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The harmonization of academic degree and quality assurance standards throughout Europe, that started with the Bologna declaration in 1999, represent the main objective of the Bologna Process. This aimed to create more comparable, compatible and coherent systems of higher education throughout Europe named “European Higher Education Area”.

One year before the Bologna declaration, Education Ministers of France, Germany, Italy and United Kingdome signed the Sorbonne declaration in Paris 1998, committing themselves to "harmonizing the architecture of the European Higher Education system" giving the basis for the Bologna declaration. It is for this reason that the Bologna process is often named La Sorbonne/Bologna process.

The Bologna declaration was originally signed by Ministers of Education from 29 European countries. This was opened up to other countries, and further governmental meetings have been held in Prague (2001), Berlin (2003) and Bergen (2005). The next meeting will take place in London in Autumn 2007.

The European process, thanks to the extraordinary achievements of the last few years, has become an increasingly concrete and relevant reality for the Union and its citizens. Enlargement prospects together with deepening relations with other European countries, provide even wider dimensions to that reality. This is a fundamental step for Europe, in particular it will be amendatory in building upon and strengthening its intellectual, cultural, social and scientific and technological dimensions. Central to the Bologna reforms are the three intermediate priorities emphasized by the Ministers responsible for Higher Education at the Berlin Conference on 18-19 September 2003, namely the introduction of study programs based on three main cycles, more effective recognition of degrees and periods of study, and the promotion of effective quality assurance systems. Implementation of these policy objectives is crucial. From this standpoint, the present Eurydice report represents an essential contribution to the mid-term stocktaking of the Bologna process, which the Ministers also called for in Berlin [1].

Concerning study programs based on three main cycles, Italy did actually fit the framework since 2001 where the lowest degree is the "Laurea", that can be achieved after 3 years of studies, followed by 2 more years of "specialization" (Laurea Magistrale). Only those who have obtained the latter are considered "full" graduates and are eligible for a doctorate. Some exceptions to this rule are represented by courses in Medicine (6 years), **Pharmacy (5 years)**, Veterinary (5 years) Architecture (5 years) and from the coming year Law (5 years). The postgraduate courses last 3 or 4 years that furnished an additional academic title (Doctorate). In addition the Italian system includes also Masters that are divided in "First Level Masters", that can be achieved by those who hold at least the first level "Laurea" degree, and in "Second Level Masters", that requires a "Laurea Magistrale".

Moreover, the great majority of the Italian Pharmacy Schools joined the ECTS program that consists in defining subjects in terms of contents, number of hours dedicated to theoretical and practical parts, name of Teachers, tutoring, number of credits and whatever is needed for their full characterization.

The promotion of effective quality assurance systems is probably the objective of the Bologna process that progressed more slowly during these years in the European Countries included Italy. The Italian Universities made the first at-

tempt in 2001 by mean of a project named CampusOne [2].

CampusOne was managed by the CRUI (Conference of the Italian University Rectors), Foundation in close cooperation with CNEL, Confindustria (the Confederation of Industry), MIUR (the Ministry of Education), the regions, trade-union organisations and Unioncamere (the Association of Chambers of Commerce).

CampusOne is a three-year experimental project (the academic years 2001-2003) specifically addressed to degree courses in order to sustain and disseminate technological educational and innovation. It follows up and implements general reform of university teaching.

CampusOne is financed by the Presidency of the Council of Ministers with the funds from UMTS licences. The objective is to promote and implement the principles of the reform by involving all the universities and in particular those in the South of Italy.

The main objectives of CampusOne regard:

- Didactic management, as a set of functions and services, which working alongside the university's own resources, facilitate relations with students, the verification of the effectiveness of the teaching, and dialogue with bodies outside the university and within the labor market.

- Quality evaluation, based on a control methodology analyzing and evaluating the quality of the teaching of the curriculum courses, adopts the standpoint of attributing credits to the various study curricula.

- Establishing links between academic studies and the professions through internships, language and IT courses, as well as through regular on-going relations with businesses, economic agents and local authorities in order to bring the university into closer contact with society, the requirements of the labor market and corporate culture.

- Communication, using activities and instruments suitable for doing justice to the new physiognomy of the University, as also its objectives and results, in order to encourage a constant dialogue with students designed to keep them well-informed and to guide their academic development and cultural growth throughout all the entire course of studies.

The meaning of quality evaluation. CampusOne avails itself of a methodology inspired (with due modifications) by the quality evaluation models of service companies (ISO 9000), which has been developed in cooperation with professional quality control sector associations.

The evaluation contributes towards the definition of goals, operational arrangements and the results of the system and at the same time facilitates the control over factors of success or unsuccess, but always in relation to changes in the external world.

CampusOne was adopted by 70 Italian University and involves about 270 undergraduate courses, 9.000 faculty members and 50.000 students.

Most of the undergraduate courses adherent to CampusOne, named Campus-Like, are in the fields of engineering sciences, agronomy, and pharmaceutical science and technology.

Universities of Salerno and Camerino included their Faculty of Pharmacy, with all the different undergraduate courses, in the aforementioned project. The Pharmacy School of Florence is actually under evaluation. Pharmacy Faculties of some other Universities, such as Perugia, Catania, Siena and Trieste, began this experimental project with just one undergraduate course.

Interesting is to report the outcome of the evaluation of CampusOne in order to have a feedback in the improvement of the quality of Pharmacy curricula. The Pharmacy School of the University of Salerno experienced a substantial positive rate for the organization and quality of its courses. From the analysis of the first two years of the pharmacy curricula it stands out the need for a larger amount of basic knowledge and at the same time the necessity of more practical activity coupled to the theo-

retical teaching and a better coordination between the different subjects.

With the experience maturated during the three years of CampusOne, a Committee for quality assurance of the University of Perugia (Comitato Qualità dell' Ateneo di Perugia) was instituted in April 14th 2003.

The University of Perugia is the first Italian University that successfully started the certification UNI EN ISO 9001:2000.

At the same time the "Nucleo di Progettazione Universitaria" was validated, from the Council of Umbria State (May 30th 2005), as a structure to deliver higher and continuous education according to the European Community guidelines.

A first step in the promotion of quality assurance systems in pharmacy curricula and schools in Italy has been hence performed. However much more should be done in this field since the majority of the Italian Pharmacy Schools so far did not submit them self to the evaluation program.

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HARMONIZATION BETWEEN ACCREDITATION AND INSTITUTIONAL QUALITY IMPROVEMENT AT UNIVERSITY OF SZEGED, HUNGARY

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Introduction

National responsibility for quality policy lies with the Ministry of Education, for accreditation with the Hungarian Accreditation Comittee (HAC), while quality assurance at the institutional level is the responsibility of the Higher Education Institutes (HEIs).

Accreditation process in Hungary

The Hungarian Accreditation Committee operates since 1992 and was established by Hungary's first Higher Education Act in 1993. The HAC is responsible for evaluating and accrediting the quality of teaching and research at higher education institutions in Hungary. The HAC accredits both programs and institutions.

Accreditation of institutions, faculties, and programs, both new and operating, are compulsory in Hungary. New institutions, faculties and programs must be accredited as a prerequisite of the licence of operation; while operating organizations are accredited in an 8 year cycle within the framework of institutional accreditation. Programme accreditation starts with an application.

HAC employs the internationally well-known method, comprising the following steps:

- self-evaluation
- peer-review

- expert report
- accreditation decision

The first cycle was completed in 2000. As a part of a recent initiative, a parallel accreditation started in 2004; it means the evaluation of the same programs running in the country at the same time [1].

Institutional Quality Assurance (QA)

Institutions had to implement their internal QA systems by the end of 2001. HEIs are free to choose the type and way of implementation of their QA systems. A yearly quality report is sent to HAC containing information on each and every degree program taught at the given institution [2].

Quality issues at University of Szeged

The Quality Statutes of University of Szeged was established in 2002 and also the institutional committee representing the 11 faculties was formed at the same time. Harmonization among the different faculties with very high diversities in their programs has been a challenging task. Parallel with institutional activities, also Quality Assurance committees were established at faculty levels as well.

A successful application to the „Human Resources Development Operational Programme" (European Social Fund and the European Regional Development Fund) can be counted as a milestone in the QA activities of University of Szeged, Hungary (2004-2006) [3].

As national accreditation – as external quality evaluation – has a strong input focus; an output oriented point of view is priorized within the frame of this project.

Quality of Pharmacy program at University of Szeged

Faculty of Pharmacy at University of Szeged successfully went through the „parallel accreditation process of pharmacy degree" of HAC in 2005.

As a result of this accreditation process, evaluated by both national and international experts, and by meeting the criteria of HAC in this respect, the „Place of Excellence" title was awarded to our Faculty this year for a 5 year period till 2011.

Handling quality assurance issues is a „built in" skill for a pharmacist, originating from our highly regulated profession; therefore our faculty actively participates in the institutional quality improvement activities and has its own QA committee since 2002. However, the activities till now – as well as at institutional level – were restricted mainly to the annual quality reports and to meet the actual accreditation requirements.

The following present activities can be mentioned:

- identification of the basic operating processes and activities running;
- change to output oriented, so called performance evaluation viewpoint e.g. students evaluate the courses, teachers and exams; strengthening Alumni relations etc.
- documentation operational processes in an internationally well-known form of Standard Operating Procedures (SOPs) has been started.

Summary

Input elements dominate the accreditation requirements standards of the HAC, and not the

teaching or research processes are assessed. Internal QA systems should:

- identify key output elements
- find performance indicators
- determine profession specific basic processes and indicators
- document SOPs
- evaluate regularly and give feedback
- handle and harmonize data for generating information to accreditation.

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QUALITY ASSESSMENT IN PHARMACY SCHOOLS IN SPAIN

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"**Quality in Higher Education** is a description of the effectiveness of everything that is done to **ensure that diligent students can derive maximum benefit** from the educational opportunities available to them **and also fulfill the requirements for the award** for which they are working". (ENQA. Standards and Guidelines for Quality Assurance in the European Higher Education Area).

The implantation of mechanisms of quality guarantee in the Spanish System of Higher Education begins with the announcement of the National Plan of Quality Assessment of Universities, in December 1995. This Plan was elaborated with the mission of providing universities, educational administrations and citizens in general with instruments and methods to preserve and, as it indicates in its preamble, to promote an "unavoidable vocation of academic and scientific excellence that leads them to a constant improvement of the quality of its services ".

This First Plan was a consequence, and a continuation, of other two previous experimental programs designed to promote politics of Quality realized in 1992 and 1995. These programs were managed by the Council of Universities, since the full recognition of the autonomy of universities in order to comply "the yield of the institution in relation to resources that the society puts to its disposition". In this respect, the First Plan represented the initial impulse to insert a culture of integral quality into the university education and allowing the creation of Quality Units in universities and some Organisms of Evaluation in the Autonomous Communities, often under the figure of consortia as a precedent of the current agencies.

In 2001 the Second Plan of University Quality was established with a life of six years and the purpose to continue fomenting the implantation of quality systems for constant improvement, to continue promoting the participation of Autonomous Communities in order to create a Network of Quality Agencies, to implant systems of information and to establish systems of accreditation. The Organic Law of Universities, December 2001, reinforced the idea that the quality is an essential aim of the university politics. These aims were later fulfilled with the creation of a National Agency for Quality Assessment and Accreditation (ANECA), the institution that represents Spain at ENQA, whose activities are related to the maintenance and guarantee of the quality of universities.

Anyone in direct contact with the universities today will know that they are currently engaged in coming to terms with the need to adapt, in the not very far future, to a new model of studies and teaching which will constitute a verita-

ble revolution in the concept of the university as it has existed for more than two hundred years.

The Institutional Assessment Programme has the purpose to facilitate evaluation process to improve of the quality of educations programmes intended to obtain university degrees of official character. It is a process of diagnosis of the fortresses and weaknesses, enlightening as final product a Plan of Improvements

The process is carried out in three phases:

- Self-assessment: The evaluated unit, through the Committee of Self-assessment, describes and values its situation with regard to the established criteria, initially identifying those offers of improvement from which the plans of performance starting once the whole process concluded will be elaborated. The result is the "Self-assessment Report"

- External assessment: A group of external assessors to the unit evaluated, named by the ANECA, and under their own directives and supervision analyzes the Self-assessment Report through a documentary study including a visit to the evaluated unit. Later it emits his recommendations and proposes improvements. The result of this phase is the "Report of External Evaluation ".

- Final assessment: The principal results of the process of evaluation are gathered. In this phase the plan of improvements of the unit goes to as end, in which the actions of improvement detected in the phase of self-assessment are related, and the tasks to realize for the attainment of these are decided, as well as the persons in charge, the implied resources and the period for its implantation. Similarly, the indicators of follow-up of detected actions as well as the benefits expected are identified.

Up to now not all the Pharmacy Schools in Spain have been assessed and two are now in the process. I will write only a general outline of the assessment in these Schools:

The goals and aims of the curricula are clearly established. The aims are in general directives of their own study curriculum leading to obtaining the official degree in Pharmacy. The curricula were elaborated according to the guidelines of the European Union with regard to the knowledge that future pharmacists must acquire. Due to the curriculum coincidence with the European Guidelines, the graduate has his Degree automatically authorized to be employed at any country of the European Union.

The formation that pharmacists acquire includes knowledge allowing them to accede both to diverse pharmaceutical specializations and to the different roles like teaching, researching, industry and in the administration.

The Study plan is constructed in two cycles, with differences among Schools in relation to their extension (3 plus 2 or 2.5 plus 2.5). The goal of the study plans is to train the students in theoretical and practical aspects.

In relation to the program matters, overlapping and recurrence in the programs of different departments may exist.

The students complain about an excess in school load and the lack of time that prevent them from realizing review works that could allow them a better learning. In general, among students there is a widespread opinion about the overloading of the study plan and an imbalance among the load of theoretical and practical credits.

The offer of elective matters has been realized on the basis of the knowledge, experience and material possibilities of professors of Departments implicated in the Degree. The students often choose the elective matters more for their accessibility that for their interest.

Majority of the registered student requested the School as their first option and so it is vocational, however their previous training is often deficient. The only way for students to be accepted in a Degree in Public Universities in Spain is their marks in the access to University. Schools are not able to choose their students.

The students register for an excessive number of credits although they are aware that for a bet-

ter learning a minor number of credits would be preferable. This is one of the reasons why the number of passes appearing in statistics diminishes being this fact visualized as school failure.

The students know from the beginning of the academic term, the planning for examinations, for theoretical classes and, in some Schools, for practical classes also.

The criteria for passing the examinations are known by the student since the beginning of academic term.

The students do not regularly use the tutorial classes and they only attend them in the proximities of the examinations.

The professors make use of different didactic resources where blackboard or transparencies coexist with multimedia.

The professors at a very high percentage are active in research with an important number of financed projects and the students have a good concept of their professors with a good relationship with them.

There is an important effort to establish international relations with an important number of ERASMUS students from Spain going to other European countries and vice versa.

With respect to the equipment resources there are differences among Schools but although standards are generally good it is never enough and they need to be improved**.**

The assessed Schools acknowledge assessment as positive as it allows the recognition of their strengths and weakness. Assessment helps University to establish specific programs to strengthen the assessed Schools in the aim of performing the proposed in the final report.

QALITY ASSURANCE AND ACCREDITATION OF PHARMACEUTICAL EDUCATION IN NORWAY

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Introduction

In Norway there is a general system for the accreditation and evaluation of higher education. An independent national agency (NOKUT) is responsible for assessing the quality of programmes and institutions [1]. The agency has accreditation powers for all higher education in Norway and no specific system exists for accreditation of pharmaceutical education. To ensure that the education given at the University of Oslo fulfils the specific pharmaceutical requirements, our curriculum is based on the specifications given for pharmacists in article 44 of the EU directive on the recognition of professional qualifications (2005/36/EC) [2] and are in accordance with the condition of qualification for a Qualified Person as laid out in article 49 of directive 2001/83/EC [3]. To be able to practice as a pharmacist an authorisation is required. The conditions and quality assurance for pharmaceutical practice are laid down in Helsepersonelloven (the Health Personell Act) [4] and Apotekloven (the Pharmacy Act) [5].

The Norwegian Agency for Quality Assurance in Education (NOKUT).

NOKUT is an independent governmental agency whose purpose is to control and develop the quality of Norwegian higher education institutions through the evaluation, accreditation and recognition of quality assurance systems,

institutions and education programmes. It was established by the Storting (Norwegian Parliament) in 2002 and became operative 1 January 2003. As NOKUT is an independent body the Ministry cannot issue injunctions outside the lawful mandate or specified regulations. Nor can the Ministry rescind NOKUT's decisions or give permission to establish education programmes which have not been given accreditation or recognition. NOKUT also has the authority to withdraw previously granted accreditation or recognition if the conditions are no longer fulfilled. It is the institutions which, pursuant to law, assume the responsibility for the quality of their own educational provision. The role of NOKUT is to check the quality of Norwegian higher education provision and to inform the general public about this work, and also to bolster the institutions in their own efforts in quality development.

The most important tasks of NOKUT are as follows:

- Evaluation of the quality system set up by the institutions
- Accreditation of institutions such as state university colleges, specialized university colleges and universities. Accreditations are based on standards decided by the ministry of education
- Revision of earlier accreditations
- *The accreditation is based on the following parameters:*
- Course curriculum
- Quality and stability of the academic personnel
- Infrastructure suited to type of education
- International collaboration
- Internal quality assurance system regarding the curriculum

The quality assurance system of the education at the University of Oslo

The University of Oslo has adapted a quality assurance system that is closely linked to the system used by NOKUT.

The following elements are vital in the quality assurance system used:

- High quality of the course programme and each subject in the curriculum
- External control by having examiners from other institutions
- Yearly analysis, evaluation and reporting on the quality of the education and the quality assurance process

This system is mandatory by all faculties and departments within each faculty of the university.

Authorisation as a pharmacist

In accordance with the Health Personnel Act of 1999 the Norwegian Registration Authority for Health Personnel will issue a certification that a person is authorised to work as a pharmacist based on a certificate from a Norwegian university or college. This office will therefore not act as control institution with regard to the education received by those candidates who are educated in Norway.

The issued authorisation is a regulatory tool which is intended to protect the safety of patients. An authorisation is also intended to ensure that pharmacists possess the required qualifications to practise their profession. The authorisation involves an independent and personal responsibility to carry out one's work tasks in a proper fashion, which would imply that all authorised personnel meet requirements of a high professional and ethical standard. This would also imply a responsibility to uphold professional qualifications, and to abstain from

rendering health care in areas in which one does not possess the required competence.

The following requirements are laid down in the Pharmacy Act of 2 June 2002:

"*The pharmacy should have professional personnel which in number and competence is adequate to ensure high quality and safety of storage, manufacturing, handling and dispensing of drugs in the pharmacy. The pharmacy concessionaire should contribute to the provision of necessary postgraduate and continuing education".*

Inspectors from the Norwegian Medicines Agency supervise pharmacies in their role as points of specialized trade. Among other things the inspectors will review the working procedures of the pharmacy and whether the pharmacy has sufficient and competent personnel to handle the pharmacy related professional tasks in a proper fashion. The supervision of pharmacists in their role as health personnel has been delegated to the Norwegian Board of Health. This institution does not perform regular supervisory inspections, but will follow up specific inquiries.

Continuing education

Norwegian legislation clearly expresses requirements that employees working in medicinal product manufacturing should undergo basic and continuing education, which in particular should include the theoretical and practical application of concepts such as quality assurance and Good Manufacturing Practice, as well as specific requirements for training when applicable to the areas of manufacturing in which the employee is involved. This education should be documented and verified. This is the only area in which there is a requirement to document to the authorities the updated pharmaceutical competence of the employees.

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ACCREDITATION – QUALITY INSURANCE FOR GERMAN SCHOOLS OF PHARMACY?

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Introduction

The introduction of Bachelor´s, Master´s and Ph.D.´s programmes by Germany´s universities within the scope of European and national policies and statutory guidelines has put tremendous pressure on formal and qualitative requirements. These new tasks are put on study programs in almost all fields of higher education. Until now in Germany the field of pharmacy is excluded from this accreditation procedure like other fields, e.g. medicine and dentistry, because the regulation by national laws distracts these health fields from specific university regulations und puts national standards in education.

Germany

Therefore, Germany has almost no experience in the accreditation procedure on regular phar-

maceutical education. Nevertheless numerous programmes have been accredited in related fields like biotechnology, pharmaceutical / medicinal chemistry, computational sciences, microbiology, bioinformatics, biochemistry, biology, chemistry etc. In a small number of these programmes pharmaceutical faculties have been involved.

ASIIN

Numerous organisations have been established which follow the national and international rules on accreditation. The ASIIN (Accreditation Agency for Study Programs in Engineering, Informatics, Natural Sciences and Mathematics) is one of the German leading agencies on the aforementioned topics [1]. As member of the Commission for Accreditation in natural sciences (AK II) the author has followed many application procedures as well as the set-up of standards and guidelines. For each application it is a huge work to face the general requirements on modularization, credit point system, practicals, additional curricular requirements, soft skills, admission requirements, transitions etc. In addition to the time needed and the formal paper work one has to consider that this procedure is consuming financial resources and have to be repeated within a period of 5-6 years for re-evaluation.

Beside the input on work and money one has to focus on the outcome of the accreditation procedure and its goals.

Procedure

The whole steps of accreditation procedure are in short: 1) Inquiry, 2) Examination of application and existing standards, 3) Formal application, 4) Audit Team with representatives from university, applied science university, industry, and students performs local inspection, 5) Report of Audit Team, 6) Processing by Technical Committee of experts, and 7) Decision by Accreditation Commission. This procedure normally takes about 3-4 months.

