. (a) Results of self-assessed knowledge by students who participated in the Pharmacy-University Study. Note that the assessment is on a scale from 0.5 to 4.0. (b) Results of self-assessed knowledge by non-participants in the Pharmacy-University Study. Note that the assessment is on a scale from 0.5 to 4.0.

The differences (gain) in self-assessed knowledge from baseline to end between the two groups (see Figure 3a, b) shows a statistically significant gain for students in the Pharmacy-University Study in the areas “drug treatment of Type 2 diabetes” ($p < 0.0001$) and “medication record and drug-related problems” ($p = 0.003$). While no statistically significant difference was found between the two groups of students concerning “patient’s perception and behaviour”.

Question 2

The extent to which the Pharmacy-University Study as a whole contributed to a larger academic outcome of the internship was assessed using a questionnaire (Appendix 3). Only students participating in the Study were supplied data for these results/questions ($n = 107$) and the response rate was 100%.

Fifty four point two percent of the students found that the Pharmacy-University Study improved their outcome of their test scores. Only three students selected the category “none whatsoever” to describe the extent of the contribution, while four students selected the opposite end of the scale entitled “greatly”.

The students were asked in an open-ended question to point out which part of the Pharmacy-University Study in particular had contributed to an improved academic outcome of the internship. Most students mentioned “the opportunity to study a subject in depth” ($n = 63$, 39.4%), as well as “contact with patients” ($n = 26$, 16.3%), “conducting the interviews” ($n = 21$, 13.1%) and “focus on a special clinical area” ($n = 17$, 10.6%). Other reasons we were unable to categorise totalled 33 (20.6%).

In response to the question ‘Would you recommend similar studies for internships in future?’, (78.5%) of the students marked > 2 on a scale from 0 to 4, while only 10 (9.3%) marked < 2 ; the response rate was 107 (100%).

Students were also asked for any negative feedback about the Pharmacy-University Study, and drawbacks were recorded. The students mentioned ‘too time consuming’ ($n = 36$, 31.6%), ‘lack of conclusion for the overall study’ ($n = 37$, 32.5%) and ‘lack of interest from pharmacy staff’ ($n = 9$, 7.9%), plus 32 (28.1%) other reasons we were unable to categorise.

Students spent an average of 50.7 h (SD: 15–140 h) on the Pharmacy-University Study. The students ($n = 36$) who selected time consumption as the biggest drawback spent an average of 53.1 h (SD: 15–80 h). Thus on average the students who found the study more time consuming spent only a few more hours than all students in general. Students were asked to spend a maximum of 40 h on the Study.

Question 3

All students ($n = 153$) were asked to assess their satisfaction in relation to the general factors satisfaction and expectations; 148 (96.7%) of the students responded (Figure 4).

The test between groups shows a statistically significant increase in satisfaction with the opportunities to use theoretical knowledge during the internship ($p = 0.027$) among the students who did not participate in the Pharmacy-University Study. There were no significant differences between the two groups regarding the question about satisfaction with working independently and working in teams. However,

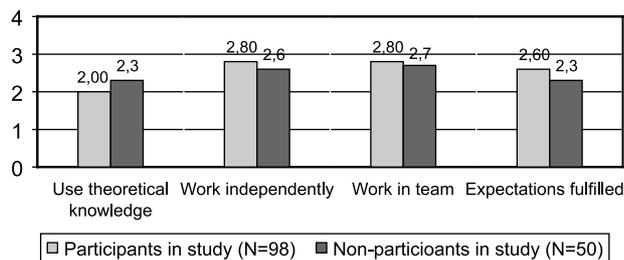


Figure 4. Student satisfaction with internship, divided into participation in Pharmacy-University Study or not.

statistically significant ratings were found among the students who participated in the Study with regard to their overall expectations about internship ($p = 0.050$).

Discussion

The data presented in this study was collected as part of standard quality assurance of the internship, which means there are some weaknesses in the data. First of all, the data was anonymised to protect the individual student from being recognized, thus there were no student identification numbers. This prohibited researchers from pooling data to conduct analysis across the different datasets. Likewise, the missing identification numbers made any calculations of individual differences impossible. As a result, all tests presented in the results section were conducted between groups. Also, ten students were included who served their internships in hospitals, where they followed a Pharmacy-University Study adapted for hospital wards and therefore, slightly different. In future studies of this kind, a student identification number system should be set up to enable researchers to follow the individual and still ensure student anonymity.

The strength of the study includes the use of research methods based on the students' cognitive skills, thereby allowing data on social involvement in the pharmacy supplement each other. It is believed that this triangulation of different methods and perspectives on the evaluation data outweighs the weaknesses of the study.

Pharmacy intern students contributed key resources to the study in the form of data on patient and pharmacy staff perceptions. Thus, the Pharmacy-University Study abandoned the traditional form of apprenticeship, since by joining the study, students made a contribution to a pharmacy practice research project. Thus influencing pharmacy practice development in the area of pharmaceutical care. The Pharmacy-University Study was thus in keeping with policy statements from FIP stating that "Educational programmes should ensure that patient-focused pharmaceutical care as outlined in the FIP Statement 'Pharmaceutical Care'... is a mandatory part of the curriculum" (FIP Statements, 2000).

The overall objectives on which to evaluate the internship in pharmacy are to increase the students' knowledge in specific areas, to meet the students' expectations about the internship in general, to integrate the students' theoretical knowledge from university studies into everyday pharmacy practice, to provide a platform for the students to work independently and to integrate the students into the working community of the pharmacy.

The above-mentioned objectives were evaluated and found in relation to increases in knowledge. Both the external assessment, in the form of factual recognition, knowledge in a relevant context, as well as self-assessment of personal knowledge revealed that the Pharmacy-University Study participants gained significantly more knowledge in the area of pharmaceutical care than those who followed the standard curriculum.

Expectations of the students were found to have been met for the internship experience. The score for meeting expectations was higher in participants in the Pharmacy-University Study than for non-participants.

In general, the students' ability to integrate theoretical knowledge into practice was moderate. Although it was expected the students who participated in the Pharmacy-University Study would score higher in this area, the opposite was found to be true. One possible explanation is that students who participate in the Pharmacy-University Study do not have enough time to carry out a research project of their own choosing, and thus do not integrate their theoretical knowledge into practice.

Lave and Wenger (1991) describe learning theory based on the kinds of social involvement the proper context provides for learning to take place. In other words, a person acquires the skill to perform by actually engaging in the process under attenuated conditions of legitimate peripheral participation. During the pharmacy internship, the students were brought into this type of situated learning context. This is explained by the term "legitimate peripheral participation". Legitimate means that the person who learns is accepted as a member of the working community and peripheral participation is defined as the opposite of full participation.

The students were asked about their level of satisfaction in working independently and being integrated into the working community. These two questions can be seen as indicators of the degree of legitimate peripheral participation. In other words, the better students perceive themselves as working independently and the higher they evaluate their degree of integration into the working community, the greater their chances of having achieved legitimate peripheral participation. The students who participated in the Pharmacy-University Study scored 2.6 and 2.7, respectively (on a scale of 0–4, four being the highest) with regard to working independently and

being well integrated into the working community, illustrating that they see themselves as having a certain legitimate peripheral participation. Since the students in the Pharmacy-University Study score significantly higher, it can be inferred that students with a specific project that combines students with the working pharmacy will have a direct reason for being part of the working community.

A research project with a participatory action approach was chosen as the focus of cooperation between the teachers/researchers and the internship pharmacies, a form of cooperation relevant for both the educators and the pharmacies. Therefore, the project group had positive support for the study and a high rate of pharmacy participation in the project. Not all of the students who participated in the Pharmacy-University Study were satisfied. Perhaps the study's design made students unable to complete it in the estimated timeframe. The majority of the students spent more time than we had estimated.

In a study by Cheng, Bazil, Desselle & Feifer (1998), objectives were to involve the students in a clinical research project during their clerkship in community pharmacy, to enhance the students' pharmaceutical care skills, and to assess the research project as a teaching tool based on feedback from the students. The students responded favourably regarding their experiences with the project, and it was noted that research projects were useful teaching tools for introducing clinical research to students while improving their pharmaceutical care skills. The study also found that with proper instructions and guidance, the students were able to collect reliable research data.

In this study, the students also constituted a very strong resource for collecting data on pharmacy practice, contributing to new knowledge (Haugbølle, Sørensen & Gundersen, 2002a; Haugbølle, Sørensen & Henriksen, 2002b). However, it is important to note that good results require the involvement of both students and pharmacies in the study. With this in mind, a participatory research design and method was used (Haugbølle et al., 2002a).

Kane, Briceland & Hamilton (1993) concluded that students with didactic training using the pharmacies' workup of drug therapy (PWDT) and drug-related problem (DRP) approach were better able to identify real DRPs compared to students with no such training. McKenzie (1985) evaluated a module on learning by pharmacy students serving a clerkship. The students in the experimental group showed significantly greater mastery than the students in the control group. These two studies show that more structured teaching/instruction of students results in better learning during internship. Students participating in the Pharmacy-University Study worked with detailed descriptions during their internship. Wenger (2002) argues that it is possible to facilitate learning by using a planned and systematic approach.