Output

It is of great importance that especially with interdisciplinary study program like the ones in which Pharmacy Schools are involved experts in different fields are involved in the evaluation and the different steps of the decisions. Based on the experience received one has to state that accreditation has improved quality of education and put it to general standards within different institutions of higher education. This system ensures that graduates of accredited study programs receive qualifications that enable them to be successful in their chosen profession. Since the universities create their own curriculae for their study programs the problems of national and international guidelines have been occurred. Due to the lack thereof the ASIIN has created in many fields high level standards for education. In the different fields of health education the high quality, ongoing improvement, actual demands and constant innovation in education seems to raise the main problems. Although specialization is needed in different areas it is also important to have a broad education in all pharmaceutical disciplines for the pharmacist.

In this respect, accreditation offers chances and dangers for pharmaceutical education which have to be faced within the coming months or years. It strongly depends on the way the pharmaceutical faculties will follow or neglect these chances to be prepared for the scopes in future.

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[1] www.assin.de

EVALUATION OF VETERINARY TRAINING IN THE EU

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The principle of free movement of persons and services between Member States is fundamental in the European Community. Evidence of formal qualifications shall be issued by a competent authority of the Member State. For the health professions (doctors, dentists, veterinary surgeons etc) for which a specific license or certificate is usually required to get permission to practice, also the minimum conditions of the formal education are specified in EU Directives. The legislation governing basic veterinary training (Directives 1978/1026, 1978/1027 and 2005/36/EEC) lays down the minimum compulsory requirements for all EU Member States. Directive (1978/1028/EEC) established the Advisory Committee on Veterinary Training (ACVT). The ACVT suggested that the best way to ensure a comparably high standard of veterinary training throughout the EU was to establish a permanent, Europe-wide system of evaluation of veterinary schools. From 1986 to 1989, the system was developed as a pilot study, designed to review and refine the scheme, and was conducted in one veterinary school in each Member State.

The responsibility for administrating the programme was assigned to the European Association of Establishments for Veterinary Education (EAEVE) in 1994. Within the frames of EAEVE a specific Evaluation Unit was established, holding the responsibility to run and administer the evaluation system.

The principles of the method of evaluation of veterinary training institutions were adopted by the ACVT on 12 March 1999, and summarized in a Standard Operation Procedures booklet. By the year 2000, the European Commission disbanded the ACVT. EAEVE continued to hold the mandate given by the EEC to run the evaluation system build, together with the Federation of Veterinarians of Europe (FVE), a common education committee (Joint Education Committee, JEC) that took over the role of ACVT as the reviewing instance of the evaluation reports yielded by the evaluation teams. Evaluation of EU veterinary schools is carried out in conjunction with the European Commission.

This evaluation system focuses solely on undergraduate veterinary training, seeking to ensure that such training is of a comparably high standard throughout the European Union.

Within the EAEVE, the evaluation system is managed by the Education Committee, assisted by a programme co-ordinator and a *rapporteur.* Evaluations are carried out at 7-10 year intervals, which will entail 8 to 11 visits per year to veterinary institutions in Europe.

Where an institution is being visited for the first time, it has been a good practice to have a preliminary visit to be made by the programme co-ordinator during the year prior to the scheduled site visit. The approved schedule, once agreed upon more than one year prior to the visit, cannot be changed, except in the event of *force majeur.* Institutions must choose one of the two approved official languages for the visits: English or French.

The membership of the visiting groups of experts is based on a number of criteria. There is a list of experts who have agreed to be involved in this task. The experts' personal files contain various items of information, in particular, their area of expertise and knowledge of European languages. Each group of experts selects a practising veterinary surgeon from a list drawn up by the FVE to take part in the visits. A group of experts must comprise five persons, one for each of the three sectors defined in Annex I of Directive 1978/1027/EEC (basic science subjects, animal production and food hygiene) and two for the clinical subjects (one teacher and one practising veterinarian). One member who has taken part in at least one visit acts as chair-

person. At least one other member of the group must also have participated in a previous visit. The chairperson is responsible for preparing the experts' report. The group must be accompanied by a *rapporteur,* whose task is to assist in the preparation of the report. Often, the programme co-ordinator also participates. In consultation with the EAEVE, the institution appoints a liaison officer who is well acquainted with that institution, but independent of it.

The travel and accommodation expenses of the visiting team (experts, secretariat and liaison officer) and the cost of translating the evaluation report into English or French, where necessary, are borne by the institution visited. The institution also contributes to the administrative costs of the visit.

Different guides exist for the administrative officials of the institutions to be visited, for visiting experts and for the liaison officers in order to facilitate preparatory work for the visits and the task of the visiting experts.

The self-evaluation report is an essential part of the evaluation method used. It provides basic data for the group of experts. It describes the aims, structures, system of organisation, methods, resources, mode of operation and results of the institution concerned.

The self-evaluation report must contain, in standardised form, full but concise quantitative and qualitative data to allow the quality of the training to be evaluated. In drawing up the report, the institution must answer all the questions contained in the document "Information to be provided in the self-evaluation report" divided between the following 13 chapters: objectives, organisation, finances, curriculum, teaching – quality and evaluation, facilities and equipment, animals and teaching material of animal origin, library and learning resources, admission and enrolment, academic and support staff, continuing education, postgraduate education, research. Each chapter or sub-chapter should set out factual information, comments, and suggestions for improvement.

The administration concerned with report preparation may consult the chairperson of the group of experts or the evaluation system co-ordinator if in doubt about how to answer certain questions. The experts must receive the self-evaluation report in the chosen language (English or French) not later than two months prior to the start of the visit.

The aim of **the visit** is to verify and, where appropriate, complete the information provided in the self-evaluation report and to give views on the level of undergraduate training and on the extent to which the minimum standards set by EU legislation are respected. It also aims at making practical suggestions for improving training.

At the end of the visit, the chairperson of the group of experts submits the main comments and conclusions of the visiting team orally to the head of the institution, to his/her collaborators and, where appropriate, to the rector of the university responsible. Duration of the visit of experts is one week.

The report of the group of experts should be prepared along the same lines as the self-evaluation report. Each chapter should comprise a descriptive section under the heading "Findings" (based on the selfevaluation report and on the findings made during the visit) and one analytical section in the form of "Comments". It should be completed, where appropriate, by a section entitled "Suggestions".

The draft report prepared by the experts should be sent, as soon as possible after the visit, to the head of the institution visited for correction of material errors, and to the members of the EAEVE's Education Committee for comments. The EAEVE's Education Committee is enlarged to include, in addition to its constituent members, representatives of the ACVT, the FVE, and the Commission.

Once the relevant changes have been incorporated, the new version of the report should indicate the extent to which the institution complies with guidelines, requirements and main indica-

tors of Annex I, divided into **category I and II suggestions**:

• *Suggestions which, if not implemented, mean that the establishment does not reach the minimum level specified in the EU veterinary training directives (Directive 78/1027/EC and its appendix) as interpreted in the 'Guidelines, requirements and main indicators' (contained within document XV/E/8488/2/98) (category I).*

• *Suggestions the implementation of which does not affect the conformity of the teaching at the University with EU veterinary training directives as interpreted in the 'Guidelines, requirements and main indicators',* i.e. suggestions for changes which the team of experts consider would improve the training, even though they relate to weaknesses that do not effect conformity of the training to the above directive.

Dissemination of the reports is limited. Only the administration of the institution visited and the competent/responsible authority may disseminate the report as they wish. The reports may be disseminated with or without the comments of the institution and/or the competent authority.

For veterinary teaching establishments whose reports reveal one or more category I deficiencies, and in the absence of any initiative by the establishment itself, two to three years after the final report has been sent to the institutions concerned, the Education Committee secretariat asks them (the institutions and the competent authority, i.e. Ministry of Education) to provide information on the follow-up action taken to remedy the deficiencies in question.

On the other hand, at any time within two to three years after dispatch of the final report, an establishment that considers that it has rectified its category deficiencies is free to inform the Chairman of the Education Committee accordingly, without waiting for an enquiry from the secretariat.

The Education Committee will decide whether a follow-up visit to verify the situation is necessary, at the expense of the establishment, and if so, by whom. If the result is favourable, the establishment will then be included in the list of establishments visited that are free of category I deficiencies. If the result is unfavourable, it is for the Commission to decide upon the appropriate measures to be taken. The Commission will be informed as well if, in the case of an EU establishment, no action has been taken to rectify category I deficiencies.

If the Education Committee decides that one or more category I deficiencies exist, and the establishment considers that gross injustice has been done, it has the right to **appeal** against the category I classification. The appeal should be made in writing within 8 weeks of the receipt of the final report from the Chairman of the Education Committee.

The lack of legal means of maintaining control over those Member States not conforming to the minimum requirements can be considered a weakness of the system.

On the other hand, the fact of being listed among the approved schools proves the credibility of the educational institution and contributes to further improvement of veterinary training. In case an evaluation reveals serious deficiencies, a higher level of funding can be applied for. Over the years,

methods of evaluation have been revised and improved, whereas additional quality criteria have been applied. High awareness of the importance of quality assurance in education, business, laboratory services and other spheres of activity is obvious nowadays. Further improvement in the evaluation system of veterinary training is towards quality assurance, which is a logical prerequisite for accreditation.

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UK EXPERIENCES OF ACCREDITATION BY THE ROYAL PHARMACEUTICAL SOCIETY OF GREAT BRITAIN: THE WAY AHEAD

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Introduction

It is right that there is oversight of the educational programmes of Schools of Pharmacy[1] by some body which has developed the expertise and skills to carry out the process of quality control. The key issues are a) by what criteria does the accrediting authority approve or disapprove of educational programmes; and as important b) has the body the appropriate skills and credibility to carry the process out in a meaningful way? In the United Kingdom, accreditation of the undergraduate pharmacy degree programme – a four year programme leading to the degree of MPharm - is carried under the authority of the Council of The Royal Pharmaceutical Society of Great Britain (RSPGB). An accreditation team representing academia, hospital, community and industrial pharmacy is appointed to visit individual Schools of Pharmacy in five year cycles.

The following are personal thoughts (see also [1]) derived from experience as Dean of The School of Pharmacy of the University of London from 1989-2006 and as an occasional member of the RPSGB accreditation team and former member of the Education Committee of the Society[2].

Aspects of the process

Accreditation is not a mechanical process: it requires insight into the educational process, the funding mechanisms and the constraints under which higher education operates. It also requires empathy with the academics in their increasingly difficult task of pursuing teaching, research and administration at a time of growing class sizes. It also demands trust in academics as professionals in their own right. A key question which can be posed is "who accredits the accreditors?" and "what authority and standing do they as individuals have?"

My experience of the process has not always been satisfactory, but improvements have been made in recent years to the protocols and procedures. At first visits were constrained to one day, so that the visiting team had little opportunity to visit the School in a comprehensive way. The accreditation now takes place over two days. The accreditation documents of the Society now inform the Schools and faculties of the precise requirements and procedures. Documentation has to be provided to the Society six weeks in advance of the visit. If further documentation is required the School is notified before the actual visit. Although information is sought on postgraduate activities, the accreditation refers only to the undergraduate programme of the institution. This contrasts with the stated desire that teaching and research go hand in hand and that schools are required to have active research programmes. Research in the UK is, of course, evaluated by the roughly quinquennial Research Assessment Exercise (RAE), but this exercise is divorced from the teaching mission of institutions. Information on the ethos of the School, which includes commitment to research and to professionally

[1] In this paper, the term "school of pharmacy" is used as the standard UK nomenclature for faculty of pharmacy. Schools of Pharmacy in the UK are often part of Faculties of Science or Faculties of Medicine.

[2] The "Society" is The Royal Pharmaceutical Society of Great Britain

vital post-graduate teaching of Masters programmes is a vital part of the assessment of a School of Pharmacy. This is important at a time when new schools of pharmacy are opening in the UK, some with little pedigree of research.

There is considerable discrepancy between the revenues of individual schools of pharmacy in the UK, so the question arises "is like is being compared with like?" The contextual basis of the accreditation process is therefore one that needs attention. While each School is accredited, what are the criteria for comparisons: are these subjective, flexible or objective. There is, of course, no universal format for a School of Pharmacy, no ideal staff-student ratios, optimum income for teaching and research, numbers of qualified pharmacists on the staff, external links, postgraduate programmes, but there are notions of quality. Quality by definition cannot be assessed by numerical devices: quality in itself is not an absolute but experiences and unbiased individuals can form a view. The measurement of quality in higher education is discussed in several chapters of the book edited by Diana Green [3] Not all schools should be the same: this is a problem for the accreditation process. What are the boundaries of acceptability? Experiments in education – such as the new schools of pharmacy are in effect conducting - can be problematic, but so too is stagnation. The dilemma, if one believes in diversity, is how to adopt uniform criteria to non-uniform institutions. It is my view that accreditation is presently carried out against a background of minimal research into the factors that make for a good pharmacy undergraduate programme.

The RSPGB documentation[i]

The Society seeks information and statistics on

- the organisational arrangements in the school
- resources, both financial and human resources
- equipment and support services
- premises
- students
- the degree course
- postgraduate studies, research and external links

All of these are uncontroversial and essential for the evaluation of a school. It is perhaps the consistency of the interpretation of the facts that concerns many. There are many organisational differences within schools of pharmacy in the UK. Only one school, for example, namely The School of Pharmacy, University of London is an independent institution within a federal university. Some are "schools" within other faculties, with considerable degrees of autonomy; others are parts of faculties of life sciences where the boundaries between pharmacy and the other sciences are less clear. Some run several undergraduate degree programmes (eg in pharmaceutical sciences, cosmetic science) as well as pharmacy) or have varying degrees of service teaching. Hence the Society's requirement to have spelled out the organisational requirements of the school, and the authority that the Head of the School has in relation to finance and decision-making. The budget holder has the power. Without this facility, the head has limited authority. The fact that so many arrangements exist in the UK indicates that the Society has had only limited success in ensuring some form of uniform strength to schools.

Funding varies considerable, partly as a result of the RAE outcomes where the score determines funding for research. Some schools have no Funding Council money for their research. Research income (which amounted to some £5m per year in the School of Pharmacy, London, means that more staff can be employed and hence the resource available to students in an established research –based school is superior to that in a new or mature school whose re-

search profile has not reached international proportions. There is, however, little research on the nature of the graduates from schools with these different characteristics. If the ultimate aim is to ensure quality, the relationship between the research profile of a school and the quality of undergraduates in various branches of the profession must be assessed. Regardless, research is vital in academia if the discipline is to be maintained as deserving place in higher education.

The degree course

No one has argued for uniformity in the UK. The Society produces an "indicative" syllabus (scheme I) which allows considerable scope for variation. It could be argued that the best arbiters of the syllabus content are the academics who have long experience of teaching and researching. The increasing numbers of non-pharmacist academics, can mean that the direction is unclear. The greatest challenge is the future: what degree course now prepares best for the unknown medication and interventions of 30 years hence? I feel that the accreditation process should deal more with this interesting and challenging issue than some of the more obvious counting of computers and the like.

Scheme I: The areas of the RPSGB indicative syllabus [2]

- The Patient
- Medicines: drug action
- Medicines: the drug substance
- Medicines: the medicinal product
- Health care systems and the role of professionals
- The wider context

These will be discussed in greater detail in the presentation. The fact that the patient is placed first is an indication of the desire to ensure that courses are patient-focussed rather than product focussed. This must not be interpreted as indicating that the product is of secondary importance to the pharmacist: indeed the pharmacist is the sole repository of such information in the health care setting.

Personal experiences

Negative experiences include

a) poor chairmanship of the accreditation team: lack of grace

b) poor quality of de-briefing sessions: failure to praise schools for their innovation or commitment

c) poor choice of team members: some with little grasp of the realities of higher education

d) inability always to see the undergraduate programme in the context of a vibrant school involved in other activities

e) pointing out trivial problems – the "dust on shelves syndrome"

Conclusion

More research is needed into the factors that create an excellent graduate to make the accreditation process less subjective.

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PGEU PERSPECTIVES

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The Pharmaceutical Group of the European Union (PGEU) represents the community pharmacists of 29 European Countries. The Members of the PGEU are the professional bodies and pharmacists' associations in EU Members States, EU candidate countries and EEA Member States.

PGEU objective is to promote the role of the pharmacists as key players in healthcare systems throughout Europe and to ensure that the views of the pharmacy profession are taken into account in the EU decision making process. To achieve this PGEU provides to its members an ideal platform to facilitate exchange of information, collecting and disseminating best practices. In addition it also encourages its members to further develop new projects aiming at anticipating and responding to society's needs, in the brooder context of Public Health.

To support Pharmacists' contribution to Public Health we consider that there is a need to reinforce education, training and continuing professional development of pharmacists in what concerns their core expertise is medicines and all that concerns their efficacy, quality and safety as well as their accessibility and rational use by populations. In addition there is a need for building new competences and skills to lead positive change for a wider contribution to Public Health, such as the 5 competences for the 21st century healthcare team proposed in the WHO Report "Preparing a health care workforce for the 21st century: The challenge of Chronic Conditions".

PGEU has no formal position about accreditation systems of the pharmacy degree. Many of its members have accreditation systems currently implemented. Some are lead by the State, others by the Professional Associations/ Regulatory Bodies, as is the case of the Royal Pharmaceutical Society of Great Britain and the Portuguese Pharmaceutical Society.

Nevertheless, PGEU advocates for enabling quality in Pharmacy. Different approaches can be proposed, such as a top-down approach, a process approach or a bottom-up approach. From our experience, the bottom-up approach is the one that most effectively involves the ones responsible for implementing change. This poses the question that, in the case of an accreditation system, should it be National or European? Does subsidiarity applies at this level? Is it really needed to create new supranational structures?

We would like to contribute to this topic by raising some more points that, in our opinion, could bring interesting aspects to the discussion.

DOES PHARMACY EDUCATION NEED AN INDEPENDENT SYSTEM OF ACCREDITATION ?

POSITION OF EAFP

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In the context of the Bologna process the academic landscape in Europe - with its diversity of local and national traditions - is changing. While these particularities are not likely to disappear completely, the need for greater transparency and comparison of curricula with respect to content, methods and outcomes is perceived by students, faculty, future employers of graduates, as well as by university administrations and governments.

Accreditation by external institutions is a generally applicable instrument for industrial quality assurance. Most pharmacists are aware of its

procedures and significance in the field of health products. It is, however, relatively new to academic institutions. Autonomy and independence of external control has been the hallmark of the European university tradition, which has been defended tenaciously against any intrusion by state authorities.

Outstanding researchers and academic teachers have always attracted the best and the brightest students, but the transition of universities from establishments for the education of small numbers of prospective leaders to institutions of mass education on an international scale necessitates a revision of traditional approaches. Higher education is no longer a privilege of the elite in a democratic society it is a fundamental right of young citizens who are entitled to equal chances. On the other hand, there is a tendency to convert certain sectors of education into marketable commodities. Thus the success of modern societies depends significantly upon the degree to which they can mobilize available intellectual resources, and the functioning of such complex national and supranational institutions requires well-educated and competent leaders and staff.

In an industrial context, the quality of outcomes is based upon standards, and to a certain degree this may also be true for pharmacy education. There is probably a core of skills and knowledge which all competent pharmacists must have mastered upon graduation, irrespective of differences in national educational systems. In the future European Area of Higher Education, the structural diversity of curricula may diminish, but the career prospects of pharmacy graduates in different countries, and with them the professional competences required in the labour markets, still will depend upon national infrastructures and traditions, particularly with respect to positions in the pharmaceutical industry.

The common core of pharmacy education is given in the council directive 85/432/EEC, where five areas of adequate knowledge are defined and fourteen mandatory subjects of training are listed. This document reflects the state of development of both the science and practice of pharmacy and of educational theory and practice in 1985. It is no longer up to date. Since its publication, both the methods and the content of contemporary pharmacy curricula have changed significantly. The teacher-centered mode of education has largely been replaced by a student-centered attitude including problem-solving skills and the motivation for self-directed life-long learning. The focus on drug products has been enlarged with a patient-oriented perspective.

The European Association for Quality Assurance in Higher Education (ENQA) is the institution coordinating the efforts of national and regional accreditation agencies. Albeit its activities are not directed to specific subjects. For the accreditation of pharmacy curricula we need standards, which are closer to the educational, structural, scientific and professional issues involved. From students' point of view as well as that of employers and administrators, accreditation is a necessity, but the procedures are still under development. It is in the best interest of academic staff to cooperate and to assure that the results are sufficiently flexible.

Besides differences in national traditions and labour markets, language is a major problem as everyone involved in international student exchange is aware. It is noteworthy that the ENQA and the UK Quality Assurance Agency for Higher Education (QAA) organize a workshop on the Language of European Quality Assurance at the end of June 2006, at which the concepts underlying English terms related to quality are to be defined in different European languages. The same will be necessary for the contents of pharmacy curricula. The EAFP has begun work address this problem.

Education differs in many aspects from the production of standardized parts and the assembly of functional systems. It is similar to the relationship between commercial enterprises, owners and shareholders. There is a mutual responsibility between educational institutions, their stakeholders and supporters: the former make resources available, which are commen-

surate with institutional objectives and obligations, while the latter use them efficiently under a long-term perspective. The elaboration of structural requirements for accreditable institutions will be a long and painful process. Positions concerning the number and qualifications of full time staff and faculty, professional development of staff members, facilities, equipment and information technology, and the relationship between practical instruction in the laboratory and on the ward and during theoretical sessions are diverse and almost irreconcilable. In the long run, margins of acceptability have to be established.

There can be no doubt that many pharmacy curricula, if not all, will be accredited by national agencies in the near future. For this purpose quality standards have to be developed and discussed by stakeholders at an international level. For the faculties of pharmacy, the discussion begins right here.

PGEU INVOLVEMENT IN THE LEGISLATIVE PROCESS LEADING TO THE EUROPEAN DIRECTIVE ON RECOGNITION OF PROFESSIONAL QUALIFICATIONS

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PGEU was actively involved in the legislative process of the new Directive on Recognition of Professional Qualifications.

In this presentation I will give an overview of PGEU activity within this dossier, highlighting the following aspects:

What is still the same and what has been changed?

Implementation at national level – on going clarification.

Future discussion topics: mobility and health professionals crossing borders; competencies; minimum curricula; continuing professional development; specialisations.

LEGAL ASPECTS OF EDUCATION AND MUTUAL RECOGNITION OF QUALIFICATIONS

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To facilitate the transfer of academic and professional qualifications and competences among EU countries, the EU has introduced several instruments aimed at achieving the mutual recognition of degrees in the pharmaceutical sector mainly thanks to Directives.

These Directives recognized that a real coordination of the training conditions for specialist pharmaceutics is required when common specialist training in different member states exists.

However, many types of difficulty still exist, mainly in other professions without sectorial directives.

For the purposes of equivalence in qualifications, the minimum training conditions for pharmacists are at least 5 years duration including 6 months of stage.

Pharmacy is now an harmonised profession recognised in the 25 member states.

Activities of a very diverse political and legal nature are being superimposed, creating situation that requires additional analysis.

The Bologna Declaration proposes the adoption of a flexible system of easily readable and comparable degrees, but it is a process that

lacks basic or transcendent applicability on the grounds of coordination.

Reforms can be introduced due to the flexibility that is recognised, as long as it does not modify the rights and duties of pharmacists throughout the EU.

MANAGING THE QUALITY OF PHARMACY EDUCATION IN THE UNIVERSITY OF HELSINKI

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Background

As a part of the so-called Bologna process, faculties at the University of Helsinki are building up quality assurance systems for higher education. In Finland, the quality assurance systems of the universities are assessed by internal and external auditing systems. These audits are conducted every six years by Finnish Higher Education Evaluation Council (FINHEEC), which operates under the Ministry of Education in Finland. The aim of the auditing system is to be supportive and to enable development: universities are given notifications of their strengths and suggestions for improvements in the quality assurance systems. Prerequisite is, however, passing the audit. The University of Helsinki is preparing itself for the forthcoming audit. Due to this, also the Faculty of Pharmacy is creating and implementing a quality assurance system.

Pharmacy education was started in Helsinki already in 1897. A major development in the Finnish pharmacy curriculum was implemented in 1994, when a two-tier structure (3 years for B. Sc. + 2 years for M. Sc.) was chosen as the way to develop the pharmaceutical degrees in Finland. Bologna process brings this structure as the basis for higher education also in other university disciplines throughout Europe. During 2004-2006 the pharmacy curriculum in Helsinki is renewed further. Special attention is paid to the promotion of learning outcomes in the curricula and to the interplay between theoretical and practical elements during the development of academic pharmaceutical expertise. For example, the B.Sc. studies are constructed to six broader integrative entities, so called strands, which last throughout the whole curriculum. The European credit transfer system (ECTS) was introduced simultaneously with the new curricula with an aim to promote the mobility of students. Personal study plans were introduced as a part of the curricula to assist students in managing the processes of studying. To evaluate the enumerated reforms, the education units have to create a quality assurance scheme that encompasses the entire study process.

Curriculum objects

In fostering the quality of pharmacy education, it is needed a shared vision and aims and, further, a strategy how to achieve these aims. Interaction and discussion between the personnel, students and interest groups are all needed. The curriculum objects for bachelor's and master's degrees in Pharmacy were formulated in spring 2005 as a result of interactive debate between the interests groups, pharmacy students and the Faculties of Pharmacies (Universities of Helsinki, Kuopio and Åbo Akademi). The objects contain the essential know-how, which should be learnt during the pharmacy studies. Requirements from working life have also been taken into account in the curriculum objects: most of the graduated students, especially with a bachelor's degree, end up working in community pharmacies. We emphasize obviously

the knowledge and skills (incl. managerial tasks) of pharmacists to work as experts in community pharmacies and in drug industry, but also value the significance of critical thinking and scientific skills and viewpoints to prepare the students for life-long learning and possible Ph.D. studies later on.

These curriculum objects constitute the solid basis for pharmacy education and, thus, the quality of pharmacy education should be evaluated regularly against these objects.

Management

Essential in improving the quality of pharmacy education is collaboration. Role of management is critical in supporting the constructive atmosphere at the Faculty and, further, in achieving the curriculum objects. Open and supportive atmosphere, where it is possible to share and create new views and opinions among the staff, is a prerequisite for enhancing the quality of pharmacy education.

Organisationally, the Faculty of Pharmacy consists of six Divisions: Biopharmaceutics, Pharmaceutical Biology, Pharmaceutical Chemistry, Pharmaceutical Technology, Pharmacology and Toxicology, and Social Pharmacy. Council Committee of the Faculty consists of professors and teachers from all the educational Divisions and of student members. The Council Committee leads the educational and research activities in the Faculty. Committee of Education is responsible for the development and quality implementation regarding educational activities. This committee includes also members from the six Divisions and two student members. Furthermore, the Committee coordinates the activities of working groups involved with the development of pharmacy education. These include, for example, education reform (Bologna process) and quality assurance working groups.

The aim of the organisation structure is to promote interaction and co-operation between the teaching personnel and the students and, further, to improve transparency and coordination with an aim towards good working atmosphere. Development of education and learning has to be supported by providing pedagogical support for the teachers and students. In the Faculty of Pharmacy, resources and efforts have been directed to support teachers' pedagogical development and co-operation.

Quality in pharmacy curriculum

The curriculum reforms have been based on research and evaluation with regards to the previous pharmacy education. External evaluation of the education was conducted in 2001, when an international panel suggested some changes for syllabus (e.g., more patient-centered points of view), highlighted the importance of problem-based approach to teaching and suggested that the practical training period should be better exploited during the theoretical studies. Research in pharmacy education has shown the challenge of applying theoretical knowledge in practical situations and for the enhancement of students' comprehensive understanding of pharmacy as a discipline. This demands deep-level learning/understanding and good meta-cognitive skills, including critical thinking and self-regulation skills. Pharmacy education should also enhance the development of professional identity and prepare the students for life-long learning. These necessary but extremely challenging aims are also formulated in the curriculum objects - a danger exists that the aims fall short of becoming a reality in the education. Thus, the objects have to be supported by syllabus, curriculum structure and by qualified teaching personnel.

The content of the pharmacy curriculum has been assessed by academic curriculum core analysis. Skills and knowledge of subjects were categorized into different levels (must know, should know, nice to know). As a result, the strands in the renewed bachelor's curriculum are labelled as: 1) Scientific thinking and professional development, 2) From molecule to

drug preparation, 3) Patient and medical care, 4) Medicine and society, 5) Interaction and communication, and 6) Optional studies. Each of these strands (modules) consists of courses related to these themes. In the M. Sc. level, a large common entity (25 ECTS points) is also under constructions involving aspects of all the necessary steps during the discovery and development of drug molecules and drug formulations.

The aim of these procedures was to enhance the achievement of the curriculum objects and to foster students' deep-level learning. The new structure aimed at integration of the content of the theoretical courses in order to minimise needless overlapping of subjects taught. The other aim was to combine separate little courses to larger entities. The compulsory 6 month training period was also utilised. Until the beginning of the academic year 2005-2006, the practical training was located separately at the very end of the studies. As a part of the reform, practice period was divided in two three-month periods, the first of which will be held already during the second study year. The specific aim of is to support the integration of theoretical studies with practice.

Assessing the pharmacy education

Pharmacy education prepares the students for working life as pharmacy professionals. For this reason, education should correspond for the needs of working life. The quality of education after the reform has to be assessed properly. One tool is a multilevel feedback system, which is to be developed and implemented in 2006. This system includes course and term evaluation among the teachers and students. Curriculum's correspondence to working life is also assessed. These aspects will be evaluated among interest groups and graduated pharmacy professionals. Finally, information about learning among the students and pharmacy teachers' conceptions about teaching are collected in order to further develop the education.

For these reasons, the quality assurance systems with indicators of good quality of pharmacy education are developed in co-operation with the faculty and students. The information will be analysed carefully and utilised in the action plan and future developments.

A CAREER IN PHARMACY: A NEW APPROACH TO MEASURING THE MOTIVATIONS OF PHARMACY STUDENTS

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Introduction

Only a few studies have explored the motivation of UK students to choose pharmacy as a career. Most have been small scale, one off studies based in one school or measuring one year of students [1-3]. In contrast, a study by Roller[4] in Australia was repeated over six years to show trends. This paper will present results from a national study in thirteen UK schools of pharmacy which was focussed upon student motivation and aspirations for pharmacy. Motivation was defined as 'the reason for a certain course of action, whether conscious or unconscious', and synonymous with ambition, desire, drive and interest.

Aim

The aim of this study was to explore undergraduate student motivation for pharmacy through a composite measure of all motivational variables, based on use in previous stud-

ies and new ones derived from exploratory focus group work.

Material and methods

A review of the literature and four focus groups with undergraduate pharmacy students informed the design and collation of variables. A self-completion questionnaire was piloted and amended. In its final form the motivational variables were divided into three themes: 8 educations related, 6 personal influences and 15 personal career goals. Respondents were asked to rate the importance of each one rather than to rank them in order of importance as has been in the case of most earlier studies. The questionnaire was distributed to all first and final year undergraduates in thirteen of sixteen schools of pharmacy in the UK. Varying methods of survey administration were employed by the schools which produced an uneven response rate (14.1% to 83.0%). The overall response rate was 35.2% (n=1163); 35.0% (n=657) for year 1 students and 35.4% (n= 506) for year 4 students. Responses were calculated as the difference between the percentage who rated a variable as important and those as unimportant, known as net analysis in attitude polls.

Results and discussion

Ten personal career goals were rated as important compared to 3 educational and 2 personal motivators. Overall, the five motivators with the highest net positive influence were all career related and could be divided into two groups; either linked to a liking for science and a science based course [2] or related to career opportunities and being able to get employment [3]. The education and personal motivators were rated less important than the career ones. Only two educational ones were net positive and these were both university-linked; attendance at an open day and the prospectus. The strongest personal motivator was the influence of pharmacy work experience.

Conclusions

This study has used a new approach to measure and analyse the career motivations of pharmacy students and has covered an extended range of motivational variables on a national sample of students. When asked to assess the importance of all drivers for choice of pharmacy as a subject to study, we have shown that UK students rate most highly personal experience and personal interests and goals. However, the most motivators considered most important were relatively generic and more research is indicated on students' awareness and knowledge of pharmacy at the time of application.

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STUDENTS' OVERVIEW ON PHARMACY EDUCATION IN EUROPE

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Introduction

The European Pharmaceutical Students' Association (EPSA) aims to *"develop the interests and opinions of European pharmacy students"* in all aspects of the Pharmacy profession, including education. The European educational system is currently under major changing due to implementation of the Bologna Process and the Lisbon Strategy principles – both aim to create a European Higher Education Area by 2010. EPSA believes that students should actively participate in the evaluation of the current quality of education.

To achieve this goal, EPSA created an interactive platform to allow students across Europe to communicate their perception on their education and to share ideas for its improvement. This platform consists in three pillars: the Pharmacy Education Working Committee, workshops organized during the two EPSA Annual Congresses and online or paper surveys. In this abstract we analyse all the data and conclusions taken from these activities – our main aim is to express the opinion of European Pharmacy students about Pharmacy education.

Material and methods

Last April, during the 29th EPSA Annual Congress in Vilnius, Lithuania, Pharmacy students from all over Europe discussed their Pharmacy education – after all the work developed by the Pharmacy Education and the Pharmacy Awareness Working Committees during the past year, a workshop entitled "Pharmacy Education – Quality on trial" was held and a questionnaire entitled "EPSA Survey on Pharmacy Education" was distributed. All these activities were designed to investigate students' perception on their education and to discover general trends in proposals for the review of the structure and/or content of Pharmacy education. A shallow statistical analysis was done using Microsoft Excel™; the same software was used to build all graphics.

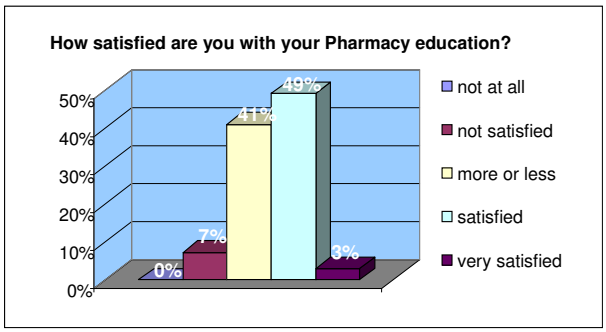
Results and discussion

Demographics

83 students from 19 European countries filled in the questionnaire (68,7% females). The survey was answered by students from all years of studies: 1st (7,21%), 2nd (19,3%), 3rd (25,3%), 4th (22,9%), 5th (20,4%), 6th (2,4%) and post-graduates (2,4%).

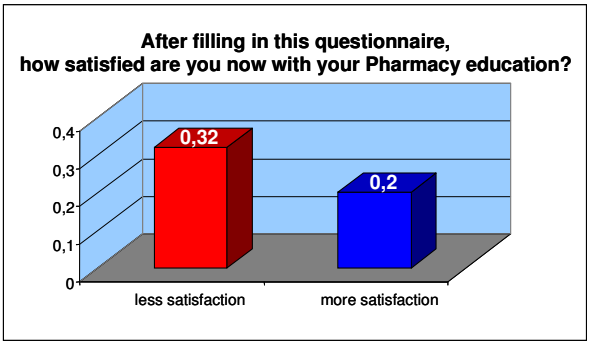
Level of satisfaction regarding Pharmacy education

First, students were asked to define the level of satisfaction regarding their education: 49% stated that they are satisfied (see Graphic 1). This result is an improvement if compared with a study done in 2001, the EPSA survey on "Quality in Pharmacy": at that time only 11,6% of students were satisfied with the quality of their education[1]. However, not even half of the students are satisfied and only 3% are very satisfied with the quality of their education: EPSA considers these results worrying.



Graphic 1: How satisfied are Pharmacy students with their education?

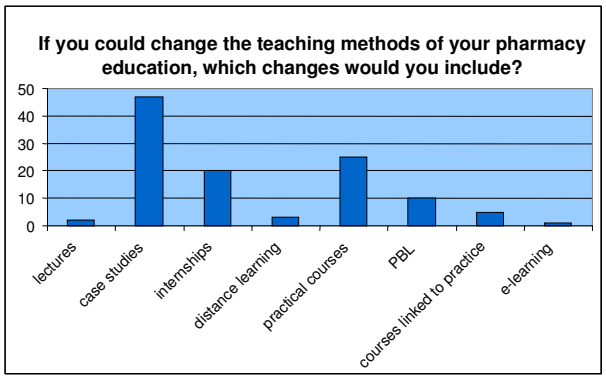
In the final question, students were asked again to express their level of satisfaction about their education: 32% expressed a lower level of satisfaction and only 20% felt more satisfied after filling the questionnaire (see Graphic 2). This is probably due to the fact that the survey questions revealed some educational aspects not taken into consideration before.



Graphic 2: How satisfied were Pharmacy students with their education, after filling in the questionnaire?

Changes in Pharmacy Education

When asked, "Did you ever think of changes in your pharmacy education?", a large percent answered yes: 56% think about it sometimes and 41% think about it very often. This may be a strong indicator that pharmacy education, from the students' point of view, hasn't reached a satisfactory level. Only 3% of the students have never thought of changes in their education.



Graphic 3: Teaching methods that students would like to see included in their education.

Teaching Methods

When asked, "If you could change the teaching methods of your pharmacy education, which changes would you include?" the most frequent answers were: case studies, practical courses and internships (see Graphic 3). This clearly indicates that students want a more practical approach in what comes to learning, since more theoretic methods were at the bottom of their preferences.

Pharmacy Fields

When asked "Which Pharmacy fields would you like to see more emphasized in your education?" most of the students replied they would like more emphasis on clinical pharmacy (56%), pharmacy and management (40%) and research and development (35%). Curiously, community pharmacy was only mentioned by 9% of students.

Skills and Courses

When asked "Which kind of skills and courses would you like to see increased in your pharmacy education?", the majority of students said they would like to learn more about the following skills: multidisciplinary collaboration (44%), clinical (39%) and communication (32%) skills and management and leadership skills (39%). These results are clearly linked to

the answers to the previous question: these skills are essential in clinical pharmacy and in pharmacy and management.

Conclusions from the workshop "Pharmacy Education – Quality on Trial" and from discussions in the EPSA Pharmacy Education Working Committee

In general Pharmacy education in Europe is not focused on the real needs of a future pharmacist. Pharmacy education should not only focus on science and theory, but also on the practice of a pharmacist. Obtaining certain skills, such as communication and counselling skills are fundamental to develop a more patient centered approach and a better multidisciplinary collaboration.

Pharmacy students feel the need for different teaching methods, more practical ones, such as case studies, practical courses and internships. Different teaching methods will make education more attractive and effective. Students also expressed a need for good teachers: in several faculties, professors are attached to the university due to research, and not because they are brilliant teachers. Students think professors should also learn proper teaching skills.

Students think that basic scientific knowledge is very important for the pharmacist: this gives value to pharmacists in the healthcare system, due to their specific knowledge on drugs that other professionals do not have.

Finally, students want to see more flexibility and the opportunity to choose for a certain direction in their education in the last years of their education. This phase would be dedicated to specialization in a certain field of pharmacy.

Students have a clear opinion about their education and feel the need for some improvement. As a sum-up of all activities, a Statement of Opinion was written in relation to Pharmacy education: "*EPSA believes that Pharmacy education in Europe should provide the students with a fundamental scientific knowledge; after this, students should also be provided with opportunities to choose training in a certain field in pharmacy to specialize themselves.*"

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PHARMACIST EDUCATION A PARTNERSHIP BETWEEN UNIVERSITY AND INDUSTRY

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Why is industry concerned about the future education of community pharmacists?

This presentation seeks to answer this question by giving a rationale and presenting a project started in Italy under the aegis of the Association of the European Self-Medication Industry (AESGP) in a Partnership between University and Industry.

The concept of "health" has undergone fundamental change over the last decades, especially in developed countries. The "absence of illness" concept has gradually been replaced by a concept of "wellbeing", meaning that people are physically able to perform the activities they want or have to perform.

Citizens' growing understanding of what they can do to achieve this state of "wellbeing" by practising responsible self-medication and the recognition by the health authorities of the role of self-care and self-medication in making citizens responsible have placed the pharmacist firmly in the centre of this process.

Pharmacists need to adapt to this constant evolution of the concept of health not only by acquiring the competences necessary to carry out their work efficiently but also by making their work more visible and recognisable in society.

There is a perceived gap between what new pharmacists are being taught today in university and citizens' changing needs.

This was confirmed in a survey carried out by the European Pharmaceutical Student Association (EPSA) (2004-2005) in various faculties around Europe. Subjects such as communication, consulting, symptoms treatable with non-prescription medicines and marketing are only present in a small part of the curricula, and are compulsory subjects in only a few faculties.

In order to fill this perceived gap, a pilot partnership programme was launched in Italy between University and Industry involving the Deans of all Pharmacy Faculties. A training plan for university teachers was defined focusing on self medication issues such as, in particular, the area of communication with citizens. From their side, university teachers have implemented various changes in their way of teaching the different subjects in their respective faculties.

At the same time the project also addressed the contents level. A specific indication of the knowledge needed to prepare new pharmacists for effective support and advice in the distribution of non-prescription medicines was inserted in the educational objectives to obtain a degree in pharmacy. The data to be shown are an update of the project's status and will be consolidated over the coming years.

Although certain difficulties were encountered when introducing new teaching subjects into existing programmes, the enthusiasm on the part of university teachers and the warm welcome given the reforms by the students are important indicators of the initiative's success.

The self-medication industry believes that professionally qualified partners are an essential precondition for the success of responsible self-medication.

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ENHANCING THE QUALITY OF PHARMACEUTICAL EDUCATION: BRIDGING THE SCIENCE PRACTICE DIVIDE

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Introduction

The nature of pharmaceutical education in the United Kingdom has evolved markedly over the last several decades away from a "traditional" degree course comprising the recognised basic disciplines of pharmacy, namely pharmaceutics, pharmaceutical chemistry, pharmacog-nosy and pharmacology. Each subject tended to be examined separately. The courses tended towards a heavy emphasis on the design, manufacture and quality control of drugs and medicines, with but a leavening of dispensing and elements of pharmacy law and ethics. There was often little integration and little emphasis on the understanding of the patent's perspectives and of personal interactions with the patient.

With the introduction of clinical pharmacy in the late 1970's the patient focus grew perceptibly, perhaps even at the expense of the teaching and understanding of the drug and the dosage form, also there was much conventional material to jettison. This led in turn in the late 1980's, following the Nuffield Report into Pharmacy, to the introduction of significant elements of social pharmacy and pharmacy practice into the curriculum. All Schools of Pharmacy in the UK have espoused this cause and some have significant Centres or Departments of Pharmacy Practice.

The four distinct phases of pharmacy educational evolution in the UK has been: I: the industrial and technically oriented degree, II: the introduction of clinical pharmacy, III: the introduction of social pharmacy and patient centred studies; and IV: the extension of the three year degree to a four year MPharm.