It can be concluded that while all students learn from internship, those students who took part in the participatory action research project learned more than those who did not. This can be explained in part by the theory of situated learning, because the students who participated became more involved and had the opportunity to become part of the working community by participating in the development project designed specifically for the pharmacy. Another explanation could be that the students received detailed instructions and a scheduled plan for their work.

Implications from the results

According to the results of the Pharmacy-University Study, students should be given specific projects/tasks that are relevant and useful to the pharmacy while performing internships. Therefore, each year since the Pharmacy-University Study advisors from the training pharmacies have been greatly involved in formulating special tasks for students that are relevant for both pharmacies and students. It has been made clear to the students that they will benefit from the project if it is defined on the basis of the pharmacy's need as well.

It has been found that these strategies put students in a better situation with regard to legitimate peripheral learning. Since a quantitative evaluation was conducted as a part of the quality assurance of the internship each year, the level of student satisfaction can be followed. Similar evaluations of internships in pharmacy were made in subsequent years 2001, 2002, 2003 and 2004 (Sørensen, 2001; 2003; Sørensen & Klinke, 2003; Sørensen, Simonsen & Klinke, 2004). These evaluations show that student satisfaction has increased over the past four years.

Conclusion

Internships provide a situated learning situation for pharmacy students. While students learn from their internship, those who participated in the Pharmacy-University Study learned more than non-participants. This is due in part to the better situation for the students in terms of legitimate peripheral participation. The tasks the students undertook as part of the Pharmacy-University Study contributed to a greater degree of acceptance in the working community of the pharmacy, resulting in a better learning situation.

As a supplement, the students were made part of a systematic and planned project, which also facilitates learning (Wenger, 2002). The Pharmacy-University Study also provides the tools to develop pharmacy practice, which creates more appropriate (optimal) learning situations for pharmacy students in future. In a larger perspective, these initiatives will contribute knowledge about user perspectives.

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Appendix 1

Test yourself	February 2000
About diabetes	Right Wrong
Type 2 diabetics do not produce any insulin	
Brain cells live primarily on glucose	
Type 1 diabetes occurs most often in the elderly	
Thirst and urinary frequency are common symptoms of hyperglycaemia	
Late-onset complications are due to low blood glucose	
Diabetes can be diagnosed by measuring glucose in urine	
There is a risk of ketoacidosis from hypoglycaemia	
Shaking, sweating, nervousness and heart palpitations are symptoms of hypoglycaemia	
Large amounts of alcohol increase blood glucose	
Type 2 diabetics have a low risk of foot ulcers	
Medicine	Right Wrong
Rapid-acting insulin should be taken before meals	
Diabetics need less insulin when they are running a fever	
Metformine can be used for both Type 1 and Type 2 diabetes	
Pregnancy is a contraindication for Glibenclamid	
Perorale anti-diabetics should always be taken at bedtime	
Two β -cell stimulants can be combined to advantage	
Insulin injected into subcutaneous abdominal tissue works faster than insulin injected into the thigh	

Insulin should be refrigerated after being opened
 Acarbose is used primarily for people who are overweight
 β-cell stimulants should be taken before each meal

Non-medicine treatment

Exercise makes blood glucose fall
 Type 1 diabetics should not get too much exercise
 Diabetics are not allowed to have sugar
 Type 2 diabetics should measure their own blood glucose
 Type 2 diabetics should regularly measure their urine for ketones
 A diabetic diet should contain more protein than an ordinary diet
 It is recommended that Type 1 diabetics eat between meals
 Strict control of blood glucose can prevent heart disease
 Type 2 diabetics should take extra doses of C and E vitamins
 It is important for both Type 1 and Type 2 diabetics to stop smoking

Right Wrong

Appendix 2

Case study:

Your neighbour (a slightly overweight woman about 60 years old) knows that you are a pharmacy student serving your internship at a pharmacy just now. Today she takes the opportunity to ask your advice because she is having a problem with urinary frequency and is also extremely tired. She asks whether you have something at the pharmacy she could take or what she should do otherwise.

1. What disease do her symptoms suggest?
2. What advice would you give your neighbour?

You meet your neighbour again a month later and there is an opportunity to talk about her problem. She says that she has been to the pharmacy as well as to her family doctor, who sent her to the laboratory for some tests.

She now has a prescription for Glucophage.
 Who would have thought she could have diabetes — she is very unhappy about that.