The present situation

Has the ideal course evolved? There have been many experiments, but experiments in education are difficult to evaluate as the time-scales are long, the knowledge base shifts and one can not ethically have controls if the objective of change is to enhance the educational experience. There are two elements in the discussion: the substance of the course and the manner in which it is delivered. Both are important but ultimately it must be the content that has primacy. Methodological changes are no substitute for appropriate and hard decisions on the nature of the material being delivered. Other commentators are more expert on modes of delivery. Here I concentrate on the substance of the syllabus. How in a fixed period of time can one change the nature of what is taught without compromising the essentials. Have we ever truly defined these essentials? Have we come to conclusions on the core knowledge base of pharmacy? Until we do make a concerted effort in this direction the approach to ideality will be slow.

It is not of course possible to predict the future, hence the need for a strong research profile in any faculty of pharmacy, so that the teachers are themselves in part inventing the future or at least participating in its construction and elaboration. Modern students tend to be more vocal about what they believe is relevant for their needs. How competent they are or not to judge is not always an issue when they are asked to evaluate courses. Complex subjects can be diluted to please students; the rigorous can fall at the hand of the facile and the enjoyable. Practice can be seen as the be-all and end-all, but there are few definitions of the educational base of "pharmacy practice". It is a discipline essential in modern courses, but one which still requires to have an intellectual thread expounded. Does it itself proclaim to incorporate the science of pharmacy in its teaching and research?

Increasingly in the teaching I have done I have felt that the spectre of examinations hovers over students so that the learning experience is affected. The obsession with examinations begins at school, but we do not have to perpetuate it. Can we guarantee that our students are the best that they can be in coping with the changing world of pharmacy and the changes that are to be wrought in the next few decades?

The American Association for the Advancement of Science Project 2061 book [1] *Science for all Americans* while addressing school sciences state criteria for the choice of material in science curricula:

Utility. *Will the proposed content – knowledge or skills- significantly enhance the graduate's long term employment prospects? Will it be useful in making personal decisions?*

Social responsibility. *Is the proposed content likely to help citizens participate intelligently in making social and political decisions on matters involving science and technology?*

The intrinsic value of knowledge. *Does the proposed content present aspects of science, mathematics and technology that are so important or so pervasive in our culture that a gen-*

eral education would be incomplete without them?

***Philosophical value**. Does the proposed content contribute to the ability of people to ponder the enduring questions of human meaning such as life and death, perception an reality, the individual good virus the collective welfare, certainty and doubt?*

***Enrichment**. Will the proposed content enhance childhood?*

These questions would need revision to address a professional pharmacy undergraduate course but nonetheless there should be questions asked about what we teach and why. And not only the flow of material from one part of the course to the other. We have often, as academics, used the "intrinsic value" argument to sustain a science content which is not enabling. This is key along with utility.

I would pose the following questions to be addressed by all of us who teach changing the order of the AAAS questions)

***The intrinsic value of the knowledge**: is the material we are presenting so important in pharmacy now and possibly in the future that it must be taught? If we argue that it is, how have we come to that conclusion?*

***Utility:** is the proposed material – knowledge or skills- vital for application in the work environment in any of the branches of pharmacy? Is it part if a unique pharmaceutical knowledge base? How have we arrived at the decision as to its utility?*

***Philosophical value**: Does the course encourage students to think of the wider issues affecting their future profession: their unique role and place in health care systems; how they can advance their role in reducing risk to patients and in enhancing care; does it give them pride in the achievements of pharmacy and an understanding of the historical context of pharmacy?*

***Responsibility**: Does the content allow our students to participate intelligently in discourse about their role and responsibilities?*

***Enrichment**: Will the course enrich the experience of their stay at the School?*

Our course should ensure that all of these criteria are met. One could argue the order of importance of each question. Knowledge and skills and the utility clearly take precedence over enrichment. We cannot, however, teach everything, but are there things that we teach which consume time and effort and which exclude subjects which might be deemed to be more pressing and important? Can we identify the underpinning science without making that a hurdle for students to pass so that they can move on to "more interesting and applicable" material, that is: is the science clearly of relevance to what pharmacists are doing, will do and may do in the future?

It is vital at this juncture with new schools (perhaps without our depth of scientific expertise) who might soon dictate agendas in education, that our science is the science of pharmacy and not a grounding for a degree in chemistry, pharmacology, social science or physical chemistry. We must ensure the integrity and integration of what we teach by addressing the issues raised above. It takes a brave academic to volunteer that his/her material is less essential than another's, but we need such courage if we are ever to move away from what we have now, unless we agree that the present degree and its structure is as near perfect as it can be.

Proposals

There is a need to ensure that the vital subjects unique to pharmacy such as pharmaceutics, biopharmaceutics, pharmaceutical and medicinal chemistry are taught in such a way that the elements essential for the preservation and elaboration of these subjects as academic disciplines as well as the enrichment of the future graduate, is achieved. Ultimately, of course, the enhancement of patient care must be a deciding factor. We must believe in the unique contribution of pharmacy to the increasingly

complex world of medication in the context of health care. Science must be applicable science: the teaching of the subject must be integrated with real examples of the importance of the subject, or its potential in the future. This requires more work on the part of the teacher, who must teach basic principles that are relevant to drug choice, medicines formulation, and patient advantage.

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POSTER PRESENTATIONS

QUALITY ASSURANCE AND EXPERIENTIAL LEARNING

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Introduction

In today's market-oriented, economics-driven society, quality assurance, quality control and validation of any process and service are assuming greater importance. In pharmacy, quality assurance associated with the analytical and industrial fields has developed also in the clinical and professional areas. The principles of quality assurance are the same across the different applications and it is important for students to be exposed to frameworks of quality assurance.

It is essential for the students to experience quality assurance processes not only to detect inconsistencies and deviations in practice or processes being used as practical examples but also to appreciate the amount of will-power and dedication that is necessary to compile the necessary documentation and to maintain good standards.

Methods

At the department of pharmacy of the University of Malta, students are exposed to quality assurance through didactic teaching in various areas including regulatory affairs, industrial pharmacy and pharmaceutical care. They also have the opportunity to witness the implementation of quality assurance during different practical attachments particularly in the pharmaceutical industry and within distributors of medicinals.

During the fifth and final year of the undergraduate course, students are exposed to experiential learning of quality assurance. The students practise for six months in a private community pharmacy. For four weeks, they are expected to conduct a quality care programme which is intended to confirm the effectiveness of the professional services provided from community pharmacies. This entails the application of the quality care programme 'Validation of Community Pharmacy' which was developed within a research programme in Malta in 1996 (1). By conducting personally a quality care programme, students are undertaking a self-inspection of the processes that are followed in clinical practice in the community setting.

The 'Validation of Community Pharmacy Method' consists of measurement instruments, referred to as validation tools which give a numerical result. The validation tools are subdivided into two parts: the internal validation tools and the external validation tools. The internal validation tools assess the setting of the pharmacy, equipment and resources available, and the processes of dispensing of medicines, responding to symptoms and communicating with patients. The external validation tools evaluate the perception held by consumers and health professionals of the services provided from the pharmacy. When the Validation of Community Pharmacy Method is conducted in a pharmacy, a validation grade is obtained which is described according to four categories: blue- excellent pharmacy services, green- good standard pharmacy services, pink- services require upgrading, yellow- unacceptable standards.

Through this exercise all the students are experiencing implementation of the quality care programme which is considered a step in quality assurance. The exercise requires documentation of the activities and processes taking place in the pharmacy. Data is recorded electronically. Students are required to present recommendations for corrective actions to the pharmacy operations and also to comment on the implementation process.

Discussion

By presenting an exercise within community pharmacy practice, students develop skills in following assessment and evaluation programmes, in participating in self-inspection activities, and in identifying corrective actions. All these are fundamental characteristics for quality assurance for any area of practice.

In addition to the experiential learning aspect, this exercise is contributing towards the quality assurance of the standards of practice in pharmacies being used by the department of pharmacy as experiential teaching sites for in-service training. The Validation of Community Pharmacy Method was developed as a robust system and was psychometrically evaluated to confirm that it is a valid and reliable method (2,3). Hence the results obtained after the implementation of the method were shown to be consistent, free from inter-rater bias and scientifically sound. The method was developed on an international dimension and was not limited to a national basis. In fact the method was implemented in pharmacies in the United Kingdom and Switzerland (1).

This method of teaching and of assessing the standards of the community pharmacies where students are attending for their in-service training, has been carried out on a yearly basis for the past four years over 20 pharmacies. To date all the pharmacies have achieved a validation grade in the blue or green category representing the provision of services above the minimum acceptable standards. The process was also applied by a number of visiting students in their own countries for example Cyprus, Greece, and Libya.

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PHARMACEUTICAL PRACTICE IN PHARMACY EDUCATION: EXPERIENCE AND PROBLEMS IN QUALITY ASSURANCE

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Introduction

The practical experience of pharmacy students is guaranteed by special practical training in the pharmacies as is defined by Council of Europe directive 85/432/EEC (1985). During pharmacy studies at Kaunas university of medicine a six months of in-service training in a pharmacy open to the public is compulsory for every student before obtaining diploma in pharmacy.

It is recognized that under the increasing pharmacist mobility, a need of standards is obvious to define an adequate educational grounding of moving pharmacists. In this case the standards should serve as necessary quality-assuring credentials of pharmacists. The importance of assessment and quality assurance in order to guar-

antee the achievement of intended educational outcomes is emphasized [1].

The World Health Organisation, in the report of its consultative group on "Preparing the Future Pharmacist" identified the following roles and responsibilities of the pharmacist: (1) care giver, (2) decision maker, (3) communicator, (4) leader, (5) manager, (6) life-long learner and (7) teacher. Also introduction to the practice of pharmacy in community and hospital pharmacies, including an introduction to the relevant aspects of the social and behavioural sciences, leading to competency in delivering patient care are considered as relevant areas of studies for pharmacy students [2].

Pharmacy student's practice in the community pharmacy is affected by many outer factors that are sometimes difficult to evaluate and standardize because of their wide range of variation. The discussion on quality assurance of student training during their practice in the pharmacy becomes complicated by the high number of factors influencing study process.

Methods

The evaluation of student practice in community pharmacies was evaluated referring to the information on the contents of the practice available in the student practice diaries. The students have been instructed about the general rules of filling in the diary to make the information on practice comparable. Also the students have been given possibility to add specific comments of their own on daily activities in the pharmacy during practice period. The practice in the pharmacies was controlled by the responsible staff members of the departments of faculty of pharmacy on the weekly basis.

Results and discussion

Student pharmacy practice at Kaunas university of medicine consists of three separate blocks: social pharmacy, pharmaceutical technology, and analytical pharmacy. The practice can take place at the pharmacies accredited for that on the basis of predefined criteria by responsible staff of the appropriate departments of the faculty of pharmacy.

The analysis of the documentation of the pharmacy practice and evaluation of these results confirmed significant variations in contents of student activities in all above mentioned blocks of the practice. It was concluded that the contents depended on the pharmacy size and specialization (only retail activities, manufacturing of pharmaceuticals according to prescription), its location, person responsible for the practice of the student in the pharmacy.

Therefore it could be recommended to perform more precise standardization of the pharmacies that could be efficiently used for adequate student training. Another important issue is characterization of the person responsible in the pharmacy for the student practice. His/her educational background and experience must be determined and testing of those qualities could be recommended. The establishment and expansion of university pharmacy should be considered advantageous in minimizing differences in providing students at the faculty of pharmacy with adequate quality practical training.

The increasing mobility of pharmacy students and the possibility to have pharmacy practice in other EU countries raise additional questions, as foreign pharmacies act under their valid national regulations.

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PROFESSIONAL PRACTICE AS A QUALITY TOOL FOR THE ACHIEVEMENT OF A PHARMACY DEGREE

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Introduction

Quality improvement in health care begins with the quality of its health care professionals. Education, training and Continuing Professional Development (CPD) set the basis for professional competence and excellence in the care provided to patients.

The school of pharmacy plays a fundamental role in preparing young graduates to become competent and qualified pharmacists and maintain that expertise throughout their careers, during which they will be faced with new and challenging professional responsibilities.

Material and methods:

In order to achieve a Pharmacy Degree at the University of Palermo, a six-month training period in a hospital or community pharmacy is required.

Training in hospital pharmacies should provide trainees with the necessary knowledge to practice the profession correctly in terms of pharmacy management with regard to technical-executive and technical-administrative areas, laboratories and galenics.

A) Technical - executive area

1. preliminary purchasing activities
2. executive relationships with units

B) Technical - administrative area

1. compiling and submitting orders to suppliers
2. stockroom organization
3. operational relations with units
4. computer systems

C) Laboratory area and galenics

1. production of galenics

In agreement with the School of Pharmacy of the University of Palermo, ISMETT (Mediterranean Institute for Transplantation and Advanced Specialized Therapies) has developed a program that offers, in addition to the standard activities of a hospital pharmacy, training rotations in the clinical area as well.

The goals of the clinical rotation are:

- To understand the role of the pharmacist as an integral part of the healthcare team.
- To select and monitor appropriate drug therapies for individual patients and patient populations.
- To develop effective communications with other healthcare professionals.
- To understand the development of an integrated pharmacy model.
- To appreciate the cultural aspects of healthcare as they apply to patients, providers, and health systems
- To compare and exchange models of health care delivery and education between Italy and others countries

Results and discussion

In order to improve or develop new skills, knowledge, and professional behaviors, it is important to work towards the achievement of goals set according to the pharmacist's educational and training needs. Identifying these needs is crucial if education and training are to be effective.

Training in our hospital pharmacy aims at providing trainees with the necessary knowledge to practice the profession correctly in clinical terms and in terms of pharmacy technical-administrative and executive management, through the activities specified above.

At ISMETT the pharmacy is an integral part of the hospital's clinical activity, as pharmacists participate in the decision making process to optimize patient care.

ISMETT is located in Palermo, Italy, and is the result of a partnership between the University of Pittsburgh Medical Center and Palermo's Civico and Cervello hospitals. The primary goal is to raise the quality of healthcare in the region of Sicily by sharing knowledge and models. The facility adopts a multi-disciplinary approach, in which pharmacists and other allied health professionals participate actively in patient care. In addition, ISMETT has a multinational patient population and staff, with staff members from all over Europe and the world.

ISMETT has a very active adult and pediatric liver transplant program, as well as kidney and pancreas transplant services. Specialized abdominal surgery is also one of the facility's strengths, including the recent inclusion of a bariatric surgery program. The cardiovascular program has also grown rapidly, including cardiovascular bypass surgery, valve replacements, pneumonectomies, and both cardiac and pulmonary transplant programs.

The presence of a dedicated Department of Pharmacy has allowed us to be part of the health system by providing clinical and scientific support to the physicians involved in transplantation, thus developing very strong connections and relationships, which is the basis for successful patient care.

In conclusion, in order to develop new skills and professional behaviors, it is important to adjust the professional curriculum to the needs identified to achieve the goals relevant to the professional profiles that can be pursued with a pharmacy degree.

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IMPROVING THE QUALITY OF TRAINING BY WAY OF EXTRAMURAL PRACTICE IN THE FACULTY PHARMACY OF THE PHARMACEUTICAL FACULTY OF THE UVPS IN BRNO

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The mission of the university level education of pharmacy is to prepare its students for a lifetime of service in the form of a professional practical activity in the health care system. Because a significant section of this study programme graduates are headed for jobs in pharmacies after their studies completion, it is the duty of all pharmaceutical faculties to modify their study curricula so as to prepare new pharmacists thoroughly for this area of their future jobs.

Recent mission of the pharmacists is focused,

with respect to the perceived society needs, at the so called Clinical Pharmacy that subsequently finds its manifestation in an activity called Pharmaceutical Care at the community pharmacies.

Czech Republic has been a member state of the European Union since May 1, 2004. The Pharmaceutical Faculty of the University of Veterinary and Pharmaceutical Sciences in Brno modified its study programmes to suit the requirements of the EU Directives and the recommendations of the EAFP. It gained accreditation that guarantees mutual recognition of professional qualifications. The Master Study Programme re-evaluation bore its fruit, among others, in implementation of a six month practical training in a community or hospital pharmacy and the study plan extension based on pharmaceutical care. The modified syllabus of the subject of Pharmaceutical Care has the three following topic sections: Psychology, Self-medication Counselling and Pharmaceutical Care focused on individual diseases (disease management) or on a patient group (case management).

Since the whole concept of pharmaceutical care is closely linked to the communication with patients (patient oriented pharmacy) and because there was a need to meet the EEC requirements regarding the six month practical training, the Faculty Pharmacy was built. Pharmacy students, under the supervision of their teachers, have the opportunity here to test their theoretical knowledge in a direct, live contact with patients and they can confront their textbook knowledge with daily life as the community pharmacy offers it, itself being inspired by the ideas of pharmaceutical care.

Because the faculty can specify individually some of the requirements or recommendations as to how the six month practical training should be passed, the students of the Brno Pharmaceutical Faculty must undergo a Faculty Pharmacy Traineeship as part of the six month practical training. The traineeship is one day long and it has two sessions. Four students take part at one session.

The first session plan is, mainly: becoming familiar with the work safety regulations, with the pharmacy operation rules, with the arrangement and equipment of the counter and the drug preparation area, reading the previous day prescriptions and introduction to the pharmacy software in operation.

The second session plan is: dispensation and counselling (dispensation basics applied in dispensing prescription and over-the-counter drugs), preparation of drugs, drug and adjuvant checks, individual student dispensed prescription analysis (applying the general rules of pharmaceutical care when dispensing, commenting on dispensation basics of the dispensed drugs), error analysis in the course of the traineeship and report writing.

QUALITY DEVELOPMENT OF PHARMACEUTICAL CURRICULUM GLOBALLY – THE MACEDONIAN EXAMPLE

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In 2004 the EU TEMPUS programme granted ½ mill. EURO for a three year project *Restructuring of Pharmacist Education in R. Macedonia (REPERM).*

Objective of the project

The objective of the project was to update the undergraduate and postgraduate programme to a high international level and in line with the Bologna process. This will be achieved through completion of three speci-fic objectives:

- Reconstruction of the graduate programme and development of a new professional Ma-ster in Pharmacy programme
- Development of new MSc and PhD programmes
- Establishment of a programme for life long learning for graduated pharmacists in the Republic of Macedonia

Management of the project

A consortium for the project was created consisting of:

- University St.Cyril and Methodius, Skopje – Faculty of Pharmacy
- University of Stockholm - Department of Biochemistry and Biophysics
- The Danish University of Pharmaceutical Sciences
- The Macedonian Chamber of Pharmacy
- The Macedonian Pharmaceutical Association
- The project will be peer reviewed by indivdual experts from University of Paris-Sud and University of Rome

The operation, monitoring and evaluation of the project will be done by a scientific board, a steering committee, the coordinator and the grant holder of the project.

The scientific board of the project will be the working body of the project, consisting of experts (professors) from the consortium members.

The present pharmacy studies at the University of Skopje

The pharmaceutical faculty at the University of Skopje offers three types of studies:

Graduate studies for pharmacists, MSc and PhD postgraduate studies and professional postgraduate studies for pharmacists.

The graduate programme is a five years one-tied programme which gives the degree “Master of Pharmacy” with the opportunity to work in industry, administration or whole-sale pharmaceutical companies. To be a registered pharmacist one additional year of internship is needed. Registered or licensed pharmacists are eligible to work as commu-nity and hospital pharmacists both in the pri-vate and in the state health care sector.

The MSc programs (10 different) last 2 years after which the graduates can continue with the PhD programme.

For graduated pharmacists a three year specialization study in seven different disciplenes is organized consisting of one year theoretical/practical teaching and two years of internship.

Problems in the current curriculum:

- The pharmaceutical education has a low level of practical training primarily due to inadequate equipment and lack of specific training of junior staff for the various disciplines.
- There is a very low level of “problem ba-sed learning” (case based learning) at all levels of theoretical and practical teaching due to inadequate curriculae and training of teachers.

- The curriculum is obsolete, there are some (much) overlapping in various courses and the curriculum is long and unattractive both for students and for the retraining of graduates.
- There is lack of a structured LLL (life long learning) programme for graduated pharmacists.

Present state of the project

In late 2004 the scientific board was established consisting of eight professors from the Danish University of Pharmaceutical Sciences, four from University of Stockholm, five from University of Skopje, one from the Macedonian Chamber of Pharmacy and one from the Macedonian Pharmaceutical Association.

The board was divided into scientific groups covering the areas: chemistry, biology, technology, pharmacognocy/botany, social/clinical pharmacy and curriculum development.

The groups have evaluated all the subjects in the present Macedonian pharmacist curricu-lum. At seminars in Copenhagen and in Ma-cedonia the curriculum and the content of the single subjects have been discussed ex-tensively. During the seminars special atten-tion has been devoted to discussions on best practices in program development and stu-dent outcome in Skopje as well as in Copenhagen and Stockholm.

To fulfil the Bologna process the group has agreed on a new 3+2 curriculum (Bachelor/Master) and at the last meeting in January the structure and the content of the first three years was established (based on ECTS). The Danish Pharmaceutical Curriculum has been a template for the new structu-re with adequate considerations to the differences in the pharmaceutical labour market in Denmark and Macedonia.

What to follow

The REPERM-project also includes retraining of professors and student mobility. In the spring 2006 professors from Skopje will visit the Danish University of Pharmaceutical Sciences and the University of Stockholm. During their stay at the Universities the visiting professors will be exposed to the teaching methods at these Universities and in particular will be retrained in certain practical and theoretical skills to be implemented in the new curriculum.

10 MSc/PhD students from the Faculty of Pharmacy in Skopje will go to Copenhagen and Stockholm for a 6 month training of practical work on certain subjects related to the new programmes.

The TEMPUS grant also includes equipment necessary for the practical training of graduate and postgraduate students.

In September 2006 the whole structure (3 + 2) and content of the new professional Master in Pharmacy should be settled.

After this period the scientific board will concentrate on establishment of a new PhD programme and development of a life long learning programme for graduated pharmacists in R. Macedonia.

The finalizing of the REPERM project will be marked with a symposium in the summer 2007, at which the outcomes of the project will be presented and discussed with rele-vant higher institutions/authorities in R. Macedonia. The symposium is intended to in-spire other colleagues and will be open for interested from other regional Universities. E.g. Albania, Bosnia and Herzegovina, Bulgaria, Serbia and Montenegro will be infor-med about the conference and will be welco-me to participate.

Outcome

It is the intention of the project to reconstruct/develop pharmacy programmes in R. Macedonia, which can be recognized in EU in accordance with the Bologna process.

QUALITY ASSURANCE OF PHARMACY EDUCATION IN SLOVENIA – A PROFESSION QUALIFICATION ASPECT

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Introduction

Annual reports concerning quality aspects of education are among various approaches intended to support the route towards quality and its assurance in higher education at University of Ljubljana. The University council yearly invites each faculty member to present the fulfilment of previous plans on quality assurance of all its activities and to state the plans for the future. The special topic chosen each year by the Faculty quality board is presented in more detail in such a report illustrating members´ efforts in achieving quality standards within some specific area, showing at the same time the experiences acquired concerning quality assurance to other members of the University. Monitoring profession qualification of pharmacy graduates is one of such topics of crucial importance not only for the advancement of pharmacy education at our faculty, but for pharmacy profession in Slovenia as a whole, as well.

Faculty presentation

The Faculty of Pharmacy, University of Ljubljana is the only university organization in the Republic of Slovenia for undergraduate and postgraduate study of pharmacy and higher professional study of laboratory biomedicine. Its activities comply with the *National Higher Education Program of the Republic of Slovenia* and with the *Higher Education Act* combining the mission of an educational institution with research and scientific work. There is a great interest in the undergraduate study of pharmacy among secondary school students resulting in limitation of admissions. The Faculty yearly admits about 150 students of undergraduate study of pharmacy, 40 students of higher professional study of laboratory biomedicine and 40 postgraduate students. In academic year 2004/2005 1112 students in all undergraduate and postgraduate programs have been matriculated at the Faculty demonstrating a 51% increase compared to school year 1995/1996. Progressing of students is good on average exhibiting, however, better results in higher classes, probably also because of unevenly loading of the students, e.g.:

generation	*1.*	*2.*	*3.*	*4.*	*5.year*
2000/01	100%	82%	63%	57%	54%
2001/02	100%	84%	62%	55%	54%

Undergraduate study program of pharmacy gives excellent employment opportunities and enables graduates to continue with postgraduate study. The profession of a pharmacist is automatically recognized in all member countries of EU since Slovenia has become its member adapting at the same time the program of the undergraduate study of pharmacy in accordance with the Directives 85/432 EEC and 85/433 EEC.

Discussion on profession qualification

On the undergraduate level the Faculty of Pharmacy performs a uniform study program of pharmacy granting graduates the title Master of Pharmacy (magister/magistra farmacije). Duration of study is 5 years and comprises a 6-month practical training. The study is a typical interdisciplinary one, in the course of which students learn first the basics of chemistry, biology and physics, followed by a gradually increasing share of professional pharmaceutical subjects including two elective subjects according to their interest. Students complete their study by preparing a degree thesis based on their own research work and defend it before the commission appointed by the senate of the faculty. For years the demand for pharmacists in Slovenia has been significantly higher than the number of students that take their degree at our faculty. The interdisciplinary study program characteristically based on different profession demands enables graduates broad spectrum of employment possibilities in public, hospital and private pharmacies, pharmaceutical industry, department drug stores, clinical biochemical and other laboratories, research institutes, in agencies of foreign pharmaceutical companies, in government bodies, in education and elsewhere as follows (year 2003):

Pharmacies	44,0%
Pharmaceutical industry	26,9%
Agencies and representatives	13,6%
Wholesalers	5,8%
Education	3,4%
Laboratory biomedicine	2,7%
Administration, institutes, research	3,6%

The harmonized study program (started in year 2004) according to fore mentioned Directives conforms the requirements put on the regulated pharmacy profession in EU enables graduates to be recognized in every member state. Such an integrated approach requires, however, that a subtle equilibrium between different knowledge topics requested by different pharmacy professions should be achieved in the study program, taking into consideration also the present trends and future perspectives in pharmacy.

For instance, pharmacists in pharmacies and hospitals suggest that more training in pharmacology and communication should be incorporated in the program, while those in industry and at wholesalers recommend more economy and management topics. Still, a broad theoretical learning given through undergraduate pharmacy education offers the graduates a sound basis for further self development in each area of professional pharmacy activity. Renewal of study program according to Bologna declaration already in progress should therefore take into account new needs and heterogeneity of pharmacy profession, however without additional loading of students. This is in essence the common statement of pharmacy profession, faculty and pharmacy students, leading eventually to better quality outcomes in education and profession environment.

Conclusion

Faculty of Pharmacy according to its stated mission continuously seeks to raise the level of quality in its educational as well as in research activities, not neglecting at the same time setting up the environmental conditions needed for such an improvement. The renewal of the educational program is one of the priorities undertaken to harmonize the study program according to regulatory requirements and professional demands. Taking into account also the much higher number of incoming students as before, only the assured quality of the program and its realization could ensure the professional competence and competitiveness of our graduates in the future.

THE TEXT-BOOKS AS A BASIS OF PHARMACY EDUCATION AT THE UNIVERSITY OF TARTU DURING EARLIER PERIOD

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Tartu University was founded in 1632, was closed in 1710 and reopened in 1802. During the years of the Swedish rule, the university was working, with some interruption, under the names of *Academia Gustaviana* and *Academia Gustavo-Carolina*. From 1710 until the events following the revolution of 1917, Estonia was a part of the Russian Empire. During this period, Germans – mainly the local landowners and clergy – continued their domination in the public spheres of the country. From its reopening in 1802, Tartu University officially operated in German until 1890; from then until 1918, Russian was the language of tuition for twenty-five years. From the beginning of the 19th century to 1820, pharmacy was taught by the professor of chemistry; from then, according to the new statutes, by the professor of chemistry and pharmacy. From 1843 a special professorship of pharmacy and institute were established. The main courses of pharmacy were taught by professor A. N. Scherer (held this post 1803-1804), D. H. Grindel (1804-1814, lectured also in 1821-1822), F. Giese (1814-1821), G. Osann (1823-1828), F. Goebel (1828-1851), E. Siller (1843-1850), C. Schmidt (1850-1852), C. Claus (1852-1864), G. Dragendorff (1864-1894) and I. Kondakov (1895-1918). By 1889, more than 1650 students had attended courses taught by the Institute of Pharmacy.

From 1804-1843, pharmaceutical courses were taught less then once a term, then twice or thrice, and from the 1860s the number of courses, taught by several people, increased to five or six a term. Pharmaceutical chemistry was taught irregularly from the beginning of the 19th century. G. Osann and F. Goebel did not use this term at all. Pharmacognosy was first taught in 1829. C. Claus started to teach both subjects during each term. Until the 1860s, a number of professors have called their principal courses simply pharmacy, adding specifications sometimes. Besides the courses mentioned above, some subsidiary subjects or special courses were taught: for instance experimental pharmacy (1830-1833, F. Goebel), first aid (1846-1849, E. Siller), volumetric analysis (from 1860, started by F. Baeckmann, continued by I. Kondakov). History of pharmacy was first taught 1867 by M. Kubli, followed by G. Dragendorff and N. Kromer. Systematic teaching of forensic chemistry began during the years of the professorship of G. Dragendorff (practical courses from 1866 and theoretical ones from 1869) and was continued by I. Kondakov and N. Kromer. A few courses in forensic chemistry were presented as early as 1850 by C. Schmidt. The 20th century introduced two new subjects – pharmaceutical bookkeeping (taught from 1903-1918 by J. R. Schindelmeiser) and analysis of provisions (1908-1914, by the same lecturer).

To deliver lectures, the lecturers used textbooks written by themselves or by others. As time passed, new books were taken into use. Most professors who taught pharmacy in Tartu University in the 19th century wrote their own textbooks. A. N. Scherer compiled several textbooks of chemistry, where pharmacy had a certain part. The textbooks by D. H. Grindel have distinct trend toward pharmacy; his aim was to describe the herbs that grew in Livonia (for instance *Grundriß der Pharmazie zu Vorlesungen*, 1806). F. Giese wrote the extensive multivolume *Lehrbuch der Pharmazie zum Gebrauche öffentlicher Vorlesungen und zur Selbstbelehrung* (1806-1811), which includes 2300 pages. He is considered to be the author of the first Russian-language textbook of chemistry. F. Goebel wrote his earliest textbook *Grundlinien der pharmazeutischen Chemie und Stöchiometrie...* in 1821, when he was younger

than 30 years. His *Handbuch der pharmazeutischen Chemie für Vorlesungen* survived three editions; the last of them appeared in 1840. A few years later, he wrote *Die Grundlehren der Pharmazie* (1843). E. Siller's textbook *Lehrbuch der Pharmacie* was published twice (1843, 1850). G. Dragendorff was the best-known professor of pharmacy in Tartu during these years; his textbooks and manuals were well known all over Europe; they were translated into Russian, French and English. They deal with analysis in forensic chemistry, effectual remedies, qualitative and quantitative analysis of plants and herbs used by different nations. His best-known book is *Die gerichtlich-chemische Ermittelung von Giften in Nahrungsmitteln, Luftgemischen, Speiseresten, Körpertheilen etc.* that appeared in four editions (^{1}1868, ^{2}1876, ^{3}1888, ^{4}1895). Dragendorff has written also another text-book of forensic chemistry – *Beiträge zur gerichtlichen Chemie einzelner organischer Gifte* (1872). He compiled some other books in this field: *Die chemische Wertbestimmung einiger starkwirkender Droguen...*(1874), *Die qualitative und quantitative Analyse von Pflanzen und Pflanzentheilen ...* (1882) and *Die Heilpflanzen der verschiedenen Völker und Zeiten* (1898). The latter describes more than 12,700 species.

The textbooks begin usually with general part. In the earlier issues, the treatment of the subject is rather general, in the following ones more concrete. The introductory part is followed by a specific one, where chemical compounds and herbs are discussed. In their structure, the textbooks closely resemble modern ones. When reading the books under discussion, we can find individual peculiarities the structure and style of the textbooks; in the course of time, the manner of presentation becomes more laconic and concentrated. Different authors treat the items with different thoroughness. On some titlepages, we find a note – for independent study; in some cases, the target group has been specified – for both learners and teachers, for students, for drug-store owners, herbalists, physicians. The connection between the textbook and the lecture course has been most clearly indicated in the 1840 edition of F. Goebel's textbook; on page 29 he makes a note: following explanations will be given orally.

The textbooks were usually written by one person; only E. Siller used the help of his colleagues – Professor of Zoology Eduard Grube and Professor of Botany Alexander v. Bunge wrote two extensive parts of Siller's book – on mineralogy and botany. G. Dragendorff definitely used the help of his colleagues and students (including master's and doctoral students), referring to their publications, dissertations included.

Tartu University also used text-books issued in Germany; among their authors we can find well-known scholars and authors Johann Bartholomäus Trommsdorff, Philipp Lorenz Geiger, Karl Damian Ritter von Schroff, August Wiggers and the future professor of Tartu University Matthias Johann Schleiden, but also some less known authors (Theodor Wilhelm Christian Martius, Adolph Strecker, Friedrich Mohr, Karl Stammer, Johann Gottlieb).

Almost all professors of chemistry and pharmacy in Tartu wrote their own textbooks, many of them several ones. At the beginning of the 20th century, study aids were also published by Lecturers Johann Robert Schindelmeiser and Viktor Skvortsov. Among the professors of chemistry, only G. Osann did not write any textbook of pharmacy; neither did C. Schmidt and C. Claus. To deliver lectures, Osann used the textbook by Johann Christoph Ebermaier; C. Schmidt and C. Claus presented their lectures, using E. Siller's textbook. Professor of pharmacy in Tartu Ivan Kondakov did not write a single textbook of pharmacy either; his research was concerned with chemistry, and he only lectured on pharmacy, having almost no publications in this field.

Writing textbooks was one of most important tasks for lecturers. This is remarkable, because in Tartu one could have used the text-books published in Germany – there was no need to translate them, as the language of tuition in

Tartu was German. Although the professors need not have bothered to write textbooks, many of them did so. Probably the individual style and habits played a certain role in this, but being the author of a text-book also was a matter of honour. The textbooks printed in Germany did not reach every student, as their price was rather high, and there were not enough textbooks in the library. We have evidence that students gathered in groups to buy the literature necessary for them. Textbooks were used not only in one higher school; the best of them were used in many universities. Some of them were translated into foreign languages. We find evidence that G. Dragendorff's textbooks of forensic chemistry were very popular, also outside Germany, as they were available in many languages. For instance, we found information that later, Johannes Gadamer, a wellknown author in Germany used G. Dragendorff's textbooks for writing his own. The textbook written by F. Goebel was also used in several universities and was sold out very soon after being published. It is certain that the textbooks of F. Giese were popular, including those published in Russian. Probably the textbooks of Siller were also appreciated, as two editions were published in a short time. The textbooks of these times needed a lot of research; this concerns especially the books of Dragendorff.

The textbooks, written by professors of chemistry and pharmacy in Tartu were not used locally only, and they gave a chance to other European universities acquaint themselves with studies and teaching in Tartu university.

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QUALITY ASSURANCE OF THE ESTONIAN HIGHER EDUCATION

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In Estonia, the main method of assuring the quality of higher education is accreditation. The main principles of carrying out the accreditation were developed by the year 1995. Accreditation is necessary for the state to acknowledge the diplomas of the institutes of higher education. The Higher Education Quality Assessment Council – HEQAC working under the Ministry of Education and Research carries out the accreditation. The HEQAC is situated in the Higher Education Accreditation Centre – HEAC. The mission of the institution is to organise the procedure of accreditation.

The concept of accreditation

The accreditation stands for periodic self-assessment of post-secondary educational institution; programme or separate unit together with an impartial external expert assessment to be convinced of achieving the goals and fulfilling the standards set by the accreditation body. The accreditation should be taken as a continuous process of evaluation with the aim to define and improve the quality and efficiency of the study process. According to the "Universities Act", the general standards of higher education are determined with the standard of education con-

forming to the acknowledged criteria. Accreditation applies to both the institutions of higher education and their curricula. The institution of higher education itself is responsible for the quality of the education as well as for assuring the quality. This also presumes accurate evaluation of the situation of the teaching process, organisation culture and administration by the institute of higher education. For applying for an accreditation, the institute of higher education has to prepare a complete report of self-evaluation and present it to the HEAC during one month.

The types of accreditation

There are two types of accreditation. Firstly, there is institutional accreditation that involves an institute of higher education as a whole or its structural unit. Secondly, there is the accreditation of curricula. In case of the first accreditation, the aim is to evaluate the organisation and administration of the institute of higher education, the efficiency and purposeful usage of the resources, and creating a thoroughly contributory environment for the student. The subject of this kind of accreditation could not be the content of the studies. Therefore, from the institutional accreditation of the institute of higher education could not be concluded if each curriculum confirms to the level acquired. On the other hand, it is a natural and necessary precondition for assuring a high-level training on the specialities taught.

In contrast, the aim of the accreditation is the content of the curriculum, accomplishing the studies and the conditions of accomplishing as well as the evaluation of teaching methods and ways of inspection deriving from it, but also the analysis of the actual knowledge and skills of the students and the level of the graduates, which proceeds from the set goals and state and international standards of level. The issuing of officially acknowledged diplomas to the graduates of accredited specialities is an important result of the accreditation of the curriculum. The accreditation of the curriculum could be carried out separately to the different levels of education of an institute of higher education. The accreditation loses its validity when changing content of the curriculum fundamentally. The accreditation is started with the schools' application to the HEQAC or the HEQAC's own application. The accreditation must be renewed after every 7 years, and in case of the conditional accreditation after the probationary period set by the HEQAC.

The main stages of accreditation

The accreditation process consists of two stages: the self-analysis carried out by the institution of higher education, and the external expert assessment. The self-analysis prepares the materials to the expert committee. The self-evaluation report has three aims:

- To stimulate the quality analyses inside the institution of higher education
- To gather and systemise the data and information concerning the quality
- To prepare the source materials to the expert committee of accreditation.

The self-analysis report must contain a survey of the mission and aims of the institute of higher education/the curriculum. The self-analysis report must give an overview of the policy, history etc. of the educational institution, entering and admitting to the school, employment and students' supporting mechanism. This is helps the external experts to understand the situation, nature and activities of the institute of higher education. The self-analysis report must include the whole membership of the institute of higher education: the teaching staff, the research fellows, the employees, the managerial staff and the students. The external expert assessment is carried out by the HEQAC. The experts that have previewed the self-analysis report of the institute of higher education visit the accredited institution. Their mission is to decide, whether

the targets and aims are in correlation with the needs of the society, and whether they are ensured with the human and financial resources of the institution, and whether the activity of the institution or the realisation the curriculum ensures achieving the goals set.

The categories of accreditation

The accreditation could have three outcomes:

Firstly "accredited", which confirms the accordance of the institution or curricula with the standards set. The accreditation decision could also contain recommendations for correcting minor shortcomings.

Secondly "conditionally accredited", which means that there are crucial shortcomings in the institute/the realisation or content of the curriculum, and that need to be corrected by all means. In case of this decision, the accreditation becomes effective for up to two years. At the end of this period, the expert committee inspects the correcting of the shortcomings and makes a suggestion for a new decision to the HEQAC. The decision could not be "conditionally accredited" anymore.

Thirdly "not accredited", which means that major shortcomings have been detected in the institute or in the curriculum and the realisation of it, which really endanger the quality of the knowledge and skills of the graduates of the institute of higher education. If the decision of the expert committee is negative and the institution has protested against it, the HEQAC carries out a supplemental expert assessment if needed. When after that the decision of the HEQAC in still negative, a suggestion will be made to the Ministry of Education and Research for liquidating the institution of curriculum or reorganising it according to the "Universities Act".

The accreditation of the curricula of the Institute of Pharmacy

The information above was the basis for the first accreditation of the pharmacy studies and doctoral studies in pharmacy in April 2001.

The Institute of Pharmacy of the University of Tartu presented the self-analysis report for the accreditation. In the report, there was a short overview of the higher education in Estonia and the enterprises related to the field of pharmacy including pharmacies of different type. The focus was on the history, structure and organisation of the studies and work of the University of Tartu, the Faculty of Medicine and the Institute of Pharmacy. The curriculum was thoroughly analysed, pointing out the changes from the year 1994. While analysing the curriculum, the higher schools of pharmacy in the European Union and elsewhere were taken as examples. The proportions of the subjects of different fields were compared, and also the proportions, the scope, the order and form of studies etc. While questioning the students, attention was paid on their opinions about the theory and practice, the auditory and independent work, the studies and their free time and the apprenticeship. As the elective courses appeared as a new part of the curriculum, it was tried to find out the students' opinions about the list, content and teaching of them. The same was also tried to find out about optional subjects. The specificity of the training of pharmacy assistants to become pharmacists at the Open University started for the first time in 2000 on the basis of the Institute of Pharmacy was explained. The doctoral studies in pharmacy were shortly characterised, the popularity of which unfortunately leaves to be desired. The Pharmaceutical Technology and Biopharmacy, and the Pharmaceutical Chemistry and Pharmacognosy were pointed out as narrower specialities.

The different forms of studies at the University of Tartu were explained: the lectures, seminars, laboratory works and the independent research and defending it at the end of the studies. An

overview was given about the assessments and examinations at the end of a course, the final examination and the scale of evaluation. Naturally, a summary was given about the teaching supplementary teaching staff, its qualification, teaching and research, and the circumstances and possibilities of conducting it.

An international expert committee (Prof. Graham Sewell, Prof. Lars Bohlin, Prof. John Lilja, and Prof. Tiiu Olm as an observer) reviewed the self-analysis report and its annexes, and visited the Institute of Pharmacy. The committee presented a summary of the results and conclusions to the Estonian Higher Education Accreditation Centre, and made a suggestion to entirely accredit the curricula.

The Joint Final Report of Accreditation is available on Internet:

(http://www.ekak.archimedes.ee/cgi/okavad/public/show_lo.py?oid=81633).

E-LEARNING METHOD AS A TOOL TO IMPROVE THE QUALITY OF PHARMACY EDUCATION

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Introduction

The undergraduate curriculum of the Faculty of Pharmacy in Cracow is under continuous revision. Academic pharmacy is in a dynamic transition towards new standards. The education has experienced significant growth through the development of new program and quality improvement.

A significant progress in education quality at the Jagiellonian University has been made due to the valuable input of the Rectors' Commission for Quality of Education. The quality of education is also ensured by the Commission for Quality of Education performing its tasks at the Faculty level.

Currently at the Faculty of Pharmacy, Jagiellonian University, the following teaching methods are used:

- presentations with multimedia enhancements
- practical classes in specialized laboratories
- seminars including issues prepared by students themselves
- multidisciplinary facultative classes
- workshops
- problem-based learning
- "play and game"
- evidence-based or case-based reasoning
- discussion panels with invited specialists

Material and methods

As a new concept, e-learning paradigm is being gradually developed and implemented into the teaching portfolio of the Faculty.

The VBoard system [1] was projected and developed to provide the multipurpose platform for e-learning and educational management at the Faculty of Pharmacy, Jagiellonian University, Cracow. This system was built with use of Open Source [2] software and its deployment bases on Linux environment providing the state-of-the-art security and scalability necessary to become a professional educational tool.