She would like you to explain just what the laboratory was looking for and how her prescription medicine works.

She is also perplexed as to why she of all people has diabetes, how long the disease will last and whether she can do anything about it.

3. What do you tell your neighbour?
 She asks you to take her prescription to the pharmacy and fill it.

4. How do you fill the prescription?
 The pharmacy where you are interning has just been encouraged to participate in a Diabetes Year Campaign. The pharmacist/your advisor asks you to come up with some proposals for activities in connection with the campaign at the pharmacy.

5. What are some of your ideas?
 6. How do you propose the pharmacy gets started?
 In providing your answers to the case study, you might want to consider touching on the following areas:

- Prescription control
- Disease, causes, symptoms, epidemiology and prevention
- Treatment methods, dosage, effect and side effects
- Pharmaceutical care, drug-related problems and medication records
- The patient's perception and behaviour in relation to illness and medicine
- Advising customers, communication, disseminating information
- Routines/procedures at the pharmacy for serving customers, giving advice and prevention
- Pharmacy practice development at the pharmacy

7. How much time did you spend working on the case study? _____
 8. Although you were asked not to, did you use any source materials to help you with your answers anyway?
 Yes _____ No _____

If yes, which: _____

9. Did you participate in the Pharmacy-University Study?
 Yes _____ No _____

Appendix 3

Part of questionnaire

The students' evaluation of Internship in pharmacy spring 2000

4. Pharmacy-University Study 2000

Did you participate in the Diabetic and Pharmacy campaign?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
The angina pectoris patient and hospital pharmacy campaign?	Yes <input type="checkbox"/>	No <input type="checkbox"/>

If yes:

On the whole, to what extent did the Pharmacy-University Study help **increase** the professional benefit of your internship at the pharmacy?

None whatsoever Not enough Neutral Very much Greatly

What in particular helped increase the professional benefit?

Were there any drawbacks to the Pharmacy-University Study?

How much time did you spend in total on the Pharmacy-University Study?

(Interviews, data processing, questionnaire, presenting results to pharmacy staff)

Approx. no. of hours: _____

Would you recommend continuing to offer similar projects to students serving their pharmacy internship?

0 1 2 3 4
 No, definitely not Yes, absolutely

Why?

Why not?

11. Professional benefit of your internship

Regarding medicine treatment

How would you rate your knowledge/experience with **medicine treatment** of Type 2 diabetes patients **before** your internship at the pharmacy?

0 1 2 3 4
 none maximum

How would you rate your knowledge/experience with **medicine treatment** of Type 2 diabetes patients **after** your internship at the pharmacy?

0 1 2 3 4
 none maximum

Regarding medication records and drug-related problems:

How would you rate your knowledge/experience with medication records and drug-related problems **before** your internship at the pharmacy?

0 1 2 3 4
 none maximum

How would you rate your knowledge/experience with medication records and drug-related problems **after** your internship at the pharmacy?

0 1 2 3 4
 none maximum

Regarding the patient's perception and behaviour in relation to illness and medicine

How would you rate your knowledge/experience with the patient's **perception and behaviour** in relation to illness and medicine **before** your internship at the pharmacy?

0 1 2 3 4
 none maximum

How would you rate your knowledge/experience with the patient's **perception and behaviour** in relation to illness and medicine **before** your internship at the pharmacy?

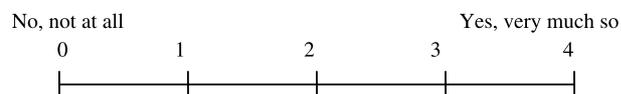
0 1 2 3 4
 none maximum

Have you been satisfied with your opportunities to use your theoretical pharmaceutical knowledge at the pharmacy?

No, not at all Yes, very much so
 0 1 2 3 4

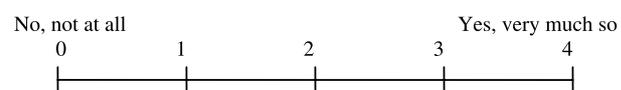
Comments: _____

Have you been satisfied with your opportunities to work independently?



Comments: _____

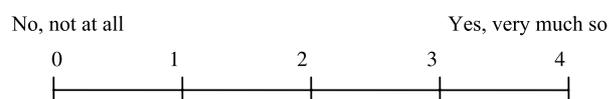
Are you satisfied with the experience you gained as part of the working community at the pharmacy?



Comments: _____

12. What were your expectations about your internship?

Have your expectations about the internship largely been met?



Suggestions for changes in the internship programme:

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Author Queries

JOB NUMBER: MS 131931—

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Q1 Please check the significant value.