Results and discussion

The VBoard name was created as **Virtual B**oard, which is a code name displaying its primary function of being electronic surrogate of classical blackboard. VBoard system is worldwide accessible for registered users with respect to their security level. Generally there are 3 levels of users: student, lecturer, and administrator. A student is able to view materials and notes, ask for an admission for particular classes, download electronic resources accessible for a specific subject and to post messages via internal e-mail engine as well as to comment on the internal forum system. A lecturer is responsible for preparation and definition of subjects. He also prepares the timetable and electronic resources, which are uploaded into the system. Moreover, the lecturer is responsible for the management of student lists, generally via admission of the students who previously asked for it. An administrator is a supervisor who is able to modify all settings of the system

Presently, VBoard is used in the following functions:

- direct contact of lecturers with students and vice-versa
- electronic time-table and exercises schedule
- electronic didactic resources provision with respect to the copyrights and libraries' licenses
- learning progress assessment with electronic tests

To date, two departments have implemented the new system in their teaching practice: the Department of Toxicology and Department of Pharmaceutical Technology and Biopharmaceutics. An example of above implementations are electronic semester tests for the students of the 5th year. The procedure is that students are working on the faculty computers and directly answering the test questions displayed on the screen with use of a specially prepared spreadsheet. Therefore, the whole test is carried out without any paper documents. A particular student is identified by means of login and password. The exam is scored based on the previously implemented answers for the questions and electronic reports, which are generated automatically by the system. An interesting feature of the system is that questions within the exam are randomly selected from a larger set of questions. Thus, each student is given a set of questions individually and randomly generated by the system.

Seminars in biopharmacy carried out on the 5th year are another example of the VBoard application. Students are working in groups preparing a written assignment on a particular topic appointed by the lecturer. In order to allow a discussion with the lecturer about the specific issues concerning biopharmacy, workshops are also organised. The topic for the discussion is introduced to the students in advance, therefore they have the chance to review the available literature. To facilitate these tasks, each group of students has access to a specifically prepared set of papers. Electronic resources are prepared and uploaded to the system. Students are also encouraged to search bibliographic databases in order to get more resources. However, they have limited access to the licensed journals. In order to overcome these problems, students are allowed to send via VBoard or regular e-mail requests to the lecturer for literature necessary to prepare their assignments. If a particular paper or equivalent from another journal is available they are given electronic copy of it via return e-mail or using electronic resources system on the VBoard. Such procedure does not violate copyrights and allows to provide a specific knowledge requested by students. In addition, it stimulates students to learn how to search and how to use scientific papers. These skills are very useful in view of the prospective master thesis preparation. An electronic contact between students and a lecturer during biopharmacy seminars is not restricted only to the resources provision. Students are allowed to ask for specific

translations of professional terms as well as to consult partially prepared assignments. Technical assistance is also provided, especially in relation to the management of electronic resources.

Current applications of VBoard system do not cover all its features. As it was stated before, the system was projected as the e-learning system, thus providing tools for preparation and management of on-line lectures. The electronic lectures might be prepared in various technologies including text, graphics and multimedia as well as combination of the above. Moreover, VBoard enables implementing the case-based reasoning, which is in the form of set of questions and possible answers creating decision trees, where a student is able to see the consequences of his decisions and to learn about his errors made during the exercise. Live teaching on-line is for now restricted only to the text mode but it is planned to become available in the next version of the software as fully multimedia-supported system.
The VBoard-based system is working now as a nationwide postgraduate e-learning system providing the opportunity for all Polish pharmacists to learn and to gain educational points using their home computers [3-5].

Future plans include full exploration of e-learning features of VBoard. Among them virtual workgroups, on-line lecutres, workshops and e-seminars will be launched and implemented into the common educational practice.

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EXTERNAL AND INTERNAL PROCEDURES IN THE EVALUATION OF QUALITY ASSURANCE IN PHARMACY EDUCATION

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Due to the internationalisation process of higher education, the quality assurance process has become mandatory for education providers in order to face the competitiveness on higher education area.

The quality of education in Faculty of Pharmacy at Medical University of Silesia is assure by a wide range of review procedures designed to safeguard academic standards and promote learning opportunities of students. Some of these procedures are run by the University itself, whereas others involve external audit. Both internal and external procedures cooperate in the continuous improvement in the effectiveness of the teaching of students.

External contribution to quality maintenance comes largely from professional quality assurance agencies. In year 2003 the Faculty participated in the academic audit visits ran by Accreditation Commission of Medical Universities. This non-governmental body was established by Rectors' Conference of Medical Universities to create accreditation system and to guarantee quality in the educational standards. Although accreditation from this body is entirely voluntary, it is considered to be the hallmark of high quality teaching. Reviewers examined the full breadth of teaching and learning activities, including direct observations of seminars and practical laboratory courses; the methods of reviewing students' achievements; curriculum structure and aims. The review report drew up by accreditation commission under-

lined that one of the greatest achievements of our Faculty in the quality learning and teaching maintenance was the establishment of its own Academic Pharmacy, where students have their practical trainings. The lack of learning resources has been indicated as a main cause that limits the laboratory practical courses. On the basis of the final report, a plan of improvement was developed and applied in the following years.

Second external review of the Faculty of Pharmacy was mandatory and was carried out in 2005 with participation of the National Accreditation Commission. This Commission oversees quality control issues for both public and private institutions. Its task is to evaluate the quality of teaching and verify compliance of the curriculum with the requirements of academic standards. The review team examined wide range of activities that shape the learning experiences and achievements of the students. Quality review process examined:

- curriculum design and content
- quality of the methods of teaching, learning and assessment
- academic staff development
- application of learning resources (library, equipment)

The review report commented upon strong areas, suggested domains for improvement, and made recommendations for further action. Among the strong points listed in the final review report were: high quality of the teaching staff; very good students' final research projects; frequent students' publication of their research projects in the international journals of high impact. The curriculum has been found to provide good scientific knowledge and understanding of the methodological and practical skills adequate for higher education. The proportion of the different types of courses (lectures, practical laboratory courses, seminars and practical trainings) was balanced with regard to the educational goals. The strong position of clinical component in the pharmacy curriculum was also highly evaluated. The students' direct contact with patients during clinical hospital visits, realized within the course "Internal disease and pharmaceutical care" develops students' communication and clinical skills. The emphasis of clinical pharmacy orientation was also achieved by introducing course "Diagnostic aspects of the pharmaceutical care" which familiarizes students with the achievements of medical sciences in the field of laboratory diagnostics of civilization illnesses. This course dedicated to the students of the 4th year of Pharmacy, develops students' skills of critical evaluation and interpretation of data derived from laboratory measurements in the field of biochemistry, haematology, immunology, microbiology and parasitology. Furthermore, review report underlined that our Faculty has its own lecture room with modern audiovisual equipment. High appreciation obtained the small but effective local library appropriately networked, with connection to the general IT services. The weak points indicated by evaluators' were: too small seminar rooms and research laboratories and teaching model not enough orientated to students' self-directed learning.

The results of external quality evaluation were taken into account in the effectiveness of our internal quality assurance process. Internal evaluation of individual academic teachers in Poland is obligatory. The procedure for individual staff assessment is developed by University itself and is defined in the University statute. In the Faculty of Pharmacy at Medical University of Silesia, typical internal review procedure involve:

- visits by the evaluator team selected from academic staff to meet units and students
- questionnaires distributed among academic staff, assessing the data concerning their research activity and publications
- questionnaires and surveys among students concerning their opinions about

the quality of lectures, seminars and laboratory works

Academic staffs' and students' opinions are valued and the Faculty takes prompt and effective action when suggestions for improvement are made.

In our Faculty the external and internal quality assessment systems mesh together and help to achieve greater effectiveness and quality of learning.

It is important to promote improvement of quality, not just to ensure that quality is maintained at the same level. Quality assurance in pharmacy education is a continuous and complex process, which has to be periodically renewed to safeguard academic standards and promote continuous improvement of learning opportunities.

MULTIDISCIPLINARY LEARNING IN THE UK MPHARM DEGREE

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Introduction

The Government has stated its aim to increase inter-professional learning within UK health professional education.[1] In 2004 the Pharmacy Practice Research Trust funded research on teaching, learning and assessment in UK Schools of Pharmacy (SOP). The aim was to map and document current programmes in the 16 old SOPs. As part of the research, information on the use of multidisciplinary learning was collated.

Methods

The study allows comparison across three datasets: quantitative course document review, qualitative staff interview and quantitative student self completion survey. All SOPs provided a set of their undergraduate course documentation for the year 2003/4. During the 2004, semi-structured interviews were undertaken with representatives from the SOPs, usually including the Director of Studies/Programme Leader. In November 2004 a self-completion questionnaire was administered, to all current final year undergraduates (n=1847) in the 15 SOPs within Great Britain.

Results

The findings from interviews were that of the 16 established SOPs, 5 undertook multidisciplinary learning, 1 was involved in some multidisciplinary teaching and 5 undertook some teaching with other science students. In the other 5 SOPs, the whole of the pharmacy programme was delivered only to pharmacy undergraduates. These findings were supported by the documentary analysis. In general most interviewees viewed multi-disciplinary learning favourably and a number of advantages were recognised: understanding of what other health professionals can bring to the healthcare team; breaks down barriers; seeing things from a different point of view; prevents misconceptions and allows students to appreciate others strengths and weaknesses; if implemented early enough, can prevent the development of professional prejudices; can lead to interdisciplinary working. However, a number of disadvantages to the implementation of multidisciplinary learning were identified: geography; timetabling and resources (exacerbated by group sizes of pharmacy and other health professional courses like medicine and nursing); need for specialist teaching skills (students come with a variety of learning objectives from a variety of backgrounds); finance; possibility

of one profession 'dominating' sessions or being dismissive of objectives. A total of 935 student questionnaires were returned (response rate 51%). Of the respondents (n=159) from the five SOPs who offer integrated multidisciplinary learning, a majority (n=96, 60%) found the experience either very or moderately useful, although there was wide inter-school variability. Respondents (n=72) from the SOP involved in multidisciplinary teaching showed much less support for the process with only 28% of students stating that they found the experience moderately useful. All respondents (n=917) were asked whether they agree with the statement that "joint learning with other health professional students should be a requirement for all undergraduate degrees in pharmacy". Over half of the respondents (n=533, 58%) either strongly agreed or agreed with the statement.

Conclusion

Interviews with key personnel from UK SOPs shows that there is wide variability in the use of multidisciplinary learning within the MPharm course. Respondents recognised many advantages to multidisciplinary learning but there were significant logistical problems. Students' experiences were variable but overall a majority had found it valuable and this was reflected in majority support for its compulsory inclusion in pharmacy programmes. By focusing upon current examples within existing MPharm courses, successful wider implementation of multidisciplinary learning can be achieved.

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UNDERGRADUATE COMMITMENT TO PHARMACY AS A SUBJECT OF STUDY AND AS A CAREER

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Introduction

For many years there has been a debate about shortages in the UK pharmacy workforce. To inform future workforce policy, the Royal Pharmaceutical Society has initiated a census of the current practicing profession[1] and commissioned ongoing research into the motivations of the current profession. A third stream of work, funded by the Pharmacy Practice Research Trust in 2004, was a national study of the motivations of UK pharmacy undergraduates to study pharmacy and of their expectations of pharmacy as a future career. This abstract reports some of the findings of this study.

Aim

To assess the strength of first and final year undergraduate students desire to study pharmacy and to work within the profession.

Material and methods

A review of the literature and four focus groups with undergraduate pharmacy students informed the design of the questionnaire which was then piloted and amended. The self-completion survey questionnaire was distributed to all undergraduates in years 1 and 4 in thirteen of the sixteen established schools of pharmacy in the UK.

Varying methods of survey administration were employed by the schools themselves, producing an uneven response rate, which varied from 14.1% to 83.0%. The total response rate was 35.2% (n=1163) (Year 1, 35.0% (n=657); Year 4, 35.4% (n= 506)).

Results and discussion

Respondents showed a strong commitment to study pharmacy. Just over two thirds of both the first year (72.6%, n=478) and the final year students (71.1%, n=361) stated that pharmacy had been their first and only choice when they made their application for entry to university. When pharmacy was not the preferred choice, the majority of the remaining students (Year 1, n=172; Year 4, n=134) chose either medicine, first year 49.4% (n=85), final year 35.8% (n=48) or dentistry, first year 15.7% (n=27), final year 11.9% (n=16). When asked about their desire to study pharmacy at the time of starting their degree, 93.2% (n=611) of first year students and 88.0% (n=448) of final year students described this as either fairly or very strong. A similar proportion in each year (Year 1 92.0% (n=603); Year 4 87.7% (n=446)) described their desire to be a pharmacist at the time of commencing the degree to be fairly or very strong. Students were asked if they could pick a different occupation which paid the same amount, whether they would probably change degree. Only 12.1% of the first year (n=79) and 17.9% of the final year (n=91) either tended or strongly agreed. Finally, the students were asked if they could do it all over again, would they choose to study for the same profession. 85.8% of the first year (n=562) and 82.3% of the final year (n=417) either tended or strongly agreed that they would.

Conclusions

Although a sizeable number of students had not made a firm commitment to pharmacy at the point of application for their degree study, this does not translate into a reluctance to commit to pharmacy. The results from this study have indicated a high level of desire to study pharmacy at entry to the degree. Lack of a wish to have studied for a different profession and similar levels of continuation of commitment to study for the pharmacy profession from both the first and final year students indicates that demotivation reported in the pharmacy workforce[2] does not originate from undergraduate study.

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THE PHARMACEUTICAL EDUCATION IN ICELAND

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Introduction

Iceland was initially settled in the ninth century by Nordic Vikings, natives from Western-Scandinavia (mainly Norway), Scotland and Ireland. In 930 AD these immigrants established a democratic society. The national assembly, "Alþingi", had legislative and judicial power and met yearly in southwest Iceland at Þingvellir. Executive power within the government was held by the Viking chieftains. Iceland was under Norwegian rule for the next 200 years. Beginning in 1264 AD the Danes ruled until Iceland obtained its independence in 1918 and founded a democratic republic in 1944. Today

Iceland is a republic with approximately 300,000 citizens. The official language is Icelandic, spoken by all Icelanders. Iceland is one of the least densely populated countries in Europe, with only 2.8 inhabitants per square kilometer and with 65% of the population living in the capital city of Reykjavik and its surrounding municipalities. The life expectancy is 83 years for females and 79 years for males, per capital GDP is about 33,000 EUR, and the unemployment is only 2.3%.

The first Icelandic pharmacy (apótek or lyfjabúð) was established by the Danish Crown in 1760. The pharmacy was to be directed by a district physician. The first pharmacist-administered pharmacy was established in 1772. Today there are more than 400 licensed pharmacists in Iceland, almost half of which serve in bout 55 community and hospital pharmacies. Almost 40% of the pharmacists work within the pharmaceutical industry. Actavis, the largest pharmaceutical company, is headquartered in Iceland with development and manufacturing facilities in Europe, the US and Asia. It is one of the three leading generic pharmaceutical companies in the world, with 10,000 employees in over 30 countries.

The educational system

The educational system in Iceland is divided into four levels, i.e. pre-school education, compulsory education, upper secondary education and higher education. Education is mandatory for children and adolescents between the ages of six and sixteen. Upper secondary education is not compulsory, but anyone who has completed compulsory education has the right to enter a course of studies in an upper secondary school. Students are usually 16-20 years of age. General academic education is primarily organized as a four-year course leading to a matriculation examination (stúdentspróf). Higher education in Iceland is regulated by Universities Act no. 136/1997. Students entering a university are required to have passed the Icelandic matriculation examination or to have completed other equivalent education. Under the act, the Icelandic term "háskóli" is used to refer both to traditional universities and institutions which do not have research responsibilities. The law does not make a distinction between universities and nonuniversities. According to the law the Minister of Education, Science and Culture determines whether and to what extent institutions shall engage in research and the Minister is responsible for establishing rules on quality evaluation and recognition of all degrees offered. At present, there are eight higher educational institutions in Iceland but only the University of Iceland offers both undergraduate and postgraduate programs as

well as research activities in a wide area of disciplines. The others are more specialized and do not have as extensive research activities and have traditionally served mainly as teaching institutions with research on an individual rather than an institutional basis.

The University of Iceland

The University of Iceland was established in 1911 by merging three professional schools founded in the 19th century: a school of theology, a school of medicine and a law school, and adding a new faculty of humanities. Since then the institution has diversified and expanded its operations. The University of Iceland has 41 research institutes under its auspices and offers more than 160 degree programs, both at the undergraduate and graduate levels, including 19 Ph.D. programs in 11 faculties: Humanities, Economics and Business Administration, Engineering, Law, Medicine, Pharmacy, Nursing, Natural Sciences, Dentistry, Social Sciences and Theology. The total number of students is about 10,000.

The academic year lasts from the end of August to the middle of May, and it is divided into two semesters, fall semester and spring semester. In some programs a special summer semester is

held in June, July and August. Student assessment is generally based on written, oral or practical examinations, held at the end of each semester, and semester papers and assignments carried out throughout the whole course of study. If the student fails he or she can normally only repeat the exam once. The studies are divided into study credits, 30 credits corresponding to one academic year of full time studies, 15 credits corresponding to one semester of full time studies; 30 (Icelandic) credits equal 60 ECTS credits.

Pharmaceutical education in Iceland

In the beginning the pharmaceutical education consisted of a three year program leading to a B.S. degree in pharmacy (examinatus pharmaciae). To operate a pharmacy the students had to go abroad, usually to Denmark, to complete a MS degree in pharmacy (candidatus pharmaciae). In 1982 the pharmacy curriculum was expanded to a full five year program. To obtain a professional qualification certificate from the Ministry of Health a pharmacy students must undertake a total of 6 months practical training, in a community or a hospital pharmacy, during the summer semesters, and 3 months training after their graduation.

The pharmacy program follows the 3 (BS) + 2 (MS) + 3 (PhD) system (Table 1). The BS program (90 credits) consists of courses in mathematics, physics, statistics, general chemistry, organic chemistry, analytical chemistry, biochemistry, physiology, pharmacokinetics, pharmaceutics, physical pharmacy, pharmacology and medicinal chemistry, and it includes about two four-hour laboratory classes per week. About 60% of the classes offered in the BS program are thought within the Faculty of Natural Sciences. The MS program (60 credits) consists of courses in natural product chemistry, drug delivery, clinical pharmacology, medicinal chemistry, toxicology, pharmaceutical analysis, epidemiology, business and administration and, a MS research project (15 credits). Emphasis is laid on laboratory work and problem based learning. In addition, a summer course in pharmaceutical care must be completed as part of internship in a pharmacy. The PhD program (90 credits) is primarily based on independent research by a doctoral candidate under the supervision of one or more faculty members. To be admitted as a PhD student, a candidate must have a master's degree in the relevant field. Furthermore, the student must have a research agenda that fits well with that of one of the faculty members. The students are expected to take courses (equivalent to total of 15 credits) both within the University of Iceland and abroad. They are also expected to participate in the undergraduate teaching. The PhD degree is awarded to those who have successfully completed a doctorate program and defended a doctoral thesis. Currently the Faculty of Pharmacy has 11 staff members and 154 students (Table 2).

Table 1. The educational program at the Faculty of Pharmacy, cu = credits.

Pharmacy education:		
BS (90cu)	Three year general education.	
MS (60cu)	Two year special education.	Certified pharmacists.
Pharmaceutical sciences education:		
MS (60cu)	Research project (15-45cu), classes (45-15cu).	Pharmaceutical research and administration.
Doctoral education:		
PhD (90cu)	Research project (75cu), classes (15cu).	Pharmaceutical research and administration.

Table 2. The number of staff and students at the Faculty of Pharmacy.

Staff/Students	Number
Academic staff	8
Other staff	3
Research assistants	4
Visiting researchers	1
Postdoctoral students	1
PhD students	8
MS students	35
BS students	110

Research at the Faculty of Pharmacy

Research within the faculty can be divided into three major fields, i.e. 1) formulation and drug delivery, 2) medical chemistry of the Icelandic fauna, and 3) pharmaco-epidemiology and pharmacoeconomics. According to statistics from the Institute for Scientific Information (ISI) each faculty member publishes on the average 2 articles per year in international peer reviewed journals (data from 1996 to 2005). Two small innovation companies, Bio-Gel Pharmaceuticals and Oculis, are operated in close collaboration with the faculty and one pharmaceutical company, Invent Farma, operates a small pilot tablet factory on the university premises.

Quality assurance

The University of Iceland operates an internal quality evaluation system on the educational and research performance of the individual faculty members. At the end of each semester the students evaluate the teaching performance of every faculty member and the results are reported to the dean's office. In January each year the quality of research conducted by individual faculty members, faculties and research institutes is evaluated. Salaries, promotions and bonus payments to the faculty are based on these internal quality evaluations.

The Ministry of Education, Science and Culture takes the initiative in conducting an external evaluation. Such external quality control is usually performed on individual faculties of the University of Iceland every five to ten years. Frequently, foreign institutions as well as faculty members from universities in Europe are asked to perform these evaluations. In 2005 European University Association (EUA) performed such an external evaluation of the University of Iceland and currently Organization for Economic Co-operation and Development (OECD) is performing a qualitative evaluation of the Icelandic universities.

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QUALITY ASSURANCE OF PHARMACY EDUCATION IN ROMANIA

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Quality assurance is a more and more an important concern for higher education in Romania, in the context of the appearance of certain private universities with pronounced economic objectives and of the recruitment of a higher number of students in order to override difficult financial situations. As a consequence, the Romanian Agency for quality assurance in higher education was created in 2005, with the purpose the evaluate the capacity of the educational institu-

tions to satisfy the expectations of their students and the standards of quality and to propose to the Ministry of Education and Research new strategies for the improvement of quality in higher education. In the future, the access of the universities to research grants and complementary financing will depend on the degree of implementation of intra-institutional mechanisms for quality assurance. The Agency will also have the role to accredit faculties and specializations, replacing the former institution with this purpose.

In this context, academic and institutional evaluation plays an important role and the University of Medicine and Pharmacy "Iuliu Hatieganu" in Cluj-Napoca has already a tradition in the academic evaluation, based on questionnaires addressed each year to graduates and first cycle students. The objectives of the evaluations were to identify the problems in the teaching process, to define the actual level of professional instruction, to find short-term and long-term solutions and strategies and to implement a continuing academic evaluation. The questionnaires have the same format for the Faculty of Pharmacy, the Faculty of Medicine and the Faculty of Dentistry, and consist of 32 items, 26 based on a 5 points Likert scale and 6 with open answers. The questions refer to teaching staff, courses, syllabus, evaluation system and to the University in general. The results obtained in several consecutive evaluations were the basis for a serious debate concerning the educational process and served to establish a strategy for curricula reform. For example, even though the graduates don't deny the importance of basic scientific disciplines in their education, they are mostly satisfied with pharmaceutical disciplines and with practical examples related to their future activity as professionals.

In the Faculty of Pharmacy, the in-service training, with duration of six months, represents an important part of the curricula. As it resulted from the questionnaires, students also highly consider this activity as pivotal for their professional formation. In order to standardize this activity, in our faculty was elaborated a Study Guide for in-service training, resuming the most important activities in a pharmacy, with precise objectives for each activity the student has to perform and with practical applications that have to be solved. The student is evaluated based on the Evaluation form filled by the supervising pharmacist, on the solutions to the problems proposed in the Study Guide and on the interview with a Jury including not only faculty staff, but also practicing pharmacists. The supervising pharmacists are accredited each 4 years by the faculty and the professional organization (College of pharmacists) and the students also evaluate them. The system is in place for two years and not only that the students' level of satisfaction is higher, but also the quality of practical training has improved.

Although objective quality standards in Romanian pharmacy education have just recently been introduced, they should represent the main arguments in the accreditation process of the faculties and in their scaling.

STAGES IN COMMUNITY PHARMACIES: THE STUDENTS' EVALUATION

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Introduction

In order to test in a periodic way the evolution of the students carrying stages in Community Pharmacies as well as their quality, a CD has been elaborated that contains the guide of practices and also an interactive evaluation program that allows the student to carry out periodic tests.

Discussion

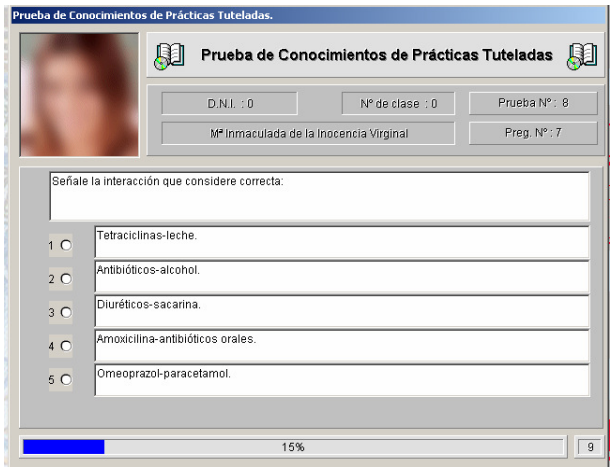
During the six months that the stages of the students in the pharmacies, the only relationship that they establish with the Faculty of Pharmacy is, occasionally, via phone to the Vice-dean of students in charge of the practices, to solve doubts or specific problems that could arise along the stage.

Given the high annual number of students carrying out the stages, it is impossible to carry out a personalised assessment of each one of the students. To be able to accomplish this, a CD that allows to periodically controlling the evolution of the knowledge of the students, has been elaborated.

Initially, the Dean of the Faculty Prof. Dr. D. Benito del Castillo carries out a presentation of the CD. Next it is included on the CD the guide of practices that the students should study (in pdf format).

In the fourth section the student can ask doubts to the Vice-dean Prof. Dr. Irene Iglesias by e-mail and the fifth, by means of a form, allows the tutors of the Pharmacies to send questions that will be included in the database.

To carry out the evaluation (third section), the student, after having been identified with the key that is assigned, should answer 50 questions, each one of them in one minute, that are randomly selected from the database of questions that at the moment consists of 894 questions that are upgraded annually.



Once the test is finished, the program assesses the student from 1 to 10 points and depending on the obtained mark, it allows them to revise their mistakes showing them the correct answer and the wrong one (grade from 7 to 10), the wrong answer only (grade from 5 to 7), the wrong question without answers (grade from 3 to 5) or it indicates them that he/she should study more and it doesn't show him anything (grade below 3).

The tests are stored on the computer and the results are saved to be sent on a monthly basis to the Faculty to check the progression of the knowledge.

To avoid continuous repetitions on the same day of the tests, one test can only be carried out twice at intervals of 6 days minimum.

STRATEGIC RESEARCH AGENDA (SRA) "INNOVATIVE MEDICINES INITIATIVE" (IMI) FOR EDUCATION AND TRAINING (E&T)

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Introduction

Europe has lost its leading place as a global centre for biomedical research. Despite a five-fold increase in the Pharmaceutical trade surplus over the last 10 years, investment in research and development (R&D) is declining markedly in comparison with the US [1]. Over the past ten years, Europe's research and development basis has gradually eroded, with new leading-edge technology research units being transferred out of Europe, mainly to the United States. Whereas R&D investments in Europe grew by 2.6 times between 1990 and 2003, the corresponding increase in the U.S. is more than fourfold. In 1990, major European research-based companies spent 73% of their worldwide R&D expenditure on the EU territory. In 1999, they spent only 59% on the EU territory. The USA was the main beneficiary of this transfer of R&D expenditure.

The Industrial Platform "Innovative Medicine" is a proposal of a Strategic Research Area (SRA) first of all in order to recuperate the advancement of US in the field of drug research.

The recommendations are organized around four main topics: improved predictivity of safety evaluation, improved predictivity of efficacy evaluation, improved knowledge management and improved education and training to develop the talent base needed for the EU biomedical environment of the future.

Analysis of the of E &T gaps

Main gaps of the actual E&T European programs are as follows.

General gaps

Need for an *integrated overview* of the entire process

Need for high *specialisation* within the natural, technical, pharmaceutical and medical sciences.

Bridging: there is a need for training of specialists who require knowledge from another scientific area than the one they graduated from.

Specific gaps

• The current organisation of universities facilitates building of "silos" where each scientific area lives its own life without much interaction with other areas. This is contributing to the fragmentation of European research (2, 3)

• In most European countries the scientific interaction between scientists in academia, industry and regulatory authorities are minimal and often the movement of intellect is unidirectional towards the industry. A situation where there is a flow of expertise between the 3 parties will facilitate share and exchange of knowledge,

• Often there is little or no interaction between clinical scientists and e.g. human biologists even they may work on the same scientific topics. This gap is critical and is yet not bridged.

The scope of the activities within Education and Training (E&T) chapter.

Main stakeholders of the program are considered Industry, Universities, Research and authorities. E&T is a separate chapter proposing:

- To establish the European Medicines Research Academy (EMRA), a pan-European platform for E & T covering the whole lifecycle of a medicine,
- to support current and future professionals involved in biomedical R&D including regulatory officers,

- to provides the basis for information on the medicines development process for stakeholders who are not directly involved in the process, e.g. journalists, venture capitalists and patients.

Top priorities of the E&T component of the InnoMed are:

1. establish the EMRA including a central coordinating unit and an advisory E&T council

2. establish programs for integrated medicines development and for ethics committees and patient organizations

3. establish programs for safety sciences, scientists within pharmaceutical R&D and pharmaceutical medicine professionals

4. establish regulatory affairs based programs

5. establish programs for bio-statisticians, bioinformaticians and biomedical informaticians

and, what was not included in the program but, since a bottleneck of drug R&D is the transfer from in vitro to in vivo, we have to consider as a priority is

6. in silico - in vitro – in vivo correlations and elaboration of predicting models.

• Scientists are urgently needed within specific areas:

- *safety scientists* with a much broader spectrum of knowledge than the

traditional toxicologist. The future safety scientist will have to integrate knowledge accumulated from many safety-relevant disciplines (e.g. primary and secondary pharmacology, functional genomics, safety pharmacology, physiology, pathophysiology, physical chemistry, animal and clinical toxicology, cellular biology, biochemistry and animal physiology with all their special branches) to excel in modern risk assessment and risk management,

- Pharmacology, non-clinical and clinical,

- Physicians specialized in *pharmaceutical medicine*,

- *Bioinformatics, biosimulation*, Knowledge Management, Systems Biology, Systems toxicology and Systems Pharmacology and physiology (in vivo whole organism) and in-silico modeling,

- Medical statistics/*Biostatisticians*,

- Medical imaging is being used more and more both in basic research and in clinical research.

• Faculties and undergraduate students are not realizing the career opportunities within biomedical R&D. Especially within e.g. Vet Medicine, Pharmacy, Biology, Medicine the focus is on the traditional career paths,

• Implementation of the Clinical trial (GCP) directive causes a need for training of regulatory personnel for GCP inspections, clinical investigators, monitors, clinical research associates.

Conclusions

Achievement of all the above objectives is need cooperation between industry, research, universities and authorities but there are some undefeatable resistances in real Europe.

First of all Council Directive of 16 September 1985 (85/432/EEC) represents the pharmaceutical education from before the war, being impossible to reform ate.

Then regulatory authorities are neglecting, or much more, are hating scientific research There is nothing in Europe similar to Center for Drug Evaluation and Research which is doubling FDA.

The fact that definition of bioequivalence is a federal law is unimaginable in Europe.

American forum: industry-FDA-universities has no correspondence in Europe.

Europeans are Dinosaurs and are condemned by their mistakes and their vanity.

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OVERVIEW OF THE STUDY PROGRAM ACCREDITATION IN LATVIA ON THE BASIS OF THE PHARMACY STUDY PROGRAM EXPERIENCE

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Introduction

The University of Latvia (LU) named at that time "The Latvia Higher School" was founded on September 28, 1919. With Latvia regaining freedom the Supreme Council of the Republic of Latvia confirmed the Constitution of the LU on September 18, 1991. Nowadays LU is the only one classical university in Latvia, providing study and research opportunities in the humanities, the natural sciences, the social sciences and medicine. Faculty of Medicine was re-established in the year 1998 whereas pharmacy study program in the faculty of Medicine was opened later in the year 2000. In the year 2005 first pharmacy master diploma holders graduated this program.

Since 1991 legislation of the higher education has been changed and soon again new laws will be accepted that will changed administrative accreditation hierarchy.

General requirements to increase the study quality

First step in the study quality evaluation is licensing of higher educational establishments to gain the rights to start the implementation of study programs. Next is accreditation of higher educational establishments. Only those higher educational establishments who have received credence (been accredited) and which offer state accredited study programs have the right to issue certificates of higher education.

Licensing of a study programs

A study program shall embrace all the requirements necessary to award an academic degree or professional qualifications through higher education. In the very beginning a study program is worked out and accepted by the faculty Study Board and approved by the faculty Dome. Then Study Board of the university organizes the independent expertise of a program, and in the case of the positive evaluation, the program is submitted for approval to the Senate. The application and other necessary documentation are submitted to the Department of the Higher Education and Science of the Ministry of Education and Science that organizes the work of the licensing commission. Necessary documentation includes the previous expertise conclusions from the university authorities, annotation of the program based on the corresponding laws and EU directives, description of the goals and evaluation according to the Latvian Republic (LR) development projects as well as comparison with the similar programs realized in the other EU countries, description of the international co-operation networks, matriculation regulations for the native and foreign students, student knowledge evaluation system and the

end examinations, the infrastructure and program realization resources: finances, existing material basis and characterization of the academic staff. As additional documentation in the supplement should be attached detailed study plan, course descriptions, *curriculum vitae* of the academic staff members, copies of the expert conclusions, support letters from the professional societies and another foreign universities where similar program is realized.

License is in the force for the 2 year period. During this period program should be accreditated.

Accreditation of a study programs

Accreditation of a study programs means quality assessment which results in awarding the study program with the status of a recognized study program. The application and other necessary documentation shall be submitted in the state language together with their translation into English or in another language acceptable for organization of foreign expertise on condition that respective permission has been granted by the Ministry of Education and Science.

Document package includes: decision of the university Senate to open or continue a program; license to start program; contract with the another institution inside university or another university which in case of the non-accreditation will take care about students; description of the study courses in the obligatory, elective obligatory and elective parts, including national credit points and ECTS credits; informative issues and advertisements about program; self-evaluation, including statements of the corresponding EU directives, national laws, professional and educational standards; written interviews of the potential employers of a graduates; goals study and research; student knowledge evaluation system (nowadays in the scores 1-10 as well as Estimated corresponding ECTS grade A-E); description of the students, the role of the student self-government, student involvement in the study process; characterization of the academic staff and their evaluation policy; financial resources; infrastructure; collaboration with the potential employers of the graduates and co-operation with another universities; students and academic staff exchange and mobility; development plan of the program.

After the acceptance of the application national Accreditation centre invites three experts (two foreign experts, one expert from Latvia) which provide expertise about the program. After that study programs are assessed by an accreditation commission formed by the Minister of Education and Science in the membership of delegated representatives of Latvian higher educational establishments, research establis-hments and those from Ministry of Education and Science; representatives from the Academy of Sciences, Council of Creative Unions, Association of Latvian Leaders of Education, Latvian Association of Doctors, Chamber of Trade and Industry and of other public organizations as well as representatives of professional associations and of branches correlating to the profile of the respective higher educational establishment.

Thus, the process of evaluation have two degrees - self-assessment and foreign expertise.

Study programs are accredited no less often than once in six years.

Pharmacy study program of LU

Pharmacist's education is harmonized by several international and national regulations in terms of content and duration to reach mutual recognition of diplomas in the EU countries. EU directives 85/432/EEC, LR law "About regulated professions and recognition of professional qualification", LR Minister Cabinet regulations state, correspondingly, content of study program and determine that diploma of higher education of pharmacist should testify to the completion of a training covering a period of five years comprising:

- at least four years of full-time theoretical and practical training in a university
- six months of in-service training in a pharmacy open to the public or in a hospital under the supervision of the pharmaceutical department of that hospital

In Latvia pharmacists after graduation of professional or academic program at university should practice three years under supervision of certificated pharmacist before he/she gets pharmacist certificate.

Pharmacy program of LU is organized at the three levels: bachelor, master and doctoral level. All programs are accreditated.

Bachelor level study program is 3 years long (120 credit points). In Latvia 1 credit point corresponds to the 40 academic hours, or 1.5 ECTS. Continuation of bachelor program is 2 years or 80 LR credit points (120 ECTS) long master degree program. Thus, whole program comprises 300 ECTS points. Bachelor thesis takes 10 credit points; master degree thesis 20, practice in the pharmacies 6 months (24 credit points).

Rest of the credit points are obtained in the theoretical courses. In a obligatory part relation of theoretical courses and laboratory training is 58 % to 42 % that corresponds to university type education. Program encloses all obligatory courses for the pharmacists education and the novel courses, like - clinical pharmacy, pharmaceutical care, new drug development strategies, proteometrics, bioinformatics, pharmacogenomics, etc. The most popular Latvian and foreign researchers are invited to supervise these courses. Some of the courses are included in E-university and are used as additional self-study tools. Latvian laws allow up to 50% of study time to use as contact hours. Thus, LU pharmacy student during 5 years gets 2982 contact hours in the theoretical courses. During bachelor, master degree thesis and practice student works 25 hours per week and 2 hours per week are planned for the paper work. After completing the required courses of study and defense of the bachelor's or master degree thesis, the student receives accordingly, the bachelor or master degree of Health Science in Pharmacy. In Latvia all science branches are divided into several groups and this classificatory group should be mentioned in the diploma whereas specific branch comes after that (e.g. pharmacy).

Since 2002/2003 all LU graduates receive diploma supplements that are worked out according to the European Commission, European Council and UNESCO/CEPES model. In the diploma supplement data about content of program and obtained results are given and educational system of the country is explained.

In general the transparency and comparability of educational outcomes are the most important goals, and accreditation serves as one of the instruments to judge the quality of the offered study program.

MODERN PHARMACY EDUCATION IN KUWAIT

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Introduction

An enormous growth and development in health care, including pharmaceutical care, and in training programs available in Middle East are a base for development and changes in all areas of pharmacy, including pharmacy education. Changes of health care system in the State of Kuwait currently taking place affect and will continue to affect future pharmacists and pharmacy education. Only continuous quality assessment and improvement can ensure high standards in pharmacy education and pharmacy practice.

Establishment of the Faculty of Pharmacy in Kuwait and basic features of the program

Kuwait University was established in 1966. Original plans for faculties of medicine, dentistry, pharmacy and allied health were part of the original plan. After 1970, several PhD students were awarded scholarships and sent abroad to undertake their studies in various biomedical and health sciences. However, the plans for establishing some of the faculties were suspended. During the mid-1980's, pharmacists in Kuwait, through their professional association, organized several campaigns to influence both Kuwait University and the Ministry of Health to establish the pharmacy program. The original proposal for the Faculty was updated to meet current trends in pharmacy education. The proposed program of the Faculty of Pharmacy was evaluated by three Colleges of Pharmacy, namely Queens University, Belfast, University of Buffalo, New York, and University of South Carolina.

In February 1996, the Faculty of Pharmacy officially became the third faculty in the Health Sciences Centre (HSC) of Kuwait University. The first students entered the program in September 1997 and graduated in June 2002. A 5-year program is offered and it leads to a Bachelor of Pharmacy (B.Pharm.) degree. The Faculty consists of 4 academic departments, namely Department of Applied Therapeutic, Pharmaceutics, Pharmaceutical Chemistry and Pharmacy Practice [1]. The current program was developed to train competent pharmacists capable of assuming their professional responsibilities in Kuwait or abroad taking into consideration the expanding role of pharmacists. Since the principal mission of the today's pharmacy profession is patient-centred pharmaceutical care, the curriculum has an increased emphasis on developing skills necessary for making clinical judgments and decisions on avoidance, initiation, maintenance and discontinuation of drug therapy while not compromising knowledge of principles of pharmaceutical chemistry and dosage form design. Communication skill in both Arabic and English are developed and students are trained in social and ethical aspects of practice as well as being introduced to management and economic facets. The practice-based placements represent an important feature of the program. These placements expose students to problems and needs of proper drug managements and dispensing activities, ward rounds and identification and resolution of patient care issues when a pharmacist is regarded as an important member of a health-care team. The program was evaluated by Accreditation Council for Pharmacy Education (USA) in February 2006.

Faculty of Pharmacy, Kuwait University today

The mission of the Faculty is to serve the needs of Kuwaiti society through education, research, and public service in all aspects of the practice of pharmacy and the pharmaceutical sciences.

Main partner for the faculty to fulfill this mission are Kuwait University and Ministry of Education and Higher Education (including HSC and its other faculties: Faculty of Medicine, Faculty of Dentistry and Faculty of Allied Health), Ministry of Health, Kuwait Pharmaceutical Association, Kuwait Pharmacy Students Association, Kuwait Institute for Medical Specialization and pharmaceutical industry, namely the private Kuwait Saudi Pharmaceutical Industries company.

The successful delivery of pharmacy education needs the following components: competent *academic staff; students; administration; resources; finances; curriculum* and an active *research.*

Academic Staff

The faculty are the main force in the design, implementation and evaluation of the educational infrastructure and processes in the program. The following is typical for the Academic Staff of Faculty of Pharmacy, Kuwait University: It is very competent and very diverse, highly committed to achieving excellence in all areas (teaching excellence is a prerequisite for promotion). The majority of Academic Staff are Assistant Professors and there is a need for more senior Academic Staff. Future faculty will be recruited from Kuwait University PhD-scholarship students that will obtain their PhD qualification in the USA or Europe. Additionally, appointment of clinically qualified academic staff is regarded as one of requirements for future development.

Students

Competencies expected of the Faculty of Pharmacy graduates in Kuwait should reflect current needs of their main future employers, which is Ministry of Health. This is reflected in ongoing discussion with ministry representatives. Consequently, Ministry of Health participates in students' placements from the early stages of our program. Pharmacy students are represented by Kuwait Pharmacy Students Association.

Administration

The Faculty administration follows Kuwait University policies and its actions are based on relevant regulations. Kuwait University as such provides support for administering some processes (i.e. payment of salaries and other allowances, contract renewals, promotions etc.). Transparency of the all processes is viewed as being essential.

Resources

Provision of quality pharmaceutical education requires ample resources. This includes excellent teachers (faculty members, teaching and scientific assistants, clinical lecturers and staff seconded by Ministry of Health), facilities, equipment, information technology (IT) and a relevant support etc., finances and other educational resources.

Faculty of Pharmacy in Kuwait has a purpose-build building and the program is being served by HSC Animal House, HSC Library, Pharmacy at the Dental Clinic, students' facilities, cafeteria, Photography Department, HSC Computer Center and HSC Shared Facility (Research).

Finances

Kuwait University is funded by government. Additional funding is also available for research projects from Kuwait Foundation for Advancement of Science (KFAS) and from Research Administration (KU). Faculty's basic annual budget is more than 255 000 Kuwaiti Dinars (KD) (> 850 000 US$; 1 KD = 3.3. US$). However, this does not include salaries, library activities and purchases, scientific missions etc.

Curriculum

The program is 5 years long and was revised once. Students are admitted to a HSC common year program and are assigned to HSC faculties after 1 year based on their preferences and academic performance. The pharmacy program was evaluated by external advisors on regular bases. At present, there is a recognized need for clinical orientation and postgraduate programs, which would be addressed in the future by introduction of a post-B.Pharm. programs/studies (Pharm.D., M.Pharm., Ph.D. etc.)

Faculty of Pharmacy, Kuwait University – vision for the future

It is accepted by the Faculty and Kuwait University that only continuous quality assessment and improvement can ensure high standards in education, particularly in pharmacy education. This is reflected in the vision for future development in the area of teaching, research and community service. The main goals are the following:

In teaching:

- To continue providing high quality education for competent professional PHARMACISTS that will benefit Kuwait society in areas of hospital, community, industrial and academic pharmacy.
- To introduce post-BPharm studies.
- To keep the educational process up to date through updating teaching methods, regular updating teaching material and curriculum and by involvement of students in research activities.
- To attract and stabilize top academic staff.
- To be a place where potential of younger colleagues can be fully developed in all areas
- To create learning environment that fosters self motivation and life-long learning.

In research:

- To produce high quality research of highest international standards for the benefit of Kuwait University and Faculty, academic staff and students.
- To make research internal part of the educational processes.

In community service:

- To participate actively towards the improvement of community health care as a center of excellence in pharmacy education by providing services and expertise to the society of Kuwait.
- To take an active role in disseminating scientific knowledge among pharmacists, other health professionals and patients (i.e. Kuwait Pharmacy Bulletin etc.).

Conclusion

Faculty of Pharmacy, Kuwait University as a contemporary institution is a place in the Middle East that follows modern trends in pharmacy education. Quality assurance is the only way ensuring the high standards in all areas of its academic life.

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REGULAR RATING OF EDUCATIONAL PROCESS BY STUDENTS AS AN INTEGRAL PART OF THE QUALITY ASSURANCE IN PHARMACY EDUCATION

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Introduction

Quality assurance and quality enhancement in the professional pharmacy education is an ongoing process certifying that a pharmacy education program meets prescribed standards and reflects progress in pharmacy-related knowledge and practice. It is widely accepted that each Faculty of Pharmacy should create and uphold a system that assesses the level to which its mission, goals, and objectives are being realized.

Methods

At the Faculty of Pharmacy (Charles University) in Hradec Králové a scheme of external and internal monitoring was established to guarantee appropriate impartial assessment of the quality of pharmacy education and its systematic perfection through a continuous and regular process of evaluating the outcomes of the educational, research, and pharmacy practice activities. Rating of the educational process by students constitutes a significant part of this scheme.

External monitoring is based on the examination of the quality of education by different expert groups or institutions such as TAIEX evaluation mission of EC, Czech Chamber of Pharmacists and/or alumni surveys with their statements and requirements concerning the structure and contents of pharmacy course. The TAIEX panel of experts from EU visited the Czech Republic in 2002 to assess the degree of compliance of existing pharmacy curriculum at Charles University with the requirements of EU. At that time the EU mission came to the conclusion that:

- current Pharmacy Curriculum at Charles University covers all compulsory subjects listed in article 2.5 of the 85/432 Directive
- overall number of direct teaching hours of the 5-year Curriculum is 3540 which fully meets demands of the EU
- the ratio of theoretical and practical direct teaching hours is only 0.40 (compare to ≥0.5 as recommended by article 2.5 of the 85/432 Directive)
- the length and timing of in-service training in pharmacies fails to meet requirements of article 2.5 of the 85/432 Directive.

A novel pharmacy curriculum accepting the incentives of EU was designed in 2002/2003. The curriculum was accredited by the Czech Ministry of Education in October 2003 for a period of 8 years. The transformed Curriculum involving introduction of the 6-month practical training in accredited pharmacies at the end of study came in full effect in the academic year 2004/2005 even though we have not considered the new system of in-service training as a step forward (we presume that a system of several practical placements of the pharmacy student in different types of pharmaceutical and health service institutions is more contributive towards the formation of the pharmaceutical profile of the graduate). The statements of the Czech Chamber of Pharmacists stressed the need of strengthening the role of patient-oriented disciplines and required reduction of certain preparatory (particularly chemical) subjects.

Another form of the evaluation of the quality of education are the conclusions of annual meetings of the administrative leaders of the Faculties of Pharmacy of Hradec Králové, Brno and Bratislava (Slovakia). These meetings are devoted especially to the discussion of current pharmacy curricula and their harmonization that would assist the students in the mobility and transfer of credits among the three Faculties.

Internal monitoring involves systematic supervision of the Heads of Departments and eventually of the Faculty management over the fulfillment of the educational aims in individual subjects and disciplines.

Results and discussion

The rating of the quality of education by students represents (together with the external and internal monitoring) an integral part of the data sources employed for the assessment of quality of education in the respective disciplines ensuring its efficient upgrading. For this purpose Education Quality Rating by Students Rules (EQRSR) were created by Charles University. Based on the EQRSR the evaluation of all compulsory and elective compulsory subjects taught in the preceding academic year is carried out in the form of an anonymous inquiry each year. The students are asked to complete an evaluation questionnaire that allows assessing of individual subjects within a scale of 1 to 5 (1 means excellent level and 5 means poorest quality) according to the following aspects:

- contribution of the subject to the overall professional knowledge,
- comprehensibility of lectures,
- accessibility and adequacy of study materials,
- contents of seminars and practical training.

The students are also encouraged to present written comments on the subject quality or on the quality of particular teachers. The evaluation of the educational process and the results of the rating are the matter of great students' interest. Typically 75 – 90% of all enrolled students take part in the evaluation. The outcomes of the assessment are publicized on the official notice board of the School as well as on the Faculty web pages.

Detailed results of the evaluation are submitted to the Heads of the individual Faculty Departments. The written comments of the students reflecting significant objections and suggestion are notably helpful as a feedback serving for possible modifications of the contents of subjects and forms of education. Subjects with the worst rating must undergo in-depth analysis; the teachers responsible for teaching such subjects are obliged to take part in a special session with the top management of the Faculty where the particular problems of the quality of education are minutely discussed. The outcomes of the rating of the education quality by students are always considered in the process of the amendment and continuous modernization of the pharmacy curriculum.

Finally it can be noted that at the Faculty of Pharmacy, Charles University, the students tend to give the best scoring to the quality of education in chemical disciplines in recent years while the social science-based and patient-oriented subjects usually receive rather adverse criticism.

ACCREDITATION OF PORTUGUESE PHARMACY DEGREES

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Introduction

The statute of the Portuguese Pharmaceutical Society (OF), officially approved by Portuguese Decree-Law 288/2001 (2001, November, 10), has established a mandatory registration examination to become a licensed pharmacist. It also establishes a professional accreditation process of university degrees in Pharmaceutical Sciences, performed by the OF according to criteria specified in its Admission Internal Rules. Students graduating from an accredited degree will be exempt from the registration examination.

Hence, faced by an explosion of new pharmacy degrees and consequently a potential for a range of heterogeneous curricula, the OF decided to implement a new admission process in order to:

- establish a comparable baseline for all its future members
- promote collaboration among academics, students and professionals in developing a dynamic and comprehensive curriculum for the future pharmacists.

Material and methods

Despite some constraints throughout the discussions, a consensus was reached, with faculties of pharmacy being not only compliant with the professional accreditation process carried out by the OF, but also committed to initiate it in May 2003. In accordance with this, the process was initiated in the academic year 2003/04 and five faculties (out of seven) have applied for accreditation of their study programmes.

Accreditation guidelines were distributed in the end of May 2003, self-evaluation studies were submitted in October 2003, on site visits were carried out in March 2004 and accreditation results became public in July 2004. In October 2004 and in September 2005, the two faculties that could not apply for accreditation in 2003 have submitted their process.

The accreditation will be periodical, once every six years, on a voluntary basis, and based on a self-evaluation report.

Important to say that OF provides accreditation to the study programmes, not to institutions.

Results and discussion

The accreditation process finishes with the presentation of a position paper which includes the recommendations for improvement of the study programme, and the recommendation for a positive or negative decision about the process. These recommendations always have in mind that the true focus of the profession is the patient, so the OF advocated that early contact with patients and real practice should be promoted during the course of the study programme.

After the first round of accreditation processes, in 2004, the Pharmacy Faculties have performed some adjustments to their study programmes in order to meet the recommendations receive from the OF, working for a future accreditation of their degrees, aiming at the continous quality improvement of the Pharmacy Education. Additionally, the OF has on its side, made an evaluation of the accreditation process and is currently revising some procedural aspects.

STRUCTURE OF PHARMACY STUDIES AT THE FACULTY OF PHARMACY, KAUNAS UNIVERSITY OF MEDICINE

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Introduction

The shift in the structure of pharmacy studies at the faculty of pharmacy, Kaunas university of medicine during last few years mainly was caused by the necessity to ensure needed conformity of the pharmacy studies at Kaunas university of medicine to the valid requirements of university education in pharmacy in European Union (EU), as Lithuania joined EU in 2004. On the other hand the performed changes in the pharmacy studies should guarantee the maintenance of the existing quality of the professional education, and give positive impact for its further improvement.

During the 1999 FIP Congress in Barcelona the Academic pharmacy section was involved in the symposium on "Evidence based pharmacy practice". The Sections programme included also a symposium on "Teaching and learning methodology in pharmacy" and a symposium on "Quality assurance in pharmacy education". The Academic pharmacy section planned to focus on how to review, assess and adjust the pharmacy curriculum towards modern pharmacy practice from different perspectives [1]. But it could be reasonable to evaluate the current pharmacy practice in each country/region for better understanding and for establishment of reliable basis in decision making concerning the future of pharmacy education in EU.

Methods

In accordance with the recommendations of the European committee on pharmacy teaching, 6 categories of studies in university education in pharmacy have been identified, and mean percentage of each category has been defined on the basis of statistical data from 16 West European countries [2]. Appropriate values of the same categories of disciplines in pharmacy education were determined in pharmacy studies at faculty of pharmacy of Kaunas university of medicine. The chemical disciplines made approximately 28,4 % of total in pharmacy studies (European values in the range 25-46 %), mathematics and physics – 3,2 % (EU 3-13 %), biology related disciplines – 16,3 % (EU 12-32 %), pharmaceutics – 12,6 % (EU 6-22 %), medicinal and clinical disciplines – 16,9 % (EU 11-30 %), social aspects of pharmacy – 13,7 % (EU 1-16 %), and disciplines specific to pharmacy teaching at Kaunas university of medicine – 8,9 % (foreign languages, philosophy). This method for comparison was chosen only for the purpose of preliminary evaluation of the structure of pharmacy studies.

Results and discussion

In general it could be concluded, that the values of specific categories are within the ranges of values appropriate categories from Western European universities. But it should be emphasised, that the ranges from these universities are relatively wide, therefore it problematic to make statement about equivalency of different categories of disciplines. Also the fraction of disciplines inside the category can vary significantly, as well as the contents of each individual discipline.

It must be also noted that the ratio of compulsory and elective courses in pharmacy studies decrease. There is more possibilities for each student to orient his/her education and to make the obtained training more individual.

The possibility free movement of work force over the territory of the present EU created the need for flexible and reliable criteria of acknowledgement of master's diploma in pharmacy taken from any EU located university. Therefore the recommendation to develop more specific criteria for quality assurance of university pharmacy studies, that could eliminate problems in work force movement on the EU territory.

The experience from participation in international programmes for students exchange between universities demonstrate significant differences in pharmacy studies in EU universities. This develops problems for student mobility as the scope of topics covered in individual disciplines and their size (credits awarded) vary, as also some discrepancies between the studies schedules exist. As a result the amount of studied disciplines in the case of student mobility increases, and this also present an obstacle in developing student mobility under various international cooperation programmes between academic institutions.

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QUALITY ASSURANCE AND ASSESSMENT METHODS IN PHARMACY EDUCATION

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Introduction

Quality assurance in higher education is one of the priority areas addressed in the Bologna Process. It is aimed that the targets of the Bologna Process are achieved by the signatory universities by 2010. Quality assurance processes have already been started at the University of Malta for all the faculties and last year an external review of the different faculties was carried out.

In pharmacy education quality assurance is intended to demonstrate that the educational programme is preparing the graduate for contemporary needs and that the graduate has acquired the necessary skills to practice and to apply knowledge in the development and manufacturing of medicines and in the provision of clinical pharmacy services. A review of the assessment methods adopted in pharmacy education may be used to assure that the pharmacy curriculum is designed in such a way as to prepare and assess the students so that they acquire the expected skills and standards.

Methods

At the department of pharmacy of the University of Malta, a structure for assessment methods is being developed across the different disciplines. It is aimed that this produces harmonisation between marking schemes across the dif-

ferent disciplines and also helps the student to assimilate the material in a seamless inter-related manner.

During the first four years of pharmacy education, students follow a modular system of 60 ECTS each year. The assessment methods for the different modules are mostly based on created response questions. Assessment methods based on created response questions were found to be very useful in such formative assessments since they provide an opportunity for the students to demonstrate their writing skills and also their skills in organising knowledge and concepts. This method of assessment is adopted in the different disciplines including pharmaceutical chemistry, pharmacy practice, and pharmaceutics. In addition meetings are organised between module co-ordinators for the different disciplines so that the curriculum and hence the assessments are organised in a collaborative manner. Hence students are following modules on the chemical, pharmacological and pharmacotherapeutic aspects of the different drugs in parallel.

In this context the educational programme is providing the basic principles in the different disciplines and the assessment methods are intended to evaluate that the students have acquired an in-depth knowledge of the various disciplines as well as an ability to apply this knowledge to practice.

In the fifth and final year of the pharmacy undergraduate course, pharmacy students are exposed to a comprehensive approach through a practice-oriented experiential learning process. The final examination is a comprehensive assessment which although it tackles the practice aspects is based on the students' ability to apply basic principles of pharmaceutical chemistry, pharmacology, pharmaceutics, mathematical skills and clinical skills to drug development and drug use. This comprehensive examination consists of selected response questions. The advantages of adopting this method of assessment are: 1) the elimination of assessors' scoring bias, 2) more material can be covered than in an examination based on created response questions where students take more time to write and complete the answer, 3) ability to measure knowledge on the material as well as skills in applying knowledge.

In a comprehensive approach the educational programme is providing the students with the required ability to assimilate knowledge acquired from the different disciplines and apply it to the area of practice whether this is in the development and manufacturing of medicines or in drug information, pharmacovigilance and regulatory affairs or in clinical practice. The assessment methods should be able to evaluate this capability as a measure of the efficiency of the educational programme.

Discussion

The quality assurance process should ensure that the assessment methods are reliable, in that consistent and reproducible results can be obtained, and valid in that they produce meaningful results. The assessment process should fairly reflect the students' knowledge and should be capable of classifying the students according to their abilities in an unbiased manner. The quality assurance process could include a review of the assessment methods to consider the layout of the assessment document, the development for each question of a model answer and a scoring plan, and the inter-exchange of assessment questions between examiners to include an external perception to the questions.

Assessment methods in pharmacy education should be evaluating students' knowledge in the different disciplines as well as the ability of the student to assimilate the scientific background and apply it to professional services.

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SUGGESTIONS FOR CHANGE IN THE SOCIAL PHARMACY SYLLABUS AT THE INSTITUTE OF PHARMACY, UNIVERSITY OF TARTU, ESTONIA

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Introduction

Social pharmacy was introduced into the curriculum at the Institute of Pharmacy, University of Tartu, in 1993. Today it is a mandatory course with 4,5 ECTS (credit points) and consists of lectures and seminars. The syllabus concentrates on the following issues: the profession role of the pharmacist, collaboration with other health care professionals, pharmaceutical care, empathy and compliance, drug communications, drug information and medical ethics. A second course related to social pharmacy and entitled "Research seminars in social pharmacy" (3 ECTS) is designed for students writing their final paper on a topic connected with the general area of social pharmacy. In 2003 an elective course "Social pharmacy in professional literature and in the Internet" (1,5 ECTS) was added. In this course students learn how to find and evaluate professional sources of information.

Social pharmacy describes different aspects of the pharmacy profession. It is involved in identifying new challenges in pharmacy practice. It can not be taught in the same way in every country. What is contained within the social pharmacy syllabus must reflect the political and professional situation of pharmacists in their own country. During the last few years ways of making social pharmacy more relevant and beneficial have been sought. The results of several studies (1, 2, 3, 4) were used to identify the opinions of different social groups about what should be the role of pharmacists in Estonia. Both physicians and pharmacy customers see the pharmacist as a drug specialist. Pharmacy customers have stressed the need for pharmacists to have good communication skills. At the same time both these groups said that pharmacists should be more willing to provide an information service to their customers, e.g., to encourage customers to ask questions.

In planning a social pharmacy course the following characteristics are regarded as important:

- an effective teaching and learning format (for students the most effective study method is the seminar which allows them to participate more effectively than in lectures)
- the supplementing of theory with practical examples
- up-to-date lectures with results from recent studies, both local and international
- emphasis on the application of theoretical knowledge to the practice situation. The current abstract describes one way of doing this.

Methods

In 2005 fifth year pharmacy students (n=38) started to document drug communications which took place during their period of pharmacy practice (Sept. 2005…February 2006). They were asked to record ten prescription drug interventions, five self-medication and five OTC drug events. In addition there were asked two general questions. The first of these involved them in assessing the expectations of customers as regards the drug information the customers expected from the pharmacy. The second question required the students to evalu-

ate the usefulness of their theoretical social pharmacy studies in the practice situation.

The students described a total of 380 prescription drug cases, 190 self-medication and 190 OTC drug incidents. 25 of the students gave answer to the general questions. A pro-forma for recording these events was given to the students based on the findings of a similar study (5).

All described cases were arranged in groups by content, coded and analysed by SPSS 10,0.

Results and discussion

In general the pharmacy students provide good descriptions of the counselling processes they witnessed. Their self-evaluation of the cases was clearly genuine. However, in some of their reports it is not clear whether the counselling of the customer was carried out by the student or by the supervising pharmacist. 32% of the students mentioned the importance of the role of the supervising pharmacist, particularly in problematic situations.

Counselling: prescription drugs

Most of the pharmacy customers (62%) were provided with information about the administration and use of their medicines. In 25% of the contacts pharmacy students clarified questions about generic prescribing and in 17% about the reimbursement system of drug prices. Discussions about the side effects of the medicines were initiated equally by the pharmacy customers (15%) and by the pharmacy students (13%). Drug interactions were mentioned in 7% of the cases.

Having to wait to talk to the pharmacist (7%), the lack of privacy (8%) and insufficient practical experience (11%) were the most common problems described.

Counselling: self-medication

Pharmacy customers were questioned about their health problems. An appropriate drug was found and counselling given, mostly about administration, in 67% of the cases. Information about some minor illness or OTC medicine without selling any preparation took place in 9% of the contacts. In 11% of the cases students having talked to the customer recommended that a physician be seen.

Counselling: OTC medicines

In almost half of the cases (47%) when pharmacy customers asked about certain preparations they did not know whether this medicine was the most appropriate for their condition. Despite 58% of the customers involved in the OTC cases saying that drug price was important, advice from the pharmacy students helped determine the final choice after considering the needs of the patient, drug efficacy and the price of the medicine. Information about OTC medicines without a resulting sale was given in 22% of the cases.

Many students stressed their limited experience and knowledge in advising about different OTC products and food additives.

General questions

Students had different opinions concerning the expectations of pharmacy customers towards drug information from the pharmacy. 38% said that customers did not want information or were unable to ask for it from the pharmacy, 23% had a different opinion to the pharmacist and 27% were interested mainly in price of the drug or simply asked “Does this medicine help?” 46% of the students said pharmacy customers were more interested in information about OTC medicines and 44% pointed out that in when it came to prescription drugs pharmacy customers were mainly interested only in administration and indications. 23% found that interest in the side effects and interactions of medicines was small.

According to the students the most important theoretical knowledge obtained from their social pharmacy course was effective communication skills (98%). 31% tried in their practice to use principles of pharmaceutical care and empathy. 23% communicated with other health care professionals (mostly physicians) on an equal footing. Some of students asked patients to come back to the pharmacy if problems continued.

Great changes have been taken place in Estonia after independence 15 years ago. The pressure of an embryonic capitalistic economy has extended to pharmacy. Social pharmacy is one of the pharmacy disciplines responsible for maintaining the principles of the profession.

The initial results from this survey show that putting the theoretical social pharmacy knowledge in a practical context is one way of maintaining the profession's identity. According to the self-evaluation reports the students acted during their pharmacy practice professionally and ethically. To some extent it was a surprise to find different opinions about their customers. Obviously this could be explained by the fact that they all saw different customers. But, on the other hand, pharmacy customers could be reflecting experiences they have had from previous contacts in pharmacy. If pharmacy customers are not used to receiving counselling from the pharmacy, they can not expect this kind of behaviour in the future.

According to the initial results the following changes should be considered in a social pharmacy syllabus:

- to make more apparent the connections between social pharmacy and pharmacy organizations in order that students are better prepared to inform customers about changes in pharmacy law
- to make more apparent the connections between social pharmacy and pharmacotherapy in order that students are better prepared to discuss with customers the side effects and interactions of medicines
- to use methods more relevant to the practice situation and patients, e.g., case studies, role playing, in the teaching of communication skills
- to encourage students to consider the outcomes of drug therapy, e.g., the risk of adverse reactions, contra-indications, absence of response, in their pharmacy practice
- to continue the current study and improve the methodology, e.g., feedback from the supervising pharmacist, a simulated patient study to evaluate the professional and communication skills of students.

References

